UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
PROGRAM PLANNING AND INTEGRATION
Silver Spring, Maryland 20910

JUN 9 2010

Dear Reviewer:

In accordance with provisions of the National Environmental Policy Act (NEPA), we enclose for your review the Final Environmental Impact Statement (FEIS) for Rationalization of the Pacific Coast Groundfish Limited Entry Trawl Fishery.

This FEIS is prepared pursuant to the National Environmental Policy Act to assess the environmental impacts associated with NOAA proceeding with a program to rationalize the limited entry trawl fleet for groundfish off the U.S. west coast (Washington, Oregon, and California). The trawl rationalization program, Amendment 20 to the Pacific Coast Groundfish Fishery Management Plan, would be a limited access privilege program (LAPP) under the Magnuson-Stevens Fishery Conservation and Management Act (MSA), 16 U.S.C. §§1851-1891d, as reauthorized in 2007. It would consist of: (1) an individual fishing quota (IFQ) program for the shore-based trawl fleet; and, (2) cooperative (co-op) programs for the at-sea trawl fleet. The trawl rationalization program is intended to increase net economic benefits, create individual economic stability, provide full utilization of the trawl sector allocation, consider environmental impacts, and achieve individual accountability of catch and bycatch.

Additional copies of the FEIS may be obtained from the Responsible Program Official identified below. The document is also accessible electronically through the Pacific Fishery Management Council's website at www.pcouncil.org.

Written comments should be submitted through mail, facsimile (fax), or email to the Responsible Program Official identified below. Written comments submitted during the agency's 30-day public comment period must be received by **July 26, 2010**. When submitting fax or email comments include the following document identifier in the comment subject line: **Trawl Rationalization FEIS**.

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Sincerely,

for Paul N. Doremus, Ph.D.
NOAA NEPA Coordinator

Enclosure

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RATIONALIZATION OF THE PACIFIC COAST GROUNDFISH LIMITED ENTRY TRAWL FISHERY

FINAL ENVIRONMENTAL IMPACT STATEMENT

INCLUDING REGULATORY IMPACT REVIEW AND INITIAL REGULATORY FLEXIBILITY ANALYSIS

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EXECUTIVE SUMMARY

The Pacific Fishery Management Council (Council) proposes changes to its *Pacific Coast Groundfish Fishery Management Plan* (groundfish FMP) to rationalize Federal management of the Pacific Coast groundfish trawl fishery. This would be accomplished by implementing a limited access privilege (LAP) program and modifying the approach to controlling bycatch of Pacific halibut in the groundfish trawl fishery.[1] LAPs are a form of output control whereby an individual fisherman, community, or other entity is granted the privilege to catch a specified portion of the total allowable catch (TAC). The proposed action (termed "trawl rationalization") is intended, among other things, to increase economic efficiency within the Pacific coast groundfish trawl fishery and reduce the incidental catch of overfished groundfish and possibly Pacific halibut (often referred to as bycatch and defined as fish that are not kept or sold and are discarded, usually at sea).[2] Implementing the action will involve both changes to the management framework in the FMP and promulgation of implementing regulations.

The Council is one of eight regional fishery management councils established by the Magnuson-Stevens Fishery Conservation and Management Act (MSA), the principal legal basis for fishery management within the Exclusive Economic Zone (EEZ), which extends from the outer boundary of the territorial sea to a distance of 200 nautical miles from shore. The Council is responsible for Federal fisheries off of Washington, Oregon, and California.

ES.1 The Proposed Action and Why it is Needed

The proposed action is to create a management regime under which the owners of Pacific Coast groundfish fishery limited entry (LE) permits with trawl endorsements are more individually accountable for catch of target and nontarget species harvested by the vessels to which that their permits are registered. As originally framed, this action focused on the more general concept of dedicated

[1] Limited Access privilege is defined in MSA §3(26)(A). "The term limited access privilege means a Federal permit, issued as part of limited access system under section 303A to harvest a quantity of fish expressed by a unit or units representing a portion of the total allocable catch of the fishery that may be received or held for exclusive use by a person. . . ."

[2] Rationalization has a general connotation in economics and sociology as the practical application of knowledge to achieve a desired end. It is intended to increase efficiency or flexibility through the standardization of practices and workflow. In the context of the proposed action, the term is meant to encompass a variety of measures intended to improve the management of groundfish resources, in part by improving the economic efficiency of the fishery. Economic efficiency, in turn, is defined in various ways, but generally refers to a condition where no one can be made better off without making someone else worse off, outputs are maximized for a given level of inputs, and production is at its lowest cost.

access privileges (DAP), now more commonly referred to as LAPs. However, as the Council developed the range of alternatives, other methods to achieve the goals and objectives listed above were considered. The current range of alternatives includes individual fishing quotas (IFQs) and a framework for mandatory fishing vessel cooperatives as the primary catch control tools for selected sectors of the groundfish trawl fishery.[3] Because of these changes, beginning in 2006, the developing program has been referred to with the more general term "trawl rationalization" to capture the social and economic objectives that are also expected to have substantial conservation benefits, for example by reducing bycatch.

Despite a program completed in 2003 to reduce fishing capacity through the buy back of groundfish LE permits and associated vessels, management of the west coast LE groundfish trawl fishery is still marked by biological, social, and economic concerns, similar to those cited in the U.S. Commission on Ocean Policy's 2004 report (2004). The trawl fishery is currently viewed as economically unsustainable.

One major source of concern stems from the management of bycatch, particularly of overfished species.[4] Over the past several years, the Council's groundfish management efforts have focused on drafting rebuilding plans for overfished species, minimizing bycatch, and specific management of overfished species. The trawl rationalization program is expected to provide individual fishery participants more flexibility and more individual accountability for their impact on overfished species, other groundfish species, and possibly Pacific halibut.

The two approaches considered for rationalizing the fishery—harvest cooperatives or IFQs—although structurally different, are intended to fulfill the following goal:

Goal

> *Create and implement a capacity rationalization plan that increases net economic benefits, creates individual economic stability, provides for full utilization of the trawl sector allocation, considers environmental impacts, and achieves individual accountability of catch and bycatch.*

Objectives

The above goal is supported by the following objectives:

1. Provide a mechanism for total catch accounting.
2. Provide for a viable, profitable, and efficient groundfish fishery.
3. Promote practices that reduce bycatch, discard mortality, and minimize ecological impacts.
4. Increase operational flexibility.
5. Minimize adverse effects from an IFQ program on fishing communities and other fisheries to the extent practical.
6. Promote measurable economic and employment benefits through the seafood catching, processing, distribution elements, and support sectors of the industry.
7. Provide quality product for the consumer.
8. Increase safety in the fishery.

[3] In the multispecies groundfish fishery sectors are differentiated by target species, gear type, and management structure. The characteristics of these sectors are described in the next section.

[4] Bycatch is defined in the MSA as "fish which are harvested in a fishery, but which are not sold or kept for personal use, and includes economic discards and regulatory discards."

ES.2 The Groundfish Fishery

The groundfish fishery as a whole comprises several different sectors, defined by fishing gear, species targeted, and regulatory context. These sectors are discussed further below. The list of current trawl target species includes flatfish, roundfish, thornyheads, and a few species of rockfish. Primary flatfish target species include petrale sole and Dover sole. Roundfish target species include Pacific whiting, Pacific cod, and sablefish. Some rockfish species, especially Pacific ocean perch and widow rockfish, were important trawl targets until the mid 1990s. However, seven rockfish species are currently declared overfished pursuant to the MSA. The need to rebuild these stocks to a healthy size has led to a variety of harvest constraints on groundfish fisheries, and rockfish are generally no longer a target of these fisheries.

As noted above, the groundfish trawl fishery is subject to a Federal license limitation program (referred to as LE), implemented in 1992; currently there are 178 extant groundfish LE trawl permits. (Groundfish fixed-gear fisheries—using longline and pot gear—are managed under a complimentary LE program. Some targeting of groundfish is allowed without an LE permit; these vessels comprise the "open access" sector.) The LE trawl fishery is divided into two broad sectors: a multi-species trawl fishery, which most often uses bottom trawl gear (hereafter called the nonwhiting sector), and the whiting fishery, which uses midwater trawl gear. The nonwhiting trawl fishery is principally managed through two-month cumulative trip limit periods along with closed areas to limit overfished species bycatch.[5] Nonwhiting trawlers target the range of species described above with the exception of Pacific whiting.[6]

The Pacific whiting fishery almost exclusively catches that species, using midwater trawl gear, although co-occurring overfished species are also caught. The whiting fishery is further subdivided into three components. The shore-based fishery delivers its catch to processing facilities on land, and the vessels are similar in size and configuration (with the exception of the type of net used) to the nonwhiting fishery. In the mothership sector, catcher vessels deliver to floating processors called motherships. The catcher-processor sector comprises vessels that both catch Pacific whiting and process it on board.

In terms of the types of trawl rationalization measures that would be applied, these four sectors—nonwhiting trawl, shoreside whiting, motherships, and catcher processors—are considered separately.

ES.3 Alternatives Considered by the Council

The Council considered four basic alternatives for implementing the trawl rationalization program. These are as follows:

- Alternative 1: Status quo management (no action alternative)
- Alternative 2: IFQs for all groundfish trawl sectors
- Alternative 3: IFQs for the nonwhiting sector and cooperatives for all whiting sectors
- Alternative 4: IFQs for a single shore-based sector and co-ops for the whiting at-sea sectors

As part of the impact analysis in this environmental impact statement (EIS), which supported Council decisionmaking, variations on some alternatives were developed to contrast key program features,

[5] The nonwhiting fishery currently uses bottom trawl gear exclusively. In the past, however, fisheries have targeted widow rockfish and other rockfish species with midwater gear. Due to the need to limit catches of overfished species, these fisheries have been closed. Once overfished species stocks are rebuilt, these fisheries could reopen.

[6] Nonwhiting vessels are allowed to land up to 20,000 pounds (lb) of whiting per trip, which could motivate some limited targeting of whiting by these vessels.

which are sub-alternatives denoted by a letter suffix. These are Alternatives 2a, 2b, and 2c and Alternatives 4a and 4b. Alternatives 1 and 3 do not contain sub-alternatives. Alternative 4b is the preferred alternative. With these variations included, six alternatives are evaluated in Chapter 4 of this EIS. The four basic alternatives are summarized below. Where sub-alternatives were developed, differences between them are noted in the description of the four basic alternatives.

The trawl rationalization program the Council developed is complex, with a large number of specific program elements. For example, in developing the IFQ component of the program, the Council considered 26 different program elements. A similar number of program elements were considered for whiting co-ops. Many of these elements do not vary across the alternatives. The analysis in Chapter 4 of this EIS analyzes the overall impact of alternative programs, while Appendix A and Appendix B evaluate the performance and effect of each program element.

ES.3.1 Alternative 1: Status Quo Management

Under this alternative, most of the elements of the current management regime for the groundfish LE trawl fishery would remain in place.

Every 2 years, the Council establishes harvest limits, called optimum yield (OY), for various species or groups of species.[7] OYs represent an annual quantity of fish that the groundfish fishery as a whole may catch. A few species, such as Pacific whiting and sablefish, have fixed trawl allocations. The FMP defines other allocations between different gears, which, in addition to the whiting and nonwhiting trawl fisheries, include LE fixed-gear, the open access sector, and recreational fisheries in each state. Other allocations are determined through the biennial process to specify harvest limits (ABCs, OYs, and harvest guidelines) and management measures. The need to rebuild the seven currently overfished rockfish species means that the OYs for these species are relatively low compared to target species OYs. Due to the multi-species nature of the fishery, these low OYs affect all aspects of groundfish management. Principal management measures for nonwhiting trawl fisheries are as follows:

- Trip limit periods. Two-month cumulative trip limit periods are the primary catch control tool.
- Gear restrictions. Gear restrictions focus on discouraging or prohibiting gear that may be used in rocky habitat, where some overfished species occur. The use of bycatch-reducing trawl nets has also been required in some areas.
- Rockfish conservation areas. Closed areas were first implemented in 2003 to keep vessels away from depth ranges where overfished species are more abundant. These closed areas, called Rockfish Conservation Areas (RCAs) are a coastwide feature of management.
- Essential fish habitat (EFH) conservation areas. These are a set of closed areas to protect bottom habitat from the adverse effects of trawl gear.

Each sector of the Pacific whiting fishery receives an annual allocation, and the fishery is managed under a primary season structure where vessels harvest Pacific whiting until the sector allocation is reached, and the fishery is closed. This is different from the cumulative trip limits used to manage the nonwhiting trawl fisheries. Incidental catch of nonwhiting groundfish species in the Pacific whiting fishery, however, is managed under the trip limit structure. Season start dates for each whiting sector are set by regulation, and each sector's fishery proceeds until the whiting quota is reached or the fishery is closed.

[7] Under new rules in the MSA, the method for determining these harvest limits may change, and they may be referred to as annual catch limits (ACLs) by the time the trawl rationalization program is implemented.

To allow the Pacific whiting industry to have the opportunity to harvest the full Pacific whiting OY, the nontribal commercial fishery is managed with whiting sector specific bycatch limits for certain overfished species. To date, bycatch limits have been established for darkblotched, canary, and widow rockfish. Regulations provide for the automatic closure of the commercial (nontribal) portion of the Pacific whiting fishery upon attainment of a bycatch limit. This is different from the nonwhiting trawl fishery where harvest availability of target species is often constrained by the projected catch of overfished species.

Incidental take of endangered or threatened salmon runs is another concern for the Pacific whiting fishery. Chinook is the salmon species most likely to be affected because of the spatial/temporal overlap between the Pacific whiting fishery and the distribution of Chinook salmon that could result in incidental take of listed salmon. The season start dates are, in part, meant to prohibit fishing when listed Chinook salmon are most likely to be taken incidentally. National Marine Fisheries Service (NMFS) also has the option of closing inshore areas to fishing if too many salmon are caught.

To improve bycatch accounting in the nonwhiting trawl fishery, NMFS implemented the West Coast Groundfish Observer Program (WCGOP) in 2002 for vessels that harvest catch and land the catch on shore. Currently less than 25 percent of nonwhiting trawl fishing trips is monitored by the WCGOP. The primary purpose of the observer coverage is to provide data that can be used to derive catch ratios of nontarget species. Using observer, fish ticket, and logbook data, the fishery is modeled to derive estimates of total catch by species. Due to the delayed availability of fish ticket and logbook data and the time needed to process observer data, the final analysis of estimated total catch by species typically is not finalized until well over 1 year after the fishing year has ended. The At-Sea Hake Observer Program (whiting mothership and catcher-processor sectors) is a seasonal program where the operational costs are shared by NMFS and the vessel owners. Observers are placed on all processing vessels.

ES.3.2 Alternative 2: IFQs for All Groundfish Trawl Sectors

Catch Control Tool

Under this alternative, all groundfish trawl sectors (both whiting and nonwhiting) would be managed with IFQs, which would replace the current two-month cumulative trip limit periods in the nonwhiting fishery and season/quota-based management in the whiting fishery as the primary catch control tool. Three sub-alternatives are evaluated under this alternative (Alternative 2a, 2b, and 2c) to compare and contrast certain key elements of the IFQ program.

Initial Allocation of IFQ and Qualification

At the start of the program quota shares (QSs) must be initially allocated to fishery participants based on catch/processing history during a catch history qualification period, 1994 to 2003. Thereafter, shareholders are free to buy and sell the QSs thus distributed.[8] QSs represent a proportion, or percent, of the TAC (OY) of different groundfish stocks. Each year, these shares are converted from a percent to a quantity by issuing quota pounds (QPs) based on the OYs/ACLs established for the year. The amount of groundfish caught by an LE trawl vessel, even if it is subsequently discarded, must be matched by an

[8] The Council considered issuing QSs for a fixed time period, after which all or a portion of the QSs would be periodically reallocated. Although a fixed duration is not part of this alternative, the MSA restricts the duration of a fishing privilege to 10 years, and specifies conditions for automatic renewal.

equivalent quantity of QPs.[9] The QPs are expended in this way, with the matched amount deducted from the vessel's account. Both QSs and QPs are perfectly divisible and tradable.

QSs would be of long duration, so a transfer represents a long-term or permanent divestment. In contrast, QPs must be used within the year for which they are issued (although there is a provision for limited carry-over of unused QPs from one year to the next or QPs issued in the following year to be used in the current year), so QP transfer would not represent a permanent divestment of the harvest privilege, so long as one continues to control the underlying QSs. QS transfers would be prohibited in the first two years of the program so that transfers would only occur once participants fully understand how the program operates, and stable prices have been reached. QPs would still be fully transferable during the first two years.

Eligibility to own QSs/QPs would be defined very broadly; the main requirements are a U.S. citizen must be the owner, and a U.S. documented fishing vessel registered to a groundfish LE trawl permit must be used to harvest groundfish using QPs.[10]

Number of Sectors

Three sectors would be established whereby the two current whiting and nonwhiting shore-based sectors would be combined into a single sector. Participants in this single sector would be free to trade IFQ (QSs or QPs), eliminating any regulatory barrier between targeting whiting and nonwhiting (operational differences among participants may mean that a large degree of specialization in targeting could continue). The whiting mothership and catcher-processor sectors would each be managed separately with their own allocations of catch opportunity and IFQ. IFQ could not be traded among the three sectors.

Accumulation Limits and Grandfather Clause

The maximum number of QSs and QPs an entity may control would be limited, with these limits varying according to the management unit (stock or stock complex). QS limits restrict the amount an individual or entity may control through ownership or other means. QP limits refer to the maximum amount that may be assigned to any one vessel during a given year to cover catch. These vessel limits are twice the control limits to allow several QS holders to work together on a single vessel. These limits are intended to restrict the consolidation of quota holdings by just a few entities. Table ES-1 summarizes control and vessel limits under the alternatives. This alternative contains a grandfather clause under which initial recipients of QSs who exceed the accumulation limits would be allowed to possess excess QSs up to the amount initially allocated to them.

Initial Allocation of IFQ to Processors

Under Alternatives 2a and 2b, all of the initial allocation of QSs would go to LE permit holders (harvesters). Under Alternative 2c, shore-based processors would receive 25 percent of the initial allocation of nongroundfish species and 50 percent of the allocation of whiting QSs, and mothership

[9] QSs/QPs would not be required to cover catch by LE permit holders in a few special circumstances: if they are fishing under an LE fixed-gear permit and using that gear type on their vessel, or if they are using trawl gear in a nongroundfish fishery, such as a shrimp trawl fishery (these nongroundfish trawl fisheries incidentally catch some groundfish).

[10] Currently, LE permits include a length endorsement that defines the maximum size of vessel that may be registered to the permit. Permits may be combined to achieve a length endorsement for a larger vessel. The length endorsement would be suspended under the IFQ program.

processors would receive 50 percent of the initial allocation of whiting QSs based on their processing history during a qualification period. Catcher-processors both harvest and process fish. For the purposes of initial allocation, they would be considered harvesters.

Species Covered by IFQ

QSs/QPs would be issued for all of the current groundfish management units. Management units are fish stocks, or complexes comprising co-occurring or related stocks, for which an OY (annual catch limit [ACL]) is established. Table ES-2 shows the management units for which IFQ would be established.[11] Procedures would be established to reallocate QSs when management units are changed or new ones are added.

Alternative 2 also includes an individual bycatch quota (IBQ) for Pacific halibut. Although functionally equivalent to the IFQ system applied to other species, Pacific halibut are a prohibited species in the groundfish trawl fishery and cannot be retained. Therefore, although accounted for through the IBQ, all halibut must be discarded.

Adaptive Management

Under Alternative 2b each year up to 10 percent of the QSs that would otherwise be distributed to eligible recipients would be set aside for an adaptive management program (AMP). This program is meant to address a variety of objectives, ranging from socioeconomic dislocation resulting from implementation of the trawl rationalization program to encouraging innovative fishing methods, for example to reduce bycatch. The Council would decide how much QP would be set aside every two years for adaptive management use as part of the biennial harvest specifications process. The harvest specifications process establishes OYs/ACLs for a two-year period and adjusts management measures so that catches will not exceed these limits.

Area Management

Under Alternative 2, no separate QSs would be created for different latitudinal areas. Area-specific QS is considered under other alternatives because this could prevent substantial geographic redistribution of QS holdings and related impacts to communities. Some stocks are currently managed geographically with separate OYs established for each component; for those stocks, QSs/QPs would be denominated accordingly.

Carryover of Unused QPs between Consecutive Years

Under Alternative 2, unused QPs amounting to 10 percent of the used and unused QPs in the vessel account may be carried over for use in the next year. Similarly, to cover an overage (landings that exceed the amount of QPs held in a vessel account) QPs that may be allocated in the next year may be transferred to the current year, up to 10 percent of the used and unused QPs in the vessel account during the current year.

[11] Under Alternative 4b (the preferred alternative), IFQ would not be used as the catch control tool for selected management units, as noted in Table ES-1. Under Alternative 2, these management units would be managed with IFQ.

Tracking and Monitoring

All vessels would be required to carry at-sea observers to monitor sorting and discarding of the catch and shoreside landings. There would also have to be an electronic system to report bycatch and landings, which may be integrated with the current state fish ticket (landings reporting) system. Plant monitors would be employed to ensure that the electronic fish tickets are accurate. NMFS would also administer a system to track QS/QP holdings. Fees would be charged to cover the cost of the tracking system. A comprehensive mandatory monitoring program is expected to require minimal increases in enforcement effort.

Gear Conversion

Once QSs have been distributed, recipients would be free to use them with any legal groundfish gear, which, aside from trawl, principally means bottom longline and fish pots. There is a separate allocation of catch opportunity to nontrawl sectors, which would be unaffected by any catches resulting from gear conversion under the IFQ program.

Table ES-1. Control limits for QSs, co-op shares, or processing and QP vessel limits under the alternatives.

Alternative	**Control Limits: QSs / Co-op Share / Processing**					**QP Vessel Limit / Co-op Usage Limit**				
	NW	SSW	MS	MS(CV)	CP	NW	SSW	MS	MS(CV)	CP
Alternative 1	N/A	N/A	N/A		N/A	N/A	N/A	N/A		N/A
Alternative 2	3%	12%	25%*		60%	6%	25%	50%*		75%
Alternative 3	1.5%	15%†	20%	10%	-	3%	-	-		-
Alternative 4a	2.2%	25%	30%	15%	-	4.4%	12%	-		-
Alternative 4b	2.7%	10%	45%	20%	-	3.2%	15%	30%‡		-

Notes:
NW: Nonwhiting sector; SSW: Shoreside whiting; MS: Whiting Mothership processors; MS(CV): Mothership catcher vessels; CP: catcher-processor whiting
CV: coefficient of variation
*Under Alternative 2 the mothership sector would be managed with IFQs, and there would be no distinction as to the type of entity that could hold QSs.
†Under Alternative 3, whiting sectors would be managed with co-ops; shoreside whiting control limit applies to vessels.
‡Catcher vessel usage limit.

ES.3.3 Alternative 3: IFQs for the Nonwhiting Sector and Cooperatives for all Whiting Sectors

Catch Control Tool

Under this alternative, the nonwhiting sector would be managed with IFQs in a program similar to that described under Alternative 2 (differences are summarized below), while the three whiting sectors would be managed with cooperatives. A separate co-op structure would be used for each of the whiting sectors.

Unlike Alternative 2, there would be four separately managed trawl sectors: shoreside nonwhiting, shoreside whiting, mothership whiting, and catcher-processor whiting.

Differences between the IFQ Program for the Nonwhiting Sector in Alternative 3 and the IFQ Program in Alternative 2

Initial Allocation: Under this alternative, the initial allocation of QSs would be based on both catch history during the qualification period and an equal allocation of the catch history associated with LE trawl permits that were bought back and retired in 2003 as part of a capacity reduction program. The buyback program is partly funded through a loan to remaining participants, which is being paid back through landing fees. Equal allocation of QSs associated with the buyback permits would result in a more even distribution of QSs among permit holders compared to allocation based on catch history alone.

Allocation of Overfished Species: Unlike Alternative 2 (where all species are allocated based on catch history) under this alternative, a different formula is used for overfished species. These species will still be under rebuilding programs after the projected implementation date of the trawl rationalization program (2011), requiring relatively small OYs. Thus, QSs/QPs for these species could act as a primary constraint on target fisheries to the degree that incidental catch is unavoidable. Furthermore, since regulations prompted a large proportion of overfished species catch to be discarded, landings toward the end of the allocation period (1994 to 2003) do not accurately reflect the actual distribution of historical catch among fishery participants. Therefore, a different formula would be applied to overfished species to allocate QSs. This formula takes into account the amount of target species QSs received by including a proportional component for overfished species QSs. It also factors in areas where fishing occurred, 2003 to 2006, by a vessel associated with an eligible permit in order to account for geographic variation in overfished species bycatch rates. This approach is intended to better balance individual holdings of target and overfished species QSs and take into account the areas where permit holders have fished in the recent past. Provisions may allow QSs to be reallocated once a species is rebuilt, recognizing that the annual OY/ACL could be increased substantially once the rebuilding restrictions are lifted. This formula would be applied to the landings history associated with current permits, which account for 57 percent of the landings history. As with nonoverfished species, landings history for overfished species associated with the buyback permits would be divided equally among the current permits.

Accumulation Limits and Grandfather Clause: Under Alternative 3, the nonwhiting sector would be subject to lower accumulation limits in comparison to Alternative 2 (see Table ES-1). Alternative 3 does not contain a grandfather clause; any potential initial allocation in excess of the accumulation limit would instead be redistributed to those permits below the limits.

Initial Allocation of IFQ to Processors: In Alternative 3, 25 percent of nonwhiting groundfish would be allocated to shoreside processors. This differs from Alternative 2c, because shoreside whiting is not included since that sector would be managed with co-ops. Small amounts of whiting, representing incidental catch by nonwhiting vessels, would be allocated as QSs to the nonwhiting sector permit holders.

Species Covered: Unlike Alternative 2, this alternative does not include a halibut IBQ. Pacific halibut bycatch would be subject to status quo management. Under status quo, the allocation to other fishery sectors in the west coast management area (International Pacific Halibut Commission [IPHC] Area 2A) is determined by reducing the area (TAC) by an amount equal an estimate of the previous year's groundfish trawl sector halibut bycatch. This is an approximate method for accounting for trawl bycatch; if the trawl bycatch in a given year exceeds the amount by which the area TAC was reduced, that is factored into the next stock assessment.

Adaptive Management Program: This alternative would include the AMP described above for Alternative 2b.

Area Management: Under this alternative, QSs/QPs for each management unit would be divided geographically so that area-specific QPs would be needed to cover catches in each area. Two zones would be established, one north and the other south of 40°10' N. latitude.

Carryover of Unused QP: This alternative would not contain the carry-over provision included under Alternative 2.

Cooperatives for the Shore-based and Mothership Pacific Whiting Sectors

Under Alternative 3, the shore-based and mothership whiting sectors would be managed separately but with a co-op structure that is very similar. For that reason, the co-op structure for both sectors is described here, but differences in the co-op rules for the two sectors are pointed out. The catcher-processor sector currently operates under a voluntary co-op. Under Alternative 3, this voluntary structure would continue with modest changes to the management system. The catcher-processor co-op included in this alternative is described in a separate, subsequent section.

The existing allocation of whiting between the shoreside whiting, mothership, and catcher-processor sectors would not change (42, 24, and 34 percent, respectively). No portion of one sector's whiting allocation could be transferred to another sector.

Although Pacific whiting comprises the dominant portion of the catch in this sector, some overfished rockfish do get caught. As discussed above, bycatch caps have been imposed on the whiting fishery. These sector caps would continue to be used under trawl rationalization. Under this alternative, there would be a single cap to cover catch in all three whiting sectors for each overfished species managed this way. These bycatch caps would be established for those overfished species likely to be caught in the whiting fishery: widow, canary, darkblotched rockfish, and Pacific ocean perch (a separate cap for the same species would be applied to the catcher-process sector). In addition, the current ESA-listed Chinook salmon bycatch management measure, a triggered 100-fathom closure, and an ESA consultation threshold would continue in effect.[12] Status quo management (trip limits) would be used for other bycatch species. In addition, an amount would be deducted from allocations to the trawl sector for these species to account for the expected small amounts of bycatch. Caps on overfished species would be expected to indirectly limit bycatch of these other species.

Motherships and catcher-processors are already subject to full observer coverage, so few changes in the current monitoring program are needed under this alternative. Shore-based whiting vessels must land all their catch, allowing full dockside monitoring. Under this alternative, this full retention requirement would continue, possibly with additional monitoring to better detect at-sea discards.

New Permit Requirements

Mothership processor permit: Historically, any vessel with the proper groundfish LE permit could enter this sector as a processor. The Council adopted a stopgap measure to limit participation, which would be replaced by a new mothership permit under this alternative. Permit qualification would be based on whiting processing history.

[12] This threshold, based on the total amount of Chinook salmon caught or the Chinook bycatch rate, triggers a reinitiation of consultation under section 7 of the ESA. As part of the consultation process, new measures can be required to mitigate listed species take.

Shore-based processor permit: Similarly, a new shore-based processor permit would be created under this alternative. Only those processors possessing one of these permits could receive whiting during the first two years of the program. Thereafter, any shore-based processor could receive whiting.

Catcher vessel permit: New, separate LE permit endorsements would be created for catcher vessels participating in either the mothership or shoreside co-op sectors. Qualification for a permit would be based on past participation in the relevant whiting sector.

Co-op Formation and Allocation

Each year, catcher vessels would be able to choose to join a co-op or fish in a non-co-op fishery. If a vessel chooses to fish in a co-op, it would have to deliver all of its catch to the processor in its co-op (a mothership or shoreside facility). If a catcher vessel wishes to change its co-op membership, it would have to first fish for a year in the non-co-op fishery before joining the new co-op.

Each co-op that is formed would receive an allocation of the sector's overall whiting allocation, based on the combined catch history associated with each member's LE permit. Although the co-op allocation would be based on particular LE permits' catch history, vessels in the co-op would be able to arrange to have another vessel harvest all or a portion of their catch if they do not want to participate in the fishery.

The non-co-op fishery would receive an allocation based on the collective catch history of vessels that choose not to join a co-op, in a fashion similar to the co-op allocations. However, harvest would be further controlled in the non-co-op fishery through season restrictions. A vessel fishing in the non-co-op fishery would not be obligated to deliver to any one processor.

Control Limits

Shoreside and mothership co-ops would be subject to control limits similar to those described for the IFQ program. Shoreside whiting catcher vessel permit holders would be limited in terms of their control of co-op shares (recognizing that one entity could own multiple permits). In the mothership sector, the mothership processors and associated catcher vessels would be limited with respect to how much of the allocation they could process or control through co-op shares. Table ES-1 summarizes these limits.

Co-op Operation

Co-ops are expected to facilitate coordination and cooperation among members with respect to harvest strategy. Although co-op members would be guaranteed catch opportunity equal to the portion of the allocation they brought into the co-op through their catch history, the co-op allocation, in general, is pooled. Members could jointly agree on the specifics of harvesting.

Two or more co-ops could reach an inter-co-op agreement to coordinate harvest strategy and pool whiting and bycatch cap allocations. Various standards for both co-op and inter-co-op contractual agreements would be established, both to aid NMFS in its fishery management role and to prevent any member from being unduly disadvantaged by co-op participation.

Management of the Non Co-op Fishery

For the duration of any given year, a permitted catcher vessel could participate in the non-co-op fishery, but the structure of this sector is intended to encourage co-op participation. Non co-op fishery

participants would not have the surety of a buyer that a processor co-op obligation represents and could not easily coordinate fishing strategy in the way they are expected to in co-ops. In essence, it would be expected to function as an Olympic-style fishery with individual vessels competing against one another to catch the largest portion of the allocation.

Mothership and Catcher Vessel Quota Limits

As in the IFQ alternative, ownership limits would be imposed so that no single entity can accumulate too large a share of the overall sector allocation, based on the catcher vessel permits they own. Processors would be limited in terms of the share of the particular sector's allocation (mothership or shoreside) they could process.

Catcher-processor Sector Cooperatives

The catcher-processor sector currently operates under a single, voluntary co-op. A permit endorsement would be created to limit participation in the sector. Historically any vessel with the proper groundfish trawl LE permit could participate. The Council adopted a stopgap measure to limit participation, which would be replaced by the catcher-processor cooperative provisions of the trawl rationalization program. There is concern that new entrants could disrupt the current voluntary co-op. Provisions allow for implementing an IFQ program if the current voluntary co-op system were to fail. Few other changes are proposed for this sector under the alternatives.

Adaptive Management Program for Whiting Sectors

An AMP, similar in intent and structure of that described under Alternative 2 would be established for each of the whiting sectors such that only participants in a given sector would be eligible for the adaptive management amounts deducted from each sector's whiting allocation.

ES.3.4 Alternative 4: IFQs for a Single Shore-based Sector and Co-ops for the Whiting At-Sea Sectors (Preferred Alternative)

Two sub-alternatives, Alternative 4a and 4b, were considered in the analysis to compare and contrast certain program elements. The Council ultimately chose Alternative 4b as their preferred alternative. Differences between the two sub-alternatives are noted. All common elements are part of the preferred alternative.

Council decisionmaking on a preferred alternative occurred over several meetings from June 2008 to June 2009. At their June 2008 meeting, the Council identified a preliminary preferred alternative to garner public input. At their November 2008 meeting, they selected a preferred alternative. However, some details of the overall preferred alternative were not finalized at this meeting. At meetings in March, April, and June of 2009, the Council finalized these aspects of the overall trawl rationalization program. Final action, signifying adoption of a complete package containing all program elements, occurred at the June 11 to 18, 2009, meeting in Spokane, Washington. Subsequent concern by participants in the nonwhiting fishery about the allocation of QSs for canary rockfish led the Council to consider a change in the proposed AMP at their October 31 to November 5, 2009, meeting. Canary rockfish is an overfished species with very small harvest limits and is also difficult to completely avoid in the nonwhiting trawl fishery.

Catch Control Tool

Alternative 4 uses IFQs as the management tool for a combined whiting and nonwhiting shoreside sector and cooperatives for the two at-sea whiting sectors.

Differences between the IFQ Program for the Shoreside Sector in Alternative 4 and the IFQ Program in Alternative 2

Initial Allocation: In contrast to Alternative 2, where initial allocation is based on catch history alone, under this alternative, the initial allocation of QSs would be based on both catch history during the qualification period and an equal allocation of the catch history associated with buyback permits, as described under Alternative 3. Under Alternative 4a, equal sharing of buyback history would apply to the combined shoreside sector only; co-op shares for catcher vessels in the whiting mothership sector would be based on catch history alone. Under Alternative 4b (the preferred alternative) the equal sharing provision would apply to both the shoreside sector and the mothership sector.[13] Since the catcher-processor sector would continue to operate as a single voluntary co-op, catch history assignment is unnecessary; the co-op has access to the full sector allocation.

Allocation of Overfished Species: Under Alternative 4, overfished species QSs would be distributed according to the area-based formula described above under Alternative 3. However, there are no equal sharing element based buyback permits except for canary rockfish under the preferred alternative (Alternative 4b), while in Alternatives 3 and 4a, IFQ based on buyback permit history is distributed equally for overfished species, as it is for nonoverfished species. This difference in the preferred alternative (Alternative 4b) resulted from a reconsideration adopted by the Council at their November 2009 meeting. Canary rockfish bycatch tends to be episodic and unpredictable and has occurred across a range of target strategies. The Council decided that an allocation formula for canary rockfish that included the equal sharing element (so that every permit gets at least some minimum level of canary rockfish IFQ) would lower the risk of some harvesters being forced out of the fishery because they did not possess, and could not obtain (due to expected high cost), the canary rockfish IFQ needed to cover their bycatch.

Accumulation Limits and Grandfather Clause: Table ES-1 compares accumulation limits (QS control/QP vessel) across the alternatives. Alternative 4a contains the grandfather clause allowing QS holdings in excess of accumulation limits based on initial allocation. Alternative 4b (the preferred alternative) does not contain the grandfather clause. Permit holders who would receive QSs in excess of the accumulation limits would have two years to divest their excess QSs to any willing receiver. This would occur in the third and fourth years of the program, since QS transfers are prohibited in the first two years of the program. Any QSs not divested at the end of the fourth year would be forfeited, and the excess QSs would be reallocated to other permit holders below the limit. Before divesture, these quota holders are free to use the QPs derived from their excess QSs. This is meant to smooth the transition for those fishery participants with historically large catches.

Initial Allocation of IFQ to Processors: Under Alternative 4a, 50 percent of shoreside whiting would be allocated to processors based on processing history. Under Alternative 4b (the preferred alternative), 20 percent of shoreside whiting would be allocated to processors.

Species Covered: Alternative 4a does not include a halibut IBQ; Alternative 4b (the preferred alternative) does include a halibut IBQ. Alternative 4b would not use IFQs as the catch control tool for

[13] Since the mothership sector would be managed with co-ops under Alternative 4, the equal sharing provision applies to the allocation of catcher vessel co-op shares.

selected management units. Table ES-2 shows management units that would have IFQs for which separate QSs/QPs would be established and those for which IFQ would not be issued under Alternative 4b. Species for which IFQ is not issued would continue to be managed with current tools, such as cumulative landing limits. Part of the trawl allocation for nonwhiting management unit species taken in the at-sea whiting sectors would be set aside to accommodate catches in those sectors; the remainder would be available for harvest in the shoreside sector.

Adaptive Management Program: Alternative 4a would implement an AMP for the combined shoreside sector reserving 10 percent of the QSs for all species (as in Alternative 2b). Alternative 4b would implement a program where only nonwhiting species QSs would be reserved. In addition, under Alternative 4b during the first two years of implementation of trawl rationalization the adaptive management QPs would be passed through to QS holders in proportion to their holdings. Allocations of other species QPs under the program would begin in the third year, based on further specification of AMP objectives and mechanisms.

Area Management: As in Alternative 2, there would be no area management provisions under Alternative 4b, except for existing area designations as shown in Table ES-2. Alternative 4a would have the same area designations described under Alternative 3.

Carryover of Unused QPs: As in Alternative 2, Alternative 4 contains the carry-over provision.

Table ES-2. Management units considered for IFQ under the alternatives. Overfished species shown in bold.

IFQ Management Units	Flatfish
Roundfish	Dover sole
Lingcod	English sole
Pacific cod	Petrale sole
Pacific whiting	Arrowtooth flounder
Sablefish north of 36° N. latitude	Starry flounder
Sablefish south of 36° N. latitude	Other Flatfish stock complex
Rockfish	**Not Managed With IFQs (Alternative 4b only)**
Pacific ocean perch	Shortbelly rockfish
Widow rockfish	Longspine Thornyhead S. of 34°27'
Canary rockfish	Black Rockfish - coastwide
Chilipepper rockfish	Minor Rockfish North Nearshore complex
Bocaccio	Minor Rockfish South Nearshore complex
Splitnose rockfish	California scorpionfish
Yellowtail rockfish	Cabezon (off CA only)
Shortspine thornyhead north of 34° 27' N. latitude	Kelp Greenling
Shortspine thornyhead south of 34° 27' N. latitude	Other Fish*
Longspine thornyhead north of 34° 27' N. latitude	
Cowcod	
Darkblotched	
Yelloweye	
Minor Rockfish North slope species complex	
Minor Rockfish North shelf species complex	
Minor Rockfish South slope species complex	
Minor Rockfish South shelf species complex	

*Starting in 2009, Longnose skate is managed under its own OY. Because during the time period used to determine initial allocation of QSs, it was managed under the Other Fish complex, however, this species would not be managed with IFQ.

Differences between the Proposed Mothership Sector Cooperative Structure under Alternative 3 and Alternative 4

The mothership cooperative structure proposed under Alternative 4 is identical in most respects to that proposed in Alternative 3, with a few key differences. There are also some important differences between Alternative 4a and 4b. These are summarized below.

Under Alternative 4a, catcher vessels would be obligated to deliver 50 percent of their catch to the processor to which they are tied (compared to all their catch under Alternative 3). They would be free to deliver the remaining 50 percent to any mothership processor willing to receive it. As in Alternative 3, to change their processor affiliation they would have to participate in the non-co-op fishery first. Under Alternative 4b, catcher vessels would declare which co-op they would join before the beginning of the fishing year. They would then be obligated to deliver their catch to the associated mothership processor for that fishing season. In any subsequent year, they could change their affiliation without first participating in the non-co-op fishery through the pre-season declaration. Provision for a non-co-op fishery would still be included in the program structure. Any vessel not wishing to affiliate with a co-op could participate in the non-co-op fishery and deliver to any willing mothership processor.

Control limits for the mothership sector differ among the alternatives as shown in Table ES-1. In addition, under Alternative 4b, mothership catcher vessels would be subject to a usage limit as well as to a control limit. The usage limit is a limit on the amount any one vessel can catch and deliver to a processor. Since co-op shares would be pooled, and the allocation of catch opportunity among vessels would be decided by co-op members, it would be impossible to track the accumulation of co-op shares on a vessel in the way that QP vessel limits work in the IFQ program. The usage limit is an alternative approach to achieve the same end.

Catcher-processor Sector Cooperatives

The catcher-processor co-op structure would be the same as described for Alternative 3.

Adaptive Management Program for At-Sea Whiting Sectors

There would be no AMP for the mothership and catcher-processor whiting sectors.

ES.4 Impacts of Trawl Rationalization under the Preferred Alternative (Alternative 4b)

Chapter 4 analyzes the effects of the alternatives. The analysis is organized around the stakeholder groups and environmental components that would likely be affected by the proposed action. These are catcher vessels in the groundfish LE trawl fishery, captain and crew on groundfish LE trawl vessels, commercial harvesters in fisheries other than the LE trawl fishery, shoreside and at-sea processors of groundfish, processing labor, suppliers, fishing communities, tribal harvesters, management agencies, groundfish resources, protected resources, and the California current ecosystem. Major impacts are briefly summarized below.

Limited Entry Trawl Groundfish Harvesters (see Section 4.6)

- Consolidation would shrink fleet size with only the most efficient vessels remaining, leading to a decrease in the cost of harvesting.
- Harvest of under-utilized target species would increase, leading to higher gross revenue per vessel and per-vessel profits.
- Due to co-op harvest privileges in the Pacific whiting sectors there would be less motivation to "race for fish," allowing harvesters to time fishing operations in a manner that optimizes revenue and improves product quality.
- A variety of factors, including bycatch avoidance, ease in transferring harvest privileges, and the use of nontrawl gear, would likely lead to changes in the geographic distribution and timing of harvest.
- Increased profits and greater flexibility would improve safety conditions on board trawl vessels.
- Harvesters not receiving an initial allocation (or one of sufficient size) would have to buy the quota necessary to participate in the fishery, increasing costs.

Captain and Crew (see Section 4.7)

- Rationalization is expected to result in a decrease in the number of captain and crew jobs, while those who remain in these jobs are expected to receive higher wages.

Nontrawl Commercial Harvesters (see Section 4.8)

- Fleet consolidation may lead to the spillover of excess vessels into the pink shrimp, Dungeness crab, or other fisheries that are operationally similar.
- Bycatch of nontarget species, such as Pacific halibut, in the trawl could change. Bycatch most likely will decrease due to IBQs, providing a benefit, but could increase as currently under-utilized target species catch increases.
- Resource, grounds, and market competition could increase due to greater operational flexibility and gear switching opportunities in the trawl sector.

Shoreside Processors of Trawl Groundfish (see Section 4.9)

Trawl rationalization may result in a wide range of impacts to shoreside processors, distributed according to the geographic shift of fishing effort and subsequent consolidation of fishing and processing enterprises. Impacts may also occur based on the extent to which processing companies gain and control QSs. The effects can be summarized as follows:

- Increased cost for raw fish could occur when harvesters hold the QSs.
- Potential regional shifts in landings may or may not be under the control of processors.
- Increase in the processing of under-utilized target species could occur.
- Lower cost of production in nonwhiting sector could occur due to increased harvest and more utilization of processing capital. Increased compliance costs could occur if first receivers must pay for the cost of shoreside catch monitors to observe offloadings.
- Lower cost of production could occur in whiting sector because of increased season length
- Consolidation could occur among shoreside whiting processors, reducing total capital costs while changing asset values.

Mothership Processors of Trawl Groundfish (see Section 4.10)

- Processor declarations would likely give mothership entities some certainty over delivery volumes in the upcoming year, but little leverage in negotiations over prices or profit sharing.
- Linkages would likely give processing entities more certainty over deliveries from catcher vessels.
- The amount of mothership processing capacity in the fishery may decline due to an increase in season length and a decline in peak harvest volumes.
- The cost of processing whiting may decline because of increased season length and less processing capital necessary to handle the same harvest volume.
- Product recovery and quality may improve along with the opportunity to develop new products and markets.

Trawl Catcher-processors (see Section 4.11)

- Minor impacts would be expected relative to status quo; measures to protect the current voluntary co-op would be implemented.

Fishing Communities (see Section 4.14)

- Fishing communities would be differentially affected due to fleet and processor consolidation. Some communities would likely benefit and others would be harmed.

- Fleet and processor consolidation could result in the concentration of vessels and commercial infrastructure in fewer ports, disadvantaging communities that lose vessels and infrastructure.
- Limits on the amount of QSs an entity can control would reduce ownership consolidation and would increase the number and types of businesses involved in the fishery, contributing to diversity and stability.
- Isolated communities, where there are few alternative employment opportunities, could be adversely affected by the loss of fishing-related jobs.
- Processors would likely consolidate and possibly move, affecting processor labor and municipal revenue.
- Fishing, in all its diversity, is culturally important to coastal communities. As a consequence, communities experiencing a decline in fishing activity due to trawl rationalization would be adversely affected.
- Family fishing businesses would have to deal with the implications of the asset value associated with IFQs (or co-op shares). This can complicate fishery entry and exit, leading to intra-family strife.
- Tourism could be adversely affected in communities that lose a working waterfront to the degree it is important to the tourist identity of the community.
- Nontrawl communities could be affected by rationalization through increased competition, gear conflicts, impacts on the support sector, infrastructure impacts, and competition in the marketplace.

Treaty Tribe Harvesters (see Section 4.15)

- Groundfish trawl fleet consolidation could make vessels available for use in other fisheries, lowering capital costs, but potentially increasing resource competition in nongroundfish fisheries.
- Loss of port infrastructure due to harvester and processor consolidation could affect tribal harvesters disproportionately.
- Changes in the Pacific halibut bycatch rate in the rationalized trawl fishery could have adverse or beneficial effects for treaty tribe halibut harvesters.
- Increased flexibility due to rationalization could increase market competition.

Management Agencies (see Section 4.16)

- Additional staff resources at the Federal level would be needed for program startup and management.
- Additional enforcement personnel would be needed at the state and Federal level; this is estimated to be one new hire for each agency.
- Changes in data collection and data sharing arrangements would occur between state and Federal agencies.
- Management of the groundfish trawl fishery in-season would likely be reduced.

Groundfish and Other Fish Stocks (see Section 4.17)

- Changes in location of catch could lead to localized depletion if fishing is concentrated in certain areas.
- Target species catch would increase, but harvest levels intended to maintain or rebuild stocks to MSY are specified separately and are not affected by the proposed action.

- Fishery-dependent data, including catch accounting, would improve due to the increased observer coverage, decreasing one source of uncertainty in some stock assessments

Protected Species including ESA-listed Salmon (see Sections 4.18 and 4.19)

- Trawl rationalization may change the level and type of interactions between trawl vessels and marine mammals and seabirds, but the magnitude and direction of this change cannot be predicted
- Take of ESA-listed salmon in trawl fisheries may change, but the changes cannot be predicted

Habitat and Ecosystem (see Section 4.20)

- Changes in catch may result in changes to the California current ecosystem food web
- A reduction in the biomass of large demersal predators (e.g., lingcod) and an increase in their prey (miscellaneous nearshore fish and shallow small rockfish) would occur at high catch levels, according to ecosystem modeling
- Fishing in different areas and using different gear (e.g., switching to fixed-gear or modifying trawl gear) would change how much and what kind of essential fish habitat would be affected by fishing.

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CHAPTER 1 INTRODUCTION

1.1 How This Document is Organized

This document provides information and an evaluation of a proposed action and alternatives for managing the Pacific Coast groundfish trawl fishery. This fishery is managed under the *Pacific Coast Groundfish Fishery Management Plan* (groundfish FMP), developed by the Pacific Fishery Management Council (Council). This action is intended, among other things, to increase economic efficiency within the fishery (termed "rationalization") and reduce bycatch (fish that are not kept or sold and are discarded, usually at sea). The proposed action also must be consistent of the Magnuson-Stevens Fishery Conservation and Management Act (MSA) the principal legal basis for fishery management within the Exclusive Economic Zone (EEZ), which extends from the outer boundary of the territorial sea to a distance of 200 nautical miles from shore, and in particular the 10 National Standards for fishery conservation and management enumerated in §301 of the Act (see Chapter 6 in this document). Alternatives considered in this environmental impact statement (EIS) propose different mechanisms to achieve these objectives. Implementing the action will involve both changes to the management framework in the FMP and promulgation of implementing regulations. National Marine Fisheries Service (NMFS) reviews management proposals developed by the Council. If a proposal is approved, the FMP is amended to reflect the changes and NMFS implements any necessary regulations.

In addition to addressing MSA mandates, this document is a final environmental impact statement (FEIS), pursuant to the National Environmental Policy Act (NEPA) of 1969, as amended. According to NEPA (Section 102(2)(C)), any "major Federal action significantly affecting the quality of the human environment" must be evaluated in an EIS. Based on a preliminary determination by Council and NMFS staff, implementing the proposed action referenced above could possibly have significant impacts. Therefore, rather than preparing an environmental assessment (EA), which provides "sufficient evidence and analysis for determining whether to prepare an environmental impact statement," NMFS and the Council have decided to proceed directly to preparation of an EIS. This document is organized so that it contains the analyses required under NEPA, MSA, the Regulatory Flexibility Act (RFA), and Executive Order (EO) 12866. For brevity, this document is referred to as an EIS, although it contains required elements of an Initial Regulatory Flexibility Analysis (IRFA) pursuant to the RFA and a Regulatory Impact Review (RIR) pursuant to EO 12866.

Federal regulations (40 Code of Federal Regulations [CFR] 1502.9) require agencies to prepare and circulate a draft EIS (DEIS), which "must fulfill and satisfy to the fullest extent possible the requirements established for final statements in Section 102(2)(C) of the Act" (i.e., NEPA). Federal regulations (40 CFR 1506.10(c)) and agency guidelines (National Oceanic and Atmospheric Administration [NOAA] Administrative Order 216-6,

Section 5.01.b.1(i)) stipulate a minimum 45-day public comment period on the DEIS.[1] At the end of this period, a FEIS is prepared, responding to comments and revising the document accordingly. After the EIS is completed, a 30-day waiting period ensues before the responsible official may sign a record of decision (ROD) and implement the proposed action.

Environmental impact analyses have four essential components: a description of the purpose and need for the proposed action; a range of alternatives, including the proposed action, that represent different ways of accomplishing the purpose and need; a description of the human environment affected by the proposed action; and an evaluation of the predicted direct, indirect, and cumulative impacts of the proposed action and the alternatives.[2] The human environment is interpreted comprehensively to include the natural and physical environment and the relationship of people with that environment (40 CFR 1508.14). These elements allow the decision maker to look at different approaches to accomplish a stated goal and to understand the likely consequences of each choice or alternative. In this EIS, Chapters 1 and 2 cover the purpose and need for the proposed action and describe the alternatives. Chapter 3 describes the components of the biological, physical, and human environments potentially affected by the proposed action. Chapter 4 evaluates the direct, indirect and cumulative effects of the proposed action and alternatives on the resources and stakeholder groups of concern. Chapter 4 is organized around environmental components whereby sections examine and describe the direct, indirect, and cumulative effects of each alternative on a particular resource or stakeholder group. The alternatives include the no action (status quo) alternative and the preferred alternative. These chapters describe both the status quo environment potentially affected by the proposed action and the predicted impacts of each of the alternatives. Subsequent chapters (and appendices) cover the following topics:

- Chapter 5 contains a review of other issues typically found in NEPA documents including short-term uses versus long-term productivity, irreversible resource commitments, and energy requirements and conservation potential of the alternatives.
- Chapter 6 examines the consistency of the proposed action with the trawl rationalization program goals, objectives, constraints, and guiding principles (listed in Section 1.2.3); the Groundfish FMP goals and objectives; and the national standards and other provisions of the MSA.
- Chapter 7 examines consistency with other Federal laws and EOs.
- Chapter 8 lists the individual preparers of this document.
- Chapter 9 presents a glossary of technical terms and a list of acronyms used in this document.
- Chapter 10 summarizes public comments submitted on the DEIS and responses to them.[3]
- Chapter 11 provides a list of the literature cited in this document.
- Appendix A contains a detailed analysis of the components, elements, and options that are part of the individual fishing quota (IFQ) alternative, one of the action alternatives described in Chapter 2.
- Appendix B contains a detailed analysis of the components, elements, and options that are part of the co-op alternative, one of the action alternatives described in Chapter 2.

[1] This required public comment period occurs after the Council has taken final action, as part of NMFS's review process. Preliminary drafts of the document were also made available for public review as part of the Council process: a partial draft document in advance of the June 2008 Council meeting and a substantially complete draft in advance of the November 2008 Council meeting.

[2] Federal regulations at 40 CFR 1502 detail the requirements for an EIS. Although there are several additional components, this list is of the core elements.

[3] The original comment letters may be viewed on the Council's website.

- Appendix C contains descriptions of the models used in the impact analysis.
- Appendix D is the detailed description of the Council's preferred alternative, which was adopted in November 2008 with additional program details finalized in June 2009.
- Appendix E contains supplemental analysis of impact of QS allocation on long-term distribution.
- Appendix F is an analysis of a fixed term, auction-based proposal for IFQ.
- Appendix G contains proposed amendments to the Groundfish FMP to implement the proposed action.
- Appendix H contains supplemental information and analysis required by the Regulatory Flexibility Act, which requires consideration of the impact of regulations on small businesses, and EO 12866, which requires and evaluation of the benefits and costs of regulatory proposals. Draft preliminary analyses were included with this FEIS to encourage early public comments on the expected economic effects of the alternatives proposed. As part of rulemaking, NMFS is preparing more comprehensive analyses. Appendix H contains analyses in support of the proposed rule published on May 27, 2010. Additional analyses will be prepared for subsequent rulemakings necessary to implement the trawl rationalization program.
- Appendix I lists the agencies, organizations, and persons to whom copies of this statement were sent.

1.2 Proposed Action and Purpose and Need

1.2.1 The Proposed Action

The proposed action is to create a management regime under which the owners of Pacific Coast groundfish fishery limited entry (LE) permits with trawl endorsements are more individually accountable for catch of target and nontarget species harvested by the vessels to which that their permits are registered. As originally framed, this action focused on the more general concept of dedicated access privileges (DAPs), now more commonly referred to as LAPs (described in Section 1.3). However, as the Council developed the range of alternatives, other methods to achieve the goals and objectives listed above were considered. The current range of alternatives includes establishing a framework for mandatory fishing vessel cooperatives (co-ops), which would not operate as an IFQ system. Because of these changes, beginning in 2006, the developing program has been referred to with the more general term "trawl rationalization" to capture the social and economic objectives that are expected to also have substantial conservation benefits, for example by reducing bycatch.[4]

1.2.2 Need for Action (Problems for Resolution)

Despite a program completed in 2003 to reduce fishing capacity through the buy back of groundfish LE permits and associated vessels, management of the west coast LE groundfish trawl fishery is still marked by biological, social, and economic concerns, similar to those cited in the U.S. Commission on Ocean

[4] Rationalization has a general connotation in economics and sociology as the practical application of knowledge to achieve a desired end. It is intended to increase efficiency or flexibility through the standardization of practices and workflow. In the context of the proposed action, the term is meant to encompass a variety of measures intended to improve the management of groundfish resources, in part by increasing the economic efficiency of the fishery. Economic efficiency, in turn, is defined in various ways, but generally refers to a condition where no one can be made better off without making someone else worse off, outputs are maximized for a given level of inputs, and production is at its lowest cost.

Policy's 2004 report (2004). Many participants and observers view the trawl fishery as economically unsustainable under the current management regime.

One major source of concern stems from the management of bycatch, particularly of overfished species.[5] Over the past several years, the Council's groundfish management efforts have focused on drafting rebuilding plans for overfished species, minimizing bycatch, and specific management of overfished species. The trawl rationalization program is expected to provide individual fishery participants more flexibility and more individual accountability for their impact on overfished species, other groundfish species, and possibly Pacific halibut.

Through the groundfish Strategic Plan and Amendment 18 to the Groundfish FMP, the Council has indicated its support for the use of IFQ programs to manage commercial groundfish fisheries.[6] These programs will give individual fishery participants more flexibility and more individual accountability for the impact of overfished species catch on the groundfish fishery as a whole.

As highlighted in the following problem statement that the Council sent out for public review in a June 2004 scoping document, problems with capacity, economic inefficiency, and bycatch management are interconnected with problems related to the ability to achieve optimum yield (OY),[7] the need for a precautionary management approach, the need for a flexible system that allows for variations and contingencies, long-term and short-term concerns for communities, and safety.

> As a result of the legal requirement to minimize bycatch of overfished species, considerable harvest opportunity is being forgone in an economically stressed fishery. The west coast groundfish trawl fishery is a multi-species fishery in which fishermen exert varying and limited control of the mix of species in their catch. The OYs for many overfished species have been set at low levels, placing a major constraint on the industry's ability to fully harvest the available OYs of the more abundant target species that co-occur with the overfished species, wasting economic opportunity. Average discard rates for the fleet are applied to project bycatch of overfished species. These discard rates determine the degree to which managers must constrain the harvest of target species that co-occur with overfished species. These discard rates are developed over a long period of time and do not rapidly respond to changes in fishing behavior by individual vessels or for the fleet as a whole. Under this system, there is little direct incentive for individual vessels to do everything possible to avoid take of species for which there are conservation concerns, such as overfished species. In an economically stressed environment, uncertainties about average bycatch rates become highly controversial. As a consequence, members of fishing fleets tend to place pressure on managers to be less conservative in their estimates of bycatch. Given all of these factors, in the current system there are uncertainties about the accuracy of bycatch estimation, few incentives for the individual to reduce personal bycatch rates, and an associated loss of economic opportunity related to the harvest of target species.

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5 Bycatch is defined in the MSA as "fish which are harvested in a fishery, but which are not sold or kept for personal use, and includes economic discards and regulatory discards."

6 Section 6.3.3 of the FMP, as amended, authorizes the Council to establish IFQ programs for any groundfish commercial fishery sector for the purposes of reducing fishing capacity, minimizing bycatch, and to meet other goals of the FMP. This part of the FMP will be amended to reflect implementation of the trawl rationalization program.

7 The MSA defines optimum yield as "the amount of fish which … will provide the greatest overall benefit to the Nation, particularly with respect to food production and recreational opportunities, and taking into account the protection of marine ecosystems; [and] … is prescribed as such on the bases of the MSY from the fishery, as reduced by any relevant economic, social, or ecological factor;…"

The current management regime is not responsive to the wide variety of fishing business strategies and operational concerns. For example, historically the Pacific Council has tried to maintain a year-round groundfish fishery. Such a pattern works well for some business strategies in the industry, but there has been substantial comment from fishermen who would prefer to be able to pursue a more seasonal groundfish fishing strategy. The current management system does not have the flexibility to accommodate these disparate interests. Nor does it have the sophistication, information, and ability to make timely responses necessary to react to changes in market, weather, and harvest conditions that occur during the fishing year. The ability to react to changing conditions is a key factor in conducting an efficient fishery in a manner that is safe for the participants.

Fishery stock depletion and economic deterioration of the fishery are concerns for fishing communities. Communities have a vital interest in the short-term and long-term economic viability of the industry, the income and employment opportunities it provides, and the safety of participants in the fishery.

In summary, management of the fishery is challenged with the competing goals of minimizing bycatch, taking advantage of the available allowable harvests of more abundant stocks, increasing management efficiency, and responding to community interest. "Taking advantage of the available allowable harvests" includes conducting safe and efficient harvest activities in a manner that optimizes net benefits over both the short and long term.

1.2.3 Purpose of the Proposed Action

In 2003, the Council established a Trawl Individual Quota Committee (TIQC), which was charged with assisting the Council in identifying the elements of a trawl individual quota program and scoping alternatives and potential impacts of those alternatives in support of the requirements of the MSA and NEPA. At its first meeting in October 2003, the TIQC drafted a set of goals and objectives, which another Council-established committee, the Independent Experts Panel (IEP), subsequently recommended modifying. The Council adopted this list in June 2005, but at their March 2007 meeting, the Council adopted a further revision of the goals and objectives. The participation of the TIQC, the IEP, and other entities in the scoping process is described below in Section 1.6. To pursue the goal thus developed and shown below, the Council considered alternatives that would rationalize the west coast trawl fishery and provide incentives to reduce bycatch, either through an IFQ program for all groundfish LE trawl sectors and/or through cooperatives for the fishery sectors targeting Pacific whiting. Under either alternative, allocations would be made to eligible fishery participants as a privilege to harvest a portion of fish, and not as a property right. Though structurally different, the Council's intention is that both the IFQ and co-op alternatives fulfill the goal of the program.

The following goal objectives outline the purpose of the proposed action:

Goal

Create and implement a capacity rationalization plan that increases net economic benefits, creates individual economic stability, provides for full utilization of the trawl sector allocation, considers environmental impacts, and achieves individual accountability of catch and bycatch.

Objectives

The above goal is supported by the following objectives:

1. Provide a mechanism for total catch accounting.
2. Provide for a viable, profitable, and efficient groundfish fishery.
3. Promote practices that reduce bycatch and discard mortality and minimize ecological impacts.
4. Increase operational flexibility.
5. Minimize adverse effects from an IFQ program on fishing communities and other fisheries to the extent practical.
6. Promote measurable economic and employment benefits through the seafood catching, processing, distribution elements, and support sectors of the industry.
7. Provide quality product for the consumer.
8. Increase safety in the fishery.

Constraints and Guiding Principles

The above goals and objectives should be achieved while the following occurs:

1. Take into account the biological structure of the stocks including, but not limited to, populations and genetics.
2. Take into account the need to ensure that the total OYs and allowable biological catch (ABC) are not exceeded.
3. Minimize negative impacts resulting from localized concentrations of fishing effort.
4. Account for total groundfish mortality.
5. Avoid provisions where the primary intent is a change in marketing power balance between harvesting and processing sectors.
6. Avoid excessive quota concentration.
7. Provide efficient and effective monitoring and enforcement.
8. Design a responsive mechanism for program review, evaluation, and modification.
9. Take into account the management and administrative costs of implementing and oversee the IFQ or co-op program and complementary catch monitoring programs, as well as the limited state and Federal resources available.

1.3 Background on Limited Access Privileges

1.3.1 The Theory behind Tradable Permits

Tradable permit arrangements have found wide application in dealing with common pool resources. Unlike private property, rights of access to and use of common pool resources are not unitary—controlled by a single person or entity. They are a kind of public good with particular characteristics; aside from the lack of unitary authority to control access and use they are subtractable—that is, the use of the resource by one person affects the ability of others to use it. Examples of common pool resources include the atmosphere (as a place to dispose of airborne pollutants traded off against its life-sustaining properties), water resources (again, both as a sink for pollutants and a resource for human use) and—relevant to the case at hand—fish. Common pool resources may be "open access" with no institutional arrangements to constrain access or use, government owned, or "common property" defined as a system under which access is limited and some type of institution facilitates decision making about resource use by the group that has exclusive access (Ostrom 1990).

U.S. fisheries traditionally have been managed under government trusteeship. Under the trust doctrine, the government sets rules about resource use for the benefit of its citizens who are the "owners" of the resource. Access may be unlimited (or practically so, if only limited to any citizen or resident), and government may establish rules over use in an effort to prevent over-exploitation. A variety of rules may be established to limit fishing activity, or effort—and, thus, indirectly, catch, such as time and area closures and limits on gear effectiveness. Alternatively, catch can be limited directly through quotas, bag limits, landing limits (trip limits), and the like.

Limiting catch directly or indirectly may address stock conservation concerns if catches can be constrained to or below maximum sustainable yield (MSY); even so, economic efficiency objectives are unlikely to be met. Furthermore, effectively matching catch with MSY can be very expensive in terms of government monitoring and enforcement costs. If participation cannot be limited, according to early fisheries economics theory (Gordon 1954; Shaefer 1957), people will enter the fishery until an equilibrium is reached where costs (including the opportunity cost of capital and labor[8]) match revenue. Even in a fishery with a few vessels, this phenomenon is expected: new vessels will continue to enter the fishery, even though average cost for each vessel increases, to the point where revenues no longer exceed costs. In an unconstrained fishery, and depending on costs, this usually occurs at a level of catch above MSY. Maximum economic yield, according to this model, occurs below MSY when revenue is highest in relation to costs. Fishery participants probably would like to maximize profit (the difference between costs and revenue), but they cannot do so if there is no means to exclude entry. Thus, while the individual may be satisfied with wages received, there is a cost in terms of lost profits for the fishery as whole.

Even if participation can be limited, profits may be dissipated as costs escalate, because of over-investment in vessels and equipment to beat out other fishermen in catching the available fish. This type of competition should not be confused with market competition, which serves to lower prices. In an unconstrained fishery, fewer fish will be caught at higher costs, resulting in higher prices in the raw fish market. Even in a constrained fishery, over-capitalization results in higher costs than would otherwise be necessary, potentially increasing prices.

Tradable permits ration access to a resource—the permit represents an exclusive right to use some increment of the resource (a ton of sulfur dioxide emitted into the air or a pound of fish brought aboard, for example) (Tietenberg 2002). In such a scheme, the first step is to set a limit on total resource use, TAC, which in the west coast groundfish context is the OY.[9] This aggregate amount can then be subdivided and allocated in some fashion. In an IFQ scheme, this allocation typically represents a percentage share of the TAC, which can vary over time (OYs, for example, are set every two years based on an assessment of stock status and can go up or down). This share can then be converted into a quantity (pounds of fish) when applied against the externally determined TAC limit (or OY/ACL).

Tradability is an important feature in terms of economic efficiency and bycatch reduction objectives. It requires each fisherman to match the amount of fish caught to the permit amount. In a competitive market, shares will tend to accrue to the highest valued use. Individuals with higher operational costs, for example, may be better off selling their shares to a person who can use them at lower overall cost (operational cost plus the cost of share purchase). The seller benefits more from selling the shares than

[8] In this context, opportunity cost represents the individual's assessment that no other activity that he or she can pursue will pay a comparable wage. Opportunity cost can include nonmonetary benefits. For example, someone may choose to continue fishing at a lower wage because the work is more enjoyable than other kinds of work that might pay better.

[9] Under new rules in the MSA, the method for determining these harvest limits may change, and OYs may be referred to as annual catch limits (ACLs) by the time the trawl rationalization program is implemented.

from using them and the buyer can still earn profit after absorbing the purchase cost.[10] In this construct, the shares have been put to the most efficient use, because both the buyer and seller are better off. However, some social costs may be external to the tradable quota system. For example, consolidation of shares in fewer hands, resulting in a smaller fishing fleet, can affect fishing-dependent communities where the lost vessels were important income generators, contributed to community identity, supported infrastructure used by other fleets, or provided other benefits. For a tradable permit system to be effective, several preconditions must be met (Tietenberg 2002). A competitive market may be distorted if any one participant exercises too much market power. Transactions costs—the costs involved in exchanging permits (above the actual sales price) and in obtaining information about prices—cannot be too high. The system as a whole relies on effective monitoring and enforcement; "free riding" or "quota busting" occurs if a participant catches fish without possessing the corresponding QPs. When free riding occurs, resource conservation objectives are not met (affecting resource value, reflected in share prices) and, over time, confidence in the system may break down.

The initial allocation of QSs is often controversial. According to economic theory, the value of the resource will be maximized no matter how the shares are initially allocated (Montgomery 1972), whether freely distributed (based on past participation or by lottery) or auctioned off. The implication, according to Tietenberg (2002) is that "the resource manager can use initial allocation to solve other goals (such as political feasibility or ethical concerns) without sacrificing cost-effectiveness."

By itself, an IFQ program may have few direct conservation benefits, but substantial indirect benefits. This may be illustrated by reference to some of the features of the preferred alternative. First, under the preferred alternative each harvester would be accountable for his or her total catch rather than just landings. Second, the fishery would be subject to 100 percent observer coverage, allowing accurate accounting of bycatch in addition to landings. The program may also increase efficiency and profits enough for industry to be able to bear these monitoring costs. These features are expected to reduce or eliminate regulatory bycatch substantially (discarding of fish because regulations discouraging targeting requires one to do so), which has been a big problem in the groundfish fishery as currently managed, resulting in lost value due to throwing away otherwise marketable fish. If not adequately accounted for, this bycatch contributes to excess mortality and misspecification of future OYs. In addition, IFQs can motivate fishermen to avoid stocks with low harvest limits (such as overfished species) because scarcity value drives up share prices for these stocks. At the same time, direct conservation benefits are probably limited. For example, OY (MSY as reduced by other biological and social factors) is set externally. If it is misspecified, the IFQs do nothing to correct the problem. Certain external costs—habitat impacts, for example—may be addressed through the use of IFQ allocations to provide incentive for use of low impact gears (as an example, see the adaptive management provisions described in Chapter 2). It could also be argued that an IFQ program, because of share value to yield, would stimulate a conservation ethic among fishermen, prompting them to minimize such external effects. For this to work, fishermen would have to see a clear correlation between their behavior and the effect on yield and be confident that all, or most, of the other fishermen behave in the same fashion. This potential benefit is discussed in the analysis.

An IFQ program may also reduce some government costs—there may be less need to constantly adjust regulations constraining the pace of fishing, for example—while increasing other administrative and monitoring costs (e.g., tracking the exchange of quota, observing total catch, requiring onboard observers).

[10] Because of the distinction between QS and QP that represents a realized amount, a variety of other arrangements can be used, such as leasing or selling QP (while retaining the asset value of the QS). But the general principal still applies.

1.3.2 Cooperatives

Cooperatives differ from IFQs in that catch privileges are held jointly by members of the co-op. They can be classed as a kind of common property regime where government plays an instrumental role. Instead of QSs held by individuals, each co-op member receives an allocation that can only be accessed exclusively when it is pooled within the co-op. How fishing occurs within the cooperative (how much of the co-op's pooled allocation any one member may catch) is a matter of joint decisionmaking by co-op members (through side deals, contracts, and the like). In effect, tradability can occur within a co-op; such arrangements are usually not brokered by government.

In theory, cooperatives are less economically efficient than IFQs because the barriers imposed on tradability prevent the assignment of catch privileges to the highest valued use. On the other hand, cooperatives may facilitate fishermen' ability to pool both opportunity and risk. This is an important benefit in West coast groundfish fisheries where low OYs/ACLs for some overfished species are likely to impose constraints on target species fishing opportunity. Government-facilitated cooperatives are probably more attractive in the Pacific whiting fishery, because the catch composition and operational characteristics of the participants are more uniform in comparison to the nonwhiting trawl fishery sector.

In addition, rather than cumulative trip limits, the whiting fishery operates under a primary season structure where each whiting fishery sector (shore-based, mothership, and catcher-processor) receives an allocation, which when reached closes that fishery. In comparison to the trip limit regime more economic efficiency may be lost in a race for fish.[11] This means that cooperatives offer efficiency gains from status quo in comparison to—other things being equal—adoption of cooperatives in the nonwhiting trawl fishery.

1.3.3 Dedicated Access Privileges and Concerns about Conferring a Property Right

The U.S. Commission on Ocean Policy (2004) popularized the term "dedicated access privilege" without defining it except by example.[12] The term is meant, first, to underscore the diversity of arrangements that can be established to regulate access to fishery resources including IFQs, cooperatives, or community control. As important, the Commission emphasized that these arrangements do not confer any real interest in property, as represented by ownership of a QS, for example:

> U.S. fishermen do not now and will never have inalienable rights to fish because the fisheries resources of the United States belong to all people of the United States. Under current law, fishermen are granted a privilege to fish, subject to certain conditions. Because this privilege can be taken away, it is not a right. (p. 289)

[11] This was partially addressed by Amendment 15 to the groundfish FMP, implemented in 2009 to reduce the incentives that result in a race for fish in the whiting sectors. Amendment 15 was intended to be an interim measure until the implementation of a trawl individual quota or co-op management program.

[12] A dedicated access privilege (DAP) fishery management program provides an individual fisherman, cooperative, or community with the exclusive privilege of harvesting a quantity of fish. In a DAP program, each recipient of a fishing privilege can use its share of the harvest quota at any time during the fishing season. The MSA currently authorizes only two forms of DAPs—individual fishing quota programs, and community quotas (specifically authorized in two geographic areas). Current DAP programs have resulted in increases in per-unit product value and decreases in total harvesting cost. They have also provided fishermen with greater control over when to fish, thus improving safety. This flexibility also allows them to improve profitability by harvesting fish when prices are most favorable. For more information, see http://www.nmfs.noaa.gov/docs/msa2005/daps_fs.pdf.

Section 303A of the reauthorized MSA, entitled "Limited Access Privilege Programs," elaborates on this point by stating that such programs do not create a right, title, or interest in allocated fishing opportunity (e.g., QSs). Any such privilege may be revoked without compensation at any time.

1.4 Biological Context of West Coast Groundfish

The species covered by the Groundfish FMP include more than 90 species that live on or near the bottom of the eastern Pacific Ocean within 200 miles of the U.S. west coast. These include the following species groups:

- **Rockfish**. The FMP covers at least[13] 64 different species of rockfish, including widow, yellowtail, canary, shortbelly, chilipepper, yelloweye, darkblotched, and vermilion rockfish; bocaccio; cowcod; thornyhead; and Pacific ocean perch.
- **Flatfish**. The FMP covers 12 species of flatfish, including various soles, starry flounder, turbot, and sanddab.
- **Roundfish**. The six species of roundfish included in the FMP are lingcod, cabezon, kelp greenling, Pacific cod, Pacific whiting (hake), and sablefish.
- **Sharks and skates**. The six species of sharks and skates in the FMP are leopard shark, soupfin shark, spiny dogfish, big skate, California skate, and longnose skate.
- **Other species**. These include ratfish, finescale codling, and Pacific rattail grenadier.

The list of current trawl target species includes flatfish, roundfish, thornyheads, and a few species of rockfish. Primary flatfish target species include petrale sole and Dover sole. Roundfish target species include Pacific whiting, Pacific cod, and sablefish. Some rockfish species, especially Pacific ocean perch and widow rockfish, were important trawl targets until the mid 1990s. Rockfish include four genera under the family Scorpaenidae. One genus, *Scorpaena*, forms only a small fishery off southern California. The thornyheads, genus *Sebastolobus*, are occasionally referred to as rockfish; however they are biologically quite different. The genus most commonly referred to as rockfish, *Sebastes*, is a very diverse group. Figure 1-1 shows the distribution of members of the genus *Sebastes* and other groundfish species by latitude and depth association.

[13] Because the management unit includes all species in the family Scorpaenidae, and their systematics are still being resolved, there is a potential for new species to be added to the management unit.

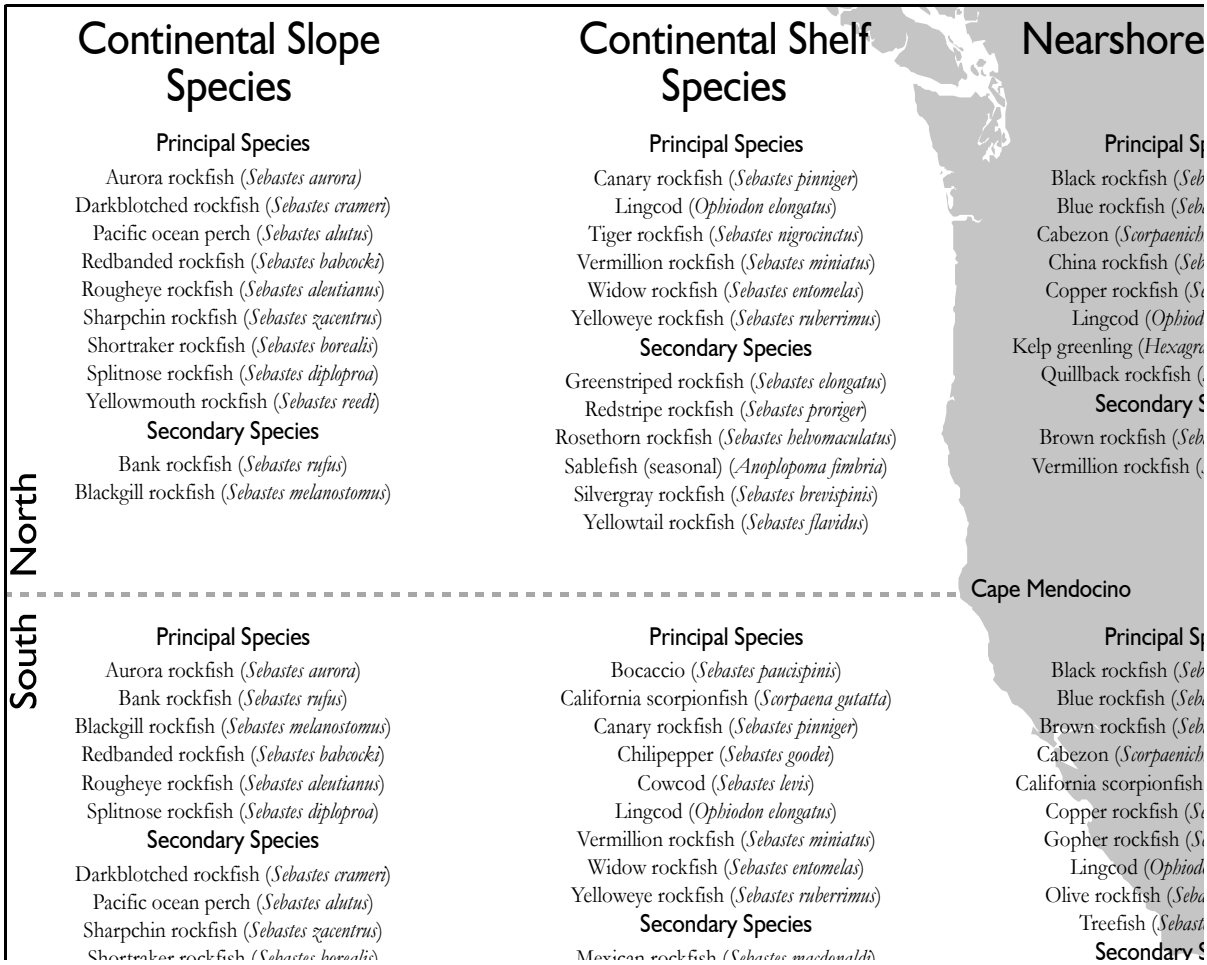


Figure 1-1. Latitude and depth association of selected groundfish species.

West coast flatfish and roundfish stocks are relatively abundant, short-lived, and productive. Large initial catches of rockfish gave the impression that these stocks were also highly productive. However, increased scientific knowledge of the natural history and stock status of several rockfish species made it clear that most members of the genus *Sebastes* are not able to withstand the level of removals that occurred until the mid 1990s. There are several reasons for this:

1. Most rockfish are viviparous. Fertilization is internal, and the female retains the eggs until they hatch, giving birth to live young. This limits the number of eggs that are produced annually.
2. Rockfish have extreme longevity. Specimens of several rockfish species have been estimated at over 60 years of age, and some over 100 years.
3. Rockfish have long generation times. Many rockfish species require 10 or more years to reach sexual maturity.
4. Rockfish have low natural mortality. Rockfish are adapted to relatively slow natural population turnover, unlike species such as Pacific whiting, sablefish, and most flatfish.
5. Fecundity increases with age. Evidence shows that older female rockfish produce more young than younger ones.

6. Rockfish have infrequent recruitment success. Ocean conditions or other factors seem to create large variability in recruitment success.
7. Specific habitat requirements vary with life stage. Eggs, larvae, juvenile, and adult forms of many rockfish use different types of habitat over their lifecycle.
8. Rockfish have relatively low mobility of adults. Many rockfish tend to inhabit a particular site for much of their adult life, making them particularly susceptible to capture.

The traits of long life, slow growth, viviparity, and increasing fecundity with age may have evolved to deal with environmental variability. The ability of rockfish to live a long time and produce more young with age increases the odds that they will be able to "wait out" poor environmental conditions and produce enough young that a few offspring will likely survive. However, these characteristics also lead to a relatively low productivity for a given biomass and mean that most rockfish are unable to support large, sustained removals. Low productivity, coupled with a tendency to associate with other target species, increases management difficulty. This is especially problematic when the associated species differ markedly in life history traits such as generation time, fecundity, and natural mortality rate.

1.5 Groundfish Fisheries Context

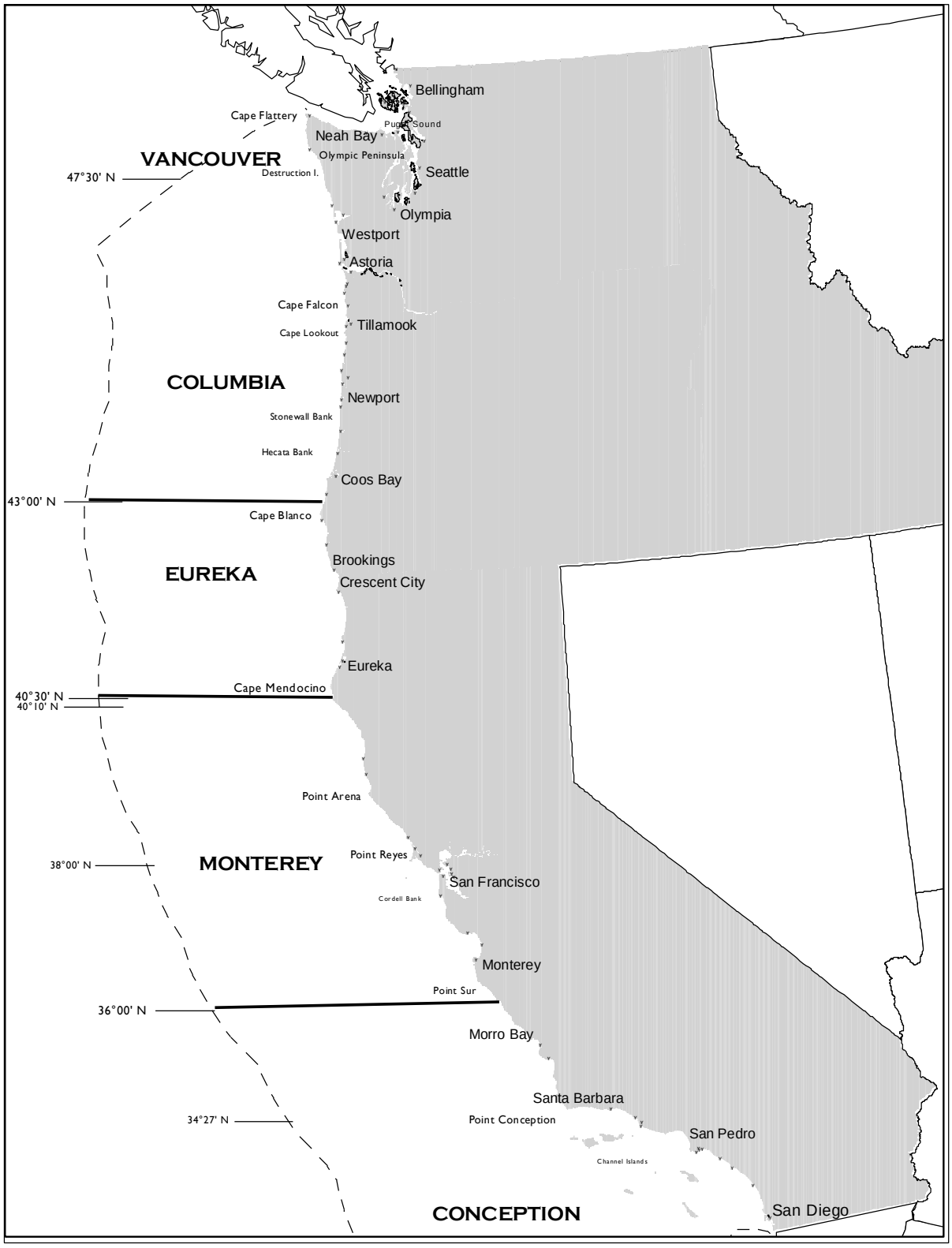
The west coast groundfish fishery uses bottom trawl (large footrope, small foot rope, and selective flatfish), midwater trawl, trap, and hook-and-line gears, including recreational gear. The commercial fishery is prosecuted over a wide range of depths, from 20 fathoms (37 meters [m.]) for English sole and sanddabs to as deep as 700 fathoms (1,280 m.) for Dover sole, thornyheads, and sablefish. Fishing may occur on smooth mud/sand substrates, rocky reefs, pinnacles, and canyons. Recreational groundfish fisheries typically occur closer inshore than most commercial fisheries.

West coast groundfish range from semi-pelagic species like Pacific whiting, shortbelly rockfish, and widow rockfish to demersal species such as Dover sole, lingcod, and thornyheads. Most species primarily inhabit the continental shelf, but Dover sole, thornyheads, rex sole, petrale sole, and some others occur in greatest abundance on the continental slope. The close spatial relationship of certain species often results in large catches of a mix of species. This is particularly true in the case of bottom trawl catches. For example, vessels catching Dover sole also catch large amounts of other valuable species such as thornyheads, sablefish, and darkblotched rockfish. Several species of rockfish may be caught in a single trawl tow, and the species mix changes from north to south. Historically, widow rockfish, yellowtail rockfish, and canary rockfish were caught in the Vancouver and Columbia management areas, while bocaccio and chilipepper rockfish have been significant catch components in the Monterey and Conception areas (Figure 1-2). Currently, only a few rockfish species are trawl targets, including yellowtail rockfish in northern midwater fisheries and splitnose rockfish and associated species in the southern slope fishery.

To exercise some control over the mix of various species in their catches, fishermen can modify the depth and area of their fishing effort, as well as the manner in which gear is fished. However, it is often impossible to avoid catch of some nontarget species. The fishery's multi-species nature is further complicated by seasonal changes in fish availability, weather, and market conditions (prices and poundage limits)—factors that may cause a trawler to fish on several species' assemblages in a single fishing trip. Many gear types are used in the commercial groundfish fishery, including trawl nets, traps, and longlines. However, trawl nets (both bottom and midwater types) account for the major portion of the groundfish catch.

In the trawl fishery, some incidental catch of nontargeted groundfish is unavoidable, and for economic or regulatory reasons, some of the catch is discarded.

Figure 1-2. West Coast groundfish management areas and other key management lines.



1.6 Groundfish Management Context

The west coast groundfish trawl fishery is jointly managed by state and Federal authorities under the MSA, which was passed in 1976 to "Americanize" U.S. fisheries. In addition to establishing eight regional fishery management councils, the MSA extended U.S. fishery management authority in territorial waters from 12 miles out to 200 miles from the shore. This created the EEZ, which, including U.S. Federal territorial waters, extends from 3 to 200 miles off shore. For the west coast (California, Oregon, and Washington), the Council coordinates Federal management of fisheries in the Federal EEZ with state management of fisheries occurring in state waters (i.e., between the shoreline and 3 miles offshore).

The Secretary of Commerce approved the Groundfish FMP in 1982. The Groundfish FMP initially focused on species targeted by the midwater trawl fishery (widow rockfish and Pacific whiting). Over the following decade, several additional species were added to the list of actively managed species, with established OY catch amounts and, in some cases, allocations, harvest guidelines, or quotas. Under the MSA, catch by foreign fleets in the EEZ was eliminated by 1992. However, this decline was more than offset by expansion of the U.S. domestic fleet, which was encouraged by government subsidies.

In 1996, the Sustainable Fisheries Act amended and reauthorized the MSA. The MSA's National Standard 1 requires that FMPs prevent overfishing while maintaining OY. OY is the harvest amount that will achieve MSY, as reduced by relevant economic, social, or ecological factors (MSA §3(33)). Under the Groundfish FMP, a stock is considered overfished if current stock biomass is less than 25 percent of the unfished biomass.

The Council manages the commercial fishery primarily with bimonthly cumulative trip limits set to prevent fishing mortality from exceeding OYs. During a two-month cumulative trip limit period under the cumulative trip limit system, each vessel may land fish up to weight limits established for each species, stock, stock complex, or other management unit for which an OY has been set. The two-month cumulative limits can change from one period to the next and may be adjusted in response to new information. The primary exceptions to the use of cumulative trip limits are the trawl whiting fishery, which is managed using quotas and season closures, and the fixed-gear sablefish fishery, which is managed using a restrictive individual quota program tied to the "stacking" of multiple permits and associated quota, on a single vessel (Section 3.8.1). Both the cumulative trip limits and the sablefish quotas are functionally limited access privilege programs (LAPPs) because individual vessels are provided an opportunity to catch specified amounts of fish. However, the cumulative limits only cover landings; the system does not provide individual accountability for bycatch, which can be a problem for constraining species, where the limit is set very low or retention is prohibited. In effect, bycatch is estimated (based on observer data) and limited indirectly through season and area closures, or gear restrictions. Fixed-gear sablefish quotas only apply to the one target species; incidental catch may be subject to cumulative limits and the same issue as described above applies to bycatch.

In multi-species fisheries such as this, it is practically impossible to optimize harvests—achieve MSY—for all stocks simultaneously. Optimally harvesting any one stock may result in either under-harvest or over-harvest of co-occurring stocks. While under-harvest is not a concern from a biological standpoint, it may have social and economic impacts in terms of forgone protein supply, revenues, and income.

Current under-harvest of target species is the indirect result of over-harvest, which led to the designation of seven groundfish species as overfished (bocaccio, canary rockfish, cowcod, darkblotched rockfish, Pacific ocean perch, widow rockfish and yelloweye rockfish). Bocaccio, lingcod, and Pacific ocean perch were declared overfished in 1999. Under the Groundfish FMP, when a species is declared overfished, mortality levels for that species must be reduced to allow the species to recover to a biomass capable of

supporting MSY. In response, the Council began implementing depth-based area closures in the summer of 2002. These measures were designed to exclude fishing effort from depth zones particularly inhabited by overfished species. In addition, to keep the groundfish fishery within the species-specific catch limits for overfished species (landings plus discard mortality), limits were imposed on the landings of healthy stocks to reduce the take of incidentally caught overfished species. The entire fishery is thus managed based on constraints imposed by a few species, even if those species are not targeted by any particular fishery. Constraints of this type led the Secretary of Commerce to declare the west coast groundfish fishery a Federal disaster in January 2000.

The current number of overfished species and their occurrence in different areas and habitats affect virtually all fisheries for healthy stocks. For this reason, overfished species are sometimes referred to as "constraining stocks." Managing fisheries to prevent overfishing of these stocks requires forgoing substantial potential harvests.

The Council has been developing programs to reduce capacity in the groundfish fisheries since the mid-1980s, culminating with this proposal to consider IFQs and/or co-ops. Groundfish FMP Amendments 6, 8, 9, and 14 were drafted specifically to reduce capacity in groundfish fisheries. A vessel buyback program implemented in 2003 reduced the number of groundfish trawl vessels by one third. The adoption of rebuilding plans for overfished species (Amendment 16) led to the development of a vessel monitoring system (VMS), implemented in 2007, to ensure that proscribed fishing does not occur in closed areas—termed groundfish conservation areas (GCAs).

1.7 Council and Agency NEPA Scoping

Pursuant to NEPA, scoping is "an early and open process for determining the scope of issues to be addressed and for identifying significant issues related to a proposed action" (40 CFR 1501.7). The scoping process described in NEPA regulations emphasizes public involvement, prioritization of issues so that the impact analysis may focus on potentially significant impacts, and planning the impact analysis. The Council and the public process it conducts pursuant to the MSA provide an effective process for coordinating involvement of the public and interested state and Federal agencies in decisionmaking related to Federal fishery management. As such, the Council process serves as an effective scoping mechanism. All Council meetings and meetings of its various committees are open to the public, and this provides an opportunity for oral and written comment on issues brought before these bodies.

Development and refinement of the alternatives leading to the Council's choice of a preferred alternative has taken more than five years, with numerous Council and committee meetings during the process. The Council initiated development of an IFQ program for groundfish trawl fisheries at its September 2003 meeting.[14] The Council Chair then appointed members to the Ad Hoc TIQC from a broad range of constituencies. The TIQC was an important part of the scoping process, making recommendations on the development of the trawl rationalization program. Several other ad hoc committees have been formed to support the process of considering individual quotas; an existing standing committee, the Groundfish Allocation Committee (GAC), has also become involved in developing and refining the alternatives and options considered by the Council. Table 1-1 lists these committees with a brief description of their functions. Rosters for standing and ad hoc committees may be accessed on the Council's website at http://www.pcouncil.org/operations/rosters.html. Table 1-2 lists the meetings that have been held by the committees as well as Council meetings at which trawl rationalization or intersector allocation (which, as described above, is a separate but closely related action) has been discussed, with a brief description of the topics covered in each meeting.

[14] IFQs were an alternative under the 1991 Amendment 6 groundfish license limitation program, and they have been raised in Council discussions about management alternatives before and since that time.

Two standing committees, the Groundfish Management Team (GMT) and the Groundfish Advisory Subpanel (GAP), play an ongoing role in all aspects of groundfish management. The GMT is composed of representatives from NMFS and state fishery management agencies, while the GAP draws its representation from groundfish fishery sectors, gear groups, and other stakeholders. These two committees meet at every Council meeting where groundfish issues are on the agenda, and the GMT also holds three or four additional week-long meetings every year. Although initially not directly involved in development of the trawl rationalization program, these two committees' roles grew by commenting and providing recommendations as program alternatives were developed. Because their activities are not confined to the trawl rationalization program and the frequency of their meetings, these two committees' activities are not listed in Table 1-2.

Examination of Table 1-2 shows that the process of program development (formulating and evaluating alternatives, culminating in Council action to choose a preferred alternative) has moved forward in several stages. In late 2003, once the Council had committed to program development, and through 2004, various committees began initial work on program development. Publication of a notice of intent (NOI) to prepare an EIS on May 24, 2004, (69 Federal Register [FR] 29482) initiated an extensive public scoping effort, including a deadline for submitting comments by August 2, 2004. Input on the range of alternatives and potential impacts of the proposed action were solicited during this scoping period. Comments received during this NEPA public scoping period are summarized in a separate document (PFMC 2004b). Although the notice established a public comment deadline, scoping has effectively continued through the Council process because, as noted above, all meetings of the Council and its committees are open to the public and opportunities for the broader public to comment are provided at each meeting.

A funding shortfall at the end of 2004 prevented much work being done until funding was secured in the summer of 2005. At that time a consulting firm (Northern Economics, Inc.) was hired to begin EIS development. This process was broken up into two stages. During the first stage a detailed outline and analytical framework were to be developed; subsequent production of the EIS is a second stage. The consultants organized a workshop in April 2006 to bring together the various Council committees and members of the public to seek further input on program development and the structure of the alternatives. The completed Stage 1 document (NEI 2006) was presented to the Council in September 2006 (this EIS document is considered the Stage 2 document). In the latter part of 2006, the TIQC and GAC developed recommendations for a major restructuring of the alternatives to simplify them, including dropping some elements (such as an alternative involving permit stacking) in order to narrow the scope of the action. It was during this period that the Council added the whiting sector cooperatives alternative.[15] Because of this broadening of the range of alternatives, what had been referred to as the trawl individual quota program was henceforth called the trawl rationalization program. These restructured alternatives were adopted by the Council in March 2007, further refined by the committees, and adopted in detailed form for analysis by the Council in November 2007. These are the alternatives evaluated in this EIS.[16]

[15] The alternative principally deals with the at-sea and shorebased whiting fishery subsectors. The third whiting subsector, catcher-processors, operates under an independently formed co-op.

[16] In the process of developing the alternatives, the Council focused on many detailed aspects of the IFQ and co-op programs, working from an outline organization of program features, which is reflected in the structure of Appendices A (IFQ program components analysis), B (co-op program components analysis), and D (description of the Council preferred alternative). The alternatives adopted in 2007 were organized in this format. Generally, Council decisionmaking proceeded along the lines of considering no action, IFQs for all the trawl sectors, and a combination of IFQs for the nonwhiting trawl sector and co-ops for the whiting sectors, with variations in many specific program components. Preliminary drafts of the environmental analysis produced in 2008 presented "analytical scenarios" in Chapter 4 that allowed programmatic comparison of these various features, consistent with the general Council approach of considering IFQs and co-ops for different trawl

Council and NMFS staff used the Stage 1 document as the basis for developing the EIS, along with some modifications to the proposed structure of the document and analytical approach and incorporating the major modifications to the alternatives subsequently made.

The Council chose a preliminary preferred alternative for trawl sector rationalization in June 2008. Council decisionmaking on the trawl rationalization program culminated in November 2008 when it took final action by choosing a preferred alternative. However, several issues relating to the detailed specification of the preferred alternative still had to be resolved. These issues were addressed in the first half of 2009, with the Council taking final action on these program details at its March, April, and June 2009 meetings. A 45-day public comment period on the DEIS commenced on December 4, 2009, as required by the Council on Environmental Quality (CEQ) regulations. This FEIS responds to comments received (see Chapter 10).[17] The responsible official within NMFS (the Assistant Administrator) may sign a ROD no less than 30 days after publication of the FEIS, which clears the way for program implementation (recognizing that various other statutory requirements must be simultaneously met). Although this NEPA process is expected to be completed in 2010, the earliest projected date for program implementation—in terms of when fishing would begin under a rationalization program involving IFQs and/or cooperatives—is January 1, 2011. Program infrastructure (e.g., IFQ monitoring systems) is under development during 2010.

1.8 Relationship to Other NEPA Documents

The EIS is a stand-alone NEPA document that does not tier off any previous EISs. A NEPA environmental review was prepared for the Groundfish FMP, which was implemented in 1982. NEPA environmental reviews have been prepared for each of the subsequent amendments to the FMP. These documents are incorporated into the EIS as necessary to fully explain the No Action (status quo) Alternative and to analyze the cumulative effects of the alternatives on the human environment.

This EIS incorporates information from other EISs produced by NMFS and the Council by reference, where applicable. EISs prepared to evaluate harvest limits and management measures for the last two biennial management cycles (2005-06 and 2007-08) (PFMC 2004a; PFMC 2006) provide detailed discussion of the Federal, state, and tribal roles and responsibilities in groundfish management; fishery ecosystem and marine biodiversity in relation to groundfish management; groundfish essential fish habitat (EFH), including adverse impacts of fishing and nonfishing related activities; life history characteristics, distribution, and stock status of groundfish species and nongroundfish species; life history, population biology, and foraging ecology of protected species, including ESA-listed salmon, marine mammals, seabirds and sea turtles; and the socioeconomic environment, which includes commercial, tribal and recreational fisheries, coastal communities, and nonconsumptive and nonmarket benefits. The *Pacific Coast Groundfish Fishery Management Plan Essential Fish Habitat Designation and Minimization of Adverse Impacts Final Environmental Impact Statement* (EFH EIS) prepared by NMFS (NMFS 2005) provides habitat information and analysis of the effects of the groundfish fishery on habitat. Additionally, *The Pacific Coast Groundfish Fishery Management Plan Bycatch Mitigation Program Final Environmental Impact Statement* (Bycatch EIS) prepared by NMFS (NMFS 2004c) provides a guide for developing issues for a rights-based program of IFQs.

sectors. In completing the DEIS, it was decided that presenting the analytical scenarios as alternatives in Chapter 2 would improve reader comprehension and better reflect the decisions made by the Council.

[17] Section 302(f) of the MSA Reauthorization Act of 2006 (P.L. 109-479) requires the Council to submit a proposal for the rationalization program to Congress within 24 months of the Act's passage, or January 12, 2007. Although a DEIS was not released for public comment by that date, a description of the Council's preferred alternative adopted in November 2008 and a preliminary version of the DEIS were submitted to Congress to satisfy this requirement.

The Council took action parallel to trawl rationalization to allocate harvest opportunity for selected species between the groundfish trawl sector and other groundfish fishery sectors (Amendment 21 to the Groundfish FMP). These allocations support trawl rationalization since a quantity of fish, by species or management unit, must be identified for assignment through the IFQ or co-op systems. A separate EIS has been prepared for this action.

Table 1-1. Description of committees involved in trawl rationalization program development.

Committee Name	Composition and Function
Groundfish Allocation Committee (GAC)	Six voting members are drawn from the Council; seven nonvoting members drawn from stakeholders. Provides high level policy guidance and refinement of alternatives for consideration by the full Council.
Ad Hoc Groundfish TIQ Committee (TIQC)	Seventeen members drawn from stakeholders; principally fishing and processing interests. Involved in the initial development of program features; provides stakeholder perspective on program development.
Ad Hoc TIQ Analytical Team	Council and agency staff and consultants conducting NEPA analysis. This group held several public meetings early in the process to discuss how the impact analysis would be done. Composition subsequently changed to include mainly agency and Council staff with most work occurring internally.
Ad Hoc TIQ Enforcement Group	Drawn from the standing Enforcement Consultants committee to review and advise on practicality of program features in terms of enforceability.
Ad Hoc Trawl Rationalization Tracking and Monitoring Committee	Management and enforcement agency staff at the state and Federal level; charged with developing program options for monitoring and enforcement.
Ad Hoc TIQ Independent Experts Panel	Five academic experts with expertise in fishery science, economics. Provides external review of program features.

Table 1-2. Committee and Council meetings related to trawl rationalization program development.

Date	Committee	Subject
September 11, 2003	Council meeting, Agenda Item C.10[a]	Initiated development of a TIQ program, which later became the trawl rationalization program.
October 28-29, 2003	Ad Hoc TIQC	Began development of alternatives for an individual quota program to cover LE trawl landings in the west coast groundfish fishery. Established committee charge, decision rules, and purpose, need, and objectives for an individual quota program.
November 6, 2003	Council meeting, Agenda Item D.12	Provided guidance based on Ad Hoc TIQC report and considered establishing a new control date.
March 18-19, 2004	Ad Hoc TIQC	Continued development of alternatives.
March 24-25, 2004	GAC[b]	Discussed allocations necessary to support trawl sector IFQs.
April 9, 2004	Council meeting, Agenda Item C.16	Provided further guidance on program development and discussed issue of latent permits.
May 25-26, 2004	Ad Hoc Groundfish TIQ Enforcement Group	Conducted preliminary scoping on types of enforcement programs that would be necessary for a groundfish trawl IFQ program, information needs, and landings tracking and monitoring systems.
June 8-9, 2004	Ad Hoc TIQ Analytical Team Ad Hoc Groundfish TIQ Independent Experts Panel	Conducted preliminary scoping on the types of impacts to be considered and analytical methods used in a groundfish trawl DAP EIS. Related data collection issues also discussed.
June 17, 2004	Council meeting, Agenda Item C.9	Heard committee reports, discussed need for programmatic EIS, and approved scoping information document for public distribution.
July 1-2, 2004	Ad Hoc TIQ Analytical Team	Continued work from previous meeting.
September 7-8, 2004	Ad Hoc TIQ Analytical Team	Reviewed results from public scoping plan and progress on analytical tasks; discussed organization and assignments for EIS.
September 17, 2004	Council meeting, Agenda Item C.11	Heard progress report and results of public scoping, provided guidance on committee work and composition, and intersector allocation.
September 22-23, 2004	Ad Hoc Groundfish TIQ Independent Experts Panel	Reviewed scoping information document and comments received during recently completed NEPA public scoping period to determine whether there were significant options and impacts not yet identified that, in the Experts Panel's view, should be considered by the Council.
September 28, 2004	Ad Hoc Groundfish TIQ Enforcement Group	Reviewed enforcement program alternatives developed at its previous meeting in the light of comments received during the recently completed NEPA scoping period and worked on developing a general assessment of the costs for status quo enforcement and levels of enforcement that might be required for different individual quota enforcement programs.

Date	Committee	Subject
October 25-26, 2004	Ad Hoc TIQC	Reviewed results from public scoping and some preliminary analysis and refined recommendations to the Council.
November 3-4, 2004	Council meeting, Agenda Item E.6	Provided guidance for the evaluation of a preliminary range of alternatives.
November 17-18, 2004	Ad Hoc TIQ Analytical Team	Reviewed the Council action from the November 2004 Council meeting; planned the next analytical tasks.
January 27, 2005	GAC*	Discussed allocations necessary to support rationalization.
February 23-24, 2005	Ad Hoc TIQC	Continued review of results from public scoping and some preliminary analysis; refined recommendations to the Council.
May 2-3, 2005	GAC	Discussed rationalization alternatives with attention to intersector allocation.
May 10-11, 2005	Ad Hoc TIQC	Developed recommendations on program design.
June 16, 2005	Council meeting, Agenda Item C.5	Approved range of alternatives for analysis.
October 30, 2005	Ad Hoc TIQC	Provided guidance on measures to mitigate impacts to communities.
November 3, 2005	Council meeting, Agenda Item H.11	Received update on progress of program development, provided guidance on measures to mitigate impacts to communities.
November 14-15, 2005	GAC	Discussed allocations necessary to support rationalization.
March 16, 2006	Ad Hoc Groundfish TIQ Independent Experts Panel	Reviewed and commented on preliminary internal draft document that consultants developed for a public workshop (see below) on approach for analysis of TIQ alternatives.
April 18-20, 2006	Public Workshop on Trawl Individual Quota Analysis	Conducted workshop to review and receive comments from the public and Council advisory bodies on the first stage of the draft analytical package developed by consultants.
June 11, 2006	Ad Hoc TIQC	Developed recommendations on structure of alternatives and program design.
June 15, 2006	Council meeting, Agenda Item F.3	Reviewed draft of the preliminary (Stage 1) analysis and provided recommendations on refinements to analytical approach. Drafting of the EIS was divided into two stages due to budget constraints. Stage 1 was an analytical framework for the EIS.
September 10, 2006	Ad Hoc TIQC	Reviewed stage 1 document (analytical framework). Provided guidance.
September 14, 2006	Council meeting, Agenda Item C.7	Reviewed Stage 1 document (analytical framework). Provided guidance on a process to revise and simplify the alternatives for Stage 2 analysis. Added alternative for cooperatives in Pacific whiting fishery.
October 18-19, 2006	GAC	Provided guidance on development of alternatives for allocation between trawl and nontrawl sectors necessary to support rationalization.

Date	Committee	Subject
November 6-8, 2006	Ad Hoc TIQC	Reviewed and further developed alternatives under analysis, with particular emphasis on co-op alternatives for whiting sectors; reviewed GMT comments from September 2006 Council meeting.
November 16, 2006	Council meeting, Agenda Item D.7	Adopted preliminary alternatives for intersector allocation, which supports trawl rationalization (to be analyzed in a separate NEPA document).
December 12-14, 2006	GAC	Recommended restructuring and narrowing the range of alternatives to be considered for rationalization.
February 20-22, 2007	Ad Hoc TIQC	Reviewed and further developed alternatives under analysis, with particular emphasis on GAC report from GAC's December meeting and GMT comments from GMT's January 2007 meeting.
March 8, 2007	Council meeting, Agenda Item E.4	Modified and simplified alternatives based on GAC and other committees' recommendations. Adopted revised goals and objectives for the program. Added feature to Pacific whiting cooperative alternative to cover shore-based sector.
May 2-4, 2007	Ad Hoc TIQC	Reviewed and further developed alternatives under analysis, particularly with respect to alternatives for whiting sector vessel co-ops.
May 15-17, 2007	GAC	Developed recommendations for further refinement of trawl rationalization alternatives.
June 13, 2007	Ad Hoc TIQC	Further refined the trawl rationalization alternatives.
September 25-27, 2007	GAC	Developed recommendations for further refinement of trawl rationalization alternatives and intersector allocation alternatives.
October 11-12, 2007	Ad Hoc TIQC	Reviewed and further developed trawl rationalization alternatives under analysis.
November 7-9, 2007	Council meeting, Agenda Items D.5 and D.7	Adopted range of intersector allocation alternatives for analysis. Refined and finalized trawl rationalization alternatives for analysis.
November 30, 2007	Ad Hoc Trawl Rationalization Tracking and Monitoring Committee	Provided agency guidance and perspectives on design constraints and scoped likely impacts of alternative configurations of tracking and monitoring systems for trawl rationalization.
February 13, 2008	Ad Hoc Trawl Rationalization Tracking and Monitoring Committee	Provided agency guidance and perspectives on design constraints and scoped likely impacts of alternative configurations of tracking and monitoring systems for trawl rationalization.
February 20-22, 2008	GAC	Considered draft alternatives (and other material for trawl rationalization) and intersector allocation alternatives.
April 7-12, 2008	Council meeting, Agenda Item H.3	Deferred selection of preferred alternative for intersector allocation to support trawl rationalization until March 2009.
May 13-15, 2008	GAC	Developed advice a preferred alternative for the Council's June 2008 decision.
May 15-16, 2008	Ad Hoc TIQC	As above for the GAC.

Date	Committee	Subject
June 8-13, 2008	Council meeting, Agenda Item F.6	Selected preliminary preferred alternative for trawl rationalization program.
October 8-9, 2008	GAC	Developed recommendations to the Council on preferred trawl rationalization alternative, on which the Council was scheduled to take final action at the November 2008 Council meeting.
November 1-7, 2008	Council meeting, Agenda Item F.3	Selected preferred alternative for trawl rationalization program.
January 27-29, 2009	GAC	Developed recommendations on accumulation and control limits for IFQs.
March 7-13, 2009	Council meeting, Agenda Item G.3	Provided guidance on eligible to own provisions and clarified aspects of its November 2008 decision.
April 2-9, 2009	Council meeting, Agenda Items F.4 and F.5	Clarified action on adaptive management program, community fishing associations, and other miscellaneous issues.
May 5-7, 2009	GAC	Considered options for adaptive management program and community fishing associations, vessel and control limits for Pacific halibut and IFQs, FMP amendment language, and other miscellaneous items.
June 11-19, 2009	Council meeting, Agenda Items E.10 - E.12	Took final action on outstanding issues for trawl rationalization program.
October 31-November 5, 2009	Council meeting, Agenda Item G.8	Modified the initial allocation formula for canary rockfish IFQs.
March, April, and June 2010	Council meetings	Council reviews proposed regulations for program implementation and deems them necessary and appropriate.

[a]Briefing materials provided at each Council meeting are available at http://www.pcouncil.org/bb/bbarchives.html. The materials constitute a substantial part of the record of the development of the program. Council meeting minutes, summarizing Council discussion and decisions, are available at http://www.pcouncil.org/minutes/cminutes.html.

[b]The GAC was originality constituted as the Ad Hoc Allocation Committee. It was converted to a standing committee in March 2005.

CHAPTER 2 DESCRIPTION OF THE ALTERNATIVES, INCLUDING THE PREFERRED ALTERNATIVE

This chapter describes the alternatives for implementing a trawl rationalization program. There were three management approaches that the Council considered in developing its action alternatives: (1) vessel cumulative landing limits, (2) IFQs, and (3) cooperatives (co-ops). From these management approaches, four basic alternatives were developed for analysis. Most of the alternatives are a hybrid of the IFQ and co-op management approaches. These management approaches are broadly described below and are described in more detail within the alternatives and in Appendices A and B.

Vessel Cumulative Landing Limits Management Approach: The groundfish LE trawl fishery is currently managed with vessel cumulative landing limits (i.e., trip limits) and season closures. The vessel cumulative landing limits are used mainly for the nonwhiting segment of the trawl fishery and are generally structured around six, two-month cumulative periods with the first period being January-February, etc. While the two-month limits are used to maintain a year-round fishery, however, if a harvest limit for the trawl fishery is exceeded, the entire fishery may face increased area restrictions or closure. Cumulative landing limits are set based on catch projections derived from a bycatch model that incorporates various data from previous years. Season closure is used as the main tool for controlling harvest in the whiting fishery.

IFQ Management Approach: IFQs are a form of LAP. They grant an entity the privilege to catch a specified portion of the LE trawl fishery's allocation of groundfish. If an individual vessel's quota, or harvest limit, is exceeded, that vessel is accountable. All catch would be monitored and independently verified, eliminating the need for catch projection based on bycatch modeling. Near real time catch data would be available to manage the fishery.

Cooperative Management Approach: Co-ops are another form of LAP. They are a system by which groups pool their resources together and act in a cooperative manner. Generally, the most efficient vessels are used to harvest the pooled resource. In the current groundfish fishery, the Pacific whiting catcher-processor sector has organized itself as a co-op (vessels in the mothership and shoreside whiting sectors operate independently, competing with one another in the seasonal fishery). All catch would be monitored and independently verified. Real time catch data would be available to manage the fishery.

From these management approaches, four basic alternatives were considered for implementing the trawl rationalization program. These are as follows:

- Alternative 1: Status quo management (no action alternative)
- Alternative 2: IFQs for all groundfish trawl sectors
- Alternative 3: IFQs for the nonwhiting sector and co-ops for all whiting sectors
- Alternative 4: IFQs for a single shore-based sector and co-ops for the whiting at-sea sectors

Implementing trawl rationalization—whether through IFQ or cooperatives—requires the specification of numerous program elements (features). In many cases, there are different ways to specify these elements. These different approaches are structured as options (choices to be made in structuring the program), where appropriate. Variations on some alternatives were developed to contrast key program features, which are sub-alternatives denoted by a letter suffix. These are Alternatives 2a, 2b, and 2c and Alternatives 4a and 4b. Alternatives 1 and 3 do not contain sub-alternatives. Alternative 4b is the preferred alternative (Section 2.4). With these variations included, six alternatives are evaluated in Chapter 4 of this EIS. The four basic alternatives are described below in Sections 2.1 through 2.4. Where sub-alternatives were developed, differences between them are noted in the description of the four basic alternatives. Table 2-1 provides an overview of the action alternatives and their program elements.

The trawl rationalization program developed by the Council is complex, with a large number of specific program elements. For example, in developing the IFQ component of the program, the Council considered 26 different program elements. A similar number of program elements were considered for whiting co-ops. Many of these elements do not vary across the alternatives. The analysis in Chapter 4 of this EIS looks at the overall impact of alternative programs, while Appendix A and Appendix B evaluate the program elements considered by the Council for an IFQ and whiting cooperative program, respectively. Appendix D is a detailed, stand-alone description of the complete trawl rationalization program recommended by the Council in the preferred alternative (Alternative 4b). Section 2.5 describes the alternatives considered but rejected from further analysis, including permit stacking and extended cumulative landing limits.

Table 2-1. Summary of alternatives by program elements.

ELEMENT	ALTERNATIVES						
	Alt. 1 (status quo/no action)	**Alt. 2a**	**Alt. 2b**	**Alt. 2c**	**Alt. 3**	**Alt. 4a**	**Alt. 4b (Preferred Alt.)**
Catch Control Tool	□2-mo cum trip limits for NonWhtg Trawl □Seasonal mngmnt for Whtg Trawl	IFQ for all Trawl Sectors			□IFQ for Nonwhiting Trawl □Co-ops for Whiting Trawl	□ IFQ for SS Trawl Co-ops for At-Sea Trawl	□ IFQ for SS Trawl (trip limits for nonIFQ species)
Initial Allocation and Qualification	None	Based on permit landing history			□ Equal sharing of buyback history in Nonwhiting (all groundfish) □Rebuilding stocks allocated on a bycatch rate □CV co-op endorsement & allocation 97-03	□ Equal sharing of buyback history in SS □Rebuilding stocks allocated on a bycatch rate (all groundfish) □CV(MS) endorsement & allocation 97-03	□ Equal sharing of buyback history in nonCP sectors (all nonoverfished spp. & canary) □Rebuilding stocks and halibut alloc. on bycatch rate/pro rata □CV(MS) end. & alloc. based on 94-03 □ MS permit: at least 1,000 mt in 2 years from 97-03
Accumulation Limits	None	□SS nonwhiting groundfish: 3% control & 6% per vessel □SS whiting: 12% control & 25% per vessel □MS: 25% ctrl & 50% per vsl □ CP: 60% ctrl & 75% per vessel			□ SS grnd: 1.5% ctrl & 3% per vsl □ CV(SS) whiting: 15% □ MS: 20% □ CV(MS): 10% □ CP: none	□ SS grnd: 2.2% ctrl & 4.4% per vsl □ SS whiting: 25% ctrl & 12% per vessel □ MS: 30% □ CV(MS): 15% □ CP: none	□ SS grnd: 2.7% ctrl & 3.2% per vessel □ SS whiting: 10% ctrl & 15% per vessel □ MS: Cannot process more than 45% □ CV(MS): 20% own, 30% usage
Grandfather clause	None	Grandfather clause exists			None	Grandfather clause exists	None, but entities must divest overage QSs at the end of year 4
Processor Initial Allocation / Co-op Affiliations	None	None		25% of grndfsh, 50% whiting to SS and MS	□ 100% Proc.affiliations in MS and SS whiting sectors. □25% SS processor alloc of SS groundfish	□50% Processor affiliation in MS sector □50% SS proc. alloc. of SS whiting □No proc. alloc. of SS grndfsh	□Annual mothership declaration requirement □20% SS processor allocation of SS whiting □No processor allocation of nonwhiting
Species Covered	All groundfish	All groundfish and Pacific halibut			□ All groundfish in nonwhiting sector □ Select species at sea. Bycatch pools are shared by all whtg sctrs	□ All groundfish in SS sector Select species at sea. At-sea sector bycatch is allocated at co-op level	□ Select groundfish species and Pacific halibut in shoreside sectors.
Number of Trawl Sectors	Four	Three			Four	Three	
Adaptive Mngmnt	None	None	10% A.M. set aside	None	10% A.M. set aside for all sectors	10% A.M. set aside for SS	10% A.M. set aside for SS nonwhiting species
Area Mgmt	TL vary by area; main split at 40 10 N lat	None			Species split at 40 10 N lat	Species split at 40 10 N lat	None
Carry-over	None	Carry-over exists			None	Carry-over exists	Carry-over exists. Allowance decreases if OY declines

1) For analytical purposes, the adaptive management provision will be assumed to be used to A) mitigate against the effects of the program on adversely impacted communities, B) provide incentives to use habitat and bycatch friendly gear, and C) to mitigate against adverse effects of the program on processors (this is specific to Alternative 2b). For Alternative 4b, the Council's goals and objectives specified for AMP are used.
2) Under the Council's preferred Alternative (Alternative 4b), control limits do not apply to QPs.
3) Assumptions regarding the sector level allocations of groundfish species and Pacific halibut differ between Alternative 4b and other alternatives. Alternative 4b uses the Council's Final Preferred Alternative for Intersector Allocation.
4) The catcher processor sector has independently developed and operated under a private co-op structure within the season structure provided by Federal regulations.

2.1 Alternative 1 - Status Quo (No Action)

Under Alternative 1, status quo/no action, most of the elements of the current management regime for the groundfish LE trawl fishery would remain in place. The Groundfish FMP describes the management

framework for the groundfish trawl fishery. The groundfish LE trawl fishery includes a nonwhiting trawl fishery (shore-based) and a whiting fishery (shore-based, mothership, and catcher-processor sectors).

Every two years, the Council establishes harvest limits (OYs) for various species or groups of species.[31] OYs represent an annual quantity of fish that the groundfish fishery as a whole may catch. A few species, such as Pacific whiting and sablefish, have fixed trawl allocations. The FMP defines other allocations between different gears, which in addition to the whiting and nonwhiting trawl fisheries include LE fixed-gear, the open access sector, and recreational fisheries in each state. Other allocations are determined through the biennial process to specify harvest limits (ABCs, OYs, and harvest guidelines [HGs],) and management measures (i.e., specifications and management measures process). The need to rebuild the seven currently overfished rockfish species means that the OYs for these species are relatively low compared to target species OYs. Due to the multi-species nature of the fishery, these low OYs affect all aspects of groundfish management.

The following sections describe the main elements of Alternative 1, as summarized in Table 2-1.

2.1.1 Catch Control Tool

Nonwhiting Trawl Fishery

Under status quo (Alternative 1), two-month, cumulative trip limit (landing limit) periods are the primary catch control tool. Other catch control tools used include the following:

- Gear restrictions focused on discouraging or prohibiting gear that may be used in rocky habitat, where some overfished species occur. The use of bycatch-reducing trawl nets has also been required in some areas.
- Rockfish conservation areas. Closed areas were first implemented in 2003 to keep vessels away from depth ranges where overfished species are more abundant. These closed areas, called RCAs, are a coastwide feature of management.
- EFH conservation areas. These are a set of closed areas to protect bottom habitat from the adverse effects of fishing gear, including trawl gear.

For the nonwhiting trawl fishery, catches resulting from a set of proposed cumulative landing limits (i.e., trip limits) can be projected, indicating the proportion of the OY expected to be taken by the fishery and the amount available to other fisheries. During the season, if projected catches diverge from generally agreed fishing opportunity for a fishery (an implicit allocation target), the proposed trawl cumulative landing limits (or those established for other fisheries) can be adjusted until the projections are in line with expectations.

OYs for some overfished species—in the case of the trawl fishery, particularly canary rockfish on the continental shelf and darkblotched rockfish on the slope—impose the greatest constraint, translated into a variety of management measures that indirectly limit mortality on the constraining stocks.

Catch restrictions based on cumulative landing limits are the primary measures set for the trawl fisheries in the biennial specifications process. The boundaries of closed areas—the RCAs or GCAs—are also often adjusted as part of the biennial process. Although trawl gear restrictions, principally intended to keep trawlers out of rocky habitat (where several of the overfished species are found), are an important part of the management process, these requirements are much less frequently modified. In addition to restrictions on the size of trawl net footropes intended for this purpose, selective flatfish trawl (SFT) gear,

[31] Under new rules in the MSA, the method for determining these harvest limits may change, and they may be referred to as annual catch limits (ACLs) by the time the trawl rationalization program is implemented.

which has shown a lower incidental catch rate for some groundfish, including some overfished species, is required shoreward of the trawl RCA north of Cape Mendocino, California.

Other measures affecting the nonwhiting trawl fishery are established in permanent regulations and are not modified through biennial or inseason action. Important among these are various measures implemented in 2006 and intended to reduce adverse impacts to EFH. These include gear restrictions and prohibitions and additional areas closed to trawl gear.

Whiting Trawl Fishery

Under status quo, all three commercial sectors of the whiting fishery (shore-based, mothership, and catcher-processor sectors) would continue to be managed under a primary season structure where vessels harvest whiting until the sector allocation is reached, and the fishery is closed. Incidental groundfish taken in the whiting fishery would continue to be managed under cumulative trip limits. To allow each sector of the whiting industry to have the opportunity to harvest its share of the whiting OY, the nontribal commercial fishery is managed with sector-specific bycatch limits for certain overfished species. To date, bycatch limits have been established for darkblotched, canary, and widow rockfish. Concern that bycatch in one sector would result in the closure of a different sector of the fishery led the Council to recommend that sector-specific bycatch limits be implemented as part of the 2009-10 Harvest Specifications and Management Measures, rather than a single bycatch limit for all commercial sectors.

Regulations provide for the automatic closure of the commercial (nontribal) portion of the whiting fishery, upon attainment of a bycatch limit. If a sector-specific bycatch limit is reached or is projected to be reached, the Pacific whiting fishery for that sector will be closed, regardless of whether the Pacific whiting allocation has been achieved.

Incidental take of endangered or threatened salmon runs is another concern for the Pacific whiting fishery. Chinook is the salmon species most likely to be affected because of the spatial/temporal overlap between the Pacific whiting fishery and the distribution of Chinook salmon such that it could result in incidental take of listed salmon. The season start dates are, in part, meant to limit targeting on whiting fishing when listed Chinook salmon are most likely to be taken incidentally. NMFS also has the option of closing inshore areas to fishing if too many salmon are caught.

2.1.2 Initial Allocation and Qualification

Measures to control capacity—such as the license limitation and vessel buyback programs—are another important permanent feature of the current groundfish trawl fishery management framework. A Pacific Coast groundfish LE permit with a trawl endorsement is required to participate in the nonwhiting trawl fishery, and participants deliver their catch to shore-based processors.

A Pacific Coast groundfish LE permit with a trawl endorsement is required to participate in the whiting fishery. Since Amendment 15 was implemented in 2008, vessels are also required to have a Pacific whiting vessel license specific to the sector in which they participate. Requirements for obtaining a Pacific whiting vessel license in the nontribal sectors were as follows: catcher vessels in the whiting shore-based fishery were required to have made sector-specific whiting landings in any one calendar year from January 1, 1994, through January 1, 2007; vessels participating in either the catcher-processor or mothership sector were required to have either caught and processed whiting (catcher-processor sector,) caught and delivered whiting (catcher vessels in mothership sector,) or processed Pacific whiting (motherships) in any one calendar year from January 1, 1997 through January 1, 2007. This was the first participation requirement for motherships, which, unlike catcher vessels, have not needed a groundfish LE permit registered to them. Amendment 15 is intended to serve as an interim measure to limit potential

participation in the whiting fishery within the U.S. west coast EEZ until implementation of a trawl rationalization program under Amendment 20 to the Groundfish FMP.

The shore-based whiting sector participants who want to participate in the maximized retention program also need an exempted fishing permit (EFP) to participate. The EFP specifies the terms and conditions of catch retention and monitoring. Pacific whiting first receivers intending to accept deliveries of EFP catch also have to obtain an EFP that specifies terms and condition of sorting, catch accounting, and monitoring.

2.1.3 Accumulation Limits and Grandfather Clause

There are no accumulation limits or grandfather clause under status quo management (Alternative 1).

2.1.4 Initial Allocation to Processors

There is no initial allocation to processors under status quo management (Alternative 1).

2.1.5 Species Covered

Alternative 1 covers all groundfish species managed under two-month cumulative trip limits. For the LE trawl fishery, these species are listed in the trip limit tables codified in regulation at 50 CFR part 660, subpart G, appendix Tables 3 (north and south).

2.1.6 Number of Sectors

The groundfish trawl fishery is divided into a nonwhiting and whiting fishery. The whiting trawl fishery is divided into three sectors: the shore-based sector, the mothership sector (including motherships and catcher vessels), and the catcher-processor sector.

2.1.7 Adaptive Management

There is no explicit adaptive management provision under status quo management (Alternative 1). On a biennial basis, the Council adapts regulations to current OYs, and it makes adjustments inseason to accommodate unexpected harvest rates. Other adaptive actions are taken up as either regulatory or FMP amendments.

2.1.8 Area Management (Latitudinal)

Under Alternative 1 (status quo/no action), the two-month cumulative trip limits for groundfish species vary by gear and by area for the nonwhiting fishery. The two-month cumulative trip limits, displayed through the groundfish biennial harvest specifications process in trip limit tables, are generally split by area to match the ABC/OYs for those species. The main area designation is at 40° 10’ N. latitude.

2.1.9 Carryover of Unused QPs between Consecutive Years

There is no carry-over provision under status quo management (Alternative 1). Regardless of each year’s harvest level, the fishery starts the subsequent year with a new OY (there are no adjustments to carry overages or underages from one year to the next). Over-harvest and under-harvest are accounted for through the effects on the status of the stocks, as reflected in stock assessment documents.

2.1.10 Tracking and Monitoring

Nonwhiting trawl fishery

Cumulative landing limits have been used to manage the trawl fishery since 1996. Landing limits were originally implemented on a per-trip basis in the 1980s. Cumulative landing limits worked reasonably well until the need to rebuild overfished stocks became a central concern of the management process. Managing by landings alone then became much less effective because the low landing limits (or no retention rules) established for these stocks led to unacceptable levels of unmonitored bycatch. To better estimate total catch, NMFS implemented the West Coast Groundfish Observer Program (WCGOP) in August 2001. The WCGOP collects data applied to derive catch ratios of nontarget species that are used to model bycatch. Using observer, fish ticket, and logbook data, the fishery is modeled to derive estimates of total catch by species. The overall estimates of total catch were much improved over the previously used bycatch ratio, which had been derived from a scientific study. The current WCGOP coverage plan identifies the monitoring target for the nonwhiting trawl fishery as 20 percent of the catch as a proportion of total landings

Although the WCGOP has substantially improved monitoring of the nonwhiting trawl fishery, the program uses partial coverage by observers to provide data on total catch by species over the course of a full year. As a result, there is a considerable lag time in the delivery to managers of catch estimates based on WCGOP observations because the program did not have the necessary observer coverage for real time fishery management of the entire groundfish fishery. Currently, observer reports, which contain bycatch rates that can be used to project total catch mortality, are on an eight-month lag. Due to the delayed availability of fish ticket and logbook data and the time needed to process observer data, the final analysis of estimated total catch by species, which gives a retrospective picture of how the fishery performed and is used to project future catch (or the effectiveness of management measures in meeting targets), is typically not finalized until well over one year after the fishing year has ended.

Whiting trawl fishery

The whiting fishery has a higher level of monitoring than the nonwhiting trawl fisheries, which would be maintained under status quo. The At-Sea Hake Observer Program (whiting mothership and catcher-processor sectors) is a seasonal program where the operational costs are shared by NMFS and the vessel owners. Since 1991, the domestic at-sea Pacific whiting processors (motherships and catcher-processors) have carried third-party observers on all processing vessels. Third-party observers are certified by NMFS to sample the catch and provide data that is used to estimate total landed catch and discards, monitor the attainment of annual groundfish allocations, estimate catch rates of prohibited species (salmon, halibut, and Dungeness crab), and assess stock conditions. Mandatory observer coverage requirements were codified in 2004 (69 FR 31751; June 7, 2004). From 1992 to July, 2004, the motherships voluntarily carried observers. Prior to 2000, most motherships each carried one observer, while catcher-processors carried two for monitoring their self-developed voluntary co-op. Since 2000, the motherships have, for the most part, carried two observers, too. Having two observers allows all or almost all hauls to be sampled and increases the accuracy of data used to monitor fishery allocations and estimate incidental catch. To date, catcher vessels in the mothership sector have not been required to have onboard monitoring, nor have they voluntarily been monitored.

Since 2007, whiting shore-based sector vessels fishing under EFPs have been required to pay directly to a NMFS-specified provider for electronic monitoring system (EMS) services as no Federal funding has been available to provide for EMS coverage. EMS is a video-based tool used to verify full retention of catch. EMS systems consist of two or more closed circuit television cameras, global positioning systems

(GPS), hydraulic and winch sensors, and on-board data storage. From an EMS pilot study, it was determined that EMS could be used accurately to identify the time and location of discard events. In 2008, NMFS began transitioning the whiting shore-based fishery from a maximized retention and monitoring program conducted under a state-run EFP to a Federal regulatory program. In doing this, NMFS chose to manage the 2008 and 2009 Pacific whiting shore-based fishery maximized retention and monitoring program under EFPs. The EFPs incorporated provisions that NMFS anticipates as being necessary in regulations implementing a maximized retention and monitoring program for the Pacific whiting shoreside vessels, including EMS coverage requirements, EMS equipment specifications, and EMS provider certification requirements.

Pacific whiting first receivers are required to have an EFP to process unsorted whiting catch. The EFP would continue to require first receivers to procure third-party catch monitors for fish ticket verification. These individuals would be trained by NMFS or to NMFS specifications. In 2009, the Council recommended that the catch monitor coverage level be increased to full coverage of all deliveries for monitoring sector-specific bycatch limits. With full coverage of all deliveries, a catch monitor must be present throughout the offloading, sorting, and weighing of each Pacific whiting delivery. With full coverage, the number of individual catch monitors per facility would vary depending on the hours of operation and the number of Pacific whiting deliveries received each day.

First receivers would continue to be required to submit federal electronic fish tickets. Electronic fish ticket requirements support a real-time inseason data system (i.e., Microsoft Access version 2003 or later or Pacific States Marine Fisheries Commission [PSMFC] software is used). Electronic fish ticket software would continue to be provided by NMFS or PSMFC at no cost.

The trawl fleet has been required to carry satellite VMS units since 2004. These units provide hourly position reports on trawl vessels and are used to ensure compliance with area restrictions.

2.1.11 Gear Conversion

There is no provision for gear conversion under status quo management (Alternative 1). Groundfish LE permits can be endorsed for trawl, longline, or pot gear, and a limited number of permits are dual-endorsed for more than one gear type. If a fisherman wants to switch to another gear, he would have to obtain (buy or lease) and register a LE permit with an endorsement for that gear to his vessel. There are frequency and vessels size restrictions on registering and transferring LE permits.

2.2 Alternative 2 - IFQs for all Groundfish Trawl Sectors

This section describes Alternative 2, IFQs for all groundfish trawl sectors (whiting and nonwhiting, shore-based and at-sea). Three sub-alternatives are evaluated under this Alternative (Alternatives 2a, 2b, and 2c) to compare and contrast certain key elements of the IFQ program. As noted above, Appendix A provides further detail on the elements and options the Council considered for an IFQ program.

This alternative would modify the status quo by establishing an IFQ program for all groundfish trawl sectors, including the nonwhiting and whiting (at-sea and shore-based) fisheries. Alternative 2 is market-centric with a high level of individuality and individual accountability. Alternative 2 is intended to illustrate the effect of market incentives on the program. Illustrating the effect of the market without special provisions limiting market influence serves as a benchmark to help inform other decisions, such as whether to include provisions to hedge against market influence. While many status quo management tools would remain in place under this alternative, the significant difference would be in the way catch is allocated and tabulated. Most cumulative landing limits and, for whiting, season closures would no

longer be used. Other measures, such as RCA boundaries, may be adjusted as experience is gained with the IFQ program.

Alternative 2 focuses on market outcomes to determine the distribution of catch among vessels and timing of harvest by issuing QSs to entities and by requiring that all groundfish species and Pacific halibut[32] be covered with QSs. This means that market incentives apply to all groundfish catch and Pacific halibut. If species were not covered by QSs, the market would not have an effect on the distribution and timing of catch, because they would not be directly managed by the rationalization system, which by definition is market-based. Issuing QSs (instead of establishing co-ops) is intended to isolate the effect of the market to individuals by holding them directly accountable for their own catch, through regulatory mechanisms. Co-ops may result in a slightly different outcome because of their collective, community nature (individuals are accountable to the co-ops). This alternative also focuses on market outcomes by establishing three trawl sectors (versus four), allowing more market influence over the harvest strategies of fishing entities for the shoreside fishery. A carry-over is included to provide flexibility in making harvesting choices across years, consistent with a market-driven approach. Accumulation limits are set at the high end of the range specified in the alternatives, and there is also a grandfather clause. This alternative would allow more consolidation in the fishery than other alternatives.

The focus on individuality in Alternative 2 is accomplished by issuing QSs (versus co-ops) for all sectors of the fishery. This creates a more individualistic perspective based on the notion that IFQ tends to make participants focus on their personal perspective, whereas participants in a harvest co-op act within a type of community.

Differences between Alternatives 2a, 2b, and 2c

Alternatives 2a, 2b, and 2c compare and contrast two key elements of the IFQ program, processor initial allocations and adaptive management; both are methods for potentially responding to processor concerns. One method is to make an initial allocation of QSs to processors. The other method is to provide the opportunity to use an adaptive management system to assist processors that are adversely impacted by rationalization. These two mechanisms have substantially different philosophies—and presumably impacts—that are explored in the analysis in Chapter 4. For the processor initial allocations (Section 2.2.4 below), alternatives 2a and 2b use harvester-only allocations to illustrate the effect of the market on the program while disentangling the harvester and processor initial allocation issue and the effects on the program caused by splitting the initial allocation between harvesters and processors. Alternatives 2a and 2b allocate 100 percent to harvesters to better isolate the influence of market incentives on the program. Alternative 2c contrasts alternatives 2a and 2b by allocating processors 25 percent of the nonwhiting groundfish and 50 percent of the whiting QSs to shore-based and mothership processors. For adaptive management (Section 2.2.7 below), alternatives 2a and 2c do not include an AMP because such a provision would be designed to directly influence, or modify, outcomes that are driven by market incentives. Alternative 2b contrasts alternatives 2a and 2c by setting aside 10 percent of the annual trawl allocation for adaptive management.

The following sections describe the main elements of Alternative 2 (including Alternatives 2a, 2b, and 2c), as summarized in Table 2-1.

[32] Pacific halibut would be covered by an individual bycatch quota (IBQ) rather than IFQ. A halibut IBQ would be created and required to cover the incidental catch of Pacific halibut in the groundfish trawl fishery. Under an IBQ program, retention would not be allowed.

2.2.1 Catch Control Tool

Under Alternative 2, all groundfish trawl sectors (both whiting and nonwhiting) would be managed with IFQs, which would replace the current two-month cumulative trip limit periods in the nonwhiting fishery and season/quota-based management in the whiting fishery as the primary harvest control tool.

2.2.2 Initial Allocation and Qualification

Alternative 2 would initially allocate IFQ as QSs to fishery participants based mainly on their historic involvement in the fishery. There are different levels of initial allocation in a quota fishery. First, the Council considered which groups should be included in the initial allocation of QSs, and the proportional split among the groups. Options ranged from allocating 100 percent of QSs to permit owners in the nonwhiting trawl fishery and whiting trawl sectors (Alternatives 2a and 2b) to allocating 75 percent to permit owners and 25 percent to processors for the nonwhiting trawl fishery, to allocating 50 percent to permit owners and 50 percent to processors for the whiting sector (Alternative 2c) (processor initial allocations are described in Section 2.2.4 below). There are additional options that would allocate 10 percent of the annual trawl allocation for an AMP (Alternative 2b) (described in Section 2.2.7 below).

Second, the Council considered specific allocation formulas to determine the amount of QSs each eligible entity would receive. These calculations are based on the delivery history associated with a vessel permit or processing company over a set number of years for both target species and nontarget groundfish species, including overfished species. Alternative 2 does not include an equal distribution of buyback history, which is included in the initial allocation formulas for alternatives 3 and 4. Additionally, as explained above, fleet allocations or bycatch limits (for widow rockfish, canary rockfish, darkblotched rockfish, and Pacific ocean perch) could be used instead of IFQs to manage bycatch species in the whiting fishery. If this option is chosen, only whiting QSs would be allocated.

At the start of the program, NMFS would determine who is eligible to own QS and how much their initial allocation would be.[33] QSs would be initially allocated to fishery participants based on catch history during a qualification period. Thereafter, shareholders are free to buy and sell the QSs thus distributed.[34] QSs represent a proportion, or percent, of the TAC (which in groundfish management is called the OY[35]) of different groundfish stocks.

Each year, these shares are converted from a percent to a quantity by issuing QPs based on the OYs established for the year. The QPs would have to be transferred to a vessel account to be used. The amount of groundfish caught by an LE trawl vessel, even if it is subsequently discarded, must be matched by an equivalent quantity of QPs.[36] The QP is expended in this way, with the matched amount deducted from the vessel's account. If there is not enough QP to cover the catch from a trip, there would be a 30-day grace period during which adequate QPs must be transferred into the vessel's account. A vessel's

[33] Catcher/processors are considered harvesters for the purposes of initial allocation and are included here.

[34] The Council considered issuing QSs for a fixed time, after which all or a portion of the QSs would be periodically reallocated. Although a fixed duration is not part of this alternative, the MSA restricts the duration of a fishing privilege to 10 years and specifies conditions for automatic renewal.

[35] Under revised National Standard 1 guidelines, the Council may instead refer to this amount as the annual catch limit (ACL). Adoption of provisions to comply with the revised guidelines is the subject of a separate FMP amendment process, which may be implemented at about the same time as the trawl rationalization program.

[36] QSs/QPs would not be required to cover catch by LE permit holders in a few special circumstances: if they are fishing under an LE fixed-gear permit and using that gear type on their vessel, or if they are using trawl gear in a nongroundfish fishery, such as a shrimp trawl fishery (these nongroundfish trawl fisheries incidentally catch some groundfish).

fishing would be limited, and its permit could not be sold, until the overage is covered. There would be a carry-over provision, which is described in Section 2.2.9. Both QSs and QPs are perfectly divisible and tradable. Making QSs and QPs divisible and able to be acquired in very small increments is intended to allow for new entrants into the fishery; for example, a crew member could slowly purchase amounts of quota.

QSs would be of long duration, so a transfer represents a long-term or permanent divestment. In contrast, QPs must be used within the year for which they are issued (although there is a provision for limited carry-over of unused QPs from one year to the next or QPs issued in the following year to be used in the current year), so QP transfer would not represent a permanent divestment of the harvest privilege, so long as one continues to control the underlying QSs. QS transfers would be prohibited in the first two years of the program so that they would only occur once participants fully understand how the program operates, and stable prices have been reached. QPs would still be fully transferable during the first two years. QSs or QPs could not be transferred between the different IFQ sectors, so there would be stability in the relative amount of fish caught within each sector.

Eligibility to own QSs/QPs would be defined very broadly; the main requirements are a U.S. citizen must be the owner, and a U.S. documented fishing vessel must be registered to a groundfish LE trawl permit must be used to harvest groundfish using QPs.[37]

2.2.3 Accumulation Limits and Grandfather Clause

Accumulation limits, or the maximum amount of QSs and QPs an entity may control, would be limited, with these limits varying according to the management unit (stock, or stock complex). QS limits are a limit on the amount an individual or entity may control through ownership or other means. QP limits refer to the maximum amount that may be assigned to any one vessel during a given year to cover catch. These vessel limits are generally twice the control limits to allow several QS holders to work together on a single vessel. These limits are intended to limit the consolidation of quota holdings. Alternative 2 QS control limits and QP vessel limits are as follows:

- Shore-based nonwhiting: 3 percent control limit; 6 percent vessel limit
- Shore-based whiting: 12 percent control limit; 25 percent vessel limit
- At-sea mothership whiting (motherships and catcher-vessels): 25 percent control limit; 50 percent vessel limit
- At-sea catcher-processor whiting: 60 percent control limit; 75 percent vessel limit

Alternative 2 contains a grandfather clause under which initial recipients of QSs who exceed the accumulation limits would be allowed to possess excess QSs up to the amount initially allocated to them.

2.2.4 Initial Allocation to Processors

Under Alternatives 2a and 2b, all of the initial allocation of QSs would go to LE permit holders (harvesters). Under Alternative 2c, shore-based processors would receive 25 percent of the initial allocation of groundfish species and would share 50 percent of the allocation of whiting QSs with mothership processors based on their processing history during a qualification period. The catcher-

[37] Currently, LE permits include a length endorsement that defines the maximum size of vessel that may be registered to the permit. Permits may be combined to achieve a length endorsement for a larger vessel. The length endorsement would be suspended under the IFQ program.

processors are not included under the initial allocation to processors under Alternative 2, but are included in the initial allocation to harvesters in Section 2.2.2.

2.2.5 Species Covered

QSs/QPs would be issued for all of the current groundfish management units. Management units are fish stocks, or complexes comprising co-occurring or related stocks, for which an OY (ACL) is established. Table 2-2 shows the management units for which IFQ would be established.[38] Procedures would be established to reallocate QSs when management units are changed or new ones added. For the whiting fishery (shore-based, mothership, and catcher-processor), IFQ would either be created for all species of groundfish, or IFQ might be created only for the target species, Pacific whiting. Under the second option, the allocation of bycatch to the whiting fishery (or to specific whiting sectors) would be managed as fleet bycatch limits for widow rockfish, canary rockfish, darkblotched rockfish, and Pacific ocean perch. Reaching the fleetwide catch allocation or bycatch limit would trigger closure of the whiting fishery (or a specific whiting sector).

Alternative 2 also includes an IBQ for Pacific halibut. Although functionally equivalent to the IFQ system applied to other species, Pacific halibut are a prohibited species in the groundfish trawl fishery and cannot be retained. Therefore, although accounted for through the IBQ, all halibut must be discarded.

[38] Under Alternative 4b (the preferred alternative), IFQ would not be used as the catch control tool for selected management units. Under Alternative 2, these management units would be managed with IFQ.

Table 2-2. Management units considered for IFQ under the alternatives. Overfished species shown in bold.

IFQ Management Units	
Roundfish	**Flatfish**
Lingcod	Dover sole
Pacific cod	English sole
Pacific whiting	Petrale sole
Sablefish north of 36° N. latitude	Arrowtooth flounder
Sablefish south of 36° N. latitude	Starry flounder
Rockfish	Other Flatfish stock complex
	Additional IFQ species *(under Alt. 4b only, these species not managed with IFQs)*
Pacific ocean perch	
Widow rockfish	Shortbelly rockfish
Canary rockfish	Longspine thornyhead south of 34°27'
Chilipepper rockfish	Black Rockfish - coastwide
Bocaccio	Minor Rockfish North Nearshore complex
Splitnose rockfish	Minor Rockfish South Nearshore complex
Yellowtail rockfish	California scorpionfish
Shortspine thornyhead north of 34° 27' N. latitude	Cabezon (off CA only)
Shortspine thornyhead south of 34° 27' N. latitude	Kelp greenling
Longspine thornyhead north of 34° 27' N. latitude	Other Fish*
Cowcod	
Darkblotched	
Yelloweye	
Minor Rockfish North slope species complex	
Minor Rockfish North shelf species complex	
Minor Rockfish South slope species complex	
Minor Rockfish South shelf species complex	

*Starting in 2009, longnose skate is managed under its own OY. However, because the time period used to determine initial allocation of QSs was managed under the Other Fish complex, this species will not be managed with IFQ.

2.2.6 Number of Sectors

Three sectors would be established whereby the two current whiting and nonwhiting shore-based sectors would be combined into a single sector. Participants in this single sector would be free to trade IFQ (QSs or QPs), eliminating any regulatory barrier between targeting whiting and nonwhiting (operational differences among participants may mean that a large degree of specialization in targeting could continue). The whiting mothership and catcher-processor sectors would each be managed separately with their own allocations of catch opportunity and IFQ. IFQ could not be traded between the three sectors.

2.2.7 Adaptive Management

Alternatives 2a and 2c do not have an adaptive management element. Under Alternative 2b, each year up to 10 percent of the trawl sector allocation would be set aside for an AMP. These are fish that would have otherwise been distributed to QS owners. This program is meant to address a variety of objectives, ranging from socioeconomic dislocation resulting from implementation of the trawl rationalization program to encouraging innovative fishing methods, for example to reduce bycatch. The Council would decide how much QP would be set aside every two years for adaptive management use as part of the

biennial harvest specifications process. The harvest specifications process establishes OYs/ACLs for a two-year period and adjusts management measures so that catches will not exceed these limits.

2.2.8 Area Management

Under Alternative 2, no separate QSs would be created for different latitudinal areas. Area-specific QS is considered under other alternatives because this could prevent substantial geographic redistribution of QS holdings and related impacts to communities. Some stocks are currently managed geographically with separate OYs established for each component; for those stocks, QSs/QPs would be denominated accordingly.

2.2.9 Carryover of Unused QPs between Consecutive Years

Under Alternative 2, unused QPs amounting to 10 percent of the used and unused QPs in the vessel account may be carried over for use in the next year. Similarly, to cover an overage (landings that exceed the amount of QPs held in a vessel account), QPs that might be allocated in the next year may be transferred to the current year, reaching up to 10 percent of the used and unused QPs in the vessel account during the current year.

2.2.10 Tracking and Monitoring

All vessels would be required to carry at-sea observers at their own expense to monitor sorting and discarding of the catch and shoreside landings. There would also have to be an electronic system to report bycatch and landings, which may be integrated with the current state fish ticket (landings reporting) system. NMFS would also administer a system to track QS/QP holdings. A comprehensive mandatory monitoring program is expected to require minimal increases in enforcement effort.

A tracking and monitoring program is necessary to ensure that the total catch (including discards) is accurately documented and matched against QPs. The requirements for accuracy are expected to be greater for QP species than they are for species that are monitored for fleetwide catch accounting. Appendix A, Section A-2.3.1, details tracking and monitoring provisions, including discarding, at-sea and shoreside monitoring, catch tracking mechanisms, cost control mechanisms, and program performance measures. For an IFQ fishery, IFQ species may be discarded at sea except for whiting shore-based vessels. Discarded IFQ species would count against QPs, and all discarded catch would be required to be covered by QPs. IBQ species must be discarded by all vessels. Shoreside whiting vessels may be required to participate in a maximized retention program where discarding is prohibited.

At-sea observers would be required on all vessels (100 percent coverage), and cameras may be used to augment the observers and assure compliance. All vessels would be required to carry at-sea observers for full total catch verification (100 percent of the groundfish IFQ species in each haul). Observers would be required to monitor the sorting, weighing, and discarding of catch. Compared to status quo monitoring of less than 25 percent provided by the WCGOP, this would be a substantial increase for a large portion of the shoreside trawl fishery and the catcher vessels in the mothership sector. To resolve ongoing monitoring issues or in response to violations, cameras may be required in place of, or in addition to, observers (feasibility to be determined).

To assure accuracy when QPs are discarded at sea, vessels may be required to meet specified monitoring and weighing provisions, including adequate space for catch sorting, an adequate location for observer monitoring, and the equipment necessary for accurately weighing and documenting QP species at sea. Vessels that are determined to be unsafe for the purposes of carrying an observer would be prohibited

from participating in any of the IFQ trawl fisheries. For shoreside whiting trips, full observer coverage may be required in addition to, or as a replacement for, an EMS system.

Little, if any, change in the number of observers per vessel in the catcher-processor and mothership sector is expected. Because most, if not all, of the processing vessels also participate in the Alaska groundfish fishery, where they are required to have specific equipment for the observers to obtain accurate weights, the changes needed to implement adequate monitoring for a rationalization program are primarily related to the sorting and weighing of catch and interactions with the observers; thus, they are not expected to be a substantial change over status quo.

Vessel-specific monitoring of total mortality would provide more accurate catch data and would, thereby, reduce the risk of exceeding a harvest allocation (ABC, OY, harvest guideline, allocation, or quota). All IFQ deliveries would require full monitoring (100 percent) shoreside for total catch verification. To control costs, landing hours may be limited, as well as landing locations. Landing locations may be certified or licensed by NMFS.

Tracking requirements would include a reporting system using electronic forms for submitting total catch data, including both discards and landings. The reporting system is expected to be integrated with the existing electronic fish ticket system currently required for Pacific whiting shoreside first receivers (72 FR 50906, September 5, 2007). A reporting system to track QS/QP holdings would be administered by NMFS. Additionally, a program for the mandatory submission of economic data are included to facilitate monitoring program performance.

NMFS would develop a fee structure based on the requirements of the MSA at Section 304(d)(2)(A) and on Council recommendations to recover program costs.

2.2.11 Gear Conversion

Within the IFQ program, vessels would be allowed to use a variety of directed groundfish commercial gear, allowing for "gear switching." There is also an option for gear conversion (switching permanently from trawl to some other gear). Once QSs have been distributed, recipients would be free to use them with any legal groundfish gear, which, aside from trawl, principally means bottom longline and fish pots. There is a separate allocation of catch opportunity to nontrawl sectors, which would be unaffected by any catches resulting from gear conversion under the IFQ program.

2.3 Alternative 3 - IFQs for the Nonwhiting Sector and Co-ops for all Whiting Sectors

This section describes Alternative 3, IFQs for nonwhiting trawl sector and co-ops for the whiting trawl sectors (shore-based, mothership, and catcher-processor). Appendix A provides further detail on the elements and options the Council considered in an IFQ program. Appendix B provides further detail on the elements and options the Council considered in a cooperative (co-op) program.

Alternative 3 uses market-mitigating factors and harvest co-ops (instead of issuing QS under an IFQ fishery) for the whiting fishery and IFQ for the nonwhiting fishery. Alternative 3 places constraints and controls on market outcomes through sector divisions, lack of a grandfather clause, an adaptive management mechanism, relatively small accumulation limits, and area management. This alternative gives more influence to processors by giving them IFQ allocations and requiring that co-ops be linked to shore-based processors and motherships.

While the whiting fishery would not be issued QSs, they would still be issued to the shore-based nonwhiting fishery under an IFQ program in Alternative 3. However, the IFQ program would have some additional differences from those described in Alternative 2, including initial allocation, accumulation limits, lack of a grandfather clause, processor allocations, no halibut IBQ, area management, and no carry-over provision. For the whiting co-op program, imposing harvest co-ops on the three whiting sectors (shore-based, mothership, and catcher-processor) under Alternative 3 is expected to result in different outcomes than issuing QS for these sectors. Harvest co-ops are like a community where members collectively decide the allocation of fishing opportunities. The effect of this type of system is expected to be somewhat different than an IFQ system where harvesters may be more likely to engage in fishing opportunities independently.

The whiting co-ops in Alternative 3 would be managed separately, but the shore-based and mothership co-ops structure would be very similar. The catcher-processor sector currently operates under a voluntary co-op in the status quo fishery (Alternative 1). Under Alternative 3, this voluntary structure would continue with modest changes to the management system.

The following sections describe the main elements of Alternative 3, as summarized in Table 2-1.

2.3.1 Catch Control Tool

Under this alternative, the nonwhiting sector would be managed with IFQs in a program similar to that described under Alternative 2 (differences are summarized below). The three whiting sectors would be managed with cooperatives. A separate co-op structure would be used for each of the whiting sectors.

2.3.2 Initial Allocation and Qualification

IFQ for nonwhiting

Under Alternative 3, the initial allocation of QS would be based on both catch history during the qualification period and an equal allocation of the catch history associated with LE trawl permits that were bought back and retired at the end of 2003 as part of a capacity reduction program. The buyback program is partly funded through a loan to remaining participants, which is being paid back through landing fees. Equal allocations of QSs associated with the buyback permits would result in a more even distribution of QSs among permit holders, compared to allocations based on catch history alone. Alternative 2 did not include buyback history in the initial allocation formula.

Unlike Alternative 2 where all species are allocated based on catch history, a different formula is used for overfished species under this alternative. These species will still be under rebuilding programs after the projected implementation date of the trawl rationalization program (2011), requiring relatively small OYs. Thus, QSs/QPs for these species could act as a primary constraint on target fisheries, to the degree that incidental catch is unavoidable. Furthermore, since regulations prompted a large proportion of overfished species catch to be discarded, landings toward the end of the allocation period (1994 to 2003) do not accurately reflect the actual distribution of historical catch among fishery participants. Therefore, a different formula would be applied to overfished species to allocate QS. This formula takes into account the amount of target species QSs received by including a proportional component for overfished species QSs (as measured by bycatch rates, individual permit logbooks, and the amount of target species QSs that an entity receives). It also factors in areas where fishing occurred, 2003 to 2006, by a vessel associated with an eligible permit to account for geographic variation in overfished species bycatch rates. This approach is intended to better balance individual holdings of target and overfished species QSs and take into account the areas where permit holders have fished in the recent past. Provisions may allow QSs to

be reallocated once a species is rebuilt, recognizing that the annual OY could be increased substantially once the rebuilding restrictions are lifted.

Co-ops for whiting

The existing, status quo allocation of whiting (Alternative 1) between the shoreside whiting, mothership, and catcher-processor sectors would not change (42, 24, and 34 percent, respectively). No portion of one sector's whiting allocation could be transferred to another sector.

Although Pacific whiting comprises the dominant portion of the catch in the whiting fishery, some overfished rockfish do get caught. As discussed in Alternative 1, bycatch limits have been imposed on the whiting fishery. These bycatch limits would continue to be used under Alternative 3, but would include Pacific ocean perch in addition to widow rockfish, canary rockfish, and darkblotched rockfish. There would be a single cap to cover catch in all three whiting sectors for each overfished species managed this way.[39] These bycatch caps would be established for those overfished species likely to be caught in the whiting fishery. In addition, the current ESA-listed Chinook salmon bycatch management measure, a triggered 100-fathom closure, and an ESA consultation threshold would continue in effect.[40] Status quo management (trip limits) would be used for other bycatch species. In addition, an amount would be deducted from allocations to the trawl sector for these species to account for the expected small amounts of bycatch. Caps on overfished species would be expected to indirectly limit bycatch of these other species.

Under Alternative 3, with co-ops for the whiting sector, the following new permits would be created:

- Mothership processor permit: Historically, any vessel with the proper groundfish LE permit could enter this sector as a processor. The Council previously adopted a stopgap measure, under Amendment 15, to limit participation, which would be replaced by a new mothership permit under Alternative 3. Permit qualification would be based on whiting processing history.

- Shore-based whiting processor permit: Similarly, a new shore-based processor permit would be created under Alternative 3 for processors. Only those processors possessing one of these permits could receive whiting during the first two years of the program. Thereafter, any shore-based processor could receive whiting. See Appendix B, Section B-3.2.2 for more details.

- Whiting catcher vessel permit: New, separate LE permit endorsements would be created for catcher vessels participating in either the mothership or shore-based co-op sectors. Qualification for a permit would be based on past participation in the relevant whiting sector.

- Catcher-processor permit: A permit endorsement would be created to limit participation in the catcher-processor sector. Historically, any vessel with the proper groundfish trawl LE permit could participate. The Council previously adopted a stopgap measure, under Amendment 15, to limit participation, which would be replaced by the catcher-processor co-op provisions of the trawl rationalization program. Only vessels with a catcher-processor-endorsed LE permit would

[39] Status quo management of bycatch limits in the whiting fishery now includes a bycatch limit of these species for each of the three whiting sectors (shore-based, mothership, and catcher-processor). This was first implemented in 2009. Because this analytical document was developed before this change, bycatch limits for one combined whiting sector remain in this alternative.

[40] This threshold, based on the total amount of Chinook salmon caught or the Chinook bycatch rate, triggers a reinitiation of consultation under section 7 of the ESA. As part of the consultation process new measures can be required to mitigate listed species take.

be allowed to harvest fish from the sector's allocation. Pacific whiting vessel licenses currently required under status quo (Alternative 1) would no longer be needed. LE permits with catcher-processor endorsements would continue to be transferable.

Whiting catcher vessels would be able to, each year, choose to join a co-op or fish in a non-co-op fishery. If a vessel chooses to fish in a co-op, it would have to deliver all of its catch to the processor in its co-op (a mothership or shore-based processor). If a catcher vessel wishes to change its co-op membership, it would have to first fish for a year in the non-co-op fishery before joining the new co-op.

Each co-op that is formed would receive an allocation of the sector's overall whiting allocation, based on the combined catch history associated with each member's LE permit. Although the co-op allocation would be based on particular LE permits' catch history, vessels in the co-op would be able to arrange to have another vessel harvest all or a portion of their catch if they do not want to actively participate in the fishery.

The non-co-op fishery would receive an allocation based on the collective catch history of vessels that choose not to join a co-op, in a fashion similar to the co-op allocations. However, harvest would be further controlled in the non-co-op fishery through season restrictions. Vessels fishing in the non-co-op fishery would not be obligated to deliver to any one processor. For the duration of any given year, a permitted catcher vessel could participate in the non-co-op fishery, but the structure of this sector is intended to encourage co-op participation. Non co-op fishery participants would not have the surety of a buyer that a processor co-op obligation represents and could not easily coordinate fishing strategy in the way they are expected to in co-ops. In essence, a non-co-op would be expected to function as an Olympic-style fishery with individual vessels competing among one another to catch the largest portion of the allocation.

Co-ops are expected to facilitate coordination and cooperation among members with respect to harvest strategy. Although co-op members would be guaranteed catch opportunity equal to the portion of the allocation they brought into the co-op through their catch history, in general the co-op allocation is pooled. Members could jointly agree on the specifics of harvesting.

Two or more co-ops could reach an inter-co-op agreement to coordinate harvest strategy and pool whiting and bycatch cap allocations. Various standards for co-op and inter-co-op contractual agreements would be established, both to aid NMFS in its fishery management role and to prevent any member from being unduly disadvantaged by co-op participation.

For the catcher-processor co-op, which currently operates as a single, voluntary co-op, there are few changes from Alternative 1. The catcher-processor permit (mentioned above in this section) would be required. Also, there would be a provision to allow for implementing an IFQ program if the current voluntary co-op system were to fail. In such a case, individual quota would be allocated to each CP permit (equally divided among all CP endorsed permits).

2.3.3 Accumulation Limits and Grandfather Clause

Under Alternative 3, accumulation limits are generally lower than in Alternative 2. Shore-based and mothership co-ops would be subject to control limits similar to those described for the IFQ program in Alternative 2. Shore-based whiting catcher vessel permit holders would be limited in terms of their control of co-op shares (recognizing that one entity could own multiple permits). In the mothership sector, the mothership processors and associated catcher vessels would be limited with respect to how

much of the allocation they could process or control through co-op shares. Alternative 3 QS control limits and, for the IFQ program, QP vessel limits are as follows:

- Shore-based nonwhiting: 1.5 percent control limit; 3 percent vessel limit
- Shore-based whiting: 15 percent control limit
- At-sea mothership whiting
  - motherships: 20 percent control limit
  - catcher-vessels: 10 percent control limit
- At-sea catcher-processor whiting: none

Alternative 3 does not contain a grandfather clause; any potential initial allocation in excess of the accumulation limit would instead be redistributed to those permits below the limits.

2.3.4 Initial Allocation to Processors; Co-op Affiliations

IFQ for nonwhiting

In Alternative 3, 25 percent of nonwhiting groundfish would be allocated to shore-based processors. This differs from Alternative 2c because shore-based whiting is not included since that sector would be managed with co-ops. Small amounts of whiting, representing incidental catch by nonwhiting vessels, would be allocated as QS to the nonwhiting sector permit holders.

Co-ops for Whiting

In Alternative 3, there would be 100 percent processor affiliations in mothership and shore-based whiting co-op sectors.

2.3.5 Species Covered

IFQ for nonwhiting

Alternative 3 contains the same groundfish species covered by an IFQ for the nonwhiting fishery as those in Alternative 2 and those listed in Table 2-2. Unlike Alternative 2, Alternative 3 does not include a halibut IBQ. Pacific halibut bycatch would be subject to status quo management. Under status quo management, the allocation to other fishery sectors in the west coast management area (IPHC Area 2A) is determined by reducing the area TAC by an amount equal to an estimate of the previous year's groundfish trawl sector halibut bycatch. This is an approximate method for accounting for trawl bycatch; if the trawl bycatch in a given year exceeds the amount by which the area TAC was reduced, that is factored into the next stock assessment.

Co-ops for whiting

Under Alternative 3, the species covered in the whiting co-op fishery are limited to whiting and bycatch species. This means that the market-based program does not directly influence how many of the species are caught that do not fall under the whiting or bycatch species category. This lessens the impact the market has on harvests and changes the degree of individual accountability associated with the harvest of groundfish species.

2.3.6 Number of Sectors

Unlike Alternative 2, Alternative 3 would have four separately managed trawl sectors: shore-based nonwhiting, shore-based whiting, mothership whiting, and catcher-processor whiting.

2.3.7 Adaptive Management

Alternative 3 would include the AMP described for Alternative 2b. For the whiting co-ops, only participants in a given sector would be eligible for the adaptive management amounts deducted from each sector's whiting allocation.

2.3.8 Area Management

Under Alternative 3, QSs/QPs for each management unit would be divided geographically so that area-specific QPs would be needed to cover catches in each area. Two zones would be established, one north and the other south of 40°10' N. latitude.

2.3.9 Carryover of Unused QPs between Consecutive Years

Alternative 3 would not contain the carry-over provision included under Alternatives 2 and 4.

2.3.10 Tracking and Monitoring

IFQ for nonwhiting

For the IFQ nonwhiting sector of the fishery, Alternative 3 would contain the tracking and monitoring components described in Alternative 2.

Co-ops for whiting

As discussed above under Alternative 2, given the high level of monitoring already in place in the whiting fishery under status quo management (Alternative 1), only moderate changes in monitoring are expected to be needed to implement Alternative 3 for the whiting fishery. NMFS would close the fishery, a particular sector, the co-op or non-co-op fishery within a sector, or individual co-ops, as appropriate, if a whiting catch or bycatch limit is reached. With respect to co-ops, inseason monitoring and closure would be needed only at the highest level of aggregation of the co-ops. For example, if individual co-ops join together to form an inter-co-op that covers the entirety of one of the whiting sectors, then NMFS would track and close the fishery at the sector level.

Additionally, a program for the mandatory submission of economic data would also be included for the IFQ and the co-op programs, to facilitate monitoring program performance.

2.3.11 Gear Conversion

For the IFQ program, gear conversion would be permitted as described under Alternative 2.

2.4 Alternative 4 (Council Preferred) - IFQs for Single Shore-based Sector and Co-ops for the Whiting At-sea Sectors

This section describes Alternative 4, IFQs for a single shore-based sector (shore-based whiting and nonwhiting) and co-ops for the whiting at-sea sectors. Two sub-alternatives are evaluated under this alternative (Alternatives 4a and 4b) to compare and contrast certain key elements of the IFQ and co-op programs. The Council-preferred alternative is Alternative 4b. As noted above, Appendix A provides further detail on the elements and options the Council considered in an IFQ program. Appendix B provides further detail on the elements and options the Council considered in a co-op program. Appendix D provides further detail on the Council-preferred alternative, Alternative 4b.

Similar to Alternative 3, Alternative 4 is a hybrid approach to rationalizing the groundfish trawl fishery using IFQ and co-ops. However, Alternative 4 moves the shore-based whiting sector from being part of the co-op fishery (as in Alternative 3) to being part of the shore-based IFQ fishery. Alternative 4 would modify the status quo by establishing a single shore-based sector (combining whiting and nonwhiting shore-based fisheries) and co-ops for the whiting at-sea sectors (mothership and catcher-processor sectors). Alternative 4 is intermediate to alternatives 2 and 3 by allowing for more market-driven outcomes than Alternative 3, but fewer than Alternative 2. Alternative 4 achieves a more moderate degree of market influence than Alternative 3 by allowing carry-over provisions, allowing for three trawl sectors, establishing accumulation limits that are between those for alternatives 2 and 3, requiring fewer processor linkages in the mothership co-op program, and crediting shore-based processors for landed whiting only.

Differences between Alternatives 4a and 4b

Alternatives 4a and 4b (Council-preferred) compare and contrast some aspects of all of the key program elements, except for the catch control tools and the number of sectors. For the IFQ program under Alternative 4b, a sub-set of species are covered with IFQs in the shore-based fishery, rather than all species in the Council's ABC/OY table for groundfish (Section 2.4.5 below). Those species would continue to be managed with cumulative landing limits. Those species that are not covered with IFQs are excluded because the incidental catch of those species is small relative to management targets, and the inclusion of those species may have negative economic implications with little to no benefit to management. For initial allocation and qualification, alternatives 4a and 4b would differ in how the buyback history is shared among sectors for the IFQ program and in the qualification requirements for the co-op fishery (Section 2.4.2 below). Accumulation limits vary between alternatives 4a and 4b (Section 2.4.3 below). Alternative 4a would include a grandfather clause, while Alternative 4b would not, but would allow QS owners time to divest any overage. For the IFQ program, alternatives 4a and 4b vary in the amount of whiting allocated to shore-based processors (Section 2.4.4 below). For the mothership co-op program, processor affiliations vary between alternatives 4a and 4b. Both alternatives include an AMP (Section 2.4.7 below). Alternative 4a would set aside 10 percent of the shore-based trawl allocation of all groundfish IFQ species, while Alternative 4b would set aside 10 percent of nonwhiting species for the shore-based sector. Alternative 4a would include area management, while Alternative 4b would not (Section 2.4.8 below). Both alternatives would include a carry-over provision; Alternative 4b would decrease the carry-over if the OY declines in the subsequent year (Section 2.4.9 below).

The following sections describe the main elements of Alternative 4 (including alternatives 4a and 4b (Council-preferred), as summarized in Table 2-1.

2.4.1 Catch Control Tool

Alternative 4 uses IFQs as the management tool for a combined whiting and nonwhiting shore-based sector and cooperatives for the two at-sea whiting sectors.

2.4.2 Initial Allocation and Qualification

IFQ for shore-based

The initial allocation of the target and overfished species in Alternative 4 is the similar to that described under Alternative 3 (Section 2.3.2), except for which sectors get IFQ and, under Alternative 4b (Council-preferred alternative), the initial allocation of overfished species IFQ. Under Alternative 4b, there is no equal sharing element for overfished species IFQ based on buyback permits, except for canary rockfish.

In Alternative 4, the shore-based whiting sector would also receive an initial allocation of IFQ and would share the buyback history. Under Alternative 3, the buyback history would be shared within the nonwhiting shore-based sector. Under Alternative 4a, equal sharing of buyback history would apply to the combined shore-based sector only (whiting and nonwhiting). Under Alternative 4b (Council-preferred), the equal sharing provision would apply to both the shore-based sector (whiting and nonwhiting) and the mothership sector, although, as noted above, there is no equal sharing component for overfished species with the exception of canary rockfish for the combined shorebased sector.[41]

The equal sharing element for initial allocation of canary rockfish IFQ in the preferred alternative (Alternative 4b) resulted from a reconsideration adopted by the Council at its November 2009 meeting. Canary rockfish bycatch tends to be episodic and unpredictable and has occurred across a range of target strategies. The Council decided that an allocation formula for canary rockfish that included the equal sharing element (so that every permit gets at least some minimum level of canary rockfish IFQ) would lower the risk of some harvesters being forced out of the fishery because they did not possess, and could not obtain (due to expected high cost), the canary rockfish IFQ needed to cover their bycatch.

Co-ops for at sea

Alternative 4 initial allocation and qualification is similar to Alternative 3, except for which sectors are managed under co-ops. The mothership and catcher-processor sectors would be managed under co-ops (i.e., the at-sea whiting fishery).

For the mothership catcher-vessels, Alternative 4a has the same qualification years as Alternative 3, 1997 through 2003 (an LE permit would qualify for a catcher vessel mothership whiting endorsement if it has a total of more than 500 million tons [mt] of whiting deliveries to motherships during those years). Under Alternative 4a, the catch history assignment for the catcher-vessels in the mothership fishery would be based on the best six out of seven years using those same years, 1997 through 2003. Under Alternative 4b (Council-preferred), different years are used for the catcher-vessel mothership endorsement qualification, 1994 through 2003, and the best 8 out of 10 years from 1994 through 2003 are used for catch history assignment.

Under Alternative 4, the catcher-processor structure and permit would be the same as described in Alternative 3. Since the catcher-processor sector would continue to operate as a single voluntary co-op, catch history assignment is unnecessary; the co-op has access to the full sector allocation.

[41] Since the mothership sector would be managed with co-ops under Alternative 4, the equal sharing provision applies to the allocation of catcher vessel co-op shares (i.e., catcher vessel catch history assignments).

The bycatch limits for the co-op fisheries described under Alternative 3 (Section 2.3.2), would also apply to Alternative 4.

2.4.3 Accumulation Limits and Grandfather Clause

Under Alternative 4, IFQ accumulation limits are generally intermediate to Alternatives 2 and 3. For the co-op fishery, they are higher than Alternative 3.

Alternative 4a QS control limits and, for the IFQ program, QP vessel limits are as follows:

- Shore-based nonwhiting: 2.2 percent control limit; 4.4 percent vessel limit
- Shore-based whiting: 25 percent control limit; 12 percent vessel limit
- At-sea mothership whiting
  - motherships: 30 percent control limit
  - catcher-vessels: 15 percent control limit
- At-sea catcher-processor whiting: none

Alternative 4b accumulation limits are similar in structure to Alternative 4a; however, mothership catcher vessels would be subject to a usage limit in addition to a control limit. The usage limit is a limit on the amount any one vessel can catch and deliver to a processor. Since co-op shares would be pooled and the allocation of catch opportunity among vessels would be decided by co-op members, it is not possible to track the accumulation of co-op shares on a vessel in the way that QP vessel limits work in the IFQ program. The usage limit is an alternative approach to achieve the same end. Alternative 4b QS control limits and, QP vessel limits for the IFQ program, are as follows:

- Shore-based nonwhiting: 2.7 percent control limit; 3.2 percent vessel limit
- Shore-based whiting: 10 percent control limit; 15 percent vessel limit
- At-sea mothership whiting
  - motherships: 45 percent control limit
  - catcher-vessels: 20 percent control limit; 30 percent vessel limit
- At-sea catcher-processor whiting: none

Alternative 4a contains the grandfather clause allowing QS holdings in excess of accumulation limits based on initial allocation. Alternative 4b (the preferred alternative) does not contain the grandfather clause. Permit holders who would receive QS in excess of the accumulation limits would have two years to divest their excess QSs to any willing receiver. This would occur in the third and fourth years of the program, since QS transfers are prohibited in the first two years of the program. Any QSs not divested at the end of the fourth year would be forfeited, and these excess QSs would be reallocated to other permit holders below the limit. Before divesture, these quota holders are free to use the QPs derived from their excess QSs. This is meant to smooth the transition for those fishery participants with historically large catches.

In addition to the overall program control limits and vessel limits, there are also species-specific limits as detailed in Table 2-3.

Table 2-3. QS control limits and QP vessel limits in the IFQ Program under Alternative 4b.

Species Category	Vessel Limit (Vessel Use Limit)	Vessel Unused QP Limit	QS Control Lim
Nonwhiting Groundfish			
Species	3.2%		2.7%
Lingcod - coastwide	3.8%		2.5%
Pacific Cod	20.0%		12.0%
Pacific whiting (shoreside)	15.0%		10.0%
Sablefish			
N. of 36° (Monterey north)	4.5%		3.0%
S. of 36° (Conception area)	15.0%		10.0%
PACIFIC OCEAN PERCH	6.0%	4.0%	4.0%
WIDOW ROCKFISH *	8.5%	5.1%	5.1%
CANARY ROCKFISH	10.0%	4.4%	4.4%
Chilipepper Rockfish	15.0%		10.0%
BOCACCIO	15.4%	13.2%	13.2%
Splitnose Rockfish	15.0%		10.0%
Yellowtail Rockfish	7.5%		5.0%
Shortspine Thornyhead			
N. of 34°27'	9.0%		6.0%
S. of 34°27'	9.0%		6.0%
Longspine Thornyhead			
N. of 34°27'	9.0%		6.0%
COWCOD	17.7%	17.7%	17.7%
DARKBLOTCHED	6.8%	4.5%	4.5%
YELLOWEYE	11.4%	5.7%	5.7%
Minor Rockfish North			
Shelf Species	7.5%		5.0%
Slope Species	7.5%		5.0%
Minor Rockfish South			
Shelf Species	13.5%		9.0%
Slope Species	9.0%		6.0%
Dover sole	3.9%		2.6%
English Sole	7.5%		5.0%
Petrale Sole	4.5%		3.0%
Arrowtooth Flounder	20.0%		10.0%
Starry Flounder	20.0%		10.0%
Other Flatfish	15.0%		10.0%
Other Fish	7.5%		5.0%
Pacific Halibut	14.4%	5.4%	5.4%

* If widow rockfish is rebuilt before initial allocation of QSs, the vessel limit will be set at limit will be 1.5 times the control limit.

2.4.4 Initial Allocation to Processors; Co-op Affiliations

IFQ for shore-based

Under Alternative 4a, 50 percent of shore-based IFQ for whiting would be allocated to processors based on processing history. Under Alternative 4b, the Council-preferred alternative, shore-based processors would be allocated 20 percent of the shore-based IFQ for whiting.

Co-ops for at sea

The mothership sector is managed with harvest co-ops, and each catcher vessel wanting to participate in a co-op must declare a mothership to which it will deliver in the upcoming year. Unlike harvest co-ops with linkages in Alternative 3 and 4a, the co-op declaration under Alternative 4b (Council-preferred) allows vessels to switch motherships freely from year to year without penalty. However, catcher vessels cannot fish for more than one mothership within a year, unless it is participating in the non-co-op fishery. Under Alternative 4b, catcher vessels would declare which co-op they would join before the beginning of the fishing year. They would then be obligated to deliver their catch to the associated mothership processor for that fishing season. In any subsequent year, they could change their affiliation without first participating in the non-co-op fishery through the pre-season declaration. Provision for a non-co-op fishery would still be included in the program structure. Any vessel not wishing to affiliate with a co-op could participate in the non-co-op fishery and deliver to any willing mothership processor. The declaration element under Alternative 4b was adopted by the Council after hearing from NOAA General Counsel that a mothership linkage may raise some legal issues. The declaration provision is intended to provide some degree of certainty to foster business planning among motherships. Under Alternative 4a, catcher vessels would be obligated to deliver 50 percent of their catch to the processor to which they are tied (compared to all their catch under Alternative 3). They would be free to deliver the remaining 50 percent to any mothership processor willing to receive it. As in Alternative 3, they would have to participate in the non-co-op fishery first to change their processor affiliation.

2.4.5 Species Covered

IFQ for shore-based

Alternative 4a does not include a halibut IBQ (similar to Alternative 3); while Alternative 4b (Council-preferred) does (similar to Alternative 2). Under Alternative 4b, bycatch mortality of Pacific halibut must be covered by IBQ, and mortality would be assessed at the individual vessel level. Under Alternative 4b, a sub-set of species are covered with IFQ in the shore-based fishery, rather than all species in the Council's ABC/OY table for groundfish. Table 2-2 shows the groundfish management units that would have IFQs and those for which IFQs would not be issued under Alternative 4b. Species for which an IFQ is not issued would continue to be managed with current tools, such as cumulative landing limits. Those species that are not covered with IFQs are excluded because the incidental catch of those species is small relative to management targets, and the inclusion of those species may have negative economic implications with little to no benefit to management.

Co-ops for at sea

Similar to Alternative 3, the species covered in the at-sea whiting co-op under Alternative 4 are limited to whiting and bycatch species. Part of the trawl allocation for nonwhiting management unit species taken in the at-sea whiting sectors would be set aside to accommodate catches in those sectors; the remainder would be available for harvest in the shore-based sector.

2.4.6 Number of Sectors

Similar to Alternative 2, Alternative 4 would have three trawl sectors: shore-based (combined whiting and nonwhiting), mothership whiting, and catcher-processor whiting.

2.4.7 Adaptive Management

IFQ for Shore-based

Alternative 4a would implement an AMP for the combined shore-based sector reserving 10 percent of the QS for all species (as in Alternative 2b). Alternative 4b would implement a program where only nonwhiting species QS would be reserved for the shore-based sector. In addition, under Alternative 4b during the first two years of implementation of trawl rationalization the adaptive management QPs would be distributed to QS holders in proportion to their holdings except for canary rockfish. Allocations of QPs under the program would begin in the third year based on further specification of AMP objectives and mechanisms.

Co-ops for at sea

Under Alternative 4, there would be no AMP for the mothership and catcher-processor whiting sectors.

2.4.8 Area Management

Alternative 4a is the same as Alternative 3, where QSs/QPs for each management unit would be divided geographically so that area-specific QPs would be needed to cover catches in each area. Two zones would be established, one north and the other south of 40°10' N. latitude. Alternative 4b would not include area management, same as Alternative 2.

2.4.9 Carryover of Unused QPs between Consecutive Years

Alternative 4 includes the same carry-over provision described in Alternative 2 (Section 2.2.9).

2.4.10 Tracking and Monitoring

IFQ for shore-based

For the IFQ program, Alternative 4 would contain the tracking and monitoring components described in Alternative 2, but would apply to the shore-based (whiting and nonwhiting) sector.

Co-ops for at sea

Alternative 4 is the same as Alternative 3.

A program for the mandatory submission of economic data would also be included for the IFQ and the co-op programs, to facilitate monitoring program performance.

2.4.11 Gear Conversion

For the IFQ program, gear conversion would be permitted as described under Alternative 2.

2.5 Alternatives considered, but rejected from further analysis

There are many different programs that might be used to rationalize the fishery. The Council focused on IFQs and co-op approaches to rationalization. Some other approaches for rationalization that were considered and set aside were permit stacking, processor QSs, community development quotas (CDQs), and a proposal called the Optimum Species Harvesting Unified Allocation Plan (OSHUA).[42] Under permit stacking, cumulative limits would have been kept in place, but they would have become catch limits instead of landing limits, necessitating 100 percent observer coverage. A vessel would have been able to access an additional set of cumulative limits for each permit it stacked on the vessel (similar to the LE fixed gear sablefish permit stacking program). Under status quo, because not every vessel lands the full cumulative limit, cumulative limits can be set higher than would be the case if each vessel's cumulative limit was fully utilized. Permit stacking would be expected to increase the utilization of cumulative limits, necessitating that the limits be reduced and likely resulting in the limits becoming quotas.[43] The prospect of full utilization of each cumulative limit would essentially turn the program into an IFQ program with very limited transferability or flexibility. The Council kept an option for permit stacking (and switching from landing to catch limits) on the table for several years during its deliberative process before finally setting it aside. The main problem with the alternative was that it entailed some of the more significant costs of the IFQ alternative (e.g., full observer coverage) but without the flexibility needed to generate significant economic benefits from rationalization.

Another major alternative considered was processor QSs. Processor QSs are shares that must be held to process fish and, thus, differ from IFQs which must be held to harvest fish (they are also different from the allocation of IFQ to processors). It is arguable whether or not processor shares are an effective or needed tool for rationalization of the fishery. The Council consideration of such an option was stemmed first by a Congressional prohibition on the spending of funds for consideration of quotas for processing and then by a prohibition in the MSA.

The Council also explored rationalization programs that might directly include communities, something similar to the CDQ programs in Alaska. A community representative was assigned to the committee that took the lead in initial program design (the TIQC). However, the Council heard both from that representative and others involved in local governments that local governments on the west coast were not interested in the administrative costs and burdens that would be entailed in running a CDQ program.

The OSHUA plan covered management of sectors (e.g., recreational) far beyond the scope of the proposed action. With respect to the portions of the proposal covering management of the trawl sector, the proposal would have been based on annual (or biannual) reallocations of fishing privileges in a manner that would reward those harvesting the most target species within rebuilding and bycatch constraints. While providing an incentive to reduce bycatch rates, the proposal did not allow for substantial rationalization of the fishery and the generation of the increased benefits needed to counteract the increased management costs. The annual allocations needed to achieve the objectives identified by the plan would have been more complicated than identified in the plan (e.g., requiring consideration of depth and latitudinal strata), administratively costly, and a substantial burden on the resources available

[42] CEQ regulations covering EISs state "for alternatives which were eliminated from detailed study, briefly discuss the reasons for their having been eliminated [sic]" (40 CFR 1502.14(a)). This section provides a short summary of the range of approaches considered, both in developing the trawl rationalization and in earlier years. Deliberations before the trawl rationalization proposal was developed are relevant because they helped to shape the range of ideas the Council considered during trawl rationalization program development.

[43] The cumulative limits would become quotas when they are reduced to the level at which, if every vessel takes its limit, the total catch will exactly equal the trawl allocation.

for fishery management. Additionally, the plan called for the delegation of responsibilities to Council advisory bodies in a manner that is not allowed under the MSA.

The Council also considered but rejected achieving individual accountability and improved mortality estimates through full retention rules in the nonwhiting fishery with compliance monitored through video cameras. Reasons for the Council recommendations on these management approaches are discussed in Sections 2.6.2 and 2.6.4.

There are a number of provisions (components of alternatives) considered by the Council but ultimately not included in the alternatives. These include fixed terms on QSs, auctions, zonal management, and gear conversion, among others. These provisions and the reasons for the Council recommendations in regard to them are documented in Appendices A and B.

2.6 Rationale for the Council's Preferred Alternative (Alternative 4b)

The need for a change from status quo is identified in the problem statement. After reviewing the status quo situation and both the beneficial and adverse impacts of the trawl rationalization alternatives (as described in detail in Chapter 2, Chapter 4 and the appendices to this document), the Council's judgment was that the advantages of its final preferred alternative for trawl rationalization, Alternative 4b, outweighed the disadvantages in comparison to continuation with status quo management, the other trawl rationalization alternatives that were considered, and other proposals for modification of status quo (e.g., providing longer cumulative limit periods).

There are two primary drivers in the problem statement that guided this process: the first is the need to account for, control, and reduce bycatch, and the second is the need to provide for an economically sustainable fishery for the benefit of industry participants and fishery dependent communities. These needs are both reflected in the goal for this action:

> *Create and implement a capacity rationalization plan that increases net economic benefits, creates individual economic stability, provides for full utilization of the trawl sector allocation, considers environmental impacts, and achieves individual accountability of catch and bycatch.*[44]

2.6.1 Trawl Focus

Foremost, this goal reflects the Council's understanding that trawl gear is the only gear that can viably harvest[45] much of the groundfish that is economically important to the fishery and important as a protein source to the broader public, i.e., it is the only gear that can be effectively used to remove much of the biomass that is available for harvest within conservation constraints. Therefore, the focus is on improving management of the trawl fishery rather than considering direct reallocation of trawl harvest to other gears. While the focus was primarily on improving management of the existing trawl fishery, the Council's action, both in its preferred alternative here, and in the intersector allocation amendment (Amendment 21), takes into account opportunities to reduce bycatch and other possible adverse environmental impacts

[44] "Bycatch" is defined in the Magnuson-Stevens Act as: "species of fish which are harvested in a fishery, but which are not sold or kept for personal use, and includes economic discards and regulatory discards. Such term does not include fish released alive under a recreational catch-and-release fishery management program."

[45] "Viably harvest" can be explained in a couple of different ways. For some species, such as many species of sole and other flatfish, trawl gear is the only proven gear that can consistently harvest a quantity that approaches the allowable catch for those species. In other cases, the price per pound received is too low to justify the use of gear that takes species in lower quantities.

by moving some of the harvest toward nontrawl gears. In this action, the potential for movement toward nontrawl gears is accounted for through the scope of the program (which includes an opportunity for vessels with trawl permits to switch to nontrawl gears to take their quota). In addition, the intersector allocation decisions made in Amendment 21 favor nontrawl gears by basing the groundfish allocation on the historic periods most favorable to nontrawl gears, by truncating the trawl groundfish allocation at a maximum of 95 percent,[46] by imposing further reductions in the trawl allocation for a few other species, and by targeting a 50 percent reduction in the trawl bycatch of halibut.

2.6.2 Bycatch Reduction Objective and Observer Coverage

This action responds to the identified need for bycatch control and the need for conservation through its focus on individual accountability for catch and bycatch. At present, total mortality for all species is measured and controlled by monitoring total landings and sampling 20 percent of the trawl trips to estimate bycatch rates (discard rates) that are then applied to landings to develop an estimate of total catch and mortality. With this approach, there is substantially less certainty about total catch and mortality than there are total landings. Further, while agencies are able to regulate total landings in the nonwhiting trawl fishery through two-month cumulative limit periods and influence bycatch rates with catch area restrictions and gear restrictions, they face difficulties in managing for total catch in the nonwhiting portion of the trawl fishery. The fishery is a mixed stock fishery. When, despite best regulatory efforts, a fisherman encounters amounts of certain species that are in excess of the two-month cumulative landing limits, they may continue to fish for other target species, discarding the species for which they have reached their limit.[47] The current monitoring system was designed to provide fleetwide total catch estimates over the course of a year. It was not intended as a tool for managing individual vessel discards in the nonwhiting trawl fishery or for providing for individual accountability.

The Pacific whiting fisheries are different in that monitoring is in place that is intended to manage for total catch. The at-sea fisheries use 100 percent observer coverage on both catcher-processors and motherships and document landings and discards that are occurring in those fisheries. The shoreside whiting fishery is exploring the feasibility of cameras intended to verify full retention of catch on board vessels in that fishery. Through a full retention program, the documentation of total catch of species in that fishery occurs dockside.

The Council considered achieving individual accountability and improved mortality estimates through full retention rules in the nonwhiting fishery with compliance monitored through video cameras. However, the practicality of using cameras in the nonwhiting fishery is problematic because of the vessels' need to discard debris and prohibited species and the difficulty of monitoring holds for surreptitious catch sorting and discarding.

The other means identified for providing individual accountability for discarding is to require 100 percent observer coverage for vessels participating in the trawl sector. Full observer coverage, combined with a shift from regulating landings to regulating catch, is a key element of the Council's preferred alternative. These elements provide for individual accountability for catch and some incentive for bycatch reduction.[48]

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[46] For several species, trawl catch typically approaches 100 percent of the available harvest.

[47] These discards are incorporated into the observer estimates of discard mortality, but the fleet as a whole pays for this activity through reduced fishing opportunity; it impacts the vessel doing the discarding only through its impacts on the fleet as a whole.

[48] When vessels must stop fishing as soon as they reach their limit of a bycatch species, that provides an incentive to avoid bycatch, at least enough so the vessel is able to catch its target species quota.

2.6.3 Link between Bycatch Control and Need for Rationalization

Full at-sea monitoring and the switch from controlling landings to controlling catch would achieve the main conservation related objectives; however, 100 percent observer coverage for the nonwhiting fishery and observers/cameras for whiting catcher vessels would be costly. Even if the observers/cameras were not paid for by industry, there are still costs that a vessel incurs when it has an observer or camera on board. If vessels must pay for the cost of observers, then the burden is substantial, and it moves the fishery away from achieving social and economic objectives. As identified in the problem statement, the fishery is already under substantial economic stress. The 2003 buyback program improved the economic situation of fishing vessels after the groundfish resource disaster that was declared in 2000.[49] However, the fleet remained only marginally profitable, as illustrated in a study by Lian et. al. (2008) . Imposing large additional costs to carry observers could devastate the fishery unless its overall economic health is also improved. Early on (in its strategic plan and Amendment 18), the Council identified rationalization as a way to improve the economic health of the fishery. Under a perfectly rationalized fishery, capacity would be reduced, and costs would be minimized so that the labor, capital, and other inputs used to capture the fish are no more than is absolutely necessary to fully take the amount that can be harvested while meeting conservation objectives. Thus trawl rationalization is viewed as a necessity for improving the health of the industry. Further, with 100 percent observer coverage, the Council would be able to better monitor total mortality of all groundfish species. Better mortality estimates would improve both stock assessments and the Council's ability to keep catch below the harvest limits developed based on those assessments, substantially contributing to conservation goals. Finally, rationalization based on a system that relies on transferable quotas enhances the incentive to avoid bycatch. Without transferable quota, the incentive is to reduce bycatch only to the point where all targeted species can be harvested. With transferable quotas, fishermen who can lower bycatch rates even further have a potential opportunity to sell their unused quota to others, thus benefiting from reducing their bycatch rate to a level lower than what was necessary for them to take their own available target harvest.

2.6.4 Choosing Between Status Quo and Trawl Rationalization: Broad-Level Council Concerns and Tradeoffs

When taking their preliminary and final actions, Council members noted the goal and eight objectives for the trawl rationalization program, as well as a number of related factors that were important considerations in developing their final recommendation. One important consideration was whether there was a potential for achieving some of the goals and objectives through other types of modifications to status quo. The Council considered whether modifications such as extending the duration of the two-month cumulative trip limit periods and a full retention requirement might achieve some of the important objectives. Extension of cumulative limit periods would decrease the Council's opportunity to make inseason adjustments and would be expected to increase the number of vessels taking their full limits. This would move the fishery in the direction of individual permit quotas without generating the degree of benefits expected from a regular IFQ program. However, extending the two-month cumulative trip limit reduces the number of opportunities the Council has for making adjustments to catch limits to stay within allowable catch levels, thus increasing the possibility of exceeding ABCs and OYs established by the Council. Extension of the length of the cumulative limit periods was an option that had been previously considered and rejected by the Council. For the whiting fishery, there is a need to end the derby because of safety and waste issues; however, the bioeconomics of the fishery does not lend itself to management through cumulative limit periods used in the nonwhiting fishery. While Amendment 15 has resolved some of these issues, the trawl rationalization program would implement a longer-term solution. The Council considered maximized retention in the Pacific whiting fishery, and NMFS is currently considering it for approval as regulations to implement Amendment 10 to the Groundfish FMP.

[49] The disaster was a result of the harvest reductions imposed to rebuild overfished stocks.

Maximized retention for the nonwhiting fishery was considered as a monitoring option under the IFQ program, but was rejected. The Council was not able to identify other ways to modify status quo that would be as effective as trawl rationalization in moving the fishery toward its most important goals and objectives (described above).

Under status quo, the trawl fishery is viewed as economically unsustainable due to the number of participating vessels, excess capacity, a regulatory approach that constrains efficiency, and the status of certain groundfish stocks along with the measures in place to protect those stocks. At the same time, there are both benefits and costs that have to be considered with respect to trawl rationalization. Regardless of the deficiencies of status quo management, the Council had to determine whether trawl rationalization, on balance, would be an improvement over status quo. In particular, the Council debated whether the economic benefits expected from increased harvest and efficiency would be sufficient and occur early enough in the program to help the fishermen handle the increased costs of the program. Some Council members expressed concern that markets for expanded harvest might take time to develop and that provisions to limit consolidation could also delay benefits. However, while most Council members shared concerns about these possibilities, the broadly held view was that the potential for improving the economics of the fishery through trawl rationalization was substantial enough to overwhelm the risks and uncertainties. Council members noted that, due to cumulative limit management, the amount of one highly marketable fish species that had gone unharvested in a recent year was nearly enough to alone cover observer program costs, and reported discard rates and wastage were unacceptable. Given the under-harvest of available OYs, the Council believed it was important to the fishermen and the public to provide an opportunity to achieve the OYs and develop markets for additional fish products. Furthermore, the program would provide the fishery an opportunity to increase profits, not just through harvest expansion, but also through a variety of mechanisms leading to cost reductions. For the nonwhiting fishery, an economically healthy fishery would also be expected to result in some improvement in safety. For the whiting fishery, an end to the derby would create substantial safety improvements.[50] In addition to the potential for safety and strong economic benefits, Council members noted the substantial conservation benefits expected from 100 percent monitoring of catch. This would help reduce bycatch and discards and rebuild stocks that are suffering partially because of discards.

While the trawl rationalization program would move the fishery toward some of its most important goals and objectives, in order for the program to realize those benefits, a large amount of consolidation would have to occur, resulting in fewer people employed in the fishery. Council members acknowledged and expressed concern about the expected consolidation and its impacts and noted the need to attend to the potential for disproportionate impacts on some communities. There was also concern that the potential accumulation of wealth under the IFQ program should have corresponding levels of benefit for the nation, and that state implementation costs be addressed. Finally, Council members expressed an interest in maintaining the character of the fleet and a diversified industry. Balancing the need for consolidation to generate adequate levels of benefit with the potential adverse impacts of consolidation was a major challenge. At the same time, continuation of status quo was having its own impacts, with both the buyback program and cumulative limits having caused significant consolidation in the fleet and a redistribution of vessels along the coast. Because of the high degree of concern about impacts on communities and maintaining some sharing of benefits (both among harvesters and between harvesters, processors, and others dependent on the fishery) the Council made a number of tradeoffs in the trawl rationalization program that may prevent the program from reaching the full degree of economic efficiency that might otherwise be achievable through rationalization. For example, accumulation limits would help disperse fishery benefits, but would inhibit consolidation. And some QS were set aside for use in adaptive management to address such objectives as community and processor stability, new entry,

[50] The catcher/processor sector is an exception because these issues have already been addressed through a self-designed and implemented co-op program.

conservation, and other unidentified/unforeseen adverse consequences. A number of other measures were also considered (documented in Appendices A and B) as the Council struggled to find a balance among sectors, states, vessels, ports, conservation obligations, and its responsibility to try to develop a regime that maximizes economic benefits while simultaneously realizing, recognizing, and honoring the social effects of its decisions.

In taking this action, the Council acknowledged that work will have to continue to monitor the program and to make adjustments in response to program performance. Even prior to implementation, the Council will continue to work on provisions for Community Fishing Associations (CFAs) and an AMP. While there may be unintended and unanticipated consequences, there will be an opportunity to modify the program through a review process, and a data collection process will be implemented to support that review.

Overall, the Council viewed the trawl rationalization program as addressing many of the difficult, time-consuming management problems it has struggled with under status quo. It is expected to provide a basic management framework that will provide the most benefits to the nation for the public resource, including assigning personal accountability for the fisheries, providing opportunities for bycatch reduction, enhancing stock rebuilding through improved fishery information and full observer coverage, providing opportunities to maximize catch of targeted species while protecting species of concern, improving economic performance, helping to maintain community stability, improving safety, guarding against local stock depletion, and addressing unforeseen circumstances through an innovative adaptive management provision. In sum, the Council views trawl rationalization as a program that will help address conservation concerns and take a system that is not economically viable for many and turn it into one that will work for those who remain in the fishery after rationalization.

2.6.5 Choice between IFQs and Co-ops for Each Trawl Sector

Having evaluated the potential of, and set aside, a number of other approaches to status quo and trawl rationalization, the Council focused most of its efforts on considering alternative designs of IFQ and co-op programs to rationalize the fishery. Under an IFQ program, each vessel acquires the quota necessary to prosecute its own fishing strategy, and each vessel is individually responsible to the fishery management agency for complying with the program and covering its harvest with quota. Under a co-op program, an allocation is given to the co-op and the co-op then distributes the allocation to its participating vessels. The co-op agreement and managers determine the amounts each vessel will harvest, and the vessels are responsible to the co-op for complying with the terms of the co-op agreement. In some cases, the allocation received by the co-op is determined by the history associated with each of the permit holders who are members of the co-op. The fishery management agencies do not track the transfer of harvest opportunity among co-op members, nor do they track each vessel's catch against allocations to that vessel. The fishery management agencies hold the co-op as a whole responsible for staying within its limits and the individual vessels responsible for complying with other aspects of the program, such as requirements to carry an observer.

The Council looked at rationalization for the four groundfish trawl sectors: nonwhiting shoreside, whiting shoreside, mothership whiting, and catcher-processor whiting. IFQs were considered for each fishery and co-ops were considered for each of the three whiting sectors.

2.6.5.1 Choice for the Shoreside Nonwhiting Sector

A co-op program was not considered for the shoreside nonwhiting fishery because the diversity of fishing strategies in which vessels participate and the geographic distribution of the shoreside fishery do not lend

themselves to the type of coordination and central operational management that is best facilitated by a co-op program. The whiting fisheries are more homogeneous in terms of fishing strategies, the timing of the fishery, and their geographic distribution. This homogeneity lends itself more to the type of centralized management provided by the co-op.

2.6.5.2 Choice for the Shoreside Whiting Sector

The shoreside whiting fishery is viewed as having greater homogeneity among participants than the nonwhiting fishery, but less homogeneity than the other whiting fisheries. In its preliminary preferred alternative, the Council considered the appropriateness of both IFQs and co-ops in this fishery and chose to specify dual preferred alternatives for the shoreside whiting fishery (IFQs or co-ops for whiting). In that action, it was noted that the Council lacked adequate authority to limit entry for processors or require a permit-processor linkage, both of which were part of the shoreside co-op alternative. Although processors are not part of harvest co-ops, both processor licensing and permit-processor linkages were considered key elements of the co-op alternative considered by the Council. These elements provided a way to maintain a balance of market power between harvesters and processors. Some also viewed processor linkages as a way to provide a central point for the sharing of information within co-ops that might tend to form around similar processors. Such information sharing may facilitate the avoidance of bycatch;[51] however, it is not clear that processor linkage is needed to encourage such information sharing within the structure of a co-op. When it took final action on this issue at its November 2008 meeting, it was clear to the Council that moving ahead with trawl rationalization for the shoreside whiting fishery could most reliably occur through a shoreside program that did not include processor linkage (i.e., did not require Congressional action). Further, representatives of the harvesting and processing sectors reached a compromise agreement and recommended that under an IFQ program there be a 20 percent allocation of whiting QS to processors. This allocation to processors addressed concerns about the effects of trawl rationalization on market power balance between the harvesting and processing sectors. Also contributing to the decision to manage the shoreside whiting sector under IFQs was the opportunity that managing the two sectors together provided for resolving intersector allocation issues between them. The rationale for the 20 percent allocation of whiting QS to processors and the advantages of managing the shoreside trawl sectors together under a single IFQ program are discussed further below in the section on rationale for specific provisions of the IFQ program.

2.6.5.3 Choice for the Mothership Whiting Sector

For the mothership fishery, the Council had more latitude to consider regulating processors, since processing facilities in this sector are on vessels and, therefore, come under the Council's authority within the MSA. While the Council had authority to limit new entry for processing vessels, NOAA General Counsel advised the Council that absent a strong conservation rationale it would not have the authority to regulate economic relationships between vessels and processors that would otherwise be determined in the marketplace; i.e., the Council's authority to recommend processor ties was limited. On this basis, the Council developed a processor tie provision that only required a vessel to commit its production to a particular processor for the coming year and did not extend that obligation to any subsequent year. This requirement came about after hearing public testimony indicating that the absence of certainty regarding catcher vessel deliveries in the mothership portion of the Bering Sea pollock fishery nearly led to the bankruptcy of a mothership company engaged in that fishery. The declaration procedure is intended to

[51] Under a co-op system, the vessels are bound together in a single entity in which the individuals have an interest in ensuring that the entity as a whole does not exceed bycatch limits prior to the time that its allocation of target species is taken. This creates an incentive for them to actively share information about high and low frequency bycatch areas with one another. In the midwater fishery in particular, such areas shift around with changing ocean conditions.

facilitate some business planning certainty to the mothership for the coming year. Even though the processor tie provision had to be severely weakened, the co-op alternative was still viewed as providing some balance of marketing power between mothership harvesters and processors, because it created an LE system for mothership processors, thereby strengthening their position vis à vis harvesters. The co-op alternative also had the advantage of encouraging vessels to work together and share information about catch rates through the co-op structure. Some savings in administrative costs were also expected because the co-op will track transfers of allocation among vessels, alleviating the need for NMFS to handle that task. Finally, some Council members voiced a preference for supporting industry participants by addressing their issues through co-op efforts and less governmental involvement. Under the IFQ program for the mothership sector, the issue of market power balance might have been addressed through an initial allocation of QS to processors (something like the 20 percent that was given to shoreside processors), but the IFQ program alternative did not include an LE system for mothership processors. Additionally, the IFQ program did not provide the incentive and structure for information sharing about bycatch. Finally, the mothership co-op alternative was originally developed through a consensus between the majority of mothership sector harvester and processor participants, and the participants in that consensus continued to support the co-op alternative, even with the substantially weakened processor tie provision.

Managing the mothership sector under an IFQ program would have provided an opportunity to reduce management costs and allocation controversy by combining the mothership and shore-based sectors under a single IFQ program. However, there were also concerns that vessels participating in the mothership sector might have an economic advantage over the traditional shoreside fleet and that if the catcher vessel fishery (shoreside and mothership catcher vessels) were managed under a single IFQ program the mothership catcher vessels might use that advantage to purchase more QS, redistributing harvest within the fleet and among communities, causing disruption and adverse social consequences.

2.6.5.4 Choice for the Catcher Processor Whiting Sector

The catcher processor sector of the whiting fishery is already rationalized under a self-developed co-op program, entered into voluntarily by the participants in that fishery. The self-designed program was initially facilitated by (1) a license limitation program, which created a barrier making it very expensive for new catcher-processors to enter the fishery, and (2) the Council's specification of a whiting allocation for the catcher-processor sector. The program was further supported by Amendment 15, which established a Pacific whiting vessel license based on historical participation. Implementation of Amendment 15 prohibits new entrants and, thereby, maintains the current structure and stability of the catcher-processor co-op. The Pacific whiting vessel license was intended to be an interim measure until the Council fully considered trawl rationalization. During the development of the preferred alternative (Alternative 4b), the Council expressed concern that the structure of the co-op could deteriorate, resulting in a derby fishery. Therefore, it specified that in the event the co-op failed the fishery would be managed with an IFQ program and that an equal amount of QS would be issued to each permit with a catcher-processor endorsement.

2.6.6 Major Decisions in Designing the IFQ Program

With respect to IFQs, the Council considered programs that would manage each trawl sector under a separate IFQ system, one that would manage the shore-based trawl sectors together, but the two at-sea whiting sectors separately, and one that would manage all four trawl sectors under a single program. Under the Council-preferred alternative (Alternative 4b), the Council chose IFQ management for the shore-based whiting sector and the nonwhiting shore-based sectors and recommended managing them together as a single shore-based trawl sector. Managing the shore-based trawl fishery as a single sector is expected to increase the likelihood that available harvest will be fully taken. If the shore-based trawl

sector were managed as two separate IFQ programs, the Council would have to allocate nonwhiting species taken incidentally in the whiting fishery to the shore-based whiting sector and nonwhiting trawl sectors. If the incidental catch allocations the Council provided to the shore-based whiting sector were not sufficient to allow the sector to take all of its whiting allocation, there would be no way for the shore-based whiting sector to acquire additional nonwhiting quota to cover its incidental catch, and whiting would go unharvested. At the same time, if the shore-based whiting sector were allocated more than the amount it needed to cover incidental catch, there would be no mechanism to move the excess back to the nonwhiting shore-based trawl fishery for its use, and the excess allocation would go unharvested. By managing the shore-based trawl sectors together under a single IFQ program, there is an increased likelihood that the market place will overcome constraining species issues as quota holders buy and sell quota to whomever can put it to best private use (i.e., to whomever is willing to pay the highest price for it).

Deciding on the groups which would receive an initial QS allocation was another major decision for the Council. One of the primary issues debated extensively was whether to give an initial allocation of QS to processors and, if so, in what amount. During Council discussion, it was noted that the MSA LAPP provisions in Section 303A(5) require that the Council ensure fair and equitable initial allocations, including consideration of (1) current and historic harvests, (2) employment in the harvesting and processing sectors, (3) investments in and dependence on the fishery, and (4) the current and historical participation of fishing communities.

Congress specifically instructed the Council to fully analyze alternative program designs, including allocation of LAPs to harvest fish to fishermen and processors. Much of the Council's discussion about an allocation to processors revolved around the impact of both status quo and trawl rationalization on market power. It was noted that the U.S. economy relies on competition and on individuals and businesses acting in their own self interest for growth, innovation, price setting, and the allocation of resources. There was a sentiment that government should not interfere in business competition unless it is necessary for the public benefit. It was noted that the Council interferes with harvesting businesses because of problems identified relative to conservation and management both in the nonwhiting and whiting fishery. When the Council intervenes in harvesting, it cannot help but also interfere with the processing businesses by changing the basic bargaining dynamics in the raw fish product market. While ex-vessel price negotiations have to be left to the harvesters and processors, the Council believed it could not ignore how fishery management actions might influence those negotiations. Some Council members opposed any allocation to processors on the grounds that they believed it would have an adverse effect on market power (increasing market power for processors) and that there were ways to address concerns about community stability other than by allocating to processors. They noted that even if processors received no QSs, after initial allocation, processors would likely be in a position to acquire additional shares and achieve the balance of power they want. The real issue of concern in this regard may be the control limits to ensure that the balance does not get out of hand. Others were concerned about small processors and expressed concern that not to allocate to processors might cause more consolidation and a further decline in the number of buyers, increasing the power of remaining processors.

In its preliminary preferred alternative, the Council recommended giving processors 20 percent of the shore-based allocation of QSs for all species except bycatch taken in the shore-based whiting fishery. Council members noted the difficulty of determining the correct percentage for a possible QS allocation to processors. The option for a 50 percent allocation of whiting QSs to processors seemed like far too much. When a 20 percent option was proposed, some Council members believed that when the 20 percent allocation to processors was combined with a 10 percent allocation for adaptive management, and considering that some processors would receive QSs for the permits they hold, the amount remaining for harvesters would be insufficient. In selecting its preliminary preferred alternative, Council members noted that the case for providing QSs to whiting processors seemed to be relatively clear but it was less

clear for nonwhiting processors. For whiting processors, the switch from a derby fishery would immediately result in some of the processing capacity becoming surplus. The shift from two-month cumulative trip limits periods to IFQs would not affect the nonwhiting processors in the same way. However, with respect to nonwhiting processors there was concern for small processors' ability to compete with larger processors. The 20 percent approach chosen for the preliminary preferred alternative was believed by some to be a fair middle ground for public review and comment.

In its final preferred alternative, after further review of the analysis and public testimony, the Council recommended giving processors 20 percent of the QSs only for shore-based whiting and no QSs for shore-based nonwhiting. In taking this action, Council members expressed their concern that an initial allocation of QSs to nonwhiting processors would add too much to the market power of shore-based nonwhiting processors. They noted that there was already considerable consolidation among processors, particularly relative to the number of vessels operating in the fishery. Providing processors with an initial allocation would be expected to further increase consolidation and market power. Additionally, the argument that the larger processors also held vessel permits, which would provide them with QS, held more sway. At the same time, Council members continued to be concerned with the impact of the program on smaller processors. It was noted that if an allocation of nonwhiting QSs to processors were to be made the appropriate amount might be 10 percent of the QSs. Instead the Council favored providing a 10 percent allocation for adaptive management. The AMP could be used not only to provide some amount of certainty and security to the larger processors, but also to provide flexibility to tailor a program that would provide some protection to smaller processors. In making its decision, the Council specified its intent that the AMP be constructed in a manner to ensure that the program accomplishes this as one of its objectives.

With respect to the decision to allocate 20 percent of the whiting QSs to processors, differing conditions between the whiting and nonwhiting sectors were noted. In particular, it was noted that the size of the shore-based whiting fleet was expected to be very small (only 20 vessels), providing the fleet with greater market power relative to the three major whiting buyers than would be experienced by the nonwhiting fleet relative to the major buyers of nonwhiting species. While the shore-based whiting fleet position would be strong, the analysis indicated that with the move from a whiting derby fishery to an IFQ program the amount of processing capital needed in the whiting fishery would decline by 30 to 50 percent[52] and that competition among whiting processors would tend to increase to continue to attract deliveries to their facilities, leading to a decrease in their market power. In contrast to whiting, the nonwhiting trawl fishery is not a derby-style system; it is managed with two-month cumulative trip limits. Therefore, the shift to IFQs will not create a sudden increase in the amount of excess processing capacity. Even with a 20 percent allocation of whiting QSs to processors, the Council believed it may be uncertain whether the initial allocation of whiting QSs to processors will offset whiting harvester gains in market power, relative to status quo. An initial allocation of whiting QSs to processors functions as a means of guaranteeing supply for processors, granting processors some leverage in bargaining power as they can hold out against harvesters, and providing an incentive to make necessary capital investments to increase product recovery yield.

Consideration was also given to allocating QSs to communities and crew members. As discussed above with respect to the Council consideration of CDQs, up to the very end of the Council's deliberations, communities expressed no interest in receiving an initial allocation of QSs. Therefore, the Council developed other mechanisms to address concerns about communities, including, but not limited to, the AMP, a two-year moratorium on QS transfers, a five-year review that includes a community advisory

[52] Processors invest in excess capacity to compete with other processors for deliveries by being able to handle peak volumes during the derby fishery. When the derby is over, much of the capital then remains idle. The move to an IFQ program will slow the pace of the fishery resulting in substantial unneeded processor capital.

committee, accumulation limits and a two-year review of some of the limits, the opportunity for communities to receive an initial QS allocation by acquiring a trawl permit, and a trailing action on CFAs. With respect to crew members, an initial allocation is difficult because there is limited historic information on the identity of crew members who have fished on trawl vessels. It is the Council's hope that by providing highly divisible QSs and ensuring that other elements of the program design facilitate crew ownership of QS, that crew members who want to do so will be able to incrementally accumulate QSs. As an example of specific consideration of crew, during GAC discussions, it was proposed that QSs be tied directly to particular vessels. This was rejected because it would have required a complex tracking system if crew members were to be able to hold and independently direct the disposition of their QSs. Initial allocation to community and crews and other provisions benefiting both are discussed further in Chapter 4 and Appendix A.

2.6.7 Major Decisions in Designing the Co-op Program

The most important and broadly controversial elements of the mothership co-op program design were the processor tie provisions and LE for mothership processors. These issues were covered above in the discussion of the Council's decision on whether to go with IFQs or co-ops for each of the whiting sectors. Decisions such as allocations for communities or crew are not usually elements of a co-op alternative because co-op formation relies on cooperation among vessels. Additionally, while it might be feasible to design a system that would provide allocations to others (e.g., communities) that would then use that allocation by joining a co-op, the processing elements of the at-sea fishery are generally tied to major population centers in Puget Sound that are substantially less dependent on the fishery. As with IFQ, a community that wants to secure involvement in the fishery could purchase a permit endorsed for participation in an at-sea whiting fishery; however, the amount of economic activity that would be secured through keeping the catcher vessel based in the community (without the accompanying processing activity) would probably not make such acquisitions worthwhile, because the delivery and processing activity occurs at sea. Also, as with IFQ, elements such as accumulation limits ensure some dispersion of benefits among multiple catcher vessels, increasing the probability that there also may be some dispersion of economic benefits among multiple communities.

For the catcher-processor co-op program, one of the most controversial design elements was the decision whether the catcher-processor co-op would be issued a permit. When the Council developed its preliminary preferred alternative on this issue, there was extensive debate on the question of whether the catcher-processor co-op would be designated as a LAPP and subject to a 3 percent fee. Some Council members opposed such a designation on the grounds that the Council's preferred alternative would not generate substantial new administrative costs or fleet benefits for the catcher-processor fleet. On the other hand, it was argued that the catcher-processor fleet would benefit from the bycatch control mechanisms that were being implemented for other trawl sectors as part of the trawl rationalization program, that they would benefit from being part of the overall LAPP system, that they were being given exclusive access to a public resource, and that their exclusive access is what enabled them to develop their own co-op. With respect to the argument that the catcher-processor sector would benefit from bycatch control provided by rationalization in other trawl sectors, other Council members felt that the catcher-processor sector should not have to pay the cost for regulations needed to clean up a problem in another sector. The Council was advised that if it provided an allocation for the co-op and required a co-op permit, then the program would be a LAPP. On this basis, in June 2008, the Council voted not to require permits for co-ops. This intent was carried through when adopting the final preferred alternative in November 2008 and June 2009. As part of the process of reviewing proposed regulations for program implementation and determining them to be necessary and appropriate ("regulatory deeming"), the Council reconsidered this issue and changed its position at its March and April 2010 meetings. At the March 2010 meeting, the Council gave public notice that it would reconsider the requirement for co-op permits; at its April 2010 meeting, the Council

agreed that the regulations should include the co-op permit requirement. NMFS indicated that the Council will participate in subsequent deliberations on formulating cost recovery provisions. Through that process, the Council may determine what aspects of program cost may be attributed to a given fishery sector.

CHAPTER 3 RESOURCES AND STAKEHOLDER PROFILES

3.1 Introduction

This chapter provides the context for evaluating the effects of the proposed action. It is divided into 19 sections. Section 3.3 describes past, present, and reasonably foreseeable actions, while Section 3.4 enumerates past, present, and reasonably foreseeable trends. Actions are defined as regulatory and programmatic activities affecting the operational environment for groundfish fisheries and the status of related resources. Trends are ongoing changes in baseline conditions that have occurred and may be reasonably expected to continue; these trends can be shaped by either environmental forces (e.g., climate forcing affecting animal populations), or human behavior in the aggregate (e.g., consumption patterns). This information supports the evaluation of cumulative effects in Chapter 4, which is organized around environmental components, definable parts of the human environment such as natural resource and social categories (e.g., marine mammals, groundfish harvesters). The cumulative effects analysis looks at the combined effects of the direct and indirect impacts of the alternatives when combined with these external actions and baseline trends (i.e., those not part of the proposed action and alternatives). In identifying external actions that may combine with the effects of the proposed action, it is important to consider their temporal aspect. While an action may have occurred at some discrete time in the past, it may cause a permanent change in baseline conditions. Alternatively, an action that was initiated in the past may continue; this is common for the types of programmatic actions that have the greatest effect on the management system and managed resources. So, although CEQ regulations reference "past, present, and reasonably foreseeable future actions," from an analytical standpoint, what is of interest is the net effect on baseline conditions at the start of the trawl rationalization program and any ongoing effects of these actions because they continue to exist programmatically. Table 3-1 shows which environmental components these categories of actions are most likely to affect.

The remainder of this chapter (Sections 3.5-3.19) then describes baseline conditions for the environmental components that are evaluated in Chapter 4 by presenting description and tabular data on conditions in the recent past. These sections are organized so that they parallel the heading numbers for the impact analysis of comparable environmental components. For example, Section 3.6 provides baseline information on groundfish trawl harvesters, and Section 4.6 evaluates the impacts of the alternatives on this environmental component.

Table 3-1. Environmental components affected by ongoing actions.

Environmental Components	Actions						
	Harvest Management	Bycatch Reduction	Rationalization	Sector Allocations	Habitat/Ecosystem Protection	Wind Energy	Trawl Rationalization Mitigation
Limited Entry Groundfish Trawl Harvesters	X	X	X	X	x	x	x
Captain and Crew	X		X				x
Nontrawl Commercial Harvesters	X	x	x	x	x	x	
Shoreside Processors of Trawl Groundfish	X		X				X
Mothership Processors of Trawl Groundfish	X	x	X	X		x	
Trawl Catcher-Processors	X	x	x	x		x	
Processing and Other Labor			x				
Input Suppliers			x				
Communities	x		X	x	x	x	X
Treaty Tribe Harvesters	x		x		x	x	
Management Agencies	X	x	X		X	x	X
Groundfish Resources	X	X	x		X	x	
ESA-listed Salmon	x	X			x		
Other Protected Resources	x				x	x	
California Current Ecosystem	x				x		

x-lesser effect; X-greater effect; blank-minimal or no effect expected

3.2 Data Sets

The major fishery data sets used in describing historical and baseline conditions are derived from the Pacific Coast Fisheries Information Network (PacFIN), which is administered by the PSMFC. PacFIN aggregates data provided by the Washington, Oregon, and California state fishery agencies. These agencies also supply species-composition and catch-by-area proportions developed from their port sampling and trawl logbook data systems. Data are stored in a relational database that, among other things, contains commercial fishery landings data based on fish tickets that must be completed at the time of landing. Because market categories may aggregate similar species, port sampling data are used when processing fish ticket data to derive weights by species. This is particularly the case with rockfish, because there are many species that are similar in appearance and hard to differentiate. PacFIN allows querying of disaggregated landings data, which allows a lot of flexibility to present data in different formats, such as by date, gear type, species composition, dollar value, and regulatory category. In addition to Washington, Oregon, and California information, data from Alaska and British Columbia are included in the database. PacFIN also contains LE permit data provided by NMFS, vessel registration data from the U.S. Coast Guard, and trawl logbook data. Logbooks are filled out by the vessel operator and contain detailed tow-by-two data, which can be used to determine when and where fishing occurred along with a rough estimate of the resulting catch.

3.3 Past, Present, and, Reasonably Foreseeable Actions

3.3.1 Harvest Management, Overfishing and Overfished Species

3.3.1.1 Groundfish Harvest Specifications

Evolution of the harvest specifications process

When the groundfish FMP was originally implemented in 1982, it contained only fixed elements; it did not describe a framework procedure for periodically changing management measures. Numerical OYs were specified for six species (Pacific whiting, sablefish, Pacific ocean perch, shortbelly rockfish, and widow rockfish); OYs for other stocks or stock complexes were simply defined as "all that are landed under regulations adopted by the Council." Before FMP implementation, foreign fishing—principally for Pacific whiting and various rockfish species—dominated catches in the area that became the EEZ (at that time the Fisheries Conservation Zone [FCZ]) in 1976. In the late 1970s and early 1980s, with the development of midwater gear technology, domestic trawlers rapidly expanded catches of widow rockfish and other rockfish species. This set the stage for a fairly permissive management regime. Domestic management focused on a few species; throughout the 1980s, the main measures were trawl trip limits for widow rockfish, Pacific ocean perch (because at the time it was already overfished), yellowtail rockfish, sablefish, and the *Sebastes* complex, under which other rockfish species were managed. Aside from these trip limits, the FMP contained trawl gear restrictions. A size limit and related landing restrictions were established for sablefish in 1983. The whiting fishery, wholly foreign at the beginning of the decade, transitioned through a joint venture phase (with U.S. catcher vessels delivering to foreign processing vessels) to a fully domestic fishery by the early 1990s.

Amendment 4, adopted by the Council in 1990, made substantial changes to the FMP and established the basic management framework permitting the annual specification of management measures and their modification inseason (during the year), if necessary, to constrain landings to management targets (whether a quota, harvest guideline, or ABC/OY). The amendment also expanded the scope for management to allow establishing OYs for any stock without an FMP amendment and providing a broader rationale for establishing a numerical target beyond stock status concerns. Throughout the 1990s, harvest specifications and management measures became increasingly complex because of the need to allocate yield and manage the various sectors established through LE more explicitly (see discussion below). More proactive management was also prompted by new requirements in the 1996 Sustainable Fisheries Act (SFA), which amended the MSA. In particular, the SFA established a more demanding framework for responding to overfishing and rebuilding overfished stocks. With the incorporation of a rebuilding framework into the FMP, by 2000, five stocks—darkblotched rockfish, Pacific ocean perch, canary rockfish, bocaccio, and cowcod—had been declared overfished due to long-term overfishing by both foreign and domestic fleets from the 1960s onwards. Two more stocks—widow and yelloweye rockfish—were declared overfished in 2001 and 2002; one stock, lingcod, has subsequently rebuilt and is no longer considered overfished.[53] Table 3-2 shows stocks for which numerical targets were established at four different times over the life of the FMP. As noted above, in the original FMP, only six stocks had numerical OYs. In 1991, after Amendment 4 was implemented, a few additional rockfish stocks came under management to numerical targets. In the last 10 years, the number of stock-specific targets has expanded substantially. The table somewhat understates the number and complexity of targets in recent years since OYs are specified for numerous components of stock complexes, and the OYs for some stocks

[53] Pacific whiting was declared overfished in 2002 and rebuilt in 2004, principally due to highly variable stock assessment results. A rebuilding plan for this stock was never developed because the overfished status only applied to one fishing year, 2003. Lingcod was found to be rebuilt following a stock assessment conducted in 2005.

are also subdivided geographically.[54] In many cases, catch is managed to these geographic or stock complex subdivision targets.

By the early 2000s, annual harvest specifications were largely driven by the need to constrain catches of overfished species and other target species, such as sablefish, that require precautionary management because stock size is below the management target (B_{MSY} or its proxy). As discussed further below, as landing limits were lowered, bycatch became increasingly problematic for managers, and the need for robust at-sea catch monitoring became more urgent. Figure 3-1 shows changes in landing limits implemented at the beginning of each year for widow rockfish, an important midwater trawl target species in the 1980s that was declared overfished in 2001 (inseason changes to the limits are not included). Because of changes in the way these limits were defined, the graph only attempts to suggest the increasing restrictions by presenting a proxy value for what could be landed in a week. Before 1984, these were simply trip limits with no restriction on total landings. From 1984 to 1992, these were weekly limits with some additional per-trip limits. Beginning in 1992, the limit period was lengthened to four weeks or a month; in 1996, the current two-month cumulative trip limit period management structure was first introduced. From 1999 onward, the limit amount was varied by period, and separate limits were established for different gear types. After 2001, a target fishery could no longer be sustained, and limits essentially allowed for incidental catch to reduce regulatory discards (bycatch).

This period also saw increasing use of spatial management. First, this was achieved indirectly through gear restrictions by defining gear with a footrope larger than 8 inches (large footrope), less than that size (small footrope), and midwater. Differential landing limits were then assigned to these gear types. The intent was to discourage the use of large footrope gear to access rocky habitat at shallower depths, a favored habitat for many vulnerable rockfish species. In late 2002, coastwide depth-based closed areas, RCAs, were established to keep vessels out of areas where overfished species are more abundant. The configuration of these areas varies by two-month cumulative trip limit period and gear type (trawl and fixed-gear). Recreational fishery management has also become more complex as recreational catches became a significant component of the OY for some overfished species, yelloweye rockfish in particular.

Amendment 17 established the current biennial management scheme where harvest specifications are set for a two-year period (with separate OYs specified for each year in the period). The amendment responded to a court decision related to the regulatory process for implementing management measures. It was also, however, an attempt to lengthen the planning horizon for periodic management because of the growing complexity of decisionmaking.

[54] Many commercially less important or less frequently caught species are combined in stock complexes for the purposes of management. These species are not generally differentiated in reported landings, and most have not had stock assessments. Multi-species complexes currently in use include the minor rockfish (additionally separated into several sub-categories), other flatfish, and other fish categories.

Table 3-2. Stocks managed to numerical targets. Overfished species in bold with year declared overfished in parenthesis.

1982-90 Numerical OYs	1991 Harvest guideline or quota	2000 Numerical OYs	2007-08 Numerical OYs
		Roundfish	
		Lingcod (1999-2005)*	Lingcod*
			Pacific Cod
Pacific whiting	Pacific whitng	Pacific whiting	Pacific Whiting
Sablefish	Sablefish	Sablefish*	Sablefish*
		Rockfish	
Pacific ocean perch	Pacific ocean perch	**Pacific ocean perch (1999)**	**Pacific ocean perch**
Shortbelly	Shortbelly	Shortbelly	Shortbelly Rockfish
Widow	Widow	Widow	**Widow rockfish (2001)**
	Canary	Canary	**Canary rockfish (2000)**
	Chilipepper	Chilipepper	Chilipepper Rockfish
	Bocaccio	**Bocaccio* (1999)**	**Bocaccio* (2000)**
		Splitnose	Splitnose Rockfish
	Yellowtail	Yellowtail	Yellowtail Rockfish
		Shortspine thornyhead*	Shortspine Thornyhead*
		Longspine thornyhead*	Longspine Thornyhead*
		Cowcod*	**Cowcod* (2000)**
			Darkblotched (2000)
			Yelloweye (2002)
			Black rockfish**
	Remaining Rockfish	Minor rockfish N	Minor Rockfish North**
	Sebastes Complex	Minor rockfish S	Minor Rockfish South**
		Flatfish	
	Dover Sole	Dover sole	Dover Sole
			English Sole
			Petrale Sole*
			Arrowtooth Flounder
			Starry Flounder
			Other Flatfish
		Other	
Jack mackerel	Jack mackeral		Other Fish**
			California scorpionfish
			Cabezon (off CA only)

*Stock managed by regional subcomponents

**Stock complex with OYs established for subcomponents, some of which managed separately.

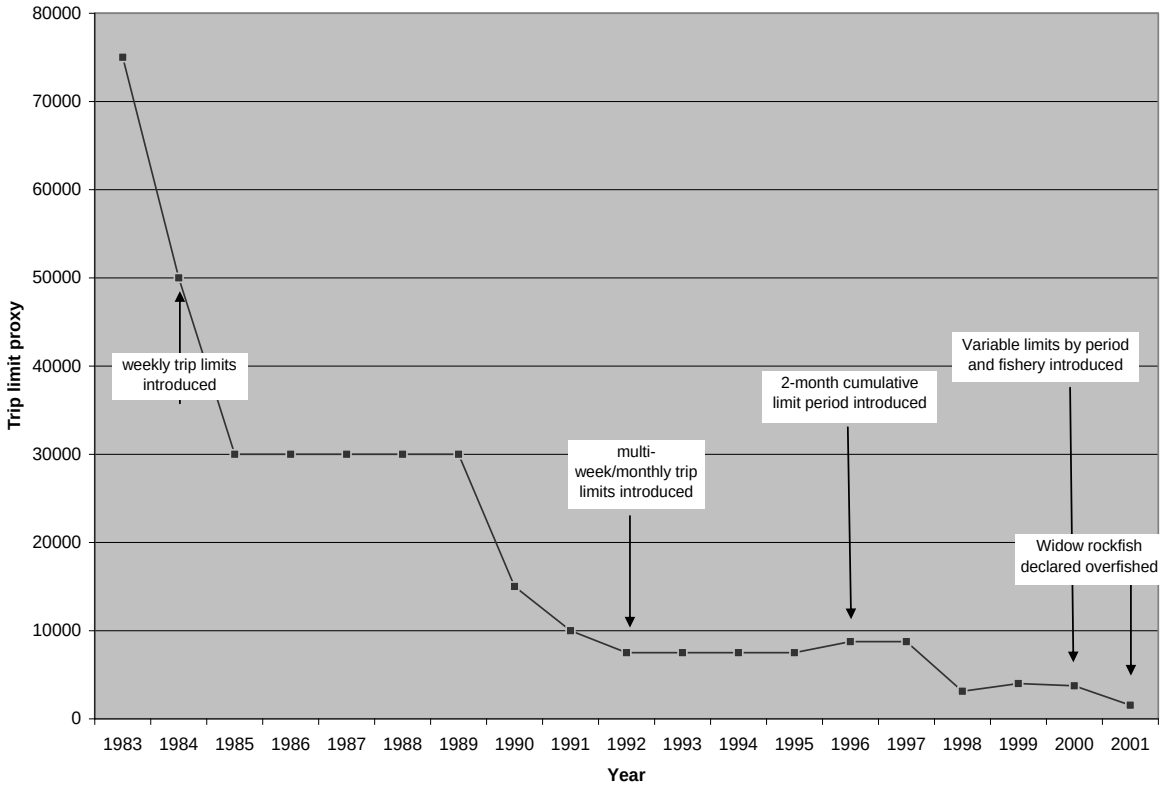


Figure 3-1. Landing limits for widow rockfish.

Current Commercial Fishery Management Measures

Biennial management of commercial fisheries is currently based on four elements: seasons, bimonthly cumulative landings limits, management areas, and exclusion zones or GCAs. These are described in Section 3.16.1.

3.3.1.2 Optimum Yield Management Framework (Amendments 11, 12, 16-1)

Chapter 4 in the groundfish FMP describes the framework used to determine stock status and set OYs accordingly. This framework was incorporated through Amendments 11, 12, and 16-1 in response to provisions of the SFA reauthorizing the MSA. These amendments were adopted in 1998, 2000, and 2004, respectively. Amendment 16-1 responded to litigation on the previous amendments and established a new framework for the development and adoption of rebuilding plans. Subsequent amendments, discussed below, incorporated elements of rebuilding plans, and changes to them, into the FMP. Previously, stocks were managed to ABC, the MSY harvest level associated with current stock abundance. Under the new framework, ABC is considered a limit (the maximum fishing mortality threshold [MFMT]), and OYs can only be reduced from that value. The framework mandates a progressively larger precautionary reduction from the ABC for stocks whose biomasses are below the B_{MSY} proxy ($B_{40\%}$[55]). It is called the 40-10 policy because it is a linear adjustment so that the OY would be set to zero at $B_{10\%}$. However, $B_{25\%}$ is the minimum stock size threshold (MSST); stocks below this level are considered overfished, and a rebuilding plan must be developed. In practice, therefore, OYs are

[55] This notation represents the current spawning stock size in relation to unfished biomass, usually denoted B_0. Thus, $B_{40\%}$ denotes a stock size that is 40 percent of the size expected if no fishing were occurring.

determined differently when biomass falls below 25 percent. Section 4.5.1 in the FMP describes the methodologies used for determining OYs under stock rebuilding. Of course, these calculations can only be made for stocks that are fully assessed, a small proportion of the total number of management unit species. If an ABC value can be determined (for example, form a partial or relatively old assessment), an OY is set with a precautionary reduction. If no ABC value can be determined, the OY is set as a precautionary reduction from trend information, such as historical catches. Nonetheless, the framework does mandate managing to numerical harvest stocks at either the stock or stock complex level; previously, not all stocks came under a numerical target or threshold (see Table 3-2).

3.3.1.3 Rebuilding Plans (Amendments 16-2, 16-3, 16-4)

NMFS is required to report to Congress any managed species considered to be overfished or approaching a condition of being overfished. For any fish stock determined to be overfished, the Council is required to prepare a plan to rebuild that stock. As described above, rebuilding plans have been developed for seven groundfish stocks. Key provisions of these plans were incorporated into the FMP through Amendments 16-2 and 16-3, adopted in 2003 and 2004. A fourth rebuilding plan amendment, Amendment 16-4, was adopted by the Council in 2006 to update some of the previously adopted rebuilding plans. The framework established by Amendment 16-1, based on National Standard 1 guidelines (50 CFR 310), identifies several key parameters to guide management. Principally, these are a target year, T_{TARGET}, by which time the stock is estimated to rebuild to $B_{40\%}$, and an associated harvest rate, presented in terms of the spawning potential ratio (SPR), which is a representation of the resulting reproductive output compared to the output of an unfished population. The choice of the target year is determined by two additional parameters: T_{MIN}, defined as the time needed to rebuild the stock in the absence of fishing, and T_{MAX}, T_{MIN} plus one mean generation time, a stock-specific biological parameter.[56] A target year closer to T_{MIN} implies reducing harvests to rebuild the stock in a shorter amount of time, while a target year closer to T_{MAX} favors higher harvest levels and a longer time to rebuild. Each time an overfished stock is assessed, this information is used to reestimate these parameters, and it is common for them to change. Depending on the degree to which the rebuilding strategy has to be revised in response to these new estimates, the changes may or may not be incorporated into the FMP through an amendment.

Revisions to rebuilding plans have been made as a part of the biennial specifications process. For the first biennial period (2005-06), the development of Amendments 16-2 and 16-3 coincided with harvest specification decisionmaking. Table 3-3 shows the target years originally adopted and subsequent changes.

The changes incorporated by Amendment 16-4 were developed in concert with decisionmaking for the 2007-08 period. In addition to revisions prompted by new stock assessments, Amendment 16-4 responded to an opinion rendered by the Ninth Circuit Court of Appeals in *Natural Resources Defense Council, Inc. and Oceana, Inc.* v. *National Marine Fisheries Service et al.,* 421 F.3d 872 (9th Cir. 2005). This opinion, referring to the controlling language in the MSA (§304(e)(4)(A)(i)), stresses that the rebuilding strategy (essentially the target year and related harvest control rule and associated management measures) must rebuild stocks in as short a time as possible, taking into account (1) the status and biology of the stocks, (2) the needs of fishing communities, and (3) interactions of depleted stocks within the marine ecosystem. In essence, the rebuilding strategy must favor rapidly rebuilding the stock, but may take into account adverse socioeconomic impacts (effects to fishing communities) as a mitigating factor. Decisionmaking should also take into account the marine ecosystem.

Additional changes to target years and harvest rates were proposed as part of the 2009-10 biennial decisionmaking process; since these changes are more modest, however, no FMP amendment is

[56] T_{MIN} is calculated from the year in which the stock was declared overfished.

required.[57] If a new rebuilding analysis projects the stock rebuilding in an earlier year, the Council has the option of not formally changing it to this earlier value and continuing to apply the same harvest rate. This was the case with bocaccio, Pacific ocean perch, and widow rockfish for modifications proposed in 2008. The estimated rebuilding years for these stocks are shown in parenthesis in Table 3-3. Since stock assessments are an integral part of the biennial management cycle, it is likely that Council will continue to modify rebuilding strategies in response to stock assessment results as part of future harvest specifications decisionmaking. More information on stock status may be found in the groundfish stock assessment and fishery evaluation (SAFE) (PFMC 2008c) and in the EIS for the 2009-10 harvest specifications (PFMC 2008a).

Table 3-3. Target year specifications for overfished stocks.

Stock	2005-06	2007-08	2009-10
Bocaccio	2023	2026	2026 (2023)
Canary rockfish	2074	2063	2021
Cowcod	2090	2039	2072
Darkblotched rockfish	2030	2011	2028
Lingcod	2009	Rebuilt	
Pacific ocean perch	2027	2017	2017 (2011)
Widow rockfish	2038	2015	2015 (2009)
Yelloweye rockfish	2058	2084	2084

3.3.1.4 Ongoing Effects of Harvest Management Related to Trawl Rationalization

Harvest management, through the setting of OYs and driven by the requirement to rebuild overfished species, has a broad, continuing effect on the groundfish trawl fishery. Trawl rationalization measures in the alternatives (IFQs, co-ops) would mainly replace the current cumulative landing limit regime; other management measures, such as the RCAs and gear restrictions, are likely to remain in place for the foreseeable future. Setting OYs determines the amount of fish available for harvest. Allocations, either permanent or for a biennial cycle, determine the portion of the OYs available to the trawl fishery. For IFQs, this equates to the translation of QSs into QPs each year; for co-ops, it determines the actual allocation to each co-op based on the catch history shares of each co-op member.

OYs are determined through the specifications framework, based on the requirements of MSY management. The accuracy of these specifications (whether fishing mortality, over time, maintains the stock at MSY) depends both on knowledge of underlying stock productivity and how it may vary over time due to nonanthropogenic factors, such as climate forcing. In the past, harvest specifications either were not made, or landing limits were set too high, resulting in the depletion of several groundfish stocks. This has led to the need to set OYs at low levels to rebuild the stocks. Constraining low OYs will continue for several stocks after implementation of trawl rationalization. Although scientific understanding of stock dynamics has improved, there is continued risk that exogenous factors, such as cyclical or long-term climate change, could reduce stock productivity. OYs would have to be reduced accordingly for those stocks or, if not reduced (because such changes are not detected through stock assessments), could lead to other stocks becoming overfished. OYs set low relative to the potential to catch that species increase risk of catch exceeding a fisherman's QP holdings. This would impose a cost of having to purchase additional QSs/QPs. Scarcity could drive prices up or make price setting difficult due to "thin market" conditions. These impacts are discussed in detail in Chapter 4.

[57] The framework requires that the target year and the harvest rate, or harvest control rule, are specified in Federal regulations, and changes to them can be made by a regulatory, rather than FMP, amendment.

3.3.2 Bycatch Reduction and Monitoring

In 1996, the Sustainable Fisheries Act (SFA) amended the Magnuson Fishery Conservation and Management Act (renamed the Magnuson-Stevens Fishery Conservation and Management Act). The SFA required that FMPs establish a standardized reporting methodology to assess the amounts and types of bycatch in a fishery and that FMPs identify and rebuild overfished stocks.

There are currently two Federal observer programs being operated by the NMFS Northwest Fishery Science Center in the Pacific coast groundfish fishery: the At-sea Hake Observer Program and the WCGOP. These two programs are very different from each other particularly in how they are funded, the type of sampling and fishery data that are used to derive total catch, and availability of data for inseason management.

The two types of funding mechanisms are currently used to fund observers on the Pacific coast groundfish fishery: federally funded observers and third-party or pay-as-you go observers. The WCGOP is federally funded and currently provides observer coverage in the LE and open access nonwhiting fisheries. Federal funds are used to run the program infrastructure (training, debriefing, and data management) and to hire, equip, insure, and transport observers. Observers are employed by the PSMFC, through a Federal contract. The third-party, or pay-as-you-go, funding approach is currently used in the mothership and catcher processor sectors of the Pacific whiting fishery. In the federally regulated third-party system used in the Pacific whiting fishery, participants are responsible for making arrangements with a NMFS-permitted observer provider, having an observer available for their vessels, and, paying the observer providers directly for the observer costs. The NMFS-permitted observer providers collect the fees directly from the vessels, recruit qualified individuals, provide insurance and benefits to the observers, deploy the observers, and ensure that the observer data are delivered to NMFS. Federal funds are used to run the program infrastructure (training, debriefing, and data management) and to equip the observers.

3.3.2.1 Groundfish Observer Programs

The WCGOP is a year-round program that provides observers for all of the commercial groundfish fisheries except the Pacific whiting fishery. Because monitoring of the Pacific whiting shoreside sector has been carried out under EFPs, WCGOP observers have not been used to provide coverage for that sector. All WCGOP sampling protocols and coverage strategies are defined by NMFS. Because there are few observers relative to the number of vessels in the groundfish fishery, observer sampling coverage has focused on obtaining bycatch data at sea that can be combined with state fish ticket data to derive bycatch ratios for different fishing areas and target fishing strategies. Vessel logbook data are used to estimate fleetwide fishing effort. Using observer, fish ticket, and logbook data, the fishery is modeled to derive an estimate of total catch by species. Due to the delayed availability of fish ticket and logbook data, and the time needed to process observer data, the final analysis of estimated total catch by species is typically not finalized until well over one year after the fishing year has ended.

Observer coverage goals for the WCGOP are detailed in a coverage plan (NMFS 2006a). Observers initially covered about 10 percent of the west coast LE trawl fleet effort, selected via a stratified random sample. Trawl fleet coverage has since increased to about 25 percent and has also been expanded to include the LE fixed-gear and open access vessels.

Mothership and Catcher-processor Sector

Since 1991, the whiting processors in the mothership and catcher-processor sectors have carried third-party observers to estimate total landed catch and discards, monitor the attainment of annual groundfish allocations, estimate catch rates of prohibited species (salmon, halibut, and Dungeness crab), and assess stock conditions. Mandatory observer coverage requirements were codified in 2004 (69 FR 31751;

June 7, 2004). From 1992 to July 2004, the motherships voluntarily carried observers. Prior to 2000, most motherships each carried one observer. Since 2000, the motherships have, for the most part, carried two observers. Having two observers allows all or almost all hauls to be sampled and increases the accuracy of data used to monitor fishery allocations and estimate incidental catch. To date, catcher vessels in the mothership sector have not been required to have onboard monitoring, nor have they voluntarily been monitored.

The Shoreside Hake Observer Program (SHOP) is a seasonal program. Observer coverage levels are defined in regulation for each processing vessel and are based on overall vessel length: all processing vessels over 125 feet are required to carry two observers, and processing vessels 125 feet and under are required to carry one observer. These coverage levels allow very large samples to be taken from almost every haul. Each processing vessel makes the necessary arrangements and pays directly to third-party companies that provide observer services and are licensed by NMFS Alaska Region to provide such services. NMFS provides training and sampling gear for the observers. Sampling protocols are also defined by NMFS. An at-sea hake observer's primary duties include recording haul information, determining the official total catch, and sampling hauls for species composition. Each observer submits electronic data files to NMFS for inclusion in the NorPAC database one or more times per day. These data are available within hours for inseason catch evaluation. Because there is such a high level of sampling coverage, NMFS expands these data during the season to unsampled portions of hauls and unsampled hauls to derive total catch by species (species groups). The data are finalized a few days after the observers return from sea, and finalized data are available within weeks after the end of the season.

As noted above, catcher vessels in the mothership sector are currently unmonitored. In recent years, the Council has raised concern about increased incentives to discard bycatch-limit species to prevent the fishery from being closed. To ensure the integrity of sector-specific bycatch limits in the Pacific whiting fishery, as part of the Harvest Specifications and Management Measures for 2009-10, the Council recommended that NMFS require catcher vessels delivering to motherships to pay for and use electron monitoring systems (EMS) at all times to ensure that catch is being retained similar to the recommendation for the whiting shore-based sectors. NMFS has determined that EMS is a suitable tool for monitoring full or maximized retention in the shore-based sector of the Pacific whiting fishery. The EMS requirements for catcher vessels in the mothership sector recommended by the Council are not being implemented by this action. Because the infrastructure necessary to support EMS monitoring was not in regulation at the time that the Harvest Specifications and Management Measures for 2009-10 were being implemented, and because the impacts of the requirement were not analyzed, NMFS is considering the Council's recommendation in this analysis. NMFS has not yet implemented these requirements.

Pacific Whiting Shore-based Sector

In 1996, to address the treatment and disposition of salmon in the Pacific whiting shoreside fishery, an EA was prepared to analyze amendments to both the groundfish FMP (FMP Amendment 10) and salmon FMP (FMP Amendment 12) (PFMC 1997). The preferred alternative included a provision for the salmon FMP to be amended to allow retention of salmonids in the trawl fishery when a Council-approved monitoring program (one that is sufficient to define the Chinook bycatch rate, detect and changing patterns in bycatch, assure compliance with specified management limitations, and provide for the collection of coded wire tags) was established in the Pacific whiting shoreside fishery (PFMC 1997). At its October 21 to 25, 1996, meeting the Council recommended the preferred alternative, including the temporary use of EFPs to monitor the incidental take of salmon until a permanent monitoring program could be implemented. Both the salmon and groundfish FMPs were amended to include the provisions of the preferred alternative; however, implementing regulations for the Pacific whiting shoreside fishery were never adopted.

Each year since 1992, NMFS has issued EFPs to vessels in the Pacific whiting shoreside fishery to allow unsorted catch to be landed at Pacific whiting shoreside fishery first receivers. Each year, most if not all Pacific whiting shoreside vessels apply for and carry EFPs. EFPs specify the terms and conditions that participating vessels must follow to be included. Vessels fishing under the Pacific whiting EFPs are allowed to land unsorted catch at Pacific whiting shoreside fishery first receivers, including species in excess of the trip limits and species such as salmon that would otherwise be illegal to have on board the vessel. Without an EFP, groundfish regulations at 50 CFR 660.306(a)(2) and (a)(6) require vessels to sort their catch at sea and discard all prohibited species (including salmon and halibut) and protected species as soon as practicable. The groundfish regulations also require vessels to discard groundfish species in excess of cumulative limits at sea.

Between 1992 and 2007, monitoring and catch accounting of EFP landings were coordinated by the SHOP. Participants in the SHOP include catcher vessels that have been issued EFPs, designated processing plants along the Pacific Coast, Council, NMFS, PSMFC, Oregon Department of Fish and Wildlife (ODFW), California Department of Fish and Game (CDFG), and Washington Department of Fish and Game (WDFW). The SHOP coordinated the collection and compilation of catch data to provide information needed to monitor attainment of the Pacific whiting shore-based allocation and to evaluate incidental catch, particularly Chinook salmon and other prohibited species. In recent years, the SHOP has also coordinated the collection of inseason data needed to monitor bycatch limits that have been established for overfished groundfish species.

From 1992 to 1994, catch composition sampling was given highest priority in the management of the EFP fishery. During the 1992 to 1994 period, SHOP set a goal of having observers sample 30 percent of the deliveries while at sea and having observers sample 20 percent of the unobserved deliveries while at the processing facility (M. Saelens, pers. comm., ODFW, October 12, 2006). The at-sea observer's role was to confirm retention of the catch. By 1995, the SHOP sampling goal had declined to 10 percent of the landings, and the sampling priority had shifted, with more emphasis being given to the collection of biological information (otoliths, lengths, weight, sex, maturity) on Pacific whiting and select bycatch species such as yellowtail rockfish, widow rockfish, darkblotched rockfish, canary rockfish, sablefish, bocaccio, Pacific chub mackerel, and jack mackerel. The sampling rate was decreased following a statistical analysis that had indicated that there was no significant difference between the fish ticket data and observer data during the early 1990s. Given the fishery management needs of the Pacific whiting fishery in 1995, it was determined that fish ticket data were an adequate representation of species composition for landed catch.

To explore the possibility of increasing biological sample data and increasing the precision of statistical estimates leading to improved stock assessments, a project referred to as the Fishing Industry and Research Scientists Together (FIRST) project was conducted in Oregon in from June 1998 to November 1998 (Builder 2000). The specific goal of this project was to examine the feasibility of collecting additional fish length data by training and using plant workers. Similar studies had found that it was feasible to have plant workers collect fish lengths, which was considered easier than having plant workers obtain data on fish age or species compositions (Gallucci, *et al.* 1996). In most groundfish fisheries, fishery-dependent data, including length data, are collected by port biologists hired by the states. However, port biologist sampling has been constrained by financial and logistical considerations. During the FIRST project, plant workers sampled 150 sablefish, Dover sole, and yellowtail rockfish deliveries. When the length data collected by plant samplers was compared to the port samplers, the quality of the length data was similar. However, time constrains on the plant workers, work priorities, and motivation to take samples were identified as being somewhat problematic during the project (Builder 2000).

In 1998, at a Pacific whiting shoreside fishery first receiver in Oregon, plant samplers began to be used to increase the collection of biological information (length, weight, age, maturity) from the Pacific whiting shoreside fishery. Data were collected from Pacific whiting and selected bycatch species (yellowtail

rockfish, widow rockfish, sablefish, Pacific mackerel, jack mackerel, and prohibited species) (Weeks and Hutton 1998). In Washington and California, port samplers continued to collect biological data. In California and Washington, port samplers monitor a portion of all deliveries and collect biological data and species composition data that is used to distinguish the species on fish tickets. In all three states, port samplers collect fish ticket data during the Pacific whiting shoreside fishery and provide information to the SHOP, where it is compiled for inseason monitoring.

In 1999, language was added to the EFPs to require vessels to deliver EFP catch to state-designated processors. It was determined that there was a need to better define the roles of shoreside processors and the state agencies in monitoring incidental catch and enforcing management measures, specifically for yellowtail rockfish. Designated processors are identified by each of the states, and they have signed written agreements that specify the standards and procedures they agree to follow when accepting unsorted EFP catch.

The proportion of landings observed by shoreside plant samplers and port biologists varied substantially among processors/first receivers and between years. Table 3-4 compares the percentage sampled at each designated Pacific whiting shoreside processor from 2002 to 2005. In 2005, the overall sampling rate was 36 percent of the deliveries or 29 percent of the Pacific whiting by weight. In 2006, the overall sampling rate was 48 percent of the deliveries or 43 percent of the Pacific whiting by weight.

Table 3-4. Percent of trips observed by SHOP at each processor, 2004-06 (Jesse and Saelens 2007; Nottage and Parker 2006; Weidoff and Parker 2004).

State	Port	Deliveries					
		2004		2005		2006	
		percent sampled	sampled /total	percent sampled	sampled /total	percent sampled	sampled /total
Washington	Westport, Ocean Gold	11.0	19/172	12.5	24/192	18.8	36/192
	Illwaco, Jessies	13.2	5/38	9.8	82/8	38.3	36/94
Oregon	Astoria						
	DeYang	--	--	--	--	100.0	34/34
	Bornstein	--	--	--	--	73.0	27/37
	Del Mar	--	--	--	--	100.0	17/17
	Warrenton						
	Pacific Coast	17.3	32/185	0	0/202 /a	30.8	60/195
	Newport						
	Ocean Beauty	19.3	11/57	34.4	61/21	42.2	19/45
	Trident	22.0	53/241	20.3	51/251	28.7	47/164
	Pacific Shrimp	61.5	139/225	100.0	227/227	100.0	163/163
	Charleston	100.0	106/106	100.0	87/87	100.0	93/93
California	Cresent City	10.3	3/29	13.3	2/15	25.0	7/28
	Eureka	5.0	4/80	3.0	2/66	12.3	9/73
	Moss Landing	--	--	100.0	1/1	--	--

a/ Plant sampler observed 23 deliveries; however, data reported to SHOP was incomplete and deemed unusable.

Since the beginning of the SHOP program in 1992, the costs associated with operating the program increased. Table 3-5 shows the in-season budget history for the SHOP between 1995 and 2005. In 1995, the budget was approximately $93,000, with approximately $25,000 for samplers and $68,000 for coordination/data processing costs) as compared to approximately $141,560 in 2005 (approximately $27,000 for plant samplers and $114,560 for coordination/data processing costs) (Nottage and Parker 2006) . The costs to the state governments included sampling personnel, infrastructure, data summary and analysis during winter months, data tracking, and Council support on bycatch issues. In 2005, an additional $70,000, which is not included in Table 3-5, was needed to fund additional ODFW staff. In the past, the costs were relatively minor. However, the costs have become increasingly substantial over time as management agencies have increased their focus on bycatch issues, which requires the data to be available sooner, as well as months of staff time for data analysis.

Table 3-5. In-season Budget History for the Shoreside Hake Observation Program, 1995-2005 (Nottage and Parker 2006).

Year	State Budgets for SHOP ($)		Industry Funding Oregon ($)	Industry Samplers Oregon ($)	Total Funds All Sources ($)	Cost per day ($)	Cost per mt whiting ($)
	Oregon	Washington and California					
1995	~20,000	18,000	~30,000	25,000	93,000	912	1.23
1996	~20,000	18,000	~30,000	29,000	97,000	815	1.11
1997	17,706	27,000	30,294	30,000	105,000	1,522	1.21
1998	19,000	27,000	30,000	30,000	106,000	876	1.22
1999	18,000	27,000	33,339	32,544	110,883	1,218	1.32
2000	18,000	27,000	38,152	32,544	115,696	1,244	1.38
2001	18,000	27,000	46,738	35,770	127,508	1,678	1.76
2002	17,926	27,000	38,371	29,808	113,105	3,649	2.52
2003	18,000	18,000	40,519	29,808	106,327	3,544	2.09
2004	22,000	18,000	53,467	27,000	120,467	2,008	1.33
2005	28,693	18,000	67,867	27,000	141,560	2,178	1.45

In 2007, the cost of monitoring the Pacific whiting shoreside fishery under EFPs was $168,326 to the state of Oregon alone (Table 3-6). The salary of industry paid plant samplers is not included in this value. Similar cost information is was not available for the States of Washington or California.

Table 3-6. Costs to the State of Oregon for monitoring the shoreside fishery in 2007 categorized as requested (data provided by ODFW staff).

Pre-season preparation	$8,547
State samplers	
Training	$1,400
Salary and benefits	$54,130
Travel	$4,460
Housing	--
Sampling supplies	$3,525
Infrastructure	$6,118
Data collection, processing, and analysis	$73,026
Other costs	
Inseason coordination	$8,573
Post season reporting	$8,547
Total costs	$168,326

Vessels fishing under EFPs have been required to retain all catch, with a few exceptions such as very large species (greater than 6 feet in length) and hauls that resulted in a concern about vessel safety. In 2004, a pilot study was initiated and funded by the Northwest Fisheries Science Center (NWFSC) in which a video-based EMS was used as a tool to verify full retention of catch by Pacific whiting EFP vessels. The 2004 study field-tested EMS on 26 fishing vessels for 100 percent data capture of on-deck fishing operations. EMS systems consist of two or more closed circuit television cameras, GPS, hydraulic and winch sensors, and on-board data storage. In 2004, the EMS was in place throughout the 61-day season for the shore-based sector. During this time, the EMS captured virtually the entire fishery, with sensors recording 98 percent and the cameras recording 96 percent of the 1,762 fishing events and 1,019 fishing trips.

From the EMS pilot study, it was determined that EMS could be used to accurately identify the time and location of discard events. As a result of the study, EFP criteria were revised to define maximized retention (most catch is retained) rather than full retention (all catch is retained). The EMS technology (EMS equipment installed on the vessels and data analysis) was again used and funded by the NWFSC during the 2005 and 2006 seasons. Following the 2004 and 2005 seasons, the NWFSC participated in public meetings with fishery participants to discuss the types of information that had been collected, EMS performance, and participants' behavior relative to the catch retention standards, as well as to seek input on mechanism for further reducing documented discard events in the fishery. EMS has moved beyond the experimental stage and has been identified as an effective tool for monitoring full and maximized retention as defined in EFPs for the Pacific whiting fishery. Since 2007, vessels fishing under the EFP have been required to pay directly to the EMS provider for services, as no Federal funding is available for EMS coverage.

In 2008, NMFS choose to manage the 2008 whiting fishery maximized retention and monitoring program under EFPs issued to vessels and, for the first time, EFPs issued to first receivers in 2008. The EFPs incorporated provisions that NMFS expects to be necessary eventually in regulations implementing a maximized retention and monitoring program. For Pacific whiting shoreside vessels, the EFPs included requirements for retention of all catch with exceptions of very large species and minor levels of operational discards and EMSs to monitor maximized retention, as well as requiring leasing of equipment from a NMFS-approved EMS provider. The Pacific whiting shoreside first receiver EFP included catch monitor coverage provisions; requirements for paying for and procuring the services of a NMFS-certified catch monitor; catch monitoring plan submission and inspection requirements; prohibited action regarding the treatment of catch monitors; restrictions on the acceptance of unsorted catch; provision regarding the

abandonment of prohibited species and overage catch; and requirements pertaining to sorting, weighing, and recordkeeping. The issuance of EFPs to vessels and first receivers in 2008 allowed the provisions of a maximized retention and monitoring program to be tested before regulatory implementation and provided NMFS with much needed information on effective implementation of a catch monitoring and verification program.

Table 3-7. Provisions of the 2008 EFP issued to the Pacific whiting shoreside fishery.

	Vessels	**First Receivers**
VMS with declaration report	X	
State paper logbooks	X	
EMS	X	
WCGOP Observers	(optional)	
Catch monitors		X
Electronic fish tickets		X
State paper fish tickets		X

As noted above, unsorted Pacific whiting EFP catch is generally delivered to the Pacific whiting shoreside fishery first receivers, where it is sorted and processed. In a few cases, however, catch has been transported by truck from the original processing facility to a secondary processor. This has primarily occurred during the early season fishery off California when catch has been trucked out of state for processing; during the coastwide season, when catch from coastal areas in Washington has been trucked to a Puget Sound processor; and in Oregon, where sorted catch was trucked to a nearby facility.

Table 3-8. Estimated per-vessel costs of EMS in the 2008 EFP Fishery, expressed as direct costs.

Direct Costs of EMS to NMFS		
	Total Fishery Cost 2008	**Average per Vessel Cost**
Outreach	$17,755	$455
EMS equipment	$0	$0
Installations/removals	$0	$0
Service	$0	$0
Review and cataloguing of data and video imagery	$23,500	$603
Analysis and final report	$35,635	$914
Certification program for EMS providers	$0	$0
Staff training on analyzing EMS data	$12,644	$324
TOTAL	$89,534	$2,296
Direct Costs of EMS to Industry		
	Total fishery cost 2008	Average per vessel cost
Outreach	$0	$0
EMS equipment	$151,970	$3,897
Installations/removals	$71,380	$1,830
Service	$46,200	$1,185
Review and cataloguing of data and video imagery	$23,500	$603
TOTAL	$293,050	$7,514

Beginning in 2008, under EFPs, Pacific whiting shoreside first receivers were required to procure the services of a single catch monitor from a NMFS-specified service provider. Catch monitors are third party employees paid for by industry and trained by NMFS in techniques used for the verification of fish ticket data. These individuals are trained in species identification, observation techniques relative to the verification of fish ticket data, the types and use of commercial scales, documentation procedures for compliance purposes, and recordkeeping. NMFS has defined the acceptable verification methods and coordinates or conducts the training of these individuals.

If catch monitors were unable to monitor all deliveries for fish ticket verification, they randomly selected deliveries to monitor using a random numbers table. It is reasonable to expect an individual catch monitor would be limited to working at the first receiver 14 hours per day. Therefore, only a portion of deliveries at first receivers in operation more than 14 hours per day were monitored in 2008. With a coverage requirement of a single catch monitor, assuming a 60-day season and 16 first receivers participating throughout the entire season, the cost to all first receivers assuming catch monitors' average daily cost ranges from $200 to $300 dollars per day; the total ranges from approximately $192,000 to $288,000, including, training, debriefing, housing, and travel time.

In 2009 under EFPs, Pacific whiting shoreside first receivers were required to have full catch monitor coverage. With full coverage of all deliveries, a catch monitor must be present throughout offloading, sorting, and weighing of each Pacific whiting delivery. With a full coverage requirement, assuming a 60-day season and 16 first receivers participating throughout the entire season, the cost to all first receivers

assuming catch monitors average daily cost ranges from $200 to $300 dollars per day; the total ranges from approximately $338,000 to $507,000, including, training, debriefing, housing, and travel time.

Federal groundfish catch sorting requirements are currently specified at 50 CFR 660.370(h)(6) for species or species groups with trip limits, size limits, quotas, harvest guidelines, or OYs. Under Federal regulations at 50 CFR 660.306(a)(7), it is unlawful for any person to fail to sort the catch prior to the first weighing after offloading. The groundfish must be sorted to the appropriate species or species groups for the fishery in which the vessel is participating. The state of landing may have additional sorting requirements, including requirements for nongroundfish species. Sorting requirements for vessels are also specified in the terms and conditions of the EFP. Since 2007, Federal groundfish regulations have required individuals who receive unsorted catch on land to sort and weigh the catch before it can be transported to another location (NMFS April 2007). In addition, Federal law at 50 CFR Subpart K, 300.160-161 requires that fish transported between states be marked with an accurate packing list, bill of lading, or other similar document that lists species and number by species or specifies other appropriate measure of the quantity such as weight.

Current Federal groundfish regulations recognize that each state has recordkeeping and reporting laws or regulations that address records that have to be kept and/or reports that have to be filed. The Federal groundfish regulations concur with state law by requiring fishery participants to report all data in the exact manner required by applicable state law or regulation. Regulatory requirements that require first receivers to submit electronic fish tickets within 24 hours of landing and prior to transporting catch from the port of first landing were implemented in October 2007 through a related action (NMFS April 2007). The electronic fish tickets are based on information currently required in state fish receiving tickets or landing receipts (hereafter referred to as state fish tickets). Requiring electronic fish ticket data to be submitted within 24 hours allows NMFS to track catch allocations, bycatch limits, and prohibited species catch. First receivers would provide the computer hardware and software (Access 2003 or later) necessary to support the electronic fish ticket program.

Each state requires the submittal of fish tickets that include the actual weight or an estimated weight of each groundfish species or species group. In the state of Oregon, weights reported on fish tickets for the Pacific whiting fishery must have been derived from a certified scale. The states of Washington and California do not specifically require that processors record actual scale weights on fish tickets. For all three states, other data such as the date of landing, gear, vessel, dealer, etc., are also included on the fish tickets. The weights reported on fish tickets are used to determine the total catch by species or species group in the Pacific whiting shoreside fishery. Catch in excess of trip limits, unmarketable catch, and nongroundfish catch are included on the fish tickets. Unlike groundfish, prohibited species are managed by number of individuals.

Each state has laws and regulations that pertain to the use of scales and scale performance by businesses for commercial purposes. Each state has an agency (county or state) that oversees weights, measures, and standards, as well as conducting or overseeing scale performance testing for commercial scales. Commercial scale requirements and how those requirements apply to seafood processors and catch reports differ substantially between states.

In Oregon, all weighing and measuring devices being used commercially in the state must be licensed with the Department of Agriculture prior to being used. Each scale must meet state standards for design, readability, accuracy, and reliability, based on National Institute of Standards and Technology (NIST) Handbook 44. Oregon Measurement Standards approval seals are applied only to those examined devices that meet all appropriate design, installation, and accuracy requirements. However, the state recognizes that knowledgeable, concerned personnel operating correct equipment result in correct weighing and measuring. Oregon requires an approved means of sealing any mechanism used for adjusting a measurement element on a commercial weighing or measuring device. The state also recommends that all

devices be placed under appropriate planned maintenance and service programs to avoid unexpected correction expense. The user of the device is responsible for the accuracy of the scale at all times.

In Washington, Pacific whiting deliveries are sorted, and, though not required by law, the catch is weighed on commercial scales that vary in type and performance. There is current Washington State regulatory code pertaining to weighing and measuring devices installed after July 5, 1997, that are used for commercial purposes (Chapter 16-664 WAC). Like Oregon requirements, commercial scales must be traceable to a National Type Evaluation Program (NTEP)[58] Certificate of Conformance.[59] In Washington State, the owner or operator of weighing or measuring equipment is responsible for the maintenance and accuracy of weighing or measuring devices at all times. Washington Weights and Measures approval seals are placed on devices that meet all appropriate design, installation, and accuracy requirements. The seal indicates that the device passed the inspection during the specified month and year. Weights and Measures officials perform unannounced inspections.

In the state of California, the Division of Measurement Standards is responsible for weights and measures. California requires that any scale used commercially be "type approved" for such use. Commercial use of a non-type-approved scale is illegal in California. Additionally, each commercial scale must have a registered service agent place it into service, or be inspected by a local weights and measures official prior to use. There are a number of requirements such as suitability, position, environmental factors, level, interface with other devices and accessories, etc., that affect proper legal use of the equipment and that require the knowledge of a service agent. County weights and measures inspectors inspect and test various types of weighing and measuring devices. The inspector certifies the devices by affixing a paper seal to them. From time to time, inspectors conduct inspections for compliance with the requirements set by laws and regulations. At the time this document was being prepared, it was not clear how California laws for commercial scales apply to Pacific whiting shoreside processors or what has been in practice in the Pacific whiting fishery. Though weights reported to the state on the landing and receipt of fish must be "accurate," there appears to be no specific requirement for the weights to have been derived from a scale.

3.3.2.2 Vessel Monitoring System

To maintain the integrity of closed areas (primarily RCAs and EFH areas), NMFS implemented a VMS monitoring program, which includes satellite tracking of vessel positions and a declaration system. VMS transceiver units transmit hourly position reports to NMFS. VMS is a tool NMFS uses to monitor fishing vessel location in relation to closed areas, including areas that are closed for habitat protection. Midwater trawl gear makes little contact with the ocean floor; therefore, there are few habitat protection measures restricting the use of the gear.

VMS was initially implemented on January 1, 2004, for all vessels registered to LE groundfish permits. In 2007, the VMS requirement was expanded to all commercial vessels that take and retain, possess. or land Federally managed groundfish species taken in Federal waters, which includes all directed and incidental groundfish open access fisheries (these fisheries are described in Section 3.3.3.5). Each trawl vessel operator is currently required to file a declaration report with NMFS to indicate the intent to use a

[58] A program of cooperation between the National Conference on Weights and Measures, the NIST, the states, and the private sector was created for just this purpose. Through 12 participating laboratories, NTEP evaluates the performance, operating characteristics, features, and options of weighing and measuring devices against the applicable standards.

[59] An official NTEP Certificate of Conformance is issued by NCWM following successful completion of the evaluation and testing of a device. This certificate indicates that the device meets applicable requirements for commercial weighing and measuring equipment in the U.S.

particular gear. Those fishing under EFPS also have to identify the intent to target Pacific whiting with the midwater trawl gear. The EA NMFS prepared for this action contains detailed description and analysis of the VMS monitoring program (NMFS 2003).

3.3.2.3 Electronic Fish Tickets

On September 5, 2007, NMFS published a final rule to establish catch accounting requirements for persons who receive, buy, or accept Pacific whiting (whiting) deliveries of 4,000 pounds (1.18 mt) or more from vessels using mid-water trawl gear during the primary whiting season (72 FR 50906). The final rule became effective on October 5, 2007. The rulemaking included requirements for first receivers to have and use a NMFS-approved electronic fish ticket program (or other NMFS-approved software) and to send daily catch reports to the PSMFC. First receivers provide the computer hardware, operational software (Microsoft Office with Access 2003 or later if PSMFC software is used), and internet access necessary to support the electronic fish ticket program and daily e-mail transmissions. For companies that have developed their own software programs that meet the reporting requirements, provisions were included to allow the software to be NMFS-approved if it meets requirements specified by PSMFC. Electronic fish tickets must be submitted within 24 hours from the date the catch is received. The electronic fish tickets are used to collect information similar to the information currently required in state fish receiving tickets or landing receipts (state fish tickets). The data are used to track catch allocations, bycatch limits, and prohibited species catch.

3.3.2.4 State-Based Landing Reports and Receipts

Various state, Federal, and tribal catch monitoring systems are used in west coast groundfish management. These are coordinated through the PSMFC. PacFIN is the commercial catch monitoring database. There are two components to total catch: (1) catch landed in port and (2) catch discarded at sea. Sorting requirements are now in place for all species with trip limits, harvest guidelines, or OYs, including all depleted species. This provides accounting for the weight of landed depleted species when catches are hailed at sea or landed. LE groundfish trawl fishermen are also required to maintain state logbooks to record the start and haul locations, time, and duration of trawl tows, as well as the total catch by species market category (i.e., those species and complexes with sorting requirements).

Landings are recorded on state fish receiving tickets. Fish tickets are designed by the individual states, PSMFC coordinates recordkeeping requirements between state and Federal managers. Poundage by sorted species category, area of catch, vessel identification number, and other data elements are required on fish tickets. Landings are also sampled in port by state personnel to collect species composition data, otoliths for ageing, lengths, and other biological data.

3.3.2.5 Bycatch Mitigation (Amendment 18)

The Council took final action on Amendment 18 in 2005. It incorporated the preferred alternative into the FMP in the September 2004 *Pacific Coast Groundfish Fishery Management Plan Bycatch Mitigation Program Final Environmental Impact Statement* (NMFS 2004c). The preferred alternative from that FEIS identifies the use of sector-specific total catch limits, or sector bycatch caps, as a way of motivating fishery participants to reduce bycatch, especially of depleted groundfish species. Sector bycatch caps have only been used in limited circumstances, such as in the at-sea whiting sector, because of the need for real-time monitoring systems to make this approach workable. The amendment also incorporated a description of current standardized bycatch monitoring methodologies and other measures for bycatch reduction into the FMP.

3.3.2.6 Amendment 10

In 1996, the Council adopted a combined amendment to the groundfish and salmon FMPs: Amendment 10 to the groundfish FMP and Amendment 12 to the salmon FMP. Under the combined amendment, the FMPs allowed for salmonids to be retained in the whiting trawl fishery (otherwise prohibited for all net gear) when the fishery was managed with a Council-approved monitoring program. As discussed in Section 3.3.2.1, the whiting shore-based sector is currently managed under annually issued EFPs that provide for the required monitoring program. An EFP is normally issued as a short-term and temporary measure with the expectation that the need will be addressed by permanent regulations.

Implementing regulations for Amendment 10 would create the regulatory structure necessary to efficiently prosecute and effectively manage the whiting shore-base sector without EFPs while providing accurate catch data such that the ESA and MSA requirements are adequately met. The whiting shore-based sector has to have a catch monitoring system in place to adequately track the incidental take of Chinook salmon as required in the ESA Section 7 Biological Opinion for Chinook salmon catch in the Pacific whiting fishery; to meet the standardized reporting methodology defined by the MSA; and to track the catch of target and overfished groundfish species such that the fishing industry is not unnecessarily constrained and that OYs, harvest guidelines, sector allocations, and bycatch limits are not exceeded. Amendment 10 implementing regulations would implement a program that is similar to the program being run under the 2008 and 2009 EFPs. A full analysis of the 2009 EFP program can be found in the March 2009 EA titled "Issuance of an Exempted Fishing Permit for a Maximized Retention and Monitoring Program for the Pacific Whiting Shoreside Fishery."

At its June 2007 meeting, the Council recommended that NMFS implement Federal regulations for a maximized retention program that requires participating vessels to procure and pay for EMS services whenever the vessel participates in the shore-based sector and for Pacific whiting shoreside first receivers to procure and pay for the services of independent catch monitors. The vessel EMS responsibilities would include paying for the purchase or lease of EMS equipment, the installation and removal of EMS systems, all EMS maintenance, and a portion of the initial cataloging of information collected from the vessel. Any additional analysis of EMS data for enforcement or management purposes would be paid for by NMFS, as would all administrative costs related to the monitoring program. The first receiver responsibilities would include paying for the services of a certified catch monitor, including the days in which the catch monitor is trained by NMFS, the days in which catch monitors are assigned to the first receiver, and post-deployment days in which the catch monitors are interviewed by NMFS and submit finalized data. Any additional data analysis costs for enforcement or management purposes would be paid for by NMFS, as would all administrative costs related to the monitoring program.

Under the Amendment 10 implementing regulation, vessels would be required to retain all catch with the exception of minor amounts of very large species and operational discards. Allowed discards include very large animals, those in excess of 6 feet in length, which rarely occur in the catch, and a single basket of operational discards (whiting only) from each haul. All events would be recorded by the vessel operator in the required logbook. Operational discard would include catch that is cleaned from the net and deck after the haul is dumped into the hold, but may only include Pacific whiting. Any additional amounts of nonwhiting catch cleaned from the net or deck must be retained and offloaded at the first receiver with the delivery. Any incidentally caught marine mammals discarded at sea would be documented in the vessel logbook and reported to the NMFS Office of Protected Resources by completing and submitting a Marine Mammal Authorization Program mortality/injury report form as required by regulations at § 50 CFR 229.4.

The Council's recommendation included requirements for vessels to obtain a Pacific whiting shoreside fishery certification. Such a certification would be issued to any vessel, provided it was registered to a LE permit with a trawl endorsement. The primary purpose of the certification would be to indicate the vessel

owner's intent to use a particular vessel to fish in the whiting shore-based fishery so that an adequate amount of EMS monitoring equipment can be available for monitoring each vessel.

To ensure that only qualified businesses could provide EMS services, the implementing regulations would include EMS provider certification requirements. NMFS would certify providers through an application and review process in which businesses provide information regarding their ability to provide adequate services to support the EMS monitoring, data storage, and data processing needs. An appeals process would be established for businesses that were not issued a catch monitor service provider certifications, or businesses that have been decertified.

Dockside monitoring of unsorted whiting catch at Pacific whiting shoreside first receivers would be conducted by catch monitors. Catch monitors are individuals who monitor the sorting and weighing of unsorted primary season whiting catch as it is received, purchased, or taken custody, control, or possession of by first receivers. In general, these activities occur at shoreside processing facilities in the port of landing, but may occur at other dockside facilities where catch is offloaded onto trucks that transport the catch to other processing facilities.

In June 2007, the Council recommended that catch monitors be trained by NMFS or to NMFS specifications, that they be responsible for all shoreside observation responsibilities, and that the initial level be based on the level of program funding for the shoreside observation program with an evaluation of the appropriateness of the coverage level being conducted following the initial year of data collection. Given the available cost data, NMFS determined that the level of coverage provided by the Council's recommendation would be for each first receiver to be required to procure the services of one catch monitor for every day that deliveries are received from the Pacific whiting shoreside fishery.

At the Council's June 2008 meeting, when the Council considered specifications and harvest measures for all of the 2009 and 2010 groundfish fisheries, an assortment of management measures were considered for the whiting fishery, including mandatory monitoring of all Pacific whiting deliveries for fish ticket verification to ensure the integrity of sector-specific bycatch limits. The Council also recommended that NMFS increase the catch monitor coverage requirements from what had been recommended in June 2007 (one catch monitor per facility) to full coverage in which all Pacific whiting deliveries are monitored by catch monitors (the number of individual catch monitors per facility would vary depending on the hours of operation and the number of whiting deliveries received each day). In response to the Council's June 2008 request, further analysis was completed (NMFS 2009b), and the proposed coverage requirements were revised to be consistent with the recommendation for full catch monitor coverage.

To ensure that only qualified businesses provide catch monitoring services, Pacific whiting catch monitor provider certifications would be provided to businesses that hire and support qualified catch monitors. Like EMS service providers, NMFS would certify providers through an application and review process. An appeals process would be established for businesses that were not issued catch monitor service provider certifications, or businesses that have been decertified.

The Amendment 10 implementing regulations would also establish qualification and certification requirements for catch monitors. Catch monitor certifications would be provided to individuals who meet the qualifying criteria, successfully complete the required training, and pass all proficiency testing. Similar to the existing regulations for observers, an appeals process would be established for individuals who were not issued a catch monitor certifications, or who have been decertified.

Recordkeeping and reporting requirements would be specified in Federal regulation and would be adequate to support a real-time inseason data system (i.e., preliminary catch weights would be available in a central database within one to two days from the date the catch was landed) as is needed for fleetwide or sector bycatch limit management. To the extent possible, Federal recordkeeping and reporting

requirements would be consistent with state regulatory requirements so that the burden of unnecessary duplication can be avoided.

3.3.2.7 Ongoing Effects of Bycatch Reduction Related to Trawl Rationalization

Trawl rationalization is intended to improve monitoring in the trawl sector and create incentives to reduce bycatch. The monitoring requirements for IFQ and co-op programs are likely to continue and expand current monitoring programs. Since the at-sea whiting fleet currently enjoys 100 percent observer coverage, which is partially financed by industry, little change in monitoring would be required. The nonwhiting trawl fishery is subject to partial observer coverage; the current program infrastructure may continue, but observer coverage will increase to 100 percent (potentially with some augmentation by electronic means, such as cameras). Like the current at-sea whiting sector, participants in a rationalized trawl fishery would likely bear most of the direct costs of hiring observers through private contracting firms.

Both an IFQ and co-op program would require establishing a new infrastructure to track QS/QP holdings and match catches to QP holdings in order to set ongoing account balances. This tracking program is likely to be complicated given the large number of units involved (all stock units for which OYs are identified plus any area subdivisions that may be assigned). NMFS would be responsible for running this tracking program, although partial cost recovery may be instituted subject to limits imposed by the MSA.

3.3.3 Rationalization and Fleet Consolidation

The Council completed its Strategic Plan on managing the groundfish fisheries in October 2000 (Ad-Hoc Pacific Groundfish Fishery Strategic Plan Development Committee 2000). One element of the Strategic Plan was an evaluation of overcapacity in the commercial groundfish fleets. This was done by comparing the potential harvest capacity of participating vessels with the amount of fish actually available for harvest. For the nonwhiting groundfish trawl fishery, the Scientific and Statistical Committee (SSC) calculated that 26 to 40 percent of the vessels then participating in the fishery were capable of taking all of the groundfish available for trawl harvest. The Strategic Plan noted that, while the number of groundfish trawl vessels fleeted had to be reduced by at least half, rationalization of the fishery would not be complete until the capacity level was in balance with the economic value of the resource.

The Strategic Plan recommended a trawl vessel buyback program as a near-term objective, and a trawl IFQ or mandatory permit stacking program as a longer-term objective. [60] An IFQ program for the LE trawl sector has been on the Council's official workload list since soon after the adoption of the Strategic Plan.

Prior to development of the Strategic Plan, two important FMP amendments comprised initial steps towards rationalizing groundfish fisheries. The most important was Amendment 6, described below. Amendment 14 rationalized the LE fixed-gear sablefish fishery through a permit stacking scheme. Although only indirectly affecting the LE trawl fishery, this approach was considered early in the trawl rationalization process as a means to rationalize the LE trawl fishery.

3.3.3.1 Limited Entry (Amendment 6)

In 1991, the Council adopted Amendment 6 to the Groundfish FMP, a groundfish license limitation program that led to the creation of Federal LE permits. At that time, the Council acknowledged that the program, while expected to limit the growth of harvesting capacity, would not resolve the problem of

[60] Mandatory permit stacking reduces capacity in the fishery by requiring permit holders to acquire an additional permit to continue fishing.

overcapacity in the groundfish fishery. An IFQ program was also considered as an alternative to the license limitation program. However, there was a great deal of opposition to IFQs across all sectors of industry at that time. The license limitation program was seen as a first step toward rationalization of the fleet with further capacity reduction measures to follow. NMFS implemented Amendment 6 in 1993, issuing, for use in 1994, 388 initial LE permits with trawl endorsements, in addition to permits issued with endorsements for longline and/or pot (trap) gear. Within the LE fishery, gear endorsements were used to constrain the number of participants using a particular gear type (trawl, longline, or pot) in the LE segment of the groundfish fishery. Vessels using other gear types (or using longline or pot gear without an endorsement) were allowed to continue as part of a so-called open access fishery (access to some of these fisheries may be limited under state programs). An allocation was established between the LE and open access fisheries. The open access allocation is generally much smaller than the limited entry allocation.

Under the Amendment 6 license limitation program, the ability to combine permits has resulted in a substantial reduction in the number of trawl vessels. Limited entry permits were issued with capacity endorsements that matched the length of the vessel that originally qualified for the permit. At the recommendation of the Council, NMFS issued a final rule in 1994 allowing permit owners to combine two or more permits to create a permit with a longer length endorsement than any of the original permits. Because a vessel's harvesting capacity increases geometrically (i.e., volumetrically) with an increase in vessel length, NMFS implemented a conversion formula for permit combinations that assigned a certain number of capacity rating points per foot of vessel length. Under this point system, a vessel owner wishing to permit a longer vessel must purchase enough existing permits to create a combined permit with capacity points sufficient for the length of the vessel (59 FR 17726, April 14, 1994). By 2003, this permit combination requirement had resulted in the effective removal of 114 trawl permits from the fishery. Of the 388 trawl permits originally issued, 274 permits remained until the 2003 buyback program.

3.3.3.2 Limited Entry Fixed-gear Permit Stacking (Amendment 14)

The fixed-gear sablefish fishery is the first Council fishery managed under a LAPP. Amendment 8 to the Groundfish FMP was an attempt to implement an IFQ program in the fixed-gear sablefish fishery. However, this program languished, first because of a congressional request for delay and then because of the MSA moratorium on the creation of new IFQ programs. Instead, Amendment 9 was adopted in 1997, establishing additional entry limits on this economically valuable fishery. Amendment 9 required that (April 1 to October 31) participating vessels possess a new sablefish endorsement in addition to a fixed-gear LE permit to fish in the primary fixed-gear sablefish fishery. Amendment 14, implemented in 2001, attempted to further rationalize this fishery by establishing a permit stacking system. Permit stacking allows a sablefish-endorsed, fixed-gear permit holder to acquire up to two additional permits and stack them for use on a given vessel. Each sablefish-endorsed permit is assigned to one of three tiers based on the original catch history associated with the permit. Each tier has a different landing limit. A vessel with stacked permits is then eligible to take the landing limit associated with the tier of each permit assigned to the vessel. For example, a vessel with three permits (all of the same tier) is eligible to land up to three times as much sablefish as a vessel with only one permit for that same tier. The duration of the season during which these limits may be taken is long enough so that each tier limit effectively functions as a vessel quota.

Since the stacked permits confer additional harvest opportunity only for sablefish and only during the primary sablefish season, the main effort-reducing effect of Amendment 14 was to reduce the number of vessels using fixed-gear to take species other than sablefish. Vessels surrendering their permits for stacking by another vessel may still shift to other nonpermitted fisheries if a viable opportunity exists. The sablefish quota (tier) for each permit—created in association with the sablefish endorsement, extended season, and permit stacking regime—has also succeeded in eliminating many of the characteristics of a derby or Olympic fishery that plagued this fishery in the past. Derby fisheries result

when overcapacity, combined with restrictive catch limits, serves to concentrate fishing into a very short season. By 1995, the primary sablefish season lasted only one week, followed by a brief mop up period to reach the established limit or allocation. Permit stacking essentially gives each vessel a fixed quota, which can be caught at any time during the seven-month primary season. Although the quota is not tradable separate from the permit, this system confers a set amount of sablefish harvest opportunity and allows it to be more efficiently allocated among vessels through permit transactions. The permit seller also captures economic rent through the sale. The transferable unit associated with a sablefish endorsed permit and its associated tier is limited to either the whole tier amount (meaning the tier has not been fished at time of transfer) or a residual tier amount (the unfished balance remaining on the tier at the time of transfer). By contrast, with QSs under an IFQ system, QS can be traded in one pound increments.

According to the latest permit data,[61] the 164 sablefish-endorsed permits were registered to 90 vessels, based on the vessel name in the permit database. For 18 permits the vessel name was listed as "unidentified"; in these cases, the permits were assigned to unique permit owner names for tabulation purposes. Of these 90 vessels (or permit owners), 41 vessels had one permit, 24 had two permits, and 25 had three permits.

3.3.3.3 Trawl Vessel Buyback Program

A line item in a 2003 Federal budget bill (PL 108-7) instructed NMFS to implement a fishing capacity reduction program for the nontribal west coast groundfish trawl fleet (excluding Pacific whiting catcher-processors). See page 129 for some additional discussion of the purposes of the buyback program. This bill funded the buyback with a $10 million appropriation and a $36 million loan approved by an industry referendum. The loan would be repaid by members of the participating fleets (LE groundfish trawl, Dungeness crab pot, and pink shrimp trawl fleets) through landings fees collected over the course of the next 30 years. On August 8, 2005, NMFS published a notice (70 FR 45695) announcing that collection for repayment of the loan would commence on September 8, 2005.

Under the buyback program, NMFS retired 91 trawl vessels, their associated state fishing permits, and Federal LE trawl permits, effective December 4, 2003. The program reduced the available pool of LE permits for vessels delivering to shore plants and motherships to 172 permits (an additional 10 permits are associated with the whiting catcher-processor fleet). Since December 2003, two additional permits were retired through permit combination, leaving 180 LE trawl permits remaining in the fishery. The 91 vessels retired under the buyback program accounted for 40 percent of the $32 million in ex-vessel revenues delivered by all LE groundfish trawlers in 2002 (including deliveries to nontribal motherships).

Following completion of the buyback program, NMFS analyzed permit latency in the LE trawl fleet to determine whether a significant number of unused or infrequently used permits remained in the fishery. The agency's concern over latent capacity stemmed from public comments observing that permit/vessel owners who had been bought out under the buyback program could rejoin the fishery by simply purchasing a latent permit and vessel. The Council found no need to take remedial action given evidence for relatively low occurrence of highly latent permits and the apparent lack of concern among industry members who bear responsibility for repaying the $36 million loan that funded the buyback.

3.3.3.4 Entry Limitation Measures for the Whiting Sector (Amendment 15)

Amendment 15 to the FMP was considered by the Council through two separate iterations. During the Council's first-round discussions on Amendment 15 (1999 to 2001), Amendment 15's focus was responding to the 1998 American Fisheries Act (AFA) for west coast fisheries, including the whiting fishery. The Council tabled its first-round discussions in 2001 and did not reexamine Amendment 15

[61] NMFS Northwest Region permit database, accessed May 5, 2008.

until 2006. In its second-round discussions, the Council moved from just looking at the effects of the AFA on west coast fisheries to a more broad examination of participation, overcapitalization, and the resulting conservation impacts, in the Pacific whiting fishery by both AFA- and non AFA-vessels.

In 2006, vessels with no previous participation in the whiting fishery entered the fishery. Additionally, participation shifts between the whiting sectors occurred in 2006. The increased participation resulted in concern by fishermen and managers that more vessels may want to enter the fishery or shift between sectors of the fishery. New entry into the Pacific whiting fishery is likely, given the increased whiting ex-vessel prices; increased prices for headed and gutted whiting, as well as for fillet products; declining west coast trawl opportunities due to overfished species rebuilding measures; and declining pollock quotas off of Alaska. Action was taken to restrict new vessels from entering into the fully capitalized whiting fishery. If fishing capacity increases (becomes further overcapitalized), the intensity of fishing may rise such that fishermen strive to catch as much Pacific whiting as possible as quickly as possible (also referred to as a derby fishery or the race for fish). This race constrains the available time for vessels to search for whiting, which can cause fishermen to neglect safety and bycatch concerns to which they would otherwise be more attentive. This accelerated race for fish would likely increase the incidental catch of nonwhiting species and management costs, while decreasing the economic returns to historical participants and communities.

In September 2006, the Council recommended that NMFS take emergency action to prevent new entry into the Pacific whiting fishery in 2007. The basis for the Council's recommendation was conservation concerns that could arise from an accelerated race for fish due to new entry of AFA-permitted vessels to the fishery. Members of the Council expressed concern that a race for fish could result in excessive harvest of whiting early in the season, greater bycatch of overfished rockfish, and higher levels of incidental catch of endangered and threatened salmon in the early season. The Council also noted its concern that new entry of AFA-permitted vessels could result in early achievement of the U.S. directed harvest whiting quotas, leaving west-coast-based vessels facing no fishing or very limited fishing while the AFA-permitted vessels could return to the rationalized Alaska pollock fisheries, in which they also had an interest. The Council's proposal would only have prohibited AFA-permitted vessels from entry into the Pacific whiting fishery in 2007 and only if they did not have a history of involvement in the fishery prior to 2006. Other non AFA vessels could still have entered the fishery. In a letter of January 11, 2007, the NMFS Northwest Regional Administrator denied the Council's request for an emergency rule. The letter noted that the Council action was intended to address actual or potential harm to west coast fisheries from the AFA; however the earlier closure of the whiting shore-based fishery in 2006 (compared to 2005) was due to new participation by both AFA-permitted vessels and non AFA vessels. While acknowledging that new market conditions were likely to attract additional vessels, the Regional Administrator pointed out that the proposed action would have denied new entry to a selected category of vessels (i.e., AFA-permitted vessels), but not to all vessels. The Regional Administrator noted that the guidelines for the use of emergency rules call for use of notice-and-comment procedures when there are controversial actions with serious economic effects, except under extraordinary circumstances. Therefore, the proposal, as with other allocation decisions, would more appropriately be handled through the Council's full rulemaking process.

The NMFS Regional Administrator subsequently advised the Council on February 13, 2007, that if it were to submit a proposal that dealt more broadly with the issue of conservation risks and management problems due to potential new entry of any new vessels into the directed whiting fishery, NMFS would review that proposal on its own merits. NMFS would continue to be concerned if the request based the proposed action on the AFA, rather than on the MSA.

At its March 2007 meeting, the Council discussed a schedule for final Council action for Amendment 15 to take place at either its June or September 2007 meeting. As an interim protective mechanism, the Council voted to request that NMFS enact an emergency rule for the 2007 nontribal season to prohibit

participation in the 2007 nontribal Pacific whiting fishery by all vessels without sector-specific history in the fishery prior to January 1, 2007 (72 CFR 27760). In addition to the factors that were presented in the 2006 Council emergency rule request, four new pieces of information were presented at the March 2007 Council meeting. The new information exacerbated concern for an accelerated race for fish. First, the price for whiting continued to increase to unprecedented levels; ex-vessel prices increased from $77.00 per ton in 2004 to $137.00 per ton in 2006—nearly doubling since 2004 and increasing by more than 22 percent compared to 2005. Industry projections for the 2007 season indicated that prices would continue to increase to over $176.00 per ton. Second, the U.S. OY of whiting was reduced by 10 percent for the 2007 season compared to 2006. Third, because of higher than projected canary rockfish bycatch rates in the nonwhiting fishery, the Council took action in March 2007 that placed more severe constraints on the LE nonwhiting trawl fishery. Vessels with reduced opportunities due to the expanded rockfish conservations areas may have had an incentive to join the whiting fishery. Fourth, the quota for Alaska pollock was reduced in 2007. All of these recent changes increased the likelihood that there could be an accelerated race for fish: the first by making entry more lucrative for additional vessels, the second by constraining supply of whiting and leading to more pressure among vessels to quickly capture the more limited supply of whiting, and the third and fourth by increasing the relative attractiveness of entering the whiting fishery this year.

Faced with this information, the Council adopted and submitted a proposal to NMFS to address the anticipated issues in 2007. The Council's proposal was to 1) prohibit via NMFS emergency action participation in the shore-based, catcher-processor, and mothership sectors of the fishery by any vessel that had no sector-specific history of participation prior to January 1, 2007; and 2) commit the Council to complete Amendment 15 to the FMP to address concerns regarding increased participation by AFA vessels for the long term, consistent with the MSA, the AFA, and other applicable law.

NMFS approved Amendment 15 to the Groundfish FMP on June 18, 2008. Amendment 15 revised the FMP to include provisions for a vessel license limitation program for the nontribal sectors of the whiting fishery. Amendment 15 is intended to serve as an interim measure to limit potential participation in the whiting fishery within the U.S. west coast EEZ until implementation of a trawl rationalization program under Amendment 20 to the Groundfish FMP. Amendment 15 implementing regulations required vessels to qualify for a whiting vessel license limitation program to harvest and/or process in the nontribal whiting fishery. This is in addition to the requirement for harvesting vessels to be registered to a groundfish LE permit. Amendment 15 restricts participation in the nontribal sectors as follows: catcher vessels in the whiting shoreside fishery would be required to have made sector-specific whiting landings in any one calendar year during the period from January 1, 1994, through January 1, 2007; vessels participating in either the catcher-processor or mothership sector would be required to have either caught and processed whiting (catcher-processor sector,) caught and delivered whiting (catcher vessels in mothership sector,), or processed whiting (motherships) in any one calendar year during the period from January 1, 1997, through January 1, 2007. This was the first participation requirement for motherships, which, unlike catcher vessels, have not needed a groundfish LE permit registered to them. The Council preferred the 1994 qualifying period start date for the shore-based sector because that was the first year the groundfish LE program was in effect. For the at-sea sectors, however, 1997 was the preferred qualifying period start date because that was the first year that whiting was specifically allocated among the three whiting sectors. Prior to 1997, whiting catch was allocated between vessels that landed on shore and those that caught whiting for processing at sea.

3.3.3.5 Open Access Limitation (Amendment 22)

As noted above, when the groundfish LE program was established in 1993, some fishing was allowed in the so-called open access sector. These fishermen used gear other than trawl or fixed-gear, or could fish with fixed-gear under small landing limits. The open access sector has what are called directed and incidental segments. The directed component comprises fishermen who are targeting groundfish as

demonstrated by the fact that a majority of their catch is groundfish species. The incidental segment consists of those targeting species other than groundfish but catching some groundfish in the process. In practice, while this distinction can be made at the level of a fishing trip, participants in this sector may be nonspecialists—participating in a variety of fisheries throughout the year—or part-time fishermen.

In its 2000 strategic plan (Ad-Hoc Pacific Groundfish Fishery Strategic Plan Development Committee 2000), the Council identified the need to reduce capacity in the open access sector. In response, the Council initiated Amendment 22 in September 2006. Previously, a control date of November 5, 1999, was set, which may be used to decide eligibility requirements for a new LE program (i.e., catch history after this date may not be considered for deciding permit eligibility). Implementation of the expanded VMS program (discussed above) created a de facto means of determining participation in the open access sector, which, heretofore, was difficult to characterize. In March 2008, the Council reviewed a preliminary EA containing a range of alternatives and made recommendations for further modification of the alternatives. The Council considered alternatives that would create two permit classes, a B permit authorizing directed groundfish harvests and a C permit authorizing incidental groundfish harvests in Federal waters. Catches in state waters, and of designated species that occur exclusively in state waters, would be exempt. These alternatives range from a basic permit program, which would not limit participation, but would allow better tracking and monitoring, to alternatives with increasingly higher capacity reduction goals for the directed fishery under the B permit program. In March 2009, the Council selected its preferred alternative, recommending the basic permit program without a LE requirement.

3.3.3.6 Impacts of Past Rationalization Measures Related to Trawl Rationalization

The principal actions with ongoing effects to the groundfish trawl fishery are LE and the vessel buyback program. Both of these programs reduced capacity; more than 300 trawl vessels were active in the 1980s, while the number today is about 120. This relatively smaller fleet size is likely to make the transition to a rationalized fishery easier than otherwise would be the case because less consolidation needs to occur.

The other actions either do not have continuing effects (Amendment 15, with its provisions sunsetting with implementation of the trawl rationalization program) or indirect effects (Amendments 14 and 22, affecting other groundfish fisheries). Ongoing indirect effects could be felt in fishing communities. Amendment 14 encouraged some consolidation in the LE fixed-gear sablefish and greater individual flexibility due to the assignment of individual nontradable quotas.

3.3.4 Sector Allocations to Support Trawl Sector Rationalization, Amendment 21

The action alternatives for the trawl rationalization program are premised on the distribution of shares, which translate into a right to catch a quantity of fish, to some combination of individual permit holders, cooperatives composed of affiliated vessels, and groundfish processors. Since various other fisheries target groundfish or catch them incidentally, some process must be used to allocate a portion of the OYs/ACLs, which are established biennially based on assessments of stock status, to the groundfish trawl sector. Pacific whiting and sablefish are already allocated between sectors using fixed percentages; all other groundfish species, however, are implicitly allocated through the management measures established biennially. Instead of these implicit allocations, fixed percentages have to be established for these species as a precursor to assignment of catch privileges envisioned under the trawl rationalization alternatives. Although such fixed allocations could be adopted and modified periodically through the biennial specifications process, the Council decided that it would be simpler and perhaps ultimately less controversial to establish permanent allocations by FMP amendment. These percentages are then applied to the OY/ACL quantities established biennially to determine the actual pounds of each species or species complex that would be allocated during the two-year period.

Groundfish FMP Amendment 21 establishes allocations to support trawl rationalization. The Council adopted a range of allocation alternatives at the November 2007 meeting. They are based on the historical share of catch by sectors for 2003 to 2005 total catch or 1995 to 2005 landed catch. Total catch estimates have only been available since 2003 when observer data became available. Overfished species not principally caught in trawl fisheries, species that already have fixed allocations, and other fish and minor shelf rockfish complexes were excluded from consideration. These species would be periodically allocated as part of the biennial specification process. This action also establishes the allocation for Pacific halibut, which is a prohibited species in the groundfish trawl fishery (meaning that it cannot be retained). Under the trawl rationalization, preferred alternative bycatch of Pacific halibut would be managed with IBQ for the shoreside component of the fishery. Pacific halibut are rarely caught in the at-sea component of the fishery, because the gear they use rarely goes near the bottom where halibut normally reside.

The Council took final action by choosing preferred sector allocations in April 2009. Table 3-9 shows allocations the Council adopted under Amendment 21 compared to trawl sector landings from 1995 to 2005. Landings are presented as the average share of OYs/ACLs and average share of landings from all groundfish sectors (which, in addition to trawl, is fixed gear, open access, tribal, and recreational). Landings of some trawl dominant species are a smaller percentage of the OY/ACL, because only a portion of the OY was caught.

Amendment 21 would establish allocations among the whiting at-sea sectors (mothership and catcher-processor) and the shoreside sector (which, under the preferred alternative, would be managed as a single sector with IFQs, combining both whiting and nonwhiting trawl) for Pacific ocean perch, widow rockfish, and darkblotched rockfish. The catcher-processor and mothership sectors would be allocated 58 percent of the whiting sectors' allocation for these three species. For Pacific ocean perch, the whiting sectors are allocated the greater of 17 percent of the trawl allocation or 30 mt, making the at-sea sector allocation 9.9 percent of the overall trawl sector allocation (9.4 percent of the total OY/ACL) or 17.4 mt. For widow rockfish, allocation schemes were established for the stock as overfished and rebuilt, since current projections indicate the stock may be declared rebuilt within a few years, and harvest limits could then be increased. While widow rockfish is declared overfished, the three whiting sectors are allocated 52 percent of the trawl allocation, resulting in the combined catcher-processor and mothership sector allocation 30.2 percent of the overall trawl sector allocation (20.9 percent of the total OY/ACL). When rebuilt, either 10 percent of the trawl allocation, or 500 mt of widow rockfish, whichever is greater, would be allocated to the catcher-processor and mothership sectors combined, making the at-sea sector allocation 5.8 percent of the overall trawl sector allocation (4 percent of the total OY/ACL) or 290 mt. For darkblotched rockfish, the whiting sectors are allocated either 9 percent of the trawl allocation, or 25 mt, making the at-sea sector allocation 5.2 percent of the overall trawl sector allocation (5 percent of the total OY/ACL) or 14.5 mt.

For Pacific halibut, Amendment 21 would establish a trawl mortality limit that would be applied to both legal and sublegal size fish. The groundfish trawl allocation would be set at 15 percent of the Area 2A (waters south of the U.S./Canada border) constant exploitation yield (CEY) for legal size halibut, not to exceed 130,000 pounds for the first four years of the trawl rationalization program, and not to exceed 100,000 pounds starting in the fifth year. The allocation scheme would represent a reduction by about half of halibut bycatch in the groundfish trawl fishery compared to current, status quo catches. Under the trawl rationalization preferred alternative, halibut bycatch would be managed by transferable quotas (IBQ). It is anticipated that the greater flexibility and accountability afforded by IBQ (similar to IFQ for species which may be retained) would provide both opportunities and incentives for trawl harvesters to operate under this tighter constraint. However, this total bycatch limit may be adjusted downward through the biennial management process in future years in response to fishery performance. Part of the overall total catch limit is a set-aside of 10 mt of Pacific halibut to accommodate bycatch in the at-sea whiting fishery and bottom trawl bycatch south of 40°10' N. latitude.

The impacts of intersector allocation relate to the actual amount of QPs and/or co-op allocations available to the trawl fishery each year. Establishing permanent allocations for most or all stocks would simplify future decisionmaking, because the allocations would be formulaic (i.e., the application of a percent value to the OY/ACL). On the other hand, permanent allocations reduce flexibility to adapt to changing conditions. In particular, the importance of a given quantity of fish over a range of possible allocations may vary. For example, a particular sector may be less able to avoid a particular species in comparison to another sector (because of fundamental technological reasons). This could create a floor in terms of the actual amount of an allocation to that sector, because below that amount the fishery can no longer operate. With a fixed percentage allocation at a low OY/ACL, the actual quantity allocated may fall below this floor. More generally, the socioeconomic value placed on different fishery sectors may change; as a result, the Council may wish to increase that sector's allocation (with the increase taken out of another sector's allocation). Without permanent allocations, the Council could consider these types of adaptations for each biennial management cycle.

Table 3-9. Allocation of harvest opportunity between the trawl sectors and other groundfish sectors as adopted by the Council in Amendment 21 compared to LE trawl landings, 1995-2005. Overfished species shown in bold.

Management Unit	LE Trawl Landings, 1995-2005		Allocation to LE Trawl Sector Under Amendment 21
	As % of the OY	As % of Total Landings [b/]	
Lingcod – Coastwide	24.2%	28.2%	45.0%
Pacific Cod	33.6%	98.5%	95.0%
Pacific Whiting (Coastwide)	86.0%	-	‡
Sablefish N. Of 36°[a/]	38.9%	50.9%	47.5%
Sablefish S. Of 36°	27.0%	43.3%	42.0%
Pacific ocean perch	64.4%	99.2%	95.0%
Shortbelly Rockfish	0.1%	-	†
Widow Rockfish	69.4%	95.7%	91.0%
Canary Rockfish	52.7%	-	**
Chilipepper Rockfish S. of 40°10'	9.3%	82.1%	75%
Bocaccio	16.6%	-	**
Splitnose Rockfish S. of 40°10'	22.3%	97.3%	95%
Yellowtail Rockfish N. of 40°10'	53.1%	90.1%	88%
Shortspine Thornyhead N. of 34°27'	36.7%	97.8%	95.0%
Shortspine Thornyhead S. of 34°27'			50 mt
Longspine Thornyhead N. of 34°27'	25.7%	99.0%	95.0%
Longspine Thornyhead S. of 34°27'	<0.1	-	†
Cowcod	<0.1	-	**
Darkblotched	72.2%	98.2%	95.0%
Yelloweye	3.5%	-	**
Black Rockfish – Coastwide	0.1%	-	†
Minor Rockfish North Nearshore Complex	0.2%	-	†
Minor Rockfish North Shelf Complex	4.4%	-	**
Minor Rockfish North Slope Complex	13.3%	84.1%	81.0%
Minor Rockfish South Nearshore Complex	0.0%	-	†
Minor Rockfish South Shelf Complex	0.8%	-	**
Minor Rockfish South Slope Complex	17.4%	69.0%	63.0%
California Scorpionfish			†
Cabezon (Off CA Only)	<0.1	-	†
Dover Sole	92.4%	99.4%	95.0%
English Sole	28.1%	97.8%	95.0%
Petrale Sole (Coastwide)	78.7%	98.2%	95.0%
Arrowtooth Flounder	39.2%	99.6%	95.0%
Starry Flounder		55.9%	50.0%
Other Flatfish	19.3%	94.0%	90.0%
Kelp Greenling			†
Other Fish			†

[a/]Equivalent to current allocation recalculated as a percent of the total nontreaty available yield or 90.6 percent (the total LE sector allocation) x 58 percent (the LE trawl sector allocation)

[b/]Data provided only for those species for which there is an Amendment 21 trawl allocation

‡Existing allocation

†Not managed with IFQs, no fixed allocation

**Allocation determined during biennial specifications

3.3.5 Habitat and Ecosystem Protection

3.3.5.1 Amendment 19

Amendment 19 revised the groundfish EFH definition, specified habitat areas of particular concern (HAPCs), and delineated area closures to mitigate the adverse impacts of fishing on habitat (NMFS 2005). These include 43 areas closed to bottom trawling in waters off all three West Coast states and 17 areas off Oregon and California closed to all bottom-contact gear. Furthermore, all waters deeper than 700 fm would be closed to bottom trawling. Figure 3-3 shows these closures, and Table 3-10 shows the areal extent of these closures. An existing measure prohibiting the use of large footrope trawl gear shoreward of a line approximating the 100 fm depth contour was incorporated into the FMP as a habitat protection measure. Footrope gear larger than 19 inches is prohibited, as is the use of dredge and beam trawl gear as part of the amendment. Implementing regulations for these measures became effective May 11, 2006.

Table 3-10. EFH closed area extent (sq. miles).

Closure Type	Adjoining State			Coastwide	Grand Total
	CA	OR	WA	700 fm	
Bottom contact gear	346.93	545.06			891.99
Bottom contact gear or other gear deployed deeper than 500-fm	775.40				775.40
Bottom trawl gear		1,843.14	918.07	129,843.90	132,605.11
Bottom trawl gear other than demersal seine	8,934.85				8,934.85
Grand Total	10,057.18	2,388.20	918.07	129,843.90	143,207.35

3.3.5.2 Essential Fish Habitat Review

Federal regulations (50 CFR 600.815(a)(10)) require that EFH provisions in FMPs are periodically reviewed and revised, as warranted, and at least every 5 years. Section 6.2.4 in the groundfish FMP describes the habitat conservation framework. It establishes a standing committee to review proposed modifications to the closed areas. Section 7.3.2 describes a process for modifying HAPC designations. Council Operating Procedure 22 details the composition and responsibilities of a review committee, intended to meet the general requirement of 50 CFR 600.815(a)(10) and specifically to make recommendations on modifications to closed areas and HAPCs. In June 2008, the Council finalized the composition of, and appointments to, the EFH Review Committee (EFHRC). An initial task of the EFHRC is to review Council Operating Procedure 22 and propose modifications to the Council. Once these procedures have been worked out, the committee will be in a position to review the EFH designation and entertain proposals for modifications to current mitigation measures.

3.3.5.3 Implementation of Marine Protected Areas at the Federal and State Level

The term "marine protected area" (MPA) covers a variety of designations for place-based conservation and management. EO 13158 defines an MPA as "any area of the marine environment that has been reserved by federal, state, tribal, territorial, or local laws or regulations to provide lasting protection for part or all of the natural and cultural resources therein." Most or all extractive activities are prohibited in marine reserves. With respect to the cumulative effects of trawl rationalization, marine reserves, or "no take" zones, where most or all types of fishing are prohibited are most relevant; however, fishing may be restricted in a variety of ways in other MPA types.

Table 3-11 shows data from the National MPA Center on the extent of MPAs off the west coast (National Marine Protected Areas Center 2008). However, the closure of all groundfish EFH in depths greater than 700 fm to bottom trawling accounts for about 130,000 square miles of the 145,159 square miles in

Federal waters where commercial fishing is restricted (Table 3-10). Because of the depth, this area was not previously trawled to a great degree. Of the remaining MPAs, all fishing is prohibited in 1.2 percent of the combined area, while all fishing is restricted in 28 percent, and commercial fishing is restricted in 45 percent of the combined area.

Table 3-11. Marine areas restricted to fishing on the West Coast (square miles).

	Federal	Local	Partnership	State	Grand Total
No Restrictions to Fishing	7,198.70	0.03	20.31	1,249.60	8,468.64
All Fishing Prohibited	6.05	0.00	308.06	91.14	405.24
Commercial Fishing Prohibited	14.26	0.00	1.78	20.11	36.15
Recreational Fishing Prohibited	0.00	0.00	0.00	13.77	13.77
All Fishing Restricted	8,863.20	0.00	17.84	612.41	9,493.45
Commerical Fishing Restricted	145,159.00	0.00	1.51	39.71	145,200.22
Recreational Fishing Restricted	239.08	0.00	0.00	4.97	244.06
Fishing Unrestricted	0.78	0.00	0.00	0.00	0.78
Grand Total	161,481.07	0.03	349.49	2,031.71	163,862.31

Channel Islands National Marine Sanctuary

In 2002, the California Fish and Game Commission (CFGC) established a network of MPAs within the nearshore waters of the Channel Islands National Marine Sanctuary. NOAA expanded the MPA network into the sanctuary's Federal waters in 2006 and 2007. The MPA network consists of 11 marine reserves, where all take and harvest is prohibited, and two marine conservation areas that allow limited take of lobster and pelagic fish (Figure 3-2). This MPA network encompasses 241 square nautical miles (or 318 square miles), making it the largest network off of the continental United States.

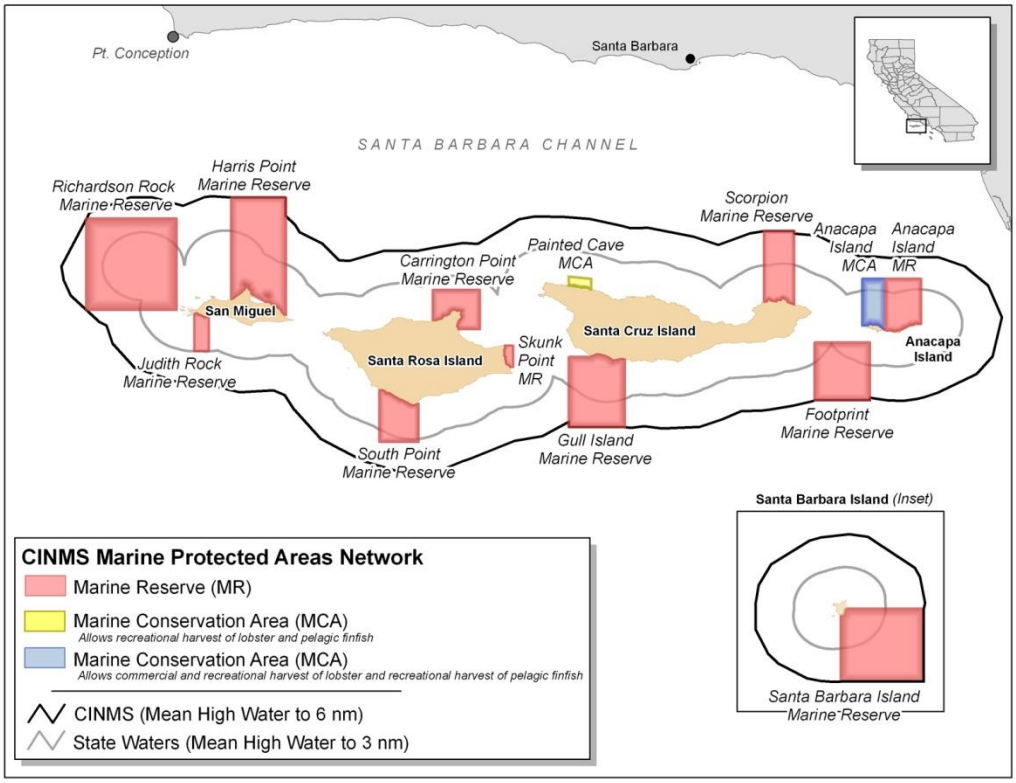


Figure 3-2. Channel Islands National Marine Sanctuary marine reserves (Source: Channel Islands National Marine Sanctuary 2008).

Monterey Bay National Marine Sanctuary

In the summer of 2007, the Monterey Bay National Marine Sanctuary (MBNMS) began considering criteria and thresholds to define the need for MPAs in Federal waters of the sanctuary. The MBNMS MPA Workgroup and the Sanctuary Advisory Council (SAC) characterized these generally as follows:

> 1) There is a need for areas where the natural ecosystem structure and function are restored and maintained; 2) there is a need for research areas to examine human impacts to the marine environment; and 3) there is a need to preserve some areas in their natural state for future generations." At the time, the MBNMS Superintendent contacted the Council as a stakeholder to solicit input on the need for MPAs. In April 2008, the Council's SSC reviewed materials provided by MBNMS staff on their process for developing need criteria. However, as noted in an April 15, 2008, letter from the Superintendent to the SAC, NOAA's Office of National Marine Sanctuaries "has decided to move forward with a process to propose MPAs in federal waters of the MBNMS.

The letter goes on to provide a lengthy rationale for the decision to pursue designation of MPAs. Given the stated rationale, MPAs that may be proposed and ultimately designated will likely restrict or prohibit fishing.

Oregon Marine Reserve System

The state of Oregon is currently soliciting public input on areas within state waters to designate as marine reserves. In 2008, Governor Ted Kulongoski directed state agencies to work with the Oregon Ocean Policy Advisory Council (OPAC) to identify marine reserve sites in state waters through a public process. OPAC is currently seeking proposals from the public for specific sites, which will be further evaluated. A deadline of December 1, 2008, has been set for OPAC to recommend up to nine sites for more detailed evaluation. A target implementation date of July 2011 has been set for this marine reserve system.

California Marine Life Protection Act

In 1999, the California State Legislature passed the Marine Life Protection Act (MLPA), which initiated a process to create a statewide network of MPAs in California state waters. The objective of this network is to protect marine life and habitats, marine ecosystems, and marine natural heritage, as well as to improve recreational, educational, and study opportunities provided by marine ecosystems (California Department of Fish and Game 2008). Various types of MPAs may be designated, including marine reserves, with varying prohibitions or restrictions on fishing. Implementation of the network is proceeding sequentially according to five study regions. The process has been completed in the central coast study region with the implementation of 29 MPAs in September 2007. As of summer 2008, recommendations have been made to the CFGCs for designation in the north central coast study region. The planning process for the south coast study region was initiated in July 2008. The remaining two study regions are the north coast and San Francisco Bay.

The 29 MPAs implemented in the central coast study region (Pigeon Point to Point Conception) cover about 18 percent of state waters within the study region (

Table 3-12). Thirteen are no-take state marine reserves covering 7.4 percent of the study region (MLPA Initiative 2007). Fishing is restricted in the other areas.

Table 3-12. MPAs in the central coast study region (Source: MLPA Initiative 2007).

Type of MPA	Area (mi^2)	Percent of Central Coast Waters
State Marine Reserve	85.34	7.42%
State Marine Park	6.35	0.55%
State Marine Conservation Area	112.19	9.76%
Total	**203.88**	**17.73%**

3.3.5.4 Pacific Council Ecosystem FMP

In November 2006, the Council indicated its intention to develop a Fishery Ecosystem Plan (FEP) that would incorporate ecosystem-based fishery management (EBFM) principles. The plan is intended to serve as an "umbrella" plan over the four existing FMPs, helping with coastwide research planning and policy guidance and creating a framework for status reports on the health of the west coast's California Current Ecosystem. The plan envisioned by the Council would not replace the existing FMPs, but would advance fishery management under these FMPs by introducing new theories, new scientific findings, and new authorities to the current Council process. Relevant concepts in EBFM include predator-prey interactions, the role of climate and oceanographic regimes on productivity, habitat protection for ecosystem resilience and long-term productivity, and consideration of the effects of fishing on the ecological role of fish stocks.

Subsequently, the Council moved to establish a plan development team for the FEP. However, to date needed funding has not materialized, so work has not begun on the FEP.

3.3.5.5 Impacts of Habitat Conservation and Ecosystem Management Measures Related to Trawl Rationalization

Habitat conservation proposals will have an ongoing effect on the groundfish trawl fishery, principally through the closure of areas to fishing, specifically trawl fishing. State proposals and closures in the National Marine Sanctuaries are likely to have a limited effect, because groundfish trawl vessels are not especially active in these areas.

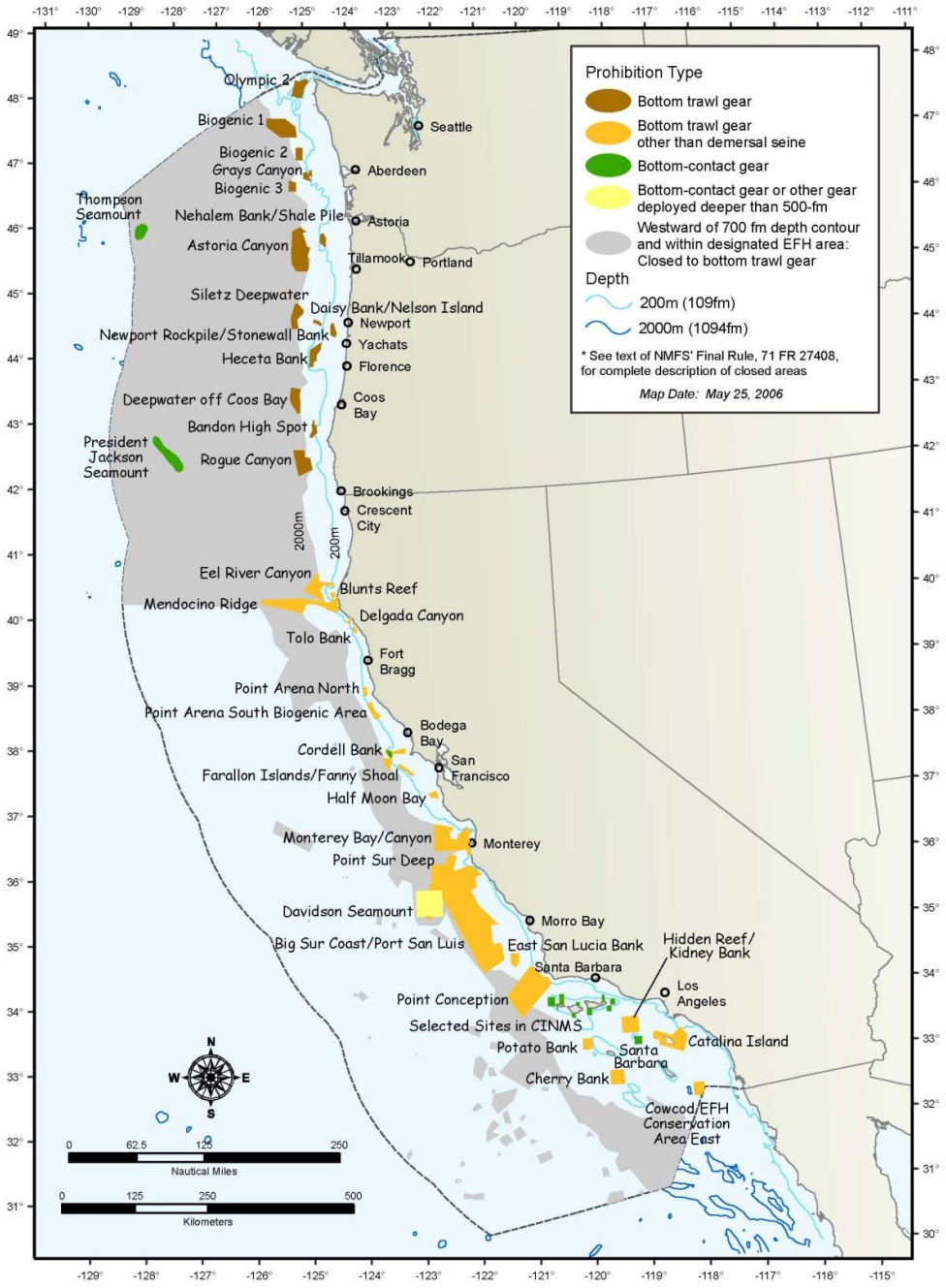


Figure 3-3. EFH closed areas.
(Source: http://www.nwr.noaa.gov/Groundfish-Halibut/Groundfish-Fishery-Management/Groundfish-Closed-Areas/Index.cfm#CP_JUMP_30292)

3.3.6 Wave Energy Proposals

Interest in wave energy (using hydraulic buoys, underwater turbines, and other technology) has surged along the coast as developers scramble to find and profit from alternative energy sources. To date, the Federal Energy Regulatory Commission (FERC), which licenses hydroelectric projects—including wave energy projects—has received preliminary applications for 23 wave energy projects along the west coast—10 in Washington, 8 in Oregon, and 5 in California. Most of the proposed projects would be placed in state waters, less than 3 miles offshore. All of the Washington permits have been granted, five

of the Oregon permits have been granted, and one of the California permits has been granted. A preliminary permit maintains priority of application for a license while the permittee studies the site and prepares to apply for a license. It does not authorize construction.

The installation of wave energy facilities has the potential to affect habitat, fish, and fisheries. Among other effects, the area encompassed by these facilities will likely be closed to all activities, including fishing. Although the area impacted by a single buoy or turbine is small, some projects would include hundreds of buoys. For example, a Reedsport, Oregon, project proposes 200 buoys, while developers of a proposed underwater turbine farm in San Francisco Bay propose 60 tidal in-stream energy conversion (TISEC) devices per square mile, eventually generating enough power for the entire city of San Francisco.

Questions about licensing, public involvement, and community input have been raised by the new proposals. For example, it is unclear who would have the authority to close waters around a wave farm to fishing. FERC has exerted its authority under the Federal Energy Act as the lead agency for this type of hydropower project; however, the Minerals Management Service also asserts authority over projects on the continental shelf, over which it has jurisdiction. In Oregon, the Oregon Division of State Lands (DSL) claims ownership of the seabed in state waters and is concerned about FERC's exertion of regulatory authority in this situation. DSL has drafted rules governing the placement of wave energy projects.

The West Coast Governors' Agreement on Ocean Health Action Plan (Gregoire, *et al.* 2008) provides information on current activities in the three west coast states related to offshore energy development. Interest in wave and tidal energy generation focuses on coastal and offshore areas from San Francisco Bay north. In Washington State, FERC has issued 10 permits for preliminary studies on wave or tidal energy projects in Puget Sound and other estuaries. Oregon now has eight active preliminary permit applications before FERC, four of which already have been approved. In California wave energy projects have been proposed for areas offshore of Mendocino, Humboldt, and Sonoma Counties.

The development of wave energy projects may affect the trawl fishery by limiting the ocean area available to trawling. Trawling in areas with wave energy platform arrays is likely to be prohibited, constrained, or impractical because of the potential conflict between the platforms and towed gear. For example, trawl gear could become entangled in the anchor lines of buoy arrays, damaging both the gear and the wave energy facility. The practical constraint will depend on the location and size of arrays. Arrays located in nearshore or untrawlable areas would have little or no effect; however, most of the proposed projects would be located in sand bottom areas. The habitat impacts of anchoring such arrays in these areas (e.g., rocky habitat) would, however, be greater than locating them on sand or mud bottoms, which are preferred habitats for bottom trawling (many rocky areas have already been closed to trawling, either as EFH conservation areas or within RCAs). Midwater trawl gear used in the Pacific whiting fishery may be less affected than bottom trawl gear, to the degree it can access the water column over rocky areas, if wave energy facilities are not located in rocky habitat.

3.3.7 Mitigating the Effects of Trawl Rationalization

3.3.7.1 Adaptive Management Program

In selecting a preferred alternative, the Council decided to include an AMP, but recommended deferring implementation until the third year after the overall trawl rationalization program is implemented (or 2013, based on the projected trawl rationalization date). The AMP included in the preferred alternative is briefly described in Chapter 2 and in more detail in Appendix A. Under the program, 10 percent of the QSs of nonwhiting groundfish would be set aside for use in the program to be distributed annually as QPs. The Council established several broad goals for the program, which would be addressed by distribution of the QPs derived from the adaptive management set aside. During the first two years of the

trawl rationalization program, the details of the AMP would be worked out, including more specificity on program focus and the mechanism for distributing adaptive management quota.

Because of the way the AMP is characterized in the preferred alternative, it may be considered both part of the proposed action and a reasonably foreseeable future action, because implementation would occur at a later date.

3.3.7.2 Community Fishing Associations

In March 2009, the Council considered whether to include provisions to establish CFAs in the proposed action, but ultimately decided to defer this topic to a separate, trailing action. CFAs would be local associations composed of community members, organizations, and local government that could hold QSs and distribute them for socially beneficial purposes, mitigating some of the adverse effects of the trawl rationalization program. The Council also discussed the possibility of CFAs holding QSs in excess of the control limits established under the proposed action. However, since developing provisions for CFAs will occur in a separate action, no detailed specifications for their structure and function have yet been worked out.

3.4 Past, Present, and, Reasonably Foreseeable Trends

As described above, many of the past actions will have continuing effects. Reasonably foreseeable future actions (RFFAs) can also affect prevailing conditions within which the trawl rationalization program will operate. There are also a wide variety of environmental and social phenomena that will collectively change baseline conditions from their current status. These are characterized as trends in discrete indicators, summarized below. Additional data substantiating these trends are provided in subsequent sections of this chapter.

- Changes in the use of ocean areas
  - Increased application of habitat protection measures will reduce the ocean area open to trawling, especially bottom trawl.
  - Energy projects will be implemented, potentially further limiting trawlable area due to conflict between wave or wind energy arrays and fishing operations.

- Changes in coastal economies and land use
  - Human population will increase in affected fishing communities. Disproportionate population increases will be driven by labor demand and will stimulate infrastructure and private construction. In general, growth will be in nonfishing economic sectors. In some communities, this growth will be due to tourism and recreation-related investment. A British study found fishery-related heritage tourism eclipsing actual fishing in North Sea fishing towns (Brookfield, *et al.* 2005). Another possible growth area is demand for retirement-related infrastructure and services, reflecting an aging population and natural amenities in coastal areas. A report on New England fishing communities found "gentrification" a growing phenomenon (Hall-Arber, *et al.* 2001). According to the report, "[g]entrification … of a fishing community implies a shift in power from the working men and women of the fishing industry to 'those from away,' those in white-collar jobs, or tourist (service) industries, and/or those who do not value the reality of a working waterfront." Growth in these sectors could compete with fishing-related activities for labor and coastal access.

- Increased demand for protein affecting real prices
  - Global population growth and rising living standards are likely to increase demand for protein sources, including fish. U.S. consumption has fluctuated over the past 30 years with an

overall increase. Per capita consumption of seafood and shellfood increased rapidly in the 1980s, from 12.5 lb in 1980 to 15 lb in 1990, with little further net increase in the 1990s and a modest increase in the 2000s from 15.26 lb in 2000 to 16 lb in 2008 (NMFS 2009a). Any future increase in consumption is likely to lead to an increase in real prices for wild-caught fish. Price increases may be mitigated by lower cost production methods in aquaculture and agriculture. Any such effect on prices will depend on demand elasticity for wild-caught fish (consumer willingness to substitute, degree of product differentiation in the market).

- Changes in relative production costs
  - The real cost of agricultural production is likely to increase because of limits on arable land and inputs (e.g., petroleum-based fertilizer, animal feed), although this could be mitigated over the long term by technological change. Improvements in aquaculture technology, including cost-lowering techniques and an increase in the range of cultured species, could lower real prices for cultured fish. Costs of fishery production are likely to be affected principally by the cost of petroleum-based fuel, since fish harvesting is highly energy intensive. The cost of other inputs (labor, new vessels) is likely to increase, but not disproportionately in comparison to other modes of production. In combination with changes in demand, described above, these factors are likely to affect real prices for wild-caught fish. Overall, real prices are expected to increase.

- Increased consumer awareness affecting purchasing decisions
  - Consumers will be increasingly willing to pay a premium for products and services that can be produced with demonstrably lower environmental impacts. In fisheries, this is evidenced by various consumer awareness and certification programs (Duchene 2004). For example, the Monterey Bay Aquarium sponsors the Seafood Watch seafood guide (http://www.mbayaq.org/cr/SeafoodWatch.asp). The guide has three ratings (best choice, good alternatives, and avoid), and it rates fish products by species and fishery. The Marine Stewardship Council [MSC] (http://www.msc.org/) is a London-based nonprofit that certifies fisheries it determines are environmentally sustainable. In order to qualify, the fishery is subjected to an extensive review process, and products must meet chain of custody requirements. Once certified, products may be labeled with the MSC "eco-label." This allows consumer product discrimination. Fisheries are willing to submit to MSC certification because increasingly consumers are willing to pay a premium for labeled products. This trend could reduce demand (prices) for fish caught by bottom trawl, because this gear type has greater adverse impacts on habitat in comparison to other gear types. Investment in new technology that mitigates adverse impacts, if understood by consumers, could mitigate consumer aversion to trawl-caught fish. But such technology could represent an increased input cost.

- Overfished species will continue to rebuild to their target biomass levels. Because of management constraints on groundfish fisheries, it is unlikely that additional stocks will be declared overfished. Although unlikely, several factors could lead to overfishing and additional overfished stocks. A substantial number of groundfish stocks have not been fully assessed, and rockfish (*Sebastes* spp.) are especially vulnerable to overfishing. As a result, the information necessary to implement management responses to prevent overfishing may be unavailable. Cyclical and ongoing changes in ocean conditions due to climate forcing can change stock productivity; depending on management response, this could result in overfishing. Rebuilding plans include a number of parameters used to estimate when the stock will reach the target biomass, given current harvest policies. The target year (T_{TARGET}) is chosen by the Council as a policy objective for the year by which the stock will be rebuilt under current harvest policies. The median year (T_{MEDIAN}) is the year having a 50 percent probability of the stock having been

rebuilt under the current harvest policy. For some stocks, as indicated below, T_{MEDIAN} is a more recent year than T_{TARGET}. T_{MAX} is an estimate of the maximum time within which a stock will rebuild, based on both policy constraints and biological characteristics of the stock. These estimates are used to assume when stocks will be rebuilt within the short term (5 years from program implementation), within the analytical timeframe (20 years from implementation), and in the long term (past the analytical timeframe or greater than 20 years from program implementation). Once a stock is rebuilt, the policy for determining OY changes, allowing the harvest limit to be increased substantially and loosening that constraint on the fishery.

- In the short term (2011 to 2016), widow rockfish (T_{TARGET} = 2015, T_{MEDIAN} = 2009) and Pacific ocean perch (T_{TARGET} = 2017, T_{MEDIAN} =2011) are likely to be rebuilt.
- In the analytical timeframe past five years (2017 to 2031), bocaccio (T_{TARGET} = 2026, T_{MEDIAN} = 2023), canary rockfish (T_{TARGET} = 2021), and darkblotched rockfish (T_{TARGET} = 2028) are likely to be rebuilt.
- In the long term, all stocks are projected to be rebuilt. The remaining two overfished stocks are cowcod (T_{TARGET} = 2072) and yelloweye rockfish (T_{TARGET} = 2084). All stocks are expected to be rebuilt by at least 2098. This is the longest duration T_{MAX} value among the seven overfished species, that for cowcod.

- Cyclical and continuing climate change will affect stock productivity in the northeast Pacific. Cyclical events include El Niño/Southern Oscillation (ENSO) and the Pacific Decadal Oscillation (PDO). Both events have been linked to changes in the relative productivity of different marine organisms, affecting ecosystem components on the regional scale (California Current ecosystem). These changes, in turn, affect the abundance of fishery resources. Global warming will have unidirectional effects on the biophysical characteristics of the California Current ecosystem with potentially permanent changes in stock productivity.

3.5 Environmental Components Where No Significant Impact are Anticipated

Subsequent to the detailed outline contained in the Stage 1 Document (NEI 2006), the analytical team determined that certain groups or resources identified in the initial outline were unlikely to be significantly affected by the proposed action. Baseline data for these components are provided in this section.

3.5.1 Fisheries Managed by Adjacent Councils

There are two adjacent Federal fishery management councils, although their management areas are not contiguous with the U.S. west coast. The North Pacific Fishery Management Council (NPFMC) is responsible for Federal waters off of Alaska. The Western Pacific Council covers Federal waters around the state of Hawaii, the Territory of American Samoa, the Territory of Guam, the Commonwealth of the Northern Mariana Islands, and several uninhabited Pacific Remote Island Areas.

The NPFMC has five FMPs: the Bering Sea/Aleutian Islands (BSAI) Groundfish FMP, the Groundfish of the Gulf of Alaska (GOA) FMP, the BSAI King and Tanner Crab FMP, the Alaska Scallop FMP, and Salmon Fisheries in the EEZ off the Coast of Alaska. The Salmon FMP prohibits fishing for salmon in the EEZ except by a limited number of vessels using troll gear, and all management of the salmon fisheries is deferred to the state of Alaska. The scallop FMP controls fishing effort in a small fishery of nine vessels; the Alaska Department of Fish and Game is responsible for ongoing (inseason) management of the fishery. The remaining three FMPs thus represent the principal ongoing responsibility of the NPFMC. The two groundfish FMPs are complementary plans for their respective regions. These FMPs cover all species of groundfish (pollock, cod, flatfish, sablefish, rockfish, etc.) fished commercially by vessels using trawl, longline, pot, and jig gear. The king and Tanner crab FMP covers all species, and the

Alaska Department of Fish and Game in Kodiak manages fisheries for king and Tanner crab (red, blue, and brown king crab, Tanner crab, and snow crab).

The Western Pacific Fishery Management Council (WPFMC) reorganized its fishery-based FMPs into four Archipelagic Ecosystem FMPs, which cover each of the island jurisdictions, plus the pelagic ecosystem. However, Secretarial approval of this reorganization is pending. Fishery-based FMPs covered deep-slope bottomfish (deepwater snappers, jacks and a single species of grouper concentrated at depths of 30 to 150 fm), lobster fisheries in the Northwestern Hawaiian Islands, precious corals, and pelagic fisheries for highly migratory species (HMS) (tunas and billfish). Both the lobster fishery, which targets spiny and slipper lobsters in the Northwestern Hawaiian Islands, and the precious corals fishery, prosecuted in a limited area of the Main Hawaiian Islands, are currently dormant. The pelagic longline fishery is the most commercially valuable fishery in Hawaii. One segment of the fishery targets tropical tunas, principally bigeye, while the other targets swordfish. Total bigeye tuna landings in 2008 were worth about $50 million dollars, slightly less than 60 percent of the value of all commercial fisheries in the state.[62] Swordfish landings were worth about $7 million in 2008. Snapper and grouper landings were worth about $1.3 million in 2008.

Figure 3-4 compares total landings and revenue for Alaska, Hawaii, and the west coast states. Although these figures are for all fisheries, not just those managed by the respective Councils, it suggests the general magnitude of fisheries in each region. It can be seen that Alaska dominates in terms of the volume of landings, while west coast fisheries posted the highest value.

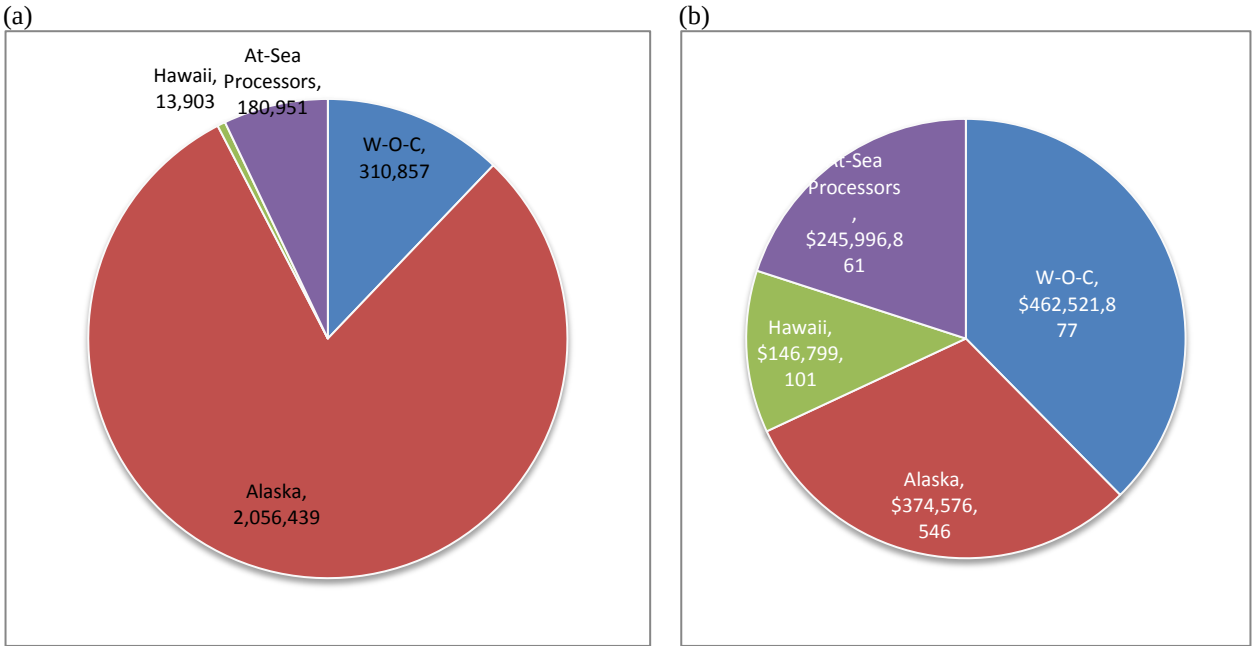


Figure 3-4. (a) Landings (mt) and (b) revenue by region, 2008. Source: NOAA Office of Science and Technology Annual Commercial Landings Statistics.

[62] Commercial fishery statistics presented here were obtained from the NOAA Office of Science and Technology Commercial Fisheries Statistics website (http://www.st.nmfs.noaa.gov/st1/index.html). These statistics represent landings by species from all fisheries, not just those managed by the WPFMC. However, Council-managed fisheries represent a large proportion of these values.

3.5.2 Processors Who Do Not Purchase Trawl-caught Groundfish

PacFIN provides information on west coast processors. To compare processors who do not process trawl-caught groundfish, data were assembled for processors who do not process groundfish and those who do for 2007 and 2008. In 2007, there were 882 first receivers who did not receive any groundfish landings (counted by processor identification number in the database), and 345 who did receive groundfish. Nongroundfish processors processed approximately 246,000 mt of other species, while groundfish processors processed approximately 230,000 mt, 51 percent of which was groundfish. Figure 3-5 shows the breakdown by management group for 2007, which aggregates species according to how they are managed. Of the 345 receiving groundfish in 2007, 75 received trawl-caught groundfish amounting to 113,623 mt. In 2008, there were 821 first receivers who did not receive any groundfish and 317 who did. Nongroundfish processors processed approximately 192,000 mt in 2008, while groundfish processors processed approximately 203,000 mt, 48 percent of which was groundfish. Figure 3-6 shows a similar breakdown of species processed for 2008. Of the 317 receiving groundfish in 2008, 80 received trawl-caught groundfish amounting to 93,363 mt. Although there are undoubtedly processors who specialize, individual processors may vary the mix of species they process between years, meaning that the year-to-year changes in the numbers of nongroundfish versus groundfish processors may be somewhat arbitrary.

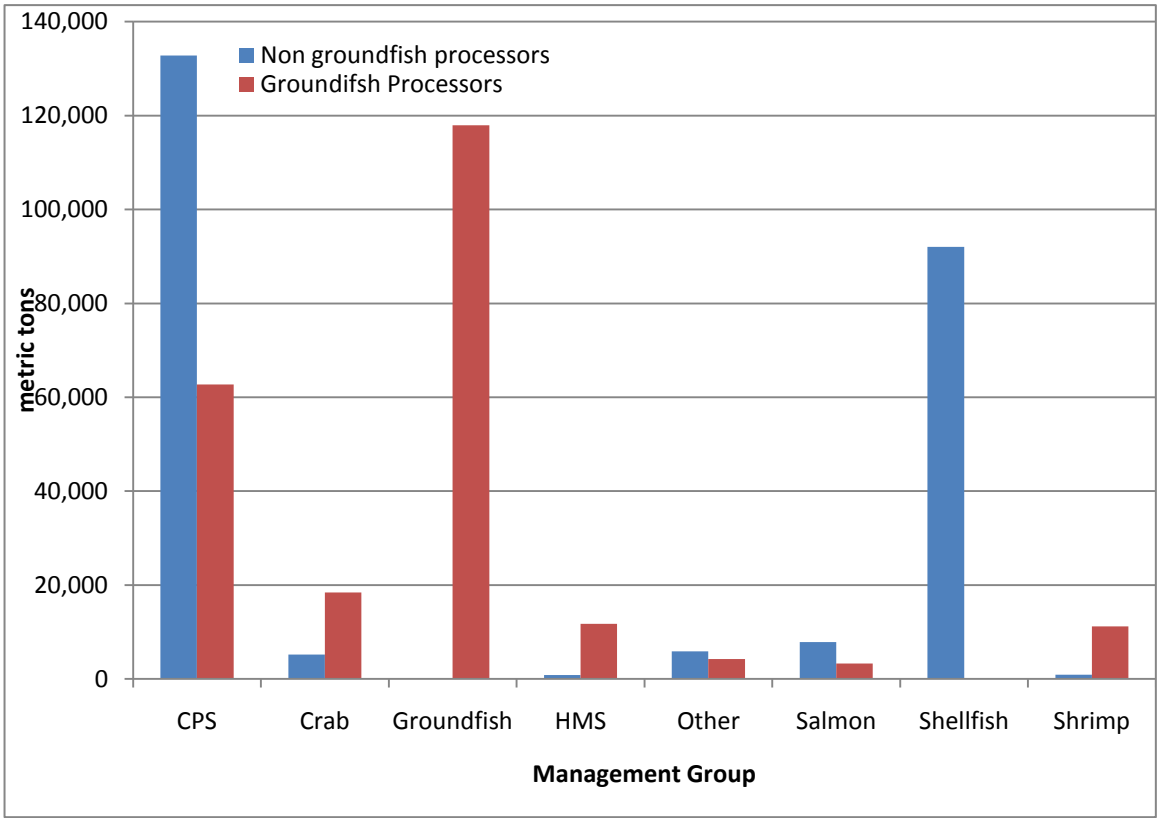


Figure 3-5. Amount received by processors by management group, 2007 (source: PacFIN).

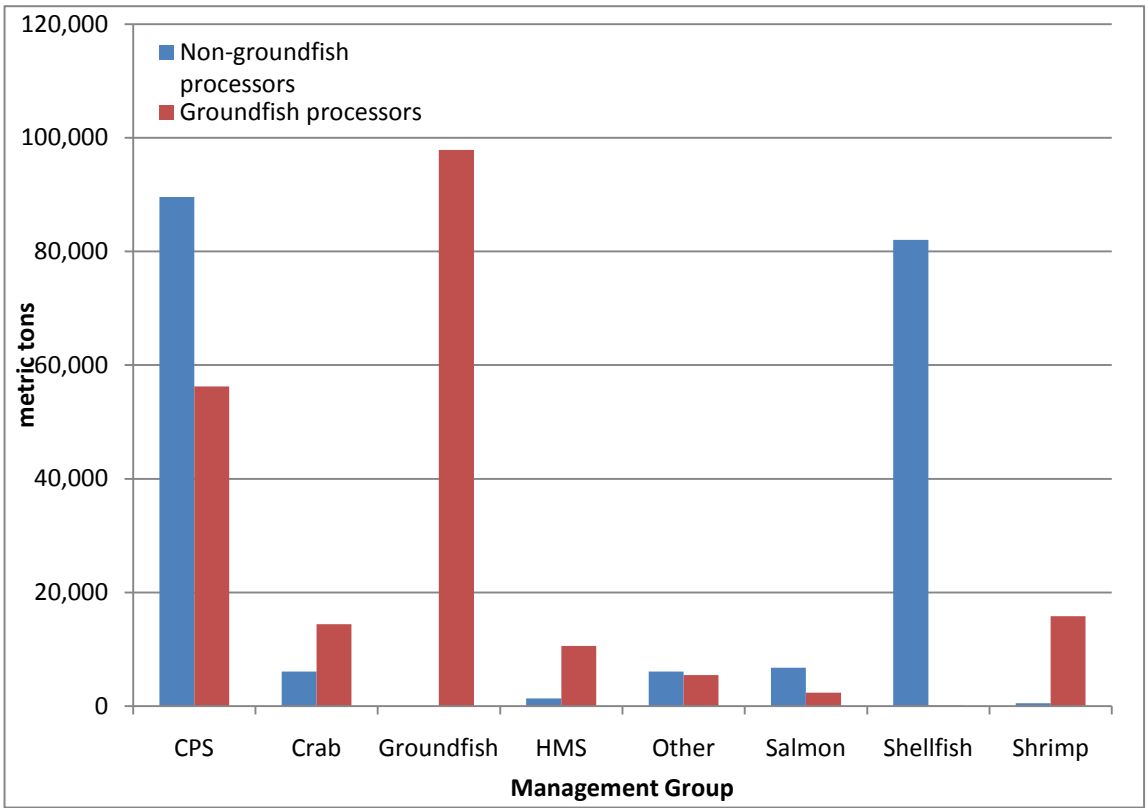


Figure 3-6. Amount received by processors by management group, 2008 (source: PacFIN).

3.5.3 Recreational Harvesters

In the U.S., more than 12 million anglers took part in 87 million marine recreational fishing trips in 2007 (NMFS 2008). In comparison, according to Table 3-13, there were 1.32 million boat-based marine recreational angler trips on the west coast; 77 percent of these trips were made off California, 8.7 percent off Washington, and 14.3 percent from Oregon.

Recreational fishing is an important economic contributor to the west coast in general, and to some communities specifically. The recreational fishing sector can be divided into the charter fleet and the private fleet. The private fleet typically is made up of vessels owned by residents living in or near areas where they fish. The charter fleet is a for-hire fleet that plays a large role in the tourism sector of many west coast communities, and opportunities to fish on a charter vessel can be a substantial draw for tourists considering a visit to the coast.

The Council's GMT estimated total angler trips by mode and by target for each west coast state between 2005 and 2007 as part of the 2009-10 groundfish harvest specifications process. In terms of total trips, there was a decline in angler trips coastwide from 1.45 million trips to 1.32 million trips (Table 3-13). However, results were mixed along the coast with increases in the number of angler trips observed in Washington and Oregon in 2007. The overall decline was driven by the California private boat mode.

Table 3-14 shows the estimated share of angler trips targeting groundfish by region. The percentage of marine area trips targeting groundfish ranges from 15.5 percent in Washington in 2005 to 52.6 percent in southern California in 2007. Overall, about 40 to 44 percent of total boat-based marine area angler trips targeted groundfish between 2005 and 2007.

Groundfish are caught incidentally when other species, such as salmon, are targeted. While the contribution of groundfish catches to the overall incentive to engage in a recreational fishing trip is uncertain, it seems likely that the possibility or frequency of groundfish catch on a trip adds to the overall enjoyment and perceived value of the trip.

Fishing effort is related to weather, with relatively more effort occurring in the milder months of summer, and relatively less in winter (Figure 3-7). As might be expected, this effect is more pronounced in higher latitudes, although the reasons include opportunity as well as climate. Salmon seasons are longest in California, second longest in Oregon, and shortest in Washington. Until recently, groundfish seasons were also more restrictive in Washington, with the lingcod season being closed from November through March.

Table 3-13. Total boat-based angler trips in marine areas by state for recent years.

State	Mode	2004	2005	2006	2007
Washington	Charter	63,000	50,947	46,863	47,862
	Private	134,000	80,581	58,499	66,820
	TOTAL	197,000	131,528	105,362	114,682
Oregon	Charter	58,000	51,933	49,920	54,821
	Private	160,000	121,699	111,874	135,409
	TOTAL	218,000	173,632	161,794	190,230
California	Charter	689,000	363,442	263,725	311,295
	Private	536,000	786,445	838,221	709,792
	TOTAL	874,000	1,149,887	1,101,946	1,021,087
Coastwide Total	Charter	810,000	466,322	360,508	413,978
	Private	830,000	988,725	1,008,594	912,021
	TOTAL	1,640,000	1,455,047	1,369,102	1,325,999

Table 3-14. Share of boat-based angler trips targeting groundfish.

Region	Trip target	2005	2006	2007
Washington	Groundfish	20,407	22,727	21,635
	Total	131,528	105,362	114,682
	% groundfish trips	15.5%	21.6%	18.9%
Oregon	Groundfish	71,427	71,674	66,665
	Total	173,632	161,794	190,230
	% groundfish trips	41.1%	44.3%	35.0%
Northern California	Groundfish	64,340	110,774	76,340
	Total	260,142	289,216	215,641
	% groundfish trips	24.7%	38.3%	35.4%
Southern California	Groundfish	427,508	333,045	423,788
	Total	889,745	812,730	805,446
	% groundfish trips	48.0%	41.0%	52.6%
Coastwide	Groundfish	583,681	538,220	588,428
	Total	1,455,047	1,369,102	1,325,999
	% groundfish trips	40.1%	39.3%	44.4%

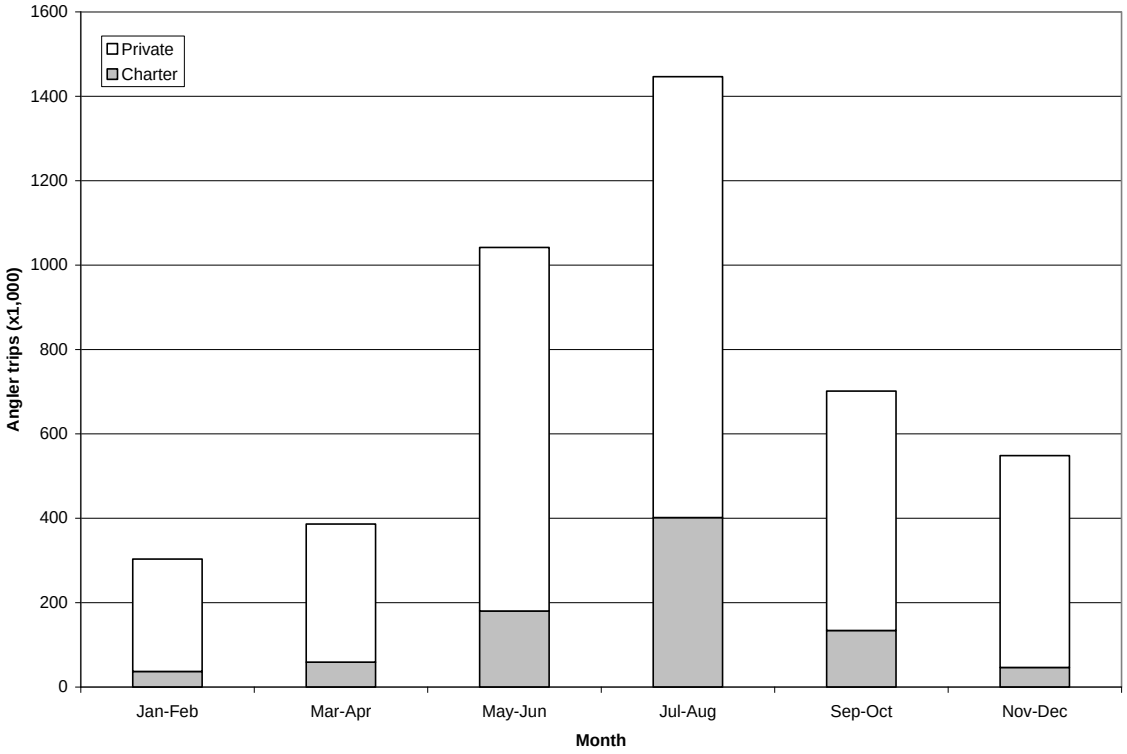


Figure 3-7. Seasonal distribution of west coast recreational marine angler boat trips for all fisheries including groundfish in 2003 by mode and region (thousands of angler trips) (Source: PFMC 2004a).

3.5.4 Seafood Consumption, Including Groundfish Products

Section 5.3.4 of the 2008 Groundfish SAFE document describes markets for groundfish products and consumption and is incorporated by reference here.

West coast groundfish compete in a global market, not only with similar species produced in other regions of the world, but also with other fish species such as salmon and tuna. In addition, fish compete with other sources of protein in consumers' budgets. About 4.2 million mt of fish and other seafood were landed in the U.S. in 2007, close to the amount landed in 2006, which was 4.3 million mt.[63] In comparison, total west coast groundfish landings in 2007 were 236,452 mt.[64] Pacific whiting typically comprises about two-thirds of west coast groundfish landings by weight, but only around 10 percent of groundfish ex-vessel revenue.

Most west coast groundfish compete in the fresh and frozen fish product markets. In 2006, the U.S. imported about 2.4 million mt of edible fishery products, including 2.1 million mt of edible fresh and frozen fish products (DOC 2007) and exported about 1.3 million mt of edible fishery products, including 1.2 million mt of edible, fresh or frozen products. The largest destination for exported fish products in 2006 was Japan at 19 percent. While surimi was the single largest component of total fresh and frozen exports by weight in 2006, scallops, groundfish, and salmon were the most valuable exports, at 371 million dollars, 369 million dollars, and 367 million dollars respectively (DOC 2007) Asia was the

[63] NOAA Fisheries, Office of Science and Technology Annual Commercial Landing Statistics, http://www.st.nmfs.noaa.gov/st1/commercial/landings/annual_landings.html.

[64] GMT PacFIN Report 2, http://www.psmfc.org/pacfin/data/r002.p07.

largest export region, absorbing 52 percent of U.S. fishery exports by volume. Next to Japan, China and Canada were the largest export destinations at 15 percent and 10 percent, respectively. Table 3-15 shows export and import quantities and values for 2000 to 2005 derived from the FAO FishStat database.

Table 3-15. U.S. trade in fishery products, amount (mt) and value, 2000-05.

	2000	2001	2002	2003	2004	2005
Export Quantity	967,816	1,158,311	1,083,348	1,079,595	1,256,174	1,321,791
Export Value	$2,955,877	$3,206,706	$3,134,511	$3,283,009	$3,512,829	$4,089,337
Import Quantity	1,697,364	1,756,299	1,893,751	2,085,178	2,120,886	2,196,814
Import Value	$10,410,598	$10,242,669	$10,005,167	$11,588,121	$11,882,828	$11,896,774

Source: FAO FishStat database.

From 1910 through the early 1970s, annual per capita fish consumption in the U.S. generally ran between 10 pounds and 12 pounds edible weight. Beginning in the early 1970s, per capita consumption increased. In the mid 1980s, per capita consumption began shifting upward again to the 15-pound to 16-pound range where it has generally remained since 1985. In 2006, annual per capita U.S. fish consumption was estimated to be 16.5 pounds. U.S. seafood consumption reached a record 16.6 pounds per capita in 2004.

3.5.5 General Public

Table 3-16 presents comparative demographic statistics for the U.S. as a whole and for selected western states including Washington, Oregon, and California as means of characterizing the general public that may be affected by the proposed action. These data are derived from the U.S. Census Bureau's American Community Survey. The 2008 population estimate indicates that the three west coast states made up 15.5 percent of the U.S. population. Of the three states, California has by far the largest population, estimated at 36.8 million, followed by Washington at 6.5 million and Oregon at 3.8 million.

Looking at Table 3-16, California stands out as a younger, more ethnically diverse, but, on average at least, higher income population, compared to both the U.S. as a whole and the other two west coast states. California has a median age of 34.9 compared to the national average of 36.9. In contrast, Washington and Oregon are older than the national average at 37.3 and 38 median age respectively. The relatively young median age of California is in part a function of a higher birthrate; in 2007, the California birthrate was 15.5 births per 1,000 population versus a national average of 14.3 (Hamilton, *et al.* 2009). Washington and Oregon, in contrast, have birth rates of 13.8 and 13.2, respectively. Of the western states shown in Table 3-16, Utah has the lowest median age, 28.7, and a birth rate of 20.8, the highest in the nation. Nonwhites make up 37.5 percent of California's population compared to the national average of 25 percent. Washington and Oregon are less racially diverse than the national average, at 19.6 percent and 13.3 percent nonwhite, respectively. California and Washington both have median household incomes substantially higher than the value for the U.S. as a whole, $61,029 and $58,078, respectively compared to $52,079. Oregon's median household income is slightly below the national value at $50,169. However, the median household income does not reveal income distribution across the population. A study conducted by the Center on Budget and Policy Priorities, a Washington think tank, compared average income of the top quintile of families compared to the bottom quintile to estimate income inequality (Bernstein, *et al.* 2008). Although the study focuses on changes in income distribution over time, it includes state-by-state comparisons. For the mid-2000s period, the study found that for the U.S. as a whole, the top quintile's average family income was 5.9 times that of the lowest quintile. For California, the value was 7.9, while it was 6.9 for both Washington and Oregon. In all three states, the employment rate shown in Table 3-16 is lower than the national average. According to September 2009 data from the Bureau of Labor Statistics, California has the fourth highest unemployment rate at 12.2 percent; Oregon has the sixth highest at 11.5 percent, and Washington ranks nineteenth at 9.3 percent, in a ranking of states including the District of Columbia (http://www.bls.gov/web/laumstrk.htm).

Table 3-16. Demographic characteristics of selected western states. (Source: U.S. Census Bureau 2008 American Community Survey.)

Geographic area	Median Age of the Total Population	Margin of Error (+/-)	Percent of the Total Population Who Are White Alone	Margin of Error (+/-)	Employment/Population Ratio for the Population 16 to 64 Years Old	Margin of Error (+/-)	Median Household Income (In 2008 Inflation-Adjusted Dollars)	Margin of Error (+/-)	Percent of Civilian Employed Population 16 Years and Over Who Were Private Wage	Margin of Error (+/-)
United States	**36.9**	**0.1**	**75**	**0.1**	**70.2**	**0.1**	**52,029**	**73**	**79**	**0.1**
Alaska	33	0.3	69.1	0.4	68.8	1.1	68,460	1,917	67.8	1.5
Arizona	35.1	0.1	80.1	0.4	69	0.4	50,958	511	79	0.5
California	**34.9**	**0.1**	**62.5**	**0.2**	**67.8**	**0.2**	**61,021**	**236**	**76.8**	**0.2**
Hawaii	38.3	0.2	27.1	0.3	70.4	0.9	67,214	1,868	72.1	1.1
Idaho	34.4	0.2	92.7	0.3	71.7	0.7	47,576	961	77.1	0.8
Montana	39.1	0.4	89.6	0.2	72.5	0.9	43,654	1,263	71.6	1.2
Nevada	35.9	0.1	77.3	0.5	71.5	0.5	56,361	793	82.5	0.5
Oregon	**38**	**0.2**	**86.7**	**0.3**	**70.6**	**0.5**	**50,169**	**523**	**78.4**	**0.5**
Utah	28.7	0.2	91	0.2	73.9	0.5	56,633	705	79.7	0.5
Washington	**37.3**	**0.2**	**80.4**	**0.2**	**70.7**	**0.4**	**58,078**	**575**	**77.6**	**0.4**
Wyoming	36.6	0.4	91.9	0.4	76.3	1.2	53,207	1,992	71.7	1.5

3.6 Groundfish Limited Entry Trawl Harvesters

3.6.1 Overview

Tables and figures below provide a summary of landings and revenue in the groundfish trawl fishery. Table 3-17 shows landings by the trawl sectors compared to all groundfish sectors and to all west coast landings. The trawl sectors account for 98 percent of all groundfish landings from 1995 to 2008. This is mainly accounted for by the high volume landings of Pacific whiting, a comparatively low value species, which accounted for 84 percent of groundfish landing during this period. Groundfish landings, in turn, accounted for 52 percent of total west coast commercial fishery landings. Table 3-18 shows revenues (in constant dollars) from the groundfish trawl sectors. Figure 3-4 shows average 2004 to 2008 landings and revenue for the trawl sectors graphically based on the tabular data. Nonwhiting accounts for a higher percentage of ex-vessel revenue, 39 percent, because of the higher value of species harvested.

Table 3-17. Annual landings (mt) by groundfish sectors compared to all west coast landings (source: PacFIN).

YEAR	Nonwhiting	Shoreside Whiting	Catcher Processor	Mothership	Trawl	Fixed Gear	Other	Total Groundfish	Total West Coast All Species
1995	49,911.04	75,028.56	61,646.56	40,263.28	226,849.43	929.54	7,087.56	234,866.53	424,327.17
1996	51,277.39	85,082.34	66,577.74	45,818.14	248,755.61	720.67	7,728.84	257,205.13	474,246.88
1997	46,956.80	87,415.21	71,268.09	50,637.08	256,277.17	560.29	7,139.33	263,976.79	484,218.50
1998	36,754.95	87,825.94	71,184.58	50,746.08	246,511.55	448.68	5,134.05	252,094.28	369,246.21
1999	36,052.86	83,469.83	68,831.99	47,979.47	236,334.15	666.13	4,234.87	241,235.15	451,032.40
2000	30,605.37	85,853.64	68,605.35	47,295.64	232,359.99	765.00	3,512.98	236,637.98	485,801.24
2001	24,522.00	73,411.06	59,233.62	35,910.23	193,076.90	592.94	3,073.63	196,743.47	425,607.39
2002	23,967.05	45,723.18	36,619.17	26,640.12	132,949.52	430.27	2,662.36	136,042.15	367,801.22
2003	21,148.52	51,255.19	41,433.12	26,039.99	139,876.81	661.98	2,673.71	143,212.51	333,652.82
2004	19,224.35	89,654.71	74,775.47	24,162.57	207,817.10	774.88	2,691.06	211,283.03	403,750.46
2005	19,698.02	97,629.50	79,332.65	49,294.81	245,954.98	958.20	2,999.11	249,912.29	449,357.26
2006	17,846.41	97,268.52	79,094.93	55,600.19	249,810.05	976.80	2,671.06	253,457.90	466,336.56
2007	20,816.14	73,282.57	73,587.43	47,985.06	215,671.21	659.50	2,357.09	218,687.80	448,363.60
2008	24,271.49	50,787.12	109,062.88	57,685.90	241,807.40	579.57	2,608.78	244,995.75	430,547.16

Table 3-18. Annual ex-vessel revenue for groundfish trawl sectors (source: PacFIN).

YEAR	Nonwhiting	Shoreside Whiting	Catcher Processor	Mothership
1995	$56,489,165	$7,868,492	$6,465,078	$4,222,542
1996	$52,922,576	$5,152,993	$4,032,266	$2,774,965
1997	$46,433,718	$8,162,572	$6,654,802	$4,728,340
1998	$34,249,365	$4,760,466	$3,858,447	$2,750,611
1999	$33,023,236	$6,839,770	$5,640,301	$3,931,582
2000	$33,625,667	$7,965,430	$6,365,148	$4,388,050
2001	$27,972,381	$5,741,781	$4,632,905	$2,808,687
2002	$23,207,487	$4,555,886	$3,648,757	$2,654,439
2003	$23,948,883	$5,085,241	$4,110,752	$2,583,536
2004	$20,879,203	$7,030,244	$5,863,494	$1,894,700
2005	$22,096,113	$10,887,944	$8,847,423	$5,497,511
2006	$22,980,905	$12,542,650	$10,199,189	$7,169,572
2007	$25,478,925	$11,328,940	$11,376,069	$7,418,134
2008	$31,472,304	$11,584,924	$24,878,063	$13,158,588

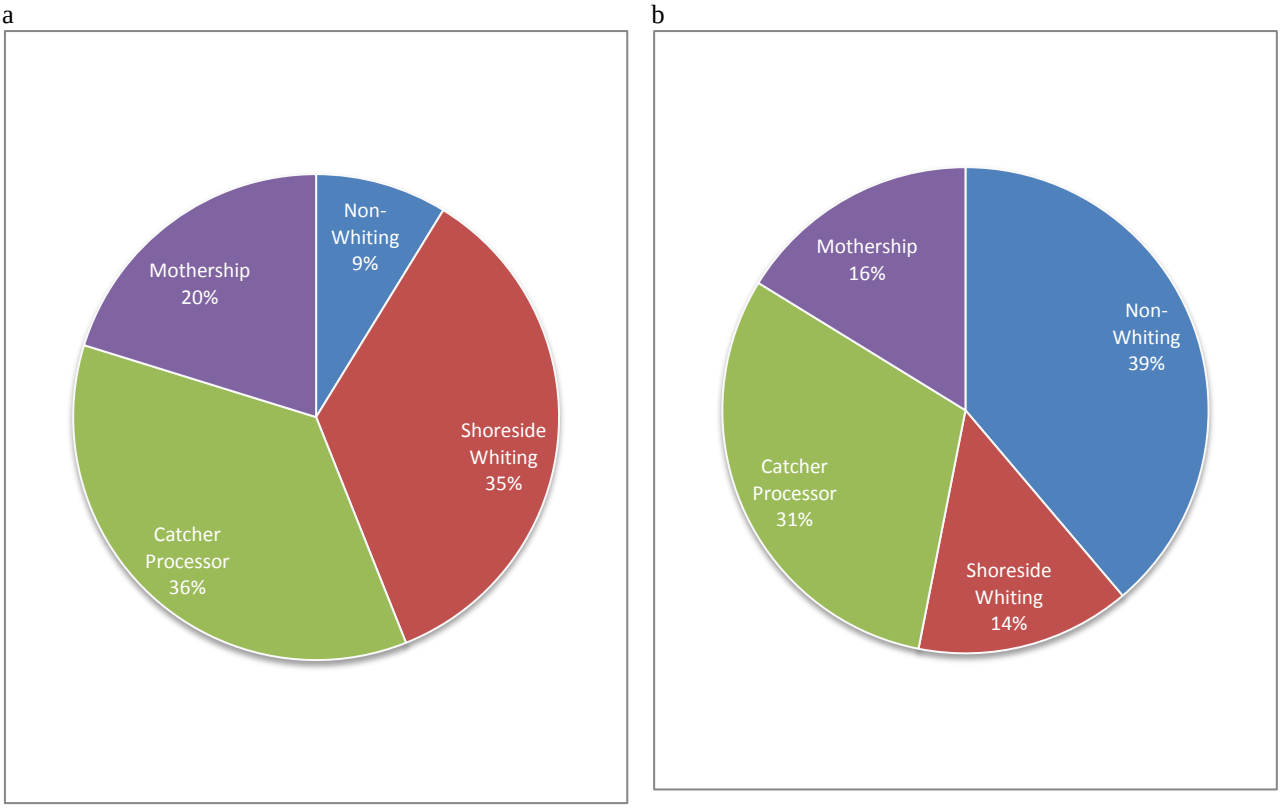


Figure 3-8. Share of landings (a) and revenue (b) by groundfish trawl sector, average 2004-08.

3.6.2 Limited Entry Shore-based Trawl Sector

West coast LE trawl vessels use midwater trawl gear and small and large footrope bottom trawl gear (defined at 50 CFR 660.302 and 660.322(b)). Midwater trawl gear is not designed to touch the ocean

bottom and is, therefore, used to target groundfish species, such as Pacific whiting and yellowtail rockfish that ascend above the ocean floor. Small and large footrope trawl gear types are designed to remain in contact with the ocean floor and are used to target species that reside along the ocean bottom such as flatfish on the continental shelf and slope, or DTS species (Dover sole, thornyhead, and sablefish complex) in deep water. Fishermen generally use small footrope trawl gear in areas that have a regular substrate (few rocks or outcroppings) and use it more widely on the continental shelf than on the continental slope, due in large part to regulatory requirements. Fishermen use large footrope trawl gear most commonly in areas that may have an irregular substrate, along the continental slope, and in deeper water.

Shore-based trawl vessels participate in bottom trawl opportunities for species like sole, rockfish, and roundfish. Opportunities are also available for Pacific whiting where most vessels use midwater trawl gear. Bottom trawlers operate in an environment of two-month cumulative trip limits, which allow a vessel to harvest a given amount of groundfish species within a two-month period. It is commonly believed that this two-month limit structure has eliminated the conditions that result in a race for fish, because vessels are able to harvest their two-month cumulative trip limits without fear of another vessel catching that limit.

In addition to cumulative trip limits, trawlers using bottom trawl gear are subject to several different area closures, including trawl RCA closures, which are designed to protect areas where depleted rockfish species are relatively abundant, and EFH area closures, which are intended to protect relatively sensitive habitat from bottom trawling. Trawl RCA boundaries and cumulative limits are routinely adjusted inseason based upon fishery performance. Managers structure catch limit opportunities and closed areas with several objectives in mind, including protecting rebuilding species while simultaneously providing for a year-round fishing opportunity. While many adjustments to catch limits and trawl RCA boundaries are relatively minor, some of these adjustments in recent years have been relatively extreme and have closed fishing opportunity for wide areas of the coast mid-season. For example, in 2004, an unexpected amount of darkblotched rockfish catch occurred in the fishery, leading to a large expansion of the trawl RCA and elimination of several target species opportunities, including petrale sole—one of the most important target species to bottom trawlers. In January and February of 2006, unseasonably favorable weather occurred, making it easy for vessels to target petrale sole during their aggregation period. This led to a catch of petrale sole during the first two-month cumulative trip limit period that was nearly twice the expected amount. This caused managers to eliminate petrale sole opportunities at the end of the year in an attempt at preventing overfishing of the stock in that year. Other events have affected opportunities available to shore-based trawl vessels. For example, other sectors have, in the past, taken more than the expected amount of a rebuilding species, necessitating the inseason restriction of many sectors to eliminate the harvest of that particular species to foster the rebuilding of that stock.

These reactionary inseason adjustments make it somewhat difficult for nonwhiting vessels to develop business plans during the year even though they operate without a race for fish condition. This is because some adjustments can prevent future harvests of several types of groundfish that are an important component of trawl target opportunities. Typically such adjustments have little advance notice.

With a few exceptions, shore-based whiting vessels operate in a different structure than nonwhiting trawlers.[65] Most shore-based whiting trawl vessels operate under a primary season structure where vessels harvest Pacific whiting until the sector allocation is reached, and the fishery is closed. Trawlers fish under a common quota of whiting and for bycatch limits. The commercial whiting OY is allocated to three different nontribal sectors, with the shore-based sector receiving 42 percent of the commercial OY.

[65] At times bottom trawl vessels have targeted Pacific whiting. Bottom trawlers that target Pacific whiting are subject to two-month limits for Pacific whiting.

The shore-based sector is closed when the whiting allocation is reached or when a bycatch limit is reached.

To allow the Pacific whiting industry to have the opportunity to harvest the full Pacific whiting OY, the nontribal commercial fishery is managed with bycatch limits for certain overfished species. To date, bycatch limits have been established for darkblotched, canary, and widow rockfish. With bycatch limits, the industry has the opportunity to harvest a larger amount of Pacific whiting, if they can do so while keeping the total catch of specific overfished species within adopted bycatch limits. Regulations provide for the automatic closure of the commercial (nontribal) portion of the Pacific whiting fishery upon attainment of a bycatch limit. This is different from the bottom trawl fishery where harvest availability of target species is often constrained by the projected catch of overfished species. Beginning in 2009, sector-specific bycatch limits for overfished species will be used allow each sector of the whiting fishery to be closed when the bycatch limit is projected to be attained. Bycatch limits are used to reduce the risk of exceeding a specified bycatch limit and possibly an overfished species OY. Because of these conditions, the whiting fishery is characterized by relatively brief periods of concentrated harvest and little opportunity for business planning.

3.6.3 Catcher-processor and Mothership Sectors

3.6.3.1 Mothership Sector Participation Trends

Historically, the primarily seasons for the at-sea sectors of the whiting fishery have started on May 15, while the coastwide primary season for the shoreside fishery has started on June 15. The actual number for fishing days in a season varies between years, given changes in participation levels, the annual allocation, market conditions, and the levels of bycatch limit species and Chinook salmon (Table 3-19). Similarly, the number of fishing days per vessels ranges.

Table 3-19. Days fished by Catcher Vessels in Pacific Whiting in the Mothership Sector, 2007-08.

Year	Range of Dates in which Primary Season Fishing Occurred	Average Number of Days Fished per Vessel	Range of Days Fished per Vessel
2007	May 15-November 15	32 days	5-26 days
2008	May 15-July 3	26 days	9-64 days

Since 1994, the number of catcher vessels that participated in the mothership sector has fluctuated from a low of three vessels in 2003 to a high of 21 vessels in 1994, with the average around 11 vessels per year (Table 3-20). Vessel and processor participation in the mothership fishery has varied over time, influenced by a variety of factors, including, but not limited to, Pacific whiting abundance and available Pacific whiting harvest levels, Pacific whiting prices on the worldwide market, and alternative west coast and Alaska fishing opportunities. Many catcher vessels participating in the mothership sector also participate in the Pacific whiting shoreside fishery. Since 2005, between 39 and 70 percent of the mothership sector catcher vessels have also participated in the Pacific whiting shoreside fishery (Table 3-20). In 2008, 4 of the 19 mothership catcher vessels had purchased EMS equipment for their vessels to meet the monitoring requirements of the Pacific whiting shoreside fishery.

Table 3-20. Mothership Sector Participation by year, 1994-2008.

Year	Pacific Whiting OY (mt)	Mothership-Catcher Vessels	Motherships
1994	260,000	43	9[1]
1995	178,400	36	6
1996	212,000	28	8[2]
1997	232,000	27	6
1998	232,000	24	6
1999	232,000	24	6
2000	232,000	23	6
2001	190,400	20	5
2002	129,600	11	4
2003	148,200	12	4
2004	250,000	10	4
2005	269,069	18	5
2006	269,069	20	6
2007	242,591	20	6
2008	269,545	19	5

[1] In 1994, one vessel participated in both the catcher-processor sector and the mothership sector.
[2] In 1996, two vessels participated in both the catcher-processor sector and the mothership sector.

Table 3-21. Catcher vessel participation in the mothership and shore-based sectors.

Year	Number of Catcher Vessels	Number of Vessels that also Participated in the Shore-based Sector	Percentage of Vessels that Participate in Both Sectors
2005	18	7	39%
2006	20	12	60%
2007	20	14	70%
2008	19	14[a]	70%

[a] As of February 2009, four vessels had purchased EMS equipment for permanent installation on the vessel.

Figure 3-9 plots the number of catcher vessels that have annually participated in the mothership sector of the Pacific whiting fishery against the ex-vessel Pacific whiting prices from 1997 to 2008. NMFS downloaded these prices from the PacFIN website and used Port of Newport, Oregon, prices because Newport is a larger Pacific whiting receiving port with consistent participation in the fishery over time, several processing plants, and plants that process Pacific whiting both as surimi and as headed-and-gutted product. Prices are likely different between the shore-based and mothership sectors; however, price data are not reported from the at-sea sectors. Therefore, shore-based sector price data are used as a proxy indicator of changing prices over time, rather than as an exact measure of those prices. Prior to 2005, there does not appear to be a close relationship between ex-vessel price and the number of catcher vessels in the mothership fishery. There does, however, appear to be a closer relationship to the number of vessels that have annually participated in the mothership sector of the Pacific whiting fishery and the mothership sector allocation between 1997 and 2008 (Figure 3-10).

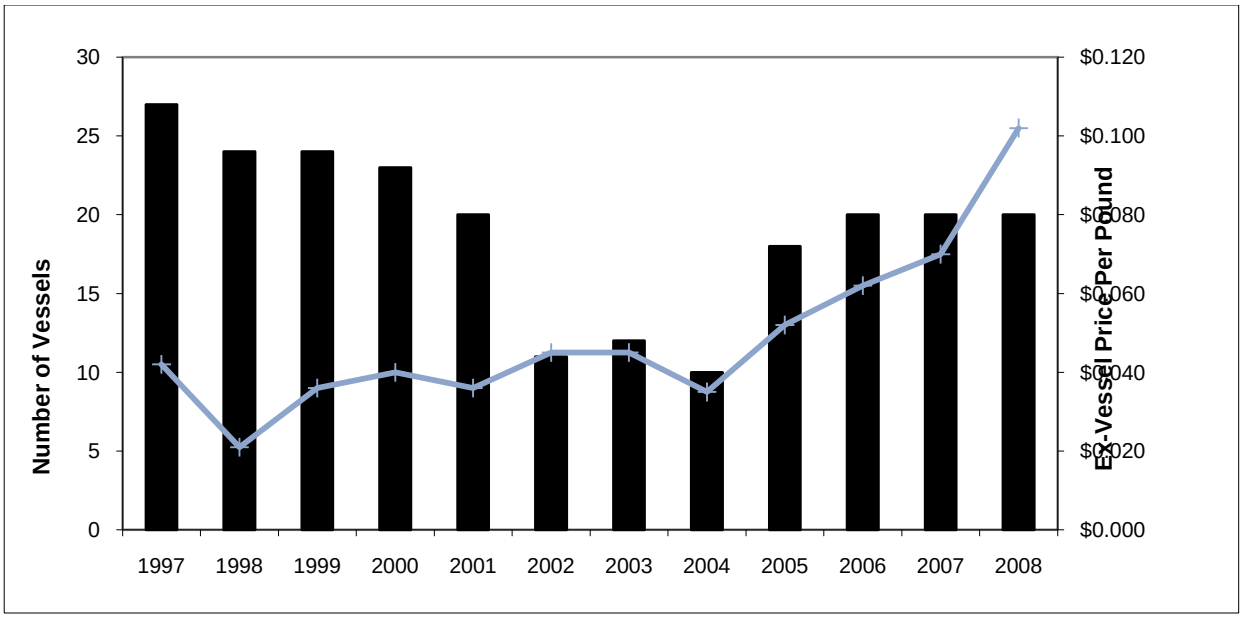


Figure 3-9. Number of catcher vessels in the Pacific whiting mothership fishery weighed against whiting ex-vessel price per pound, 1994-2006. (Port of Newport, OR prices used to provide constant comparison over time. Source: www.psmfc.org/pacfin.)

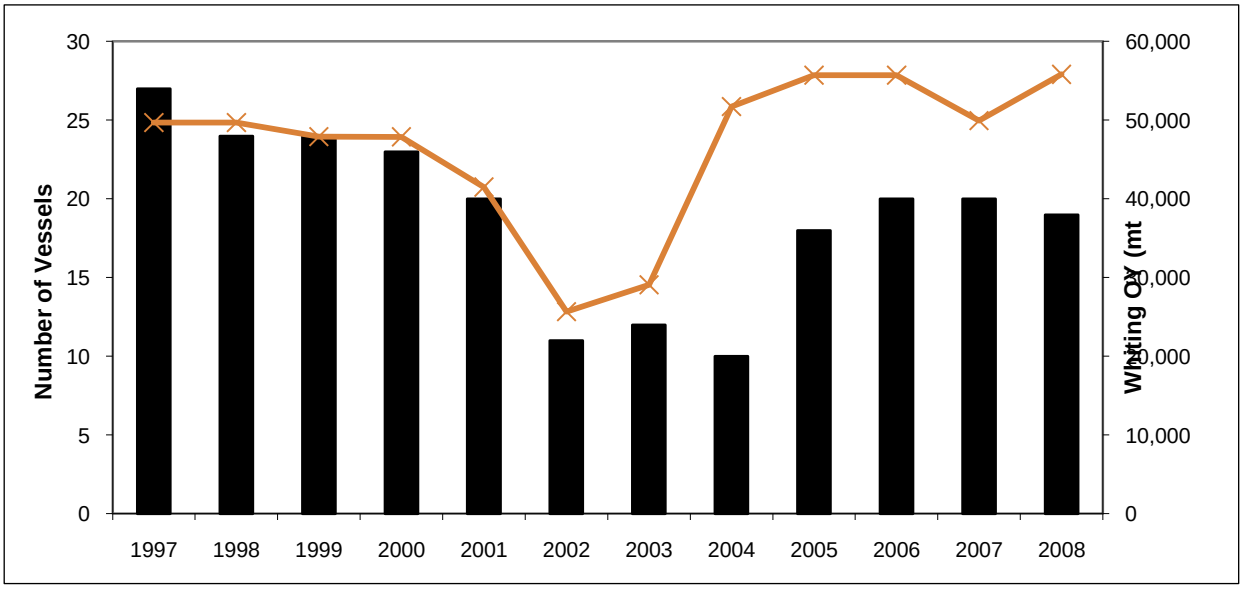


Figure 3-10. Number of catcher vessels in the Pacific whiting mothership fishery weighed against the mothership sector Pacific whiting allocation (mt), 1994-2006.

Catcher vessels that operate in the mothership sector are larger on average than vessels that operate shoreside. Several catcher vessels in the mothership sector exceed 100 feet in length, but most vessels tend to be between 80 and 100 feet in length (Table 3-22).

Table 3-22. Catch and participation of mothership catcher vessels by year and length category.

		Length Category (feet)			
Year	**Data**	**<80**	**80-90**	**90-100**	**>100**
1995	No. of Vessels	7	6	6	6
	Retained Weight (mt)	4,846	7,955	7,450	11,179
1996	No. of Vessels	4	10	5	5
	Retained Weight (mt)	6,948	15,677	8,348	9,416
1997	No. of Vessels	7	8	5	5
	Retained Weight (mt)	13,099	15,173	8,854	12,210
1998	No. of Vessels	6	6	6	6
	Retained Weight (mt)	10,919	11,602	12,379	15,845
1999	No. of Vessels	4	6	6	6
	Retained Weight (mt)	6,534	11,466	11,640	16,456
2000	No. of Vessels	3	6	6	6
	Retained Weight (mt)	5,752	12,719	10,359	15,762
2001	No. of Vessels	3	6	5	4
	Retained Weight (mt)	6,110	12,615	8,099	9,037
2002	No. of Vessels	2	5	1	3
	Retained Weight (mt)	C	10,843	C	8,501
2003	No. of Vessels	1	5	3	3
	Retained Weight (mt)	C	10,702	7,014	6,579
2004	No. of Vessels	2	5	1	2
	Retained Weight (mt)	C	10,322	C	C
2005	No. of Vessels	2	6	5	3
	Retained Weight (mt)	C	14,606	10,785	19,547
2006	No. of Vessels	4	6	6	4
	Retained Weight (mt)	9,400	23,334	12,931	9,936
2007	No. of Vessels	4	7	6	3
	Retained Weight (mt)	6,526	15,774	15,476	10,210

Source: PacFIN NPAC4900 table. July 2008
Note: "C" means data are confidential.

Participants in the mothership sector operate over several months of the year with much of the participation occurring in May and June. Many mothership catcher vessels leave the mothership fishery to participate in the shoreside whiting fishery, which begins June 15, or head to the Bering Sea to participate in the Alaska pollock "B" season. As with effort, catch is heavily concentrated toward the May and June time period (Table 3-23, Figure 3-11).

Table 3-23. Monthly distribution of mothership sector catcher vessel participation (count of vessels).

	Month							
Year	**April**	**May**	**June**	**July**	**August**	**September**	**October**	**November**
1995	35	31						
1996		28	23					
1997		26	25					
1998		24						
1999		23	23					
2000		23	23					
2001		18	6	4				
2002		11	8					
2003		12	6					
2004		10	2					
2005		16	14				3	2
2006		18	15		2	4		
2007		20	17	2				

Source: PacFIN NPAC4900 table. July 2008

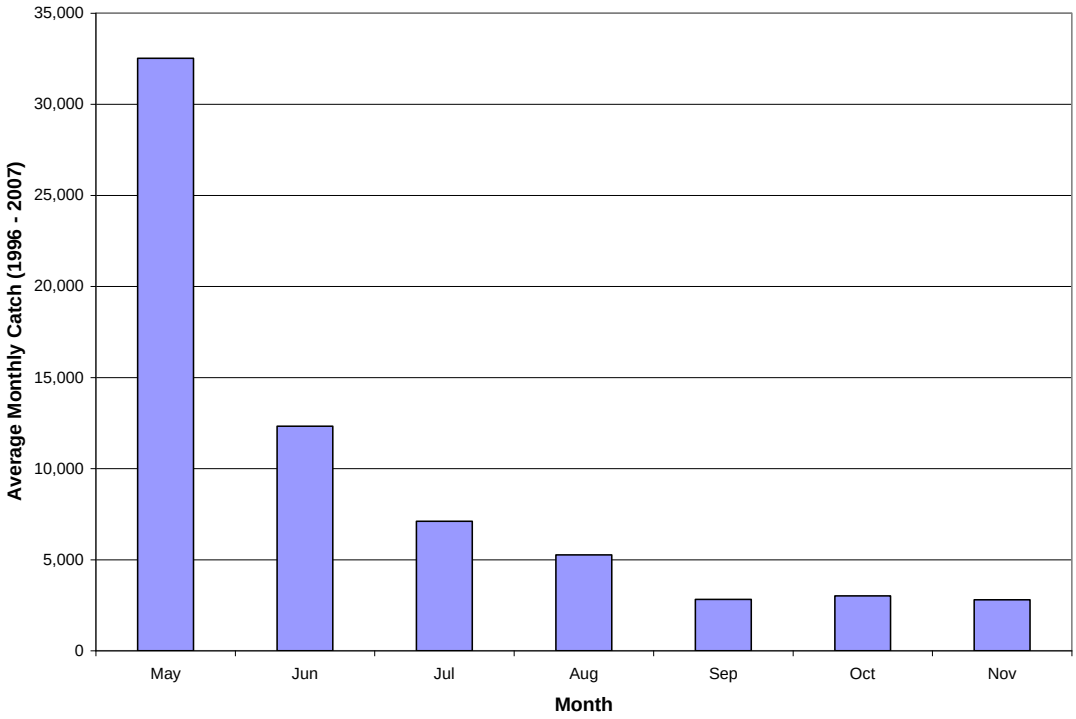


Figure 3-11. Average monthly distribution of mothership sector catch, pounds (1996-2007).

3.6.3.2 Participation and Harvest Trends in the Catcher-processor Sector

Catcher-processor effort in the fishery has varied over time. With the voluntary creation of the Pacific Whiting Conservation Cooperative in 1997, the sector took on the characteristics of a rationalized fishery. The amount of capital in the fishery generally declined as the season became longer. Companies with multiple vessels were able to consolidate to fewer vessels.

Table 3-24. Catcher-processor Sector Participation by year, 1994-2008.

Year	Pacific Whiting OY (mt)	Catcher-processors
1994	260,000	9[1]
1995	178,400	9
1996	212,000	10[2]
1997	232,000	10
1998	232,000	7
1999	232,000	6
2000	232,000	8
2001	190,400	7
2002	129,600	5
2003	148,200	6
2004	250,000	6
2005	269,069	6
2006	269,069	9
2007	242,591	XX
2008	269,545	XX

While the actual number of catcher-processor vessels participating in any given year has not varied tremendously, many vessels spend less time in the fishery and leave the fishery after June (Table 3-63). Beginning in July, only a handful of catcher-processor vessels remain, often into November, to finish off the quota remaining in the fishery. The distribution of catch has become much less concentrated in time following the formation of the voluntary co-op. Prior to the formation of the voluntary co-op, catcher-processors operated over a much shorter time period with harvest concentrated in May and June (Figure 3-28). Although most vessels participate in the Alaska pollock fishery B season, leave the fishery by spring, and return for fall fishing if allocation remains, a single AFA qualified vessel has consistently remained in the whiting fishery during the pollock B season. Consolidation of pollock effort as a result of the AFA has reduced the need for some vessels in the Alaska fishery. Under the existing AFA, a vessel may be designated as a replacement vessel for an AFA vessel in the event of actual total loss or constructive total loss. The flexibility of the catcher-processor co-op allows such AFA qualified vessels to remain operational in the whiting fishery and available to replace an AFA vessel in Alaska should it be necessary without the loss of catch opportunity in either fishery.

Table 3-25. Count of catcher-processors operating by month and year.

Year	April	May	June	July	August	Sept.	Oct.	Nov.	Dec.
1995	9	9							
1996		10	10						
1997		10	7						
1998		5	7	1	1				
1999		5	6	2					
2000		4	5	5	1	1	1	1	
2001		4	6	1	1	2	2	2	
2002		4		1	1	1	1		
2003		3	1	1	1	2	2		
2004		5	4	1	1	4	2	1	
2005		6	4	1	2	4	4		
2006		6	8	3		3	3		
2007		9	9				3	4	1

Source: PacFIN NPAC4900 table. July 2008
Note: not unique records and should not be summed

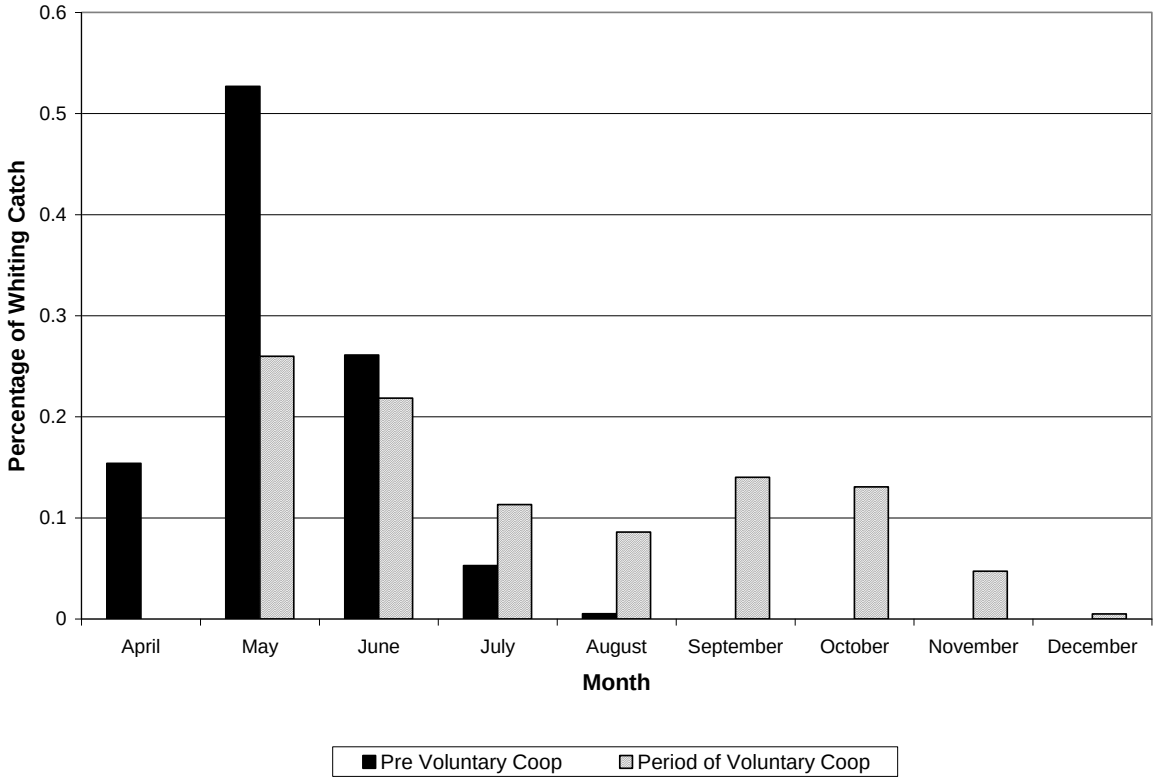


Figure 3-12. Seasonality of whiting harvest in the catcher-processor sector (before and after formation of voluntary cooperative).

Because of the catch sharing agreements created through the voluntary co-op, participants in the catcher-processor sector do not race for fish. Prior to 2009, however, participants expressed concern over the fact that another sector could preempt the catcher-processor sector through attainment of a bycatch limit and did not afford the opportunity for a pre-planned fall fishery.

3.6.3.3 At-sea Harvest and Revenue

Depending on the OY, at-sea harvests by nontribal motherships and catcher-processors ranged from 63,000 mt in 1998 to 128,000 mt in 2005. In 2007, the at-sea sector catch generated an estimated $20.3 million in ex-vessel revenue. The amount of revenue generated in the fishery has been increasing since 2001, both because of a larger OY than in 2001 and improved market conditions and higher prices received as a result. The amount of nonwhiting groundfish harvested by this fleet is quite small, often in the range of less than half of one percent of total catch.

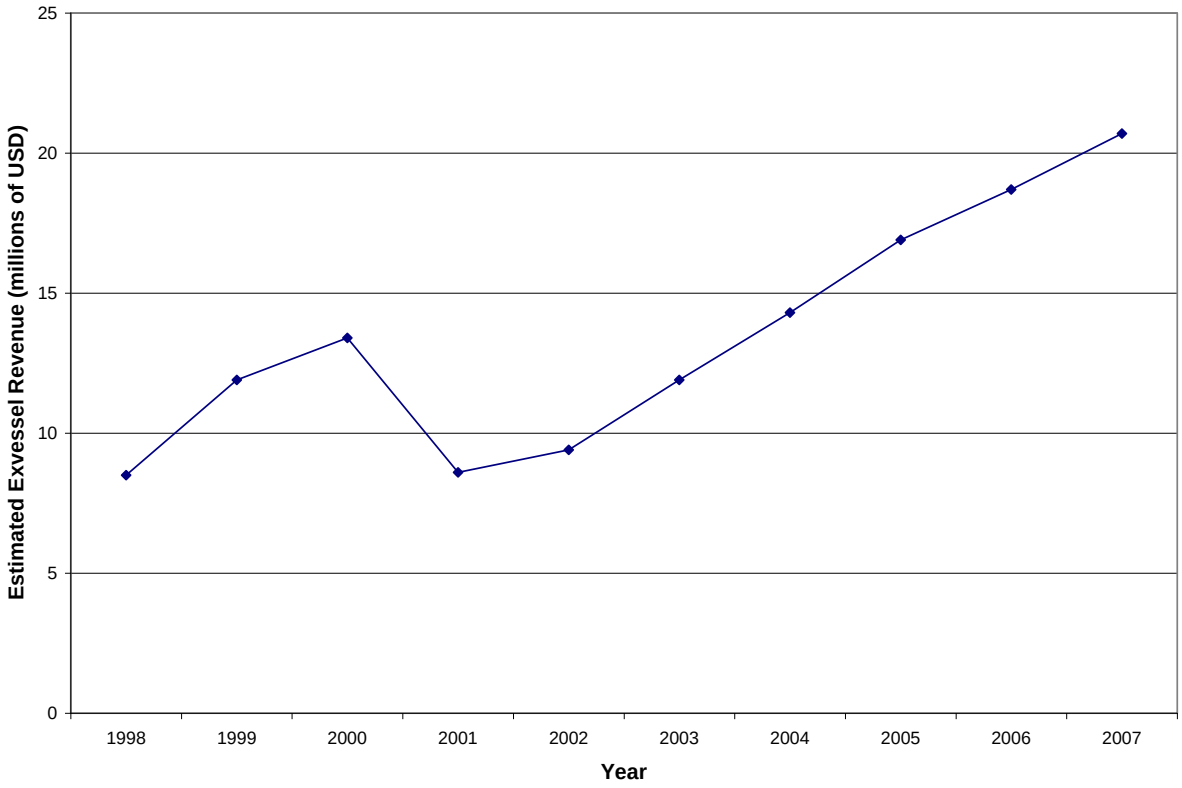


Figure 3-13. Estimated at-sea ex-vessel revenue by year. (Source: PacFIN PFMC Port Group Report. July 2008.)

At-sea whiting vessels incidentally catch a variety of species in addition to whiting. By weight, yellowtail rockfish, widow rockfish, dogfish, squid, and mackerel are the species encountered most frequently in the at-sea sectors outside of whiting. However, when measured as a percentage of the amount of whiting taken, the relative amount is small. In many years, the bycatch rate is less than 1 percent, while in other years it is between 1 and 2 percent (Table 3-26).

Table 3-26. Nontribal at-sea Pacific whiting catch (mt) by year and species.

Year	Pacific Whiting	Yellowtail Rockfish	Widow Rockfish	Dogfish	Squid	Chub Mackerel	Other	Bycatch %
1995	100,383	780	218	186	25	0	318	1.5%
1996	110,931	618	256	87	16	239	248	1.3%
1997	120,964	300	198	208	9	51	175	0.8%
1998	120,039	398	295	220	70	452	457	1.6%
1999	115,046	693	161	272	23	1	614	1.5%
2000	114,460	537	226	79	95	16	488	1.3%
2001	94,250	123	167	77	80	47	400	0.9%
2002	62,935	14	135	37	35	0	103	0.5%
2003	67,236	2	12	11	101	0	110	0.4%
2004	97,277	18	20	341	1,123	0	159	1.7%
2005	127,421	73	79	70	745	0	240	0.9%
2006	134,219	63	139	23	92	4	156	0.4%
2007	121,075	68	145	86	66	0	131	0.4%

3.6.4 Landings, Revenue, and Participation

The number of shore-based trawl vessels landing groundfish (including whiting) on the west coast has declined over time. During the 1980s, approximately 500 trawl vessels landed groundfish in any given year. With the introduction of LE, the number of vessels declined and remained between 300 and 400 vessels per year for several years. In the mid-1990s, the number of trawl vessels declined further as a result of requirements necessary to meet a specific length endorsement regulation. Catcher-processors and other large vessels desiring to participate in the fishery found it necessary to purchase multiple permits and combine them in order to acquire a large enough length endorsement to operate their relatively large vessels in the fishery. Because of the purchasing of permits by catcher-processor entities and other large vessels, the number of shoreside trawl vessels declined further. In late 2003, a Federal buyback was implemented which reduced the number of trawl vessels further yet. In 2003, for example, 241 trawl vessels recorded landings of groundfish, while in 2004, only 155 trawl vessels recorded landings of groundfish. The number has remained relatively stable since 2004.

Table 3-27. Trawl participation and landings by year (includes both LE and open access).

Year	No. of Vessels	Landed weight (mt)	Exvessel Revenue	Avg. mt per Vessel	Avg. Revenue per Vessel
1981	495	106,527	$41,651,311	215	$ 84,144
1982	560	122,056	$53,213,681	218	$ 95,024
1983	541	103,499	$48,274,450	191	$ 89,232
1984	543	104,214	$50,157,152	192	$ 92,370
1985	504	99,534	$48,827,118	197	$ 96,879
1986	502	88,226	$48,419,329	176	$ 96,453
1987	517	98,954	$61,019,114	191	$ 118,025
1988	493	91,984	$56,494,540	187	$ 114,593
1989	517	101,829	$58,782,647	197	$ 113,700
1990	502	92,341	$55,025,490	184	$ 109,613
1991	472	105,006	$59,823,428	222	$ 126,745
1992	453	140,017	$63,569,954	309	$ 140,331
1993	477	120,203	$56,703,785	252	$ 118,876
1994	460	135,739	$57,721,652	295	$ 125,482
1995	417	133,662	$69,370,347	321	$ 166,356
1996	396	147,791	$62,938,122	373	$ 158,935
1997	373	143,899	$59,305,894	386	$ 158,997
1998	345	133,450	$43,765,358	387	$ 126,856
1999	347	125,414	$43,502,581	361	$ 125,368
2000	275	119,664	$43,722,944	435	$ 158,993
2001	268	100,598	$35,377,633	375	$ 132,006
2002	261	71,274	$28,896,283	273	$ 110,714
2003	241	74,456	$30,440,612	309	$ 126,310
2004	155	111,907	$29,902,433	722	$ 192,919
2005	154	119,965	$33,503,576	779	$ 217,556
2006	151	115,406	$36,139,160	764	$ 239,332
2007	159	94,160	$37,191,912	592	$ 233,911

Source: PacFIN ftl and ft table. July 2008.
Note: Open access trawl vessels include California halibut and sea cucumber trawl vessels that incidentally land groundfish.

Over time, landings in the trawl fishery have fluctuated, especially on a species-specific basis (Figure 3-14). Pacific whiting has grown in importance, especially in recent years. Through the 1990s, the

volume of Pacific whiting landed in the fishery increased. In 2002 and 2003, landings of Pacific whiting declined due to information showing the stock was depleted and the subsequent regulations that restricted harvest to rebuild the species. Following rebuilding and the removal of the Pacific whiting stock from overfished status, catches rebounded. In addition, markets for the stock improved leading to higher ex-vessel prices than seen previously. Historically, shoreside Pacific whiting activities generated their greatest revenue in 2006.

While the Pacific whiting fishery has grown in importance in recent years, harvests in the nonwhiting component of the fishery have declined steadily since the 1980s. Ex-vessel revenues in the fishery peaked in the mid 1990s at over $60 million. Following the passage of the SFA (1996) and the listing of several species as overfished, harvests became increasingly restricted, and landings and revenues declined steadily until 2002. Since 2002, ex-vessel revenues have stabilized at around $23 million to $27 million per year.

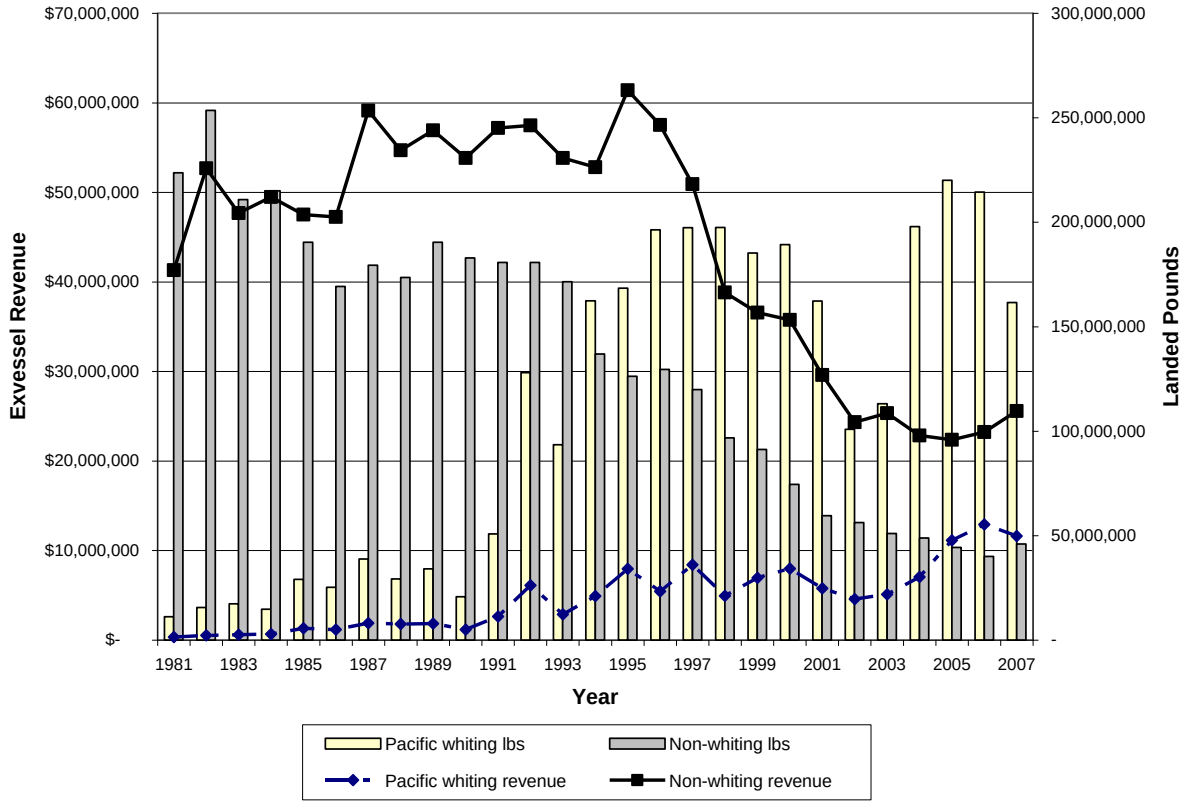


Figure 3-14. Shoreside landed pounds and ex-vessel revenue from whiting and nonwhiting groundfish caught using trawl gear.

The type of species landed shoreside in the trawl fishery has changed over the years. Rockfish were historically an important component of trawl fishery harvests, but have declined due to decreasing abundance of several rockfish species and regulations put in place to protect depleted rockfish stocks. While rockfish landings were declining, whiting harvests increased. Whiting comprises the single largest species harvested in the fishery by volume. Flatfish harvests have not fluctuated as widely as rockfish landings, but have increased in importance as their share of total fishery harvests have grown. Roundfish landings have declined over time as species like lingcod were subject to restrictive management measures to foster their rebuilding and to protect depressed rockfish stocks that are caught in conjunction with lingcod. Sablefish remains the single most important roundfish species to the trawl fishery, outside of Pacific whiting.

Table 3-28. Shoreside landings of nontribal trawl-caught groundfish by species aggregation and year.

	Landed weight (mt)				
Year	Flatfish	Rockfish	Roundfish (nonwhiting)	Shark	Pacific whiting
1981	25,742	53,790	9,333	248	827
1982	32,525	54,856	14,120	117	1,022
1983	29,637	41,536	11,200	51	1,035
1984	27,578	34,029	12,079	254	2,719
1985	30,537	30,422	10,495	214	3,890
1986	26,456	27,936	8,155	97	3,420
1987	28,485	31,749	10,499	105	4,788
1988	26,749	34,277	10,583	141	6,865
1989	29,699	38,130	10,297	90	7,353
1990	27,596	36,112	8,269	355	8,112
1991	30,410	28,606	9,343	699	20,597
1992	24,757	29,145	8,419	930	56,125
1993	22,032	31,250	7,596	859	42,112
1994	17,396	26,729	5,707	1,059	73,615
1995	18,314	25,298	5,082	363	75,034
1996	20,504	24,371	5,457	203	85,082
1997	20,410	20,360	5,271	346	87,409
1998	16,475	16,559	2,634	467	87,826
1999	20,108	11,691	3,463	475	83,418
2000	17,265	9,961	2,818	329	85,854
2001	14,729	6,202	2,746	348	73,411
2002	13,161	4,216	2,226	467	45,723
2003	14,610	2,790	3,198	201	51,255
2004	13,234	2,345	3,378	156	89,655
2005	14,266	1,919	3,011	223	97,630
2006	12,890	1,978	2,773	122	97,269
2007	15,631	2,471	2,524	109	73,283

Source: PacFIN ftl table. July 2008.

Trawlers catch a wide range of species. By weight, the following species account for the bulk of nonwhiting landings: Dover sole, sablefish arrowtooth flounder, petrale sole, English sole, longspine thornyhead, skates, Pacific cod, rex sole, and shortspine thornyhead. Management measures intended to reduce the directed and incidental catch of overfished rockfish and other depleted species have significantly reduced rockfish catches in recent years substantially below historical levels.

Table 3-29. Landings of Nonwhiting Groundfish by 10 Largest Species and Year

Species	2001	2002	2003	2004	2005	2006	2007	Total
Dover sole	6,678	5,937	6,930	6,414	6,742	5,729	8,958	47,388
Sablefish	2,369	1,433	2,105	2,226	2,202	2,318	2,356	15,010
Arrowtooth	2,470	2,081	2,302	2,246	2,081	1,723	2,042	14,944
Petrale	1,784	1,729	1,877	1,829	2,668	2,564	2,194	14,645
English sole	1,370	1,427	1,050	1,118	1,033	1,010	629	7,636
Longspine thornyhead	1,155	1,819	1,449	716	638	748	801	7,326
Skate	1,222	654	1,215	621	823	923	946	6,404
Pacific cod	422	826	1,099	1,158	765	376	54	4,701
Rex sole	551	581	582	492	566	522	541	3,834
Shortspine thornyhead	405	554	557	497	473	499	775	3,762

Both nonwhiting and whiting landings and revenues in Oregon are significantly larger than the other two states (Table 3-30). Washington is the home of a large portion of the at-sea whiting fleet, making Washington's participation in trawl fisheries substantial; however, at-sea fisheries are discussed later.

Table 3-30. Landed weight (mt) and ex-vessel revenue ($1,000s) by state and fishery sector, 2001-07.

	2001	2002	2003	2004	2005	2006	2007
California							
Non-Whiting							
Landed wt	7,473	7,187	6,380	5,499	5,594	5,003	6,130
Exvessel Rev	8,960	8,996	7,467	6,356	6,730	6,907	8,499
Pacific Whiting							
Landed wt	2,306	2,789	1,740	4,742	3,875	5,429	2,967
Exvessel Rev	171	275	170	641	427	632	385
Oregon							
Non-Whiting							
Landed wt	12,148	8,405	10,499	10,245	10,786	10,952	12,848
Exvessel Rev	14,679	10,065	12,863	11,371	12,168	13,830	15,105
Pacific Whiting							
Landed wt	53,376	32,305	36,581	59,075	61,463	61,319	42,801
Exvessel Rev	4,132	3,219	3,642	4,396	6,637	7,974	6,501
Washington							
Non-Whiting							
Landed wt	4,635	4,656	4,129	3,458	3,120	1,891	1,826
Exvessel Rev	4,232	3,723	3,569	3,127	3,173	2,273	1,888
Pacific Whiting							
Landed wt	17,730	10,630	12,934	25,838	32,238	30,520	27,514
Exvessel Rev	1,439	1,061	1,273	1,994	3,818	4,306	4,740

Source: PacFIN ftl data. July 2008

Limited entry trawlers take the vast majority of the groundfish harvest if measured by weight, but somewhat less if measured by value. In 2003, groundfish trawlers landed more than 95 percent of total groundfish harvest by weight but only 64 percent by value (Table 3-30). The difference between the weight and revenue shares is mostly due to the catch of Pacific whiting. Since whiting fetch a relatively low price and are caught almost exclusively by LE trawl vessels, they skew the overall value per unit weight for this sector.

Table 7-12. Shoreside nontribal trawl groundfish landings (mt) and ex-vessel revenue ($1,000s) by trawl type, state, and year.

	2001	2002	2003	2004	2005	2006	2007
Bottom Trawl							
California							
Landed wt	6,996	7,089	6,370	5,459	5,558	4,967	6,108
Exvessel Rev	8,457	8,888	7,460	6,321	6,700	6,876	8,483
Oregon							
Landed wt	10,012	7,942	10,459	10,077	10,613	10,857	12,735
Exvessel Rev	12,540	9,657	12,805	11,274	12,003	13,744	15,002
Washington							
Landed wt	3,777	4,330	4,121	3,338	2,919	1,725	1,571
Exvessel Rev	3,402	3,421	3,559	3,044	3,053	2,149	1,742
Midwater Trawl							
California							
Landed wt	2,782	2,886	1,750	4,781	3,911	5,464	2,990
Exvessel Rev	674	383	177	676	457	663	401
Oregon							
Landed wt	55,516	32,772	36,621	59,243	61,636	61,414	42,914
Exvessel Rev	6,276	3,633	3,701	4,493	6,801	8,060	6,604
Washington							
Landed wt	18,848	14,670	13,071	25,972	32,633	30,687	27,769
Exvessel Rev	2,355	1,770	1,311	2,079	3,954	4,429	4,886

Source: PacFIN FTL table. July 2008

Table 3-31. Shoreside groundfish landings (mt) and revenue ($1,000s) by trawl and nontrawl vessels, 2001-07. Trawl portion of total landings and revenue shown in parenthesis.

	2001	2002	2003	2004	2005	2006	2007
Non-Trawl							
Landed wt	4,614	3,806	4,192	4,231	4,658	4,324	3,698
Exvessel rev	18,355	14,613	17,952	17,239	19,780	20,775	18,286
Trawl							
Landed wt	100,723 (96%)	71,776 (95%)	79,436 (95%)	119,899 (97%)	133,106 (97%	145,716 (97%)	104,887 (97%)
Exvessel rev	35,497 (66%)	29,437 (67%)	31,938 (64%)	31,525 (65%)	36,051 (65%)	40,598 (66%)	39,688 (68%)

Source: PacFIN ftl data. July 2008

Shore-based trawl vessels deliver their catch to processors and buyers located along the coasts of Washington, Oregon, and California and tend to have their homeports located in towns within the same general area where they make deliveries, though there are several cases of vessels delivering to multiple ports during a year. Larger vessels in the shore-based LE trawl sector focus more heavily on the DTS complex in deep water and on Pacific whiting, while smaller trawl vessels focus more heavily on the shelf, in part due to technical constraints (smaller vessels are not able to trawl at deeper depths). Large trawl vessels also tend to participate in the trawl fishery for more months of the year than small trawl vessels, presumably due to a greater ability to fish during more hazardous winter months. Shore-based vessels range in size from less than 40 feet to over 90 feet in length (Table 3-32). Figure 3-15 shows the average number of vessels by state and length category, 2004 to 2007, which is the period after the vessel buyback program. It can be seen that the trawl vessels making landings are smaller overall in California than those in Oregon. Washington has fewer trawl vessels on average and a more even distribution in terms of length.

Table 3-32. Count of trawl vessels making landings by state, year, and vessel length (feet), 2001-07.

	2001	2002	2003	2004	2005	2006	2007
Washington							
<41	1	1	1	1	1		
41-50	8	7	6	5	5	4	5
51-60	8	8	7	5	5	5	7
61-70	9	10	9	5	5	6	1
71-80	12	8	8	3	4	6	8
81-90	1	2	1	3	5	6	6
>90	1	1	2	2	2	3	3
Oregon							
<41	4	3	3	3	3	2	2
41-50	11	9	9	9	9	10	11
51-60	20	18	17	10	10	14	13
61-70	40	38	39	25	26	26	28
71-80	26	26	25	19	19	20	21
81-90	8	7	9	8	7	6	6
>90	2	1	1	1	1	3	3
California							
<41	21	19	14	11	13	10	12
41-50	37	39	34	14	14	17	17
51-60	32	37	35	20	19	17	17
61-70	27	27	21	13	13	10	9
71-80	13	11	9	9	7	11	11
81-90	2	2	2	1	1	1	1
>90	1				1	1	

Source: PacFIN ftl, ft, and cg tables. July 2008.
Note: Not unique records and should not be summed.

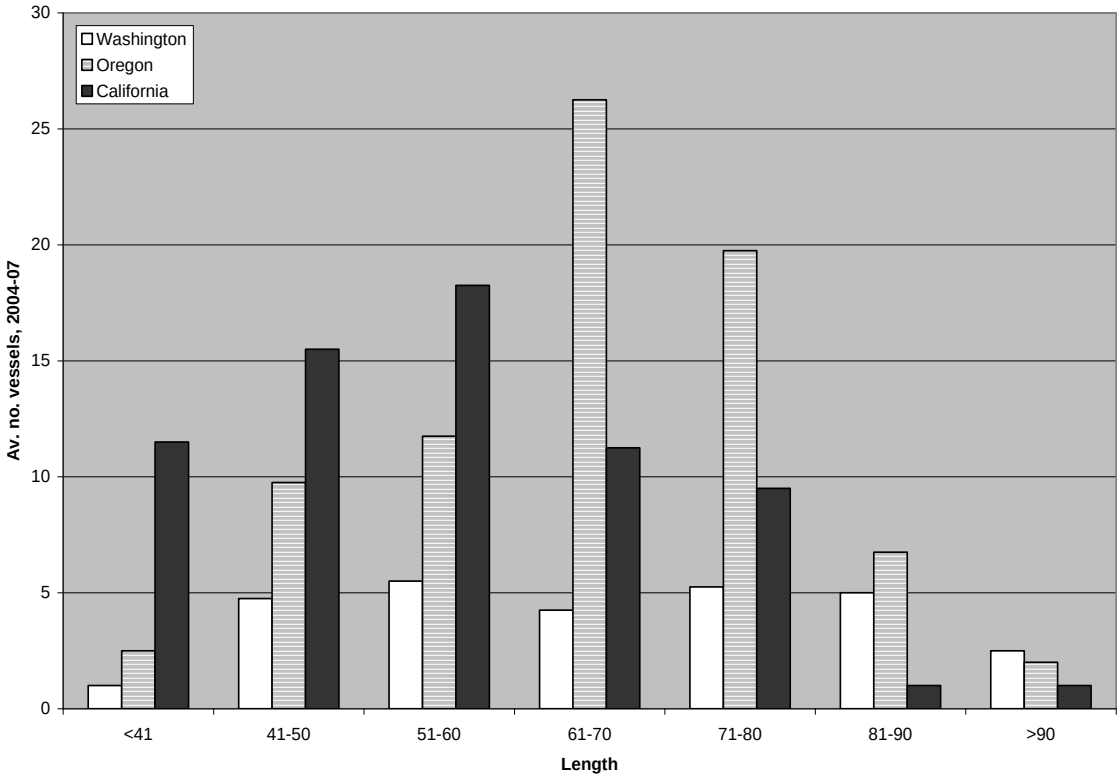


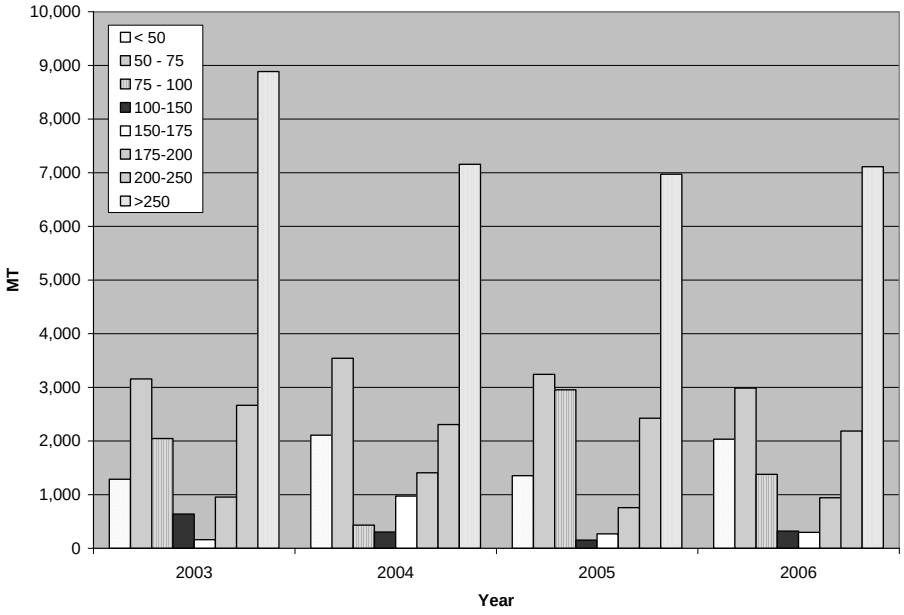
Figure 3-15. Average number of vessels 2004-07, by state and length category.

Trawl vessels fish a wide range of depths. In recent years, the trawl RCA has consistently restricted access to depths between 100 and 150 fathoms, and has, at times, restricted areas deeper and shallower depending on various factors. Nonwhiting groundfish vessels fish in depths as shallow as 10 fathoms and as deep as 600 fathoms. In recent years, the largest volume of retained catch has come from deeper than 250 fathoms (Table 3-33, Figure 3-16). Shoreside Pacific whiting vessels fish in a relatively more concentrated area, but still fish a wide range of depths. The majority of Pacific whiting is harvested in areas between 50 and 150 fathoms.

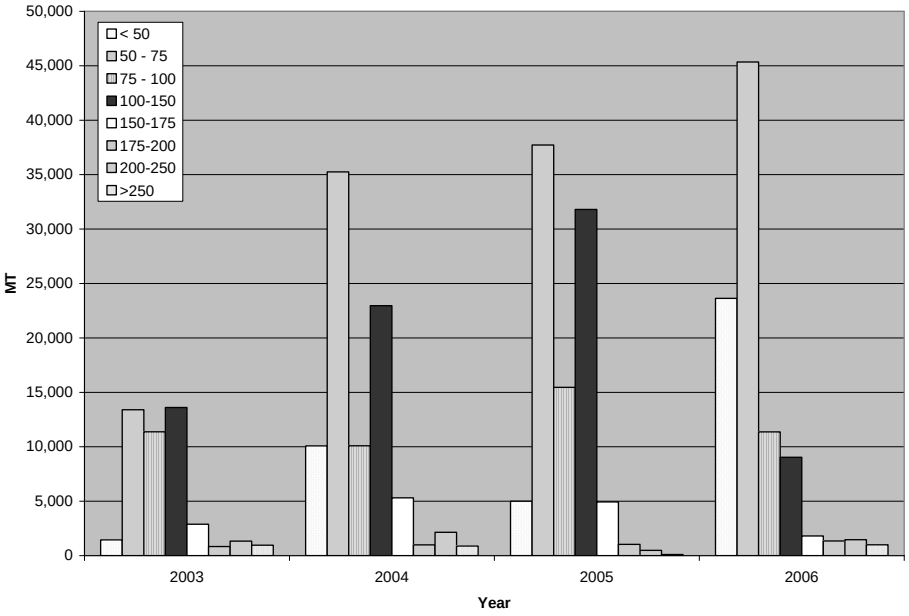
Table 3-33. Retained catch of groundfish by species type, depth, and year.

Species	Depth range	Landed MT by Year			
		2003	2004	2005	2006
Non-Whiting Groundfish	< 50	1,285.7	2,106.7	1,353.4	2,032.1
	50 - 75	3,155.8	3,540.2	3,241.3	2,985.0
	75 - 100	2,045.1	431.3	2,953.3	1,377.1
	100-150	637.5	302.8	152.6	319.2
	150-175	160.3	972.7	268.5	295.9
	175-200	954.9	1,407.0	757.2	941.4
	200-250	2,664.7	2,306.3	2,423.1	2,184.6
	>250	8,885.0	7,156.6	6,971.5	7,110.8
Pacific Whiting	< 50	1,447.3	10,076.1	4,995.3	23,630.7
	50 - 75	13,402.0	35,248.8	37,718.8	45,339.4
	75 - 100	11,369.6	10,083.8	15,459.0	11,360.8
	100-150	13,602.4	22,959.3	31,797.9	9,028.9
	150-175	2,880.2	5,305.4	4,930.4	1,807.4
	175-200	836.9	989.9	1,031.8	1,344.5
	200-250	1,333.4	2,142.5	483.9	1,461.7
	>250	959.5	881.7	100.5	997.0

Source: PacFIN logbook data. November 2007.



a. Nonwhiting landings



b. Whiting landings

Figure 3-16. (a) Nonwhiting and (b) whiting landings, mt, by depth (feet), 2003-06.

Trawl vessels harvest groundfish species across a wide array of latitudinal areas. In general, the LE trawl fleet operates north of Point Conception to the U.S./Canada border. Midwater trawl vessels concentrate in a relatively smaller area, because of the geographic distribution of Pacific whiting, which are more abundant off Oregon and Washington. Historically midwater trawlers targeted other species, such as yellowtail and widow rockfish, but opportunities for those species were eliminated to foster the rebuilding of widow and canary rockfish (a species often caught in conjunction with yellowtail).

Table 3-34. Latitudinal distribution of retained trawl catch (mt), 2003-06.

		Year			
Gear	Latitude Area	2003	2004	2005	2006
Bottom Trawl	34° 27' to 36°	716	628	388	126
	36° to 38°	1,312	1,589	1,111	840
	38° to 40° 10'	1,594	1,497	1,329	1,185
	40° 10' to 42°	3,113	1,758	2,548	2,744
	42° to 44°	2,975	2,480	2,637	3,051
	44° to 46°	2,660	2,233	2,438	2,820
	46° to 48°	3,927	4,915	4,914	4,783
	48° to US/CAN	3,737	3,029	2,539	1,549
Midwater Trawl	34° 27' to 36°				
	36° to 38°				
	38° to 40° 10'	C	C		C
	40° 10' to 42°	1,038	4,695	3,870	5,228
	42° to 44°	1,888	3,977	4,848	20,294
	44° to 46°	26,025	51,129	47,471	25,646
	46° to 48°	17,432	21,528	24,902	43,008
	48° to US/CAN	133	7,299	16,134	2,062

Source: PacFIN logbook data. November 2007

The trawl fishery harvests a variety of species at various times of the year. In recent years, petrale sole has made up the bulk of the January and February trawl fishery with Dover sole and sablefish also playing a large role during those months. From March through May, the strategy referred to as the "DTS strategy" (Dover sole, thornyheads, and sablefish) is the focus of trawl effort. Beginning in May and June, target species typically begin transitioning from deeper depths along the continental slope and deep portions of the shelf to shallower portions of the shelf, and effort in the fishery follows suit. In addition, weather becomes more favorable and smaller trawl vessels begin operating more frequently. From May through October, the fishery targets species such as "other flatfish," Dover sole, and petrale sole along the continental shelf, while other vessels choose to prosecute pink shrimp during those months. On June 15, the primary season for the shoreside whiting fishery opens, and many trawlers focus on that species in June, July, and often into August, depending on the length of the fishery. In November and December, many trawl vessels transition over to the Dungeness crab fishery, but several trawlers remain in the fishery and target petrale sole and some DTS species (Figure 3-17).

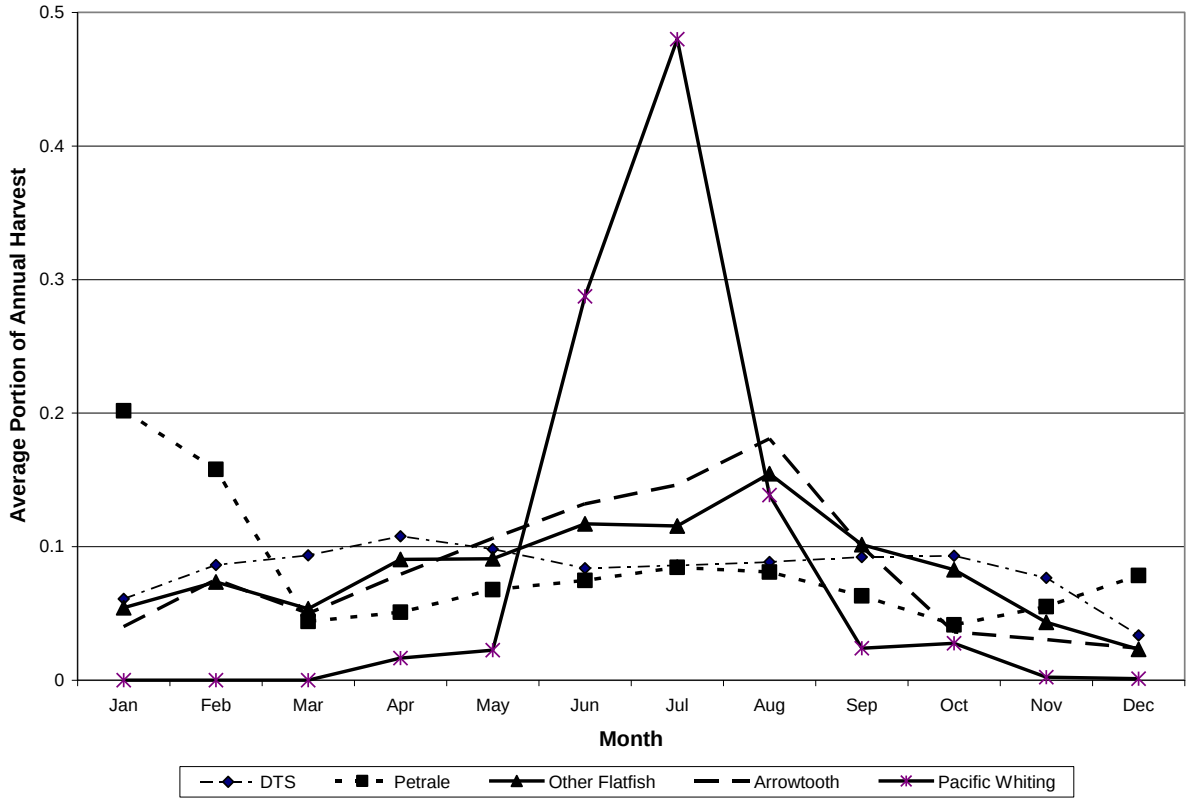


Figure 3-17. Seasonal distribution of shoreside target species landings (average 2001-07).

In 2003, a fishing capacity reduction program (buyback) was implemented off the west coast, which retired 91 vessels from the LE trawl sector. These 91 vessels represented less than 40 percent of the number of boats actively engaged in the LE trawl sector, but approximately 50 percent of historic catch. The purpose of the program was to reduce the number of vessels and permits endorsed for the operation of groundfish trawl gear to increase and stabilize economic revenues for vessels remaining in the groundfish fishery and to conserve and manage depleted groundfish species. Vessels that participated in the buyback program were sold, scrapped, or converted to nonfishing purposes, and those vessels cannot be used for fishing again.

The impact of the trawl vessel buyback appears to have been positive in terms of ex-vessel revenue per vessel, specifically for nonwhiting trawl vessels. Average trawl ex-vessel revenues generated by nonPacific whiting groundfish increased from approximately $108,000 to $151,000 between 2003 and 2004, even though total ex-vessel revenues for the fleet decreased from approximately $25,000,000 to $22,000,000 during the same period (Figure 3-18). Average bottom trawl revenues per vessel appear to have consistently remained higher than the amount of revenue generated prior to the buyback. Based on the difference between pre- and post-average revenues per vessel, the buyback appears to have increased average revenue per vessel by somewhere on the order of $50,000 per year.

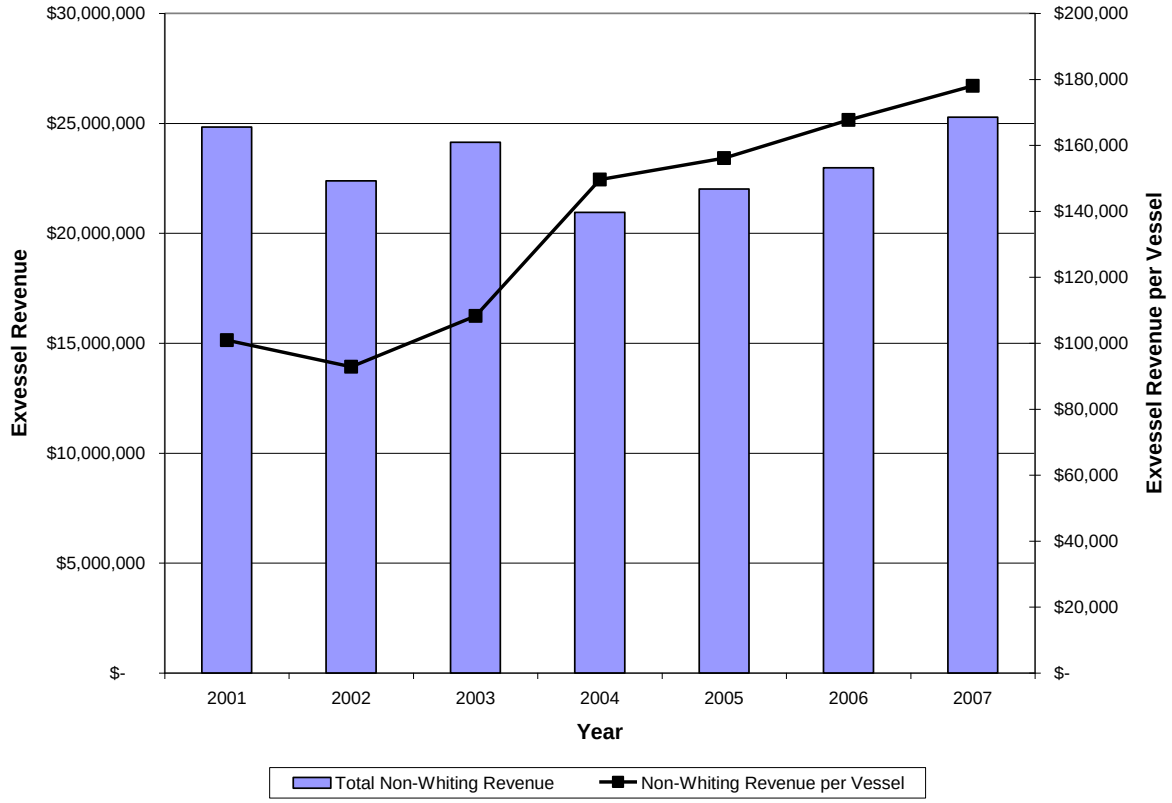
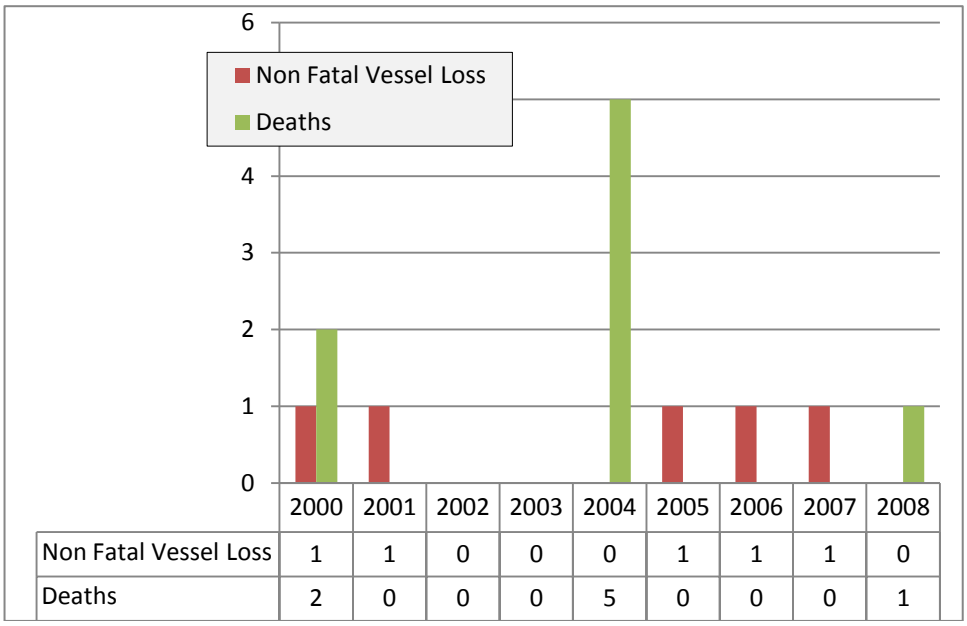


Figure 3-18. Average annual LE trawl ex-vessel revenues per year (excluding catch of Pacific whiting).

Net revenues for nonwhiting trawl vessels were estimated by Lian, Singh, and Weninger in 2008 (Lian, *et al.* 2008). Estimates of net revenues were generated using a cost earnings survey conducted by the NWFSC, which collected cost data from trawlers operating in 2004. These cost earnings data were matched with PacFIN fish ticket data to derive estimates of net revenue generated by vessels active in the fishery during 2004. These estimates indicate that the average nonwhiting trawl vessel makes zero economic profit. Simply put, zero economic profit means that there are no profits being generated in the fishery above what would be considered a normal wage plus the costs of operating and maintaining a vessel. While the average vessel makes close to zero economic profit, some vessels do make profits, while others may actually lose money and would be better off (financially speaking) leaving the fishery.

3.6.5 Fishing Vessel Safety

The National Institute for Occupational Safety and Health provided descriptive statistics on fishing vessel injury and loss from 2000 to 2008. Figure 3-19 shows nonfatal vessel losses and fishing-vessel-related deaths during this period. Five of the deaths were due to vessel loss in two incidents, two resulted from onboard injury and one from a fall overboard. Contributing factors to vessel loss were flooding, weather conditions, the vessel capsizing, vessel instability, and being struck by a large wave. The most common contributing factor, flooding (five instances), was due to capsizing, water entering over gunnels, hull breach, and unsealed hatch. Hauling back a heavy net was cited as a cause of one of the three instability instances. This suggests that weather and vessel condition were important factors in vessel loss, with vessel operation (e.g., instability due to overloading) also contributing. Of the nonfatal vessel losses, four were steel hulled, and the other was wood. They ranged in age from 22 to 103 years old.



	2000	2001	2002	2003	2004	2005	2006	2007	2008
Non Fatal Vessel Loss	1	1	0	0	0	1	1	1	0
Deaths	2	0	0	0	5	0	0	0	1

Figure 3-19. Nonfatal vessel loss and deaths in the west coast groundfish trawl fishery, 2000-08 (source: NIOSH).

3.7 Captain and Crew

Limited entry trawlers often use several crew members, and sometimes a hired captain, to assist in trawl operations. Although data are not captured on west coast crew members, anecdotal information and industry input are available to describe crew conditions and the number of jobs that exist on the west coast.

The Fishermen's Marketing Association (FMA) (P. Leipzig, pers. comm., Executive Director, FMA, August 2008) reports that west coast trawlers in the 1980s may have operated with two to three crewmembers and a captain. Larger-than-average vessels (vessels exceeding 80 feet) would often operate with a captain and three to four crewmembers. Over time, revenues generated by trawl vessels declined and crew wages and employment followed suit. Immediately prior to the 2003 buyback, many small boat owners operated their vessel independently without crew, presumably because they could not afford to pay crewmembers a share. Other vessel owners would work together by crewing for one another with one captain operating as a crewmember on another's vessel and vice versa. Following the buyback, average vessel revenues improved, and many nonwhiting operations currently operate with one captain and two crewmembers.

Captain and crew wages typically are issued based on a share of vessel productivity with adjustments for certain cost items. Captain and crew shares are based on the skill and experience of specific captain and crew. Those with greater skill and experience receive a larger percentage, and those with less skill and experience receive a smaller percentage.

Based on information from industry representatives, the type of crew compensation system varies somewhat across vessels. Many vessels compensate crew after calculating an adjusted gross revenue value which takes into account the cost of fees (to the Oregon Trawl Commission [OTC] and FMA), the cost of fuel, and the cost of groceries. The share paid to crew can vary from 8 percent of adjusted gross to 12 percent of adjusted gross, with exceptional crew fetching up to 15 percent of adjusted gross. Hired captains are also paid according to the adjusted gross revenue scale, but fetch higher shares. Captains may receive 17 to 25 percent (P. Leipzig, pers. comm., Executive Director, FMA, August 2008). The

following table illustrates information received from industry representatives, which can be used to generate order of magnitude estimates regarding crew wages under status quo conditions and under rationalized fishery conditions. This information shows that the cost of fuel under current conditions may range from 30 to 40 percent of gross, the cost of FMA fees is 1.3 percent of gross, and the cost of OTC fees is 0.5 percent of gross, meaning adjusted gross revenues may be 68.2 to 58.2 percent of actual gross (before subtracting groceries, for which no information was readily available). Crew shares range from 8 to 15 percent of adjusted gross, and hired captain shares may range from 17 to 25 percent of gross.

Table 3-35. Select itemized costs incurred by trawl vessel owners.

	Low	High
Fuel	30%	40%
FMA	1.30%	1.30%
OTC	0.50%	0.50%
100% minus subtotal	68.2%	58.2%
Crew	8%	15%
Captain	17%	25%

Source: P. Leipzig, pers. comm., Fishermen's Marketing Association, 2008.

By assuming two crewmembers and one captain, the information shown above indicates that the total share of unadjusted gross revenue received by captain and crew may range from approximately 20 to almost 40 percent. Captain and crew may receive 20 percent of unadjusted gross if the vessel incurs high fuel costs, but pays relatively low shares. Captain and crew may receive almost 40 percent of gross if the vessel incurs low fuel costs, but pays relatively high shares. Using this information enables estimating the wages made by captain and crew under status quo conditions by fishery (Table 3-35).

Table 3-36. Estimated compensation to hired captain and crew by fishery.

Fishery	Total Captain and Crew Wages (sum of all captain and crew per vessel)
Shoreside Whiting	$69,000-$161,000
Mothership Whiting	$64,500-$150,000
Nonwhiting	$39,300-$78,600

3.8 Nontrawl Commercial Groundfish Harvesters

3.8.1 Limited Entry Fixed-gear

Limited entry fixed-gear vessels use pot and hook and line gear to target species such as sablefish, nearshore rockfish, and thornyheads. Limited entry fixed-gear vessels comprise an important component of the groundfish fishery, though landings and revenues from this sector are generally smaller than in the trawl sector (Table 3-37). Since 1996, revenues in the fishery have ranged from a high of more than $22 million to a low of more than $10 million. Landings have ranged from nearly 12 million pounds to nearly 7 million pounds. Vessels using hook-and-line gear take the majority of the catch in the LE fixed-gear sector.

Table 3-37. Landings (mt) and revenue ($) by year for LE groundfish longline and pot gear.

Gear Group	Year	Landed weight (mt)	Exvessel revenue
Hook and Line	1996	4,408	14,141,815
	1997	4,482	18,655,655
	1998	3,096	8,050,076
	1999	3,577	11,841,126
	2000	3,266	12,519,786
	2001	2,662	10,488,604
	2002	2,449	8,169,857
	2003	2,445	10,726,402
	2004	2,612	11,022,205
	2005	2,923	12,736,843
	2006	2,558	12,995,531
	2007	2,350	11,546,844
Pot	1996	906	4,332,043
	1997	663	3,632,514
	1998	640	2,192,048
	1999	1,076	4,251,561
	2000	1,084	5,452,868
	2001	800	3,852,837
	2002	544	2,717,393
	2003	831	4,816,160
	2004	1,057	4,082,840
	2005	1,134	4,815,701
	2006	1,052	5,268,140
	2007	752	3,909,372

Source: PacFIN vfcmrfd table. July 2008

By weight, sablefish, dogfish, northern slope rockfish, shortspine thornyhead, and blackgill rockfish comprised the largest species landed by LE fixed-gear vessels from 2003 through 2007 (Table 3-38). Prior to 2003, the harvest of many types of rockfish species was much larger, as was harvest of species like grenadiers and lingcod.

Table 3-38. Landings (mt) and revenue ($) by species in the LE groundfish fixed-gear sector.

2003 thru 2007			1996 thru 2002		
Species	Avg annual landed weight (mt)	Avg Annual exvessel revenue	Species	Avg annual landed weight (mt)	Avg Annual exvessel revenue
Sablefish	1,970.6	10,351,700	Sablefish	2,748.1	13,259,250
Spiny Dogfish	251.4	123,100	Spiny Dogfish	282.1	121,774
Shortspine Thornyhead	109.0	753,066	Unsp. Rockfish	253.2	322,537
North. Unsp. Slope Rockfish	42.7	41,009	Grenadiers	174.0	55,358
Blackgill Rockfish	26.6	76,696	Canary Rockfish	84.9	165,443
Grenadiers	18.0	8,280	Blackgill Rockfish	50.1	98,956
Skate	14.7	7,401	Shortspine Thornyhead	79.9	350,460
Black Rockfish	12.8	46,099	Rougheye Rockfish	47.6	63,382
Lingcod	12.8	29,068	Longspine Thornyhead	40.5	151,103
Rougheye Rockfish	7.4	8,853	Yellowtail Rockfish	32.5	41,649
Longspine Thornyhead	7.1	39,384	Black Rockfish	31.3	53,058
North. Unsp. Shelf Rockfish	4.6	4,224	Shortspine Thornyhead	31.2	158,630
Thornyheads (Mixed)	4.5	27,074	Lingcod	30.4	62,996

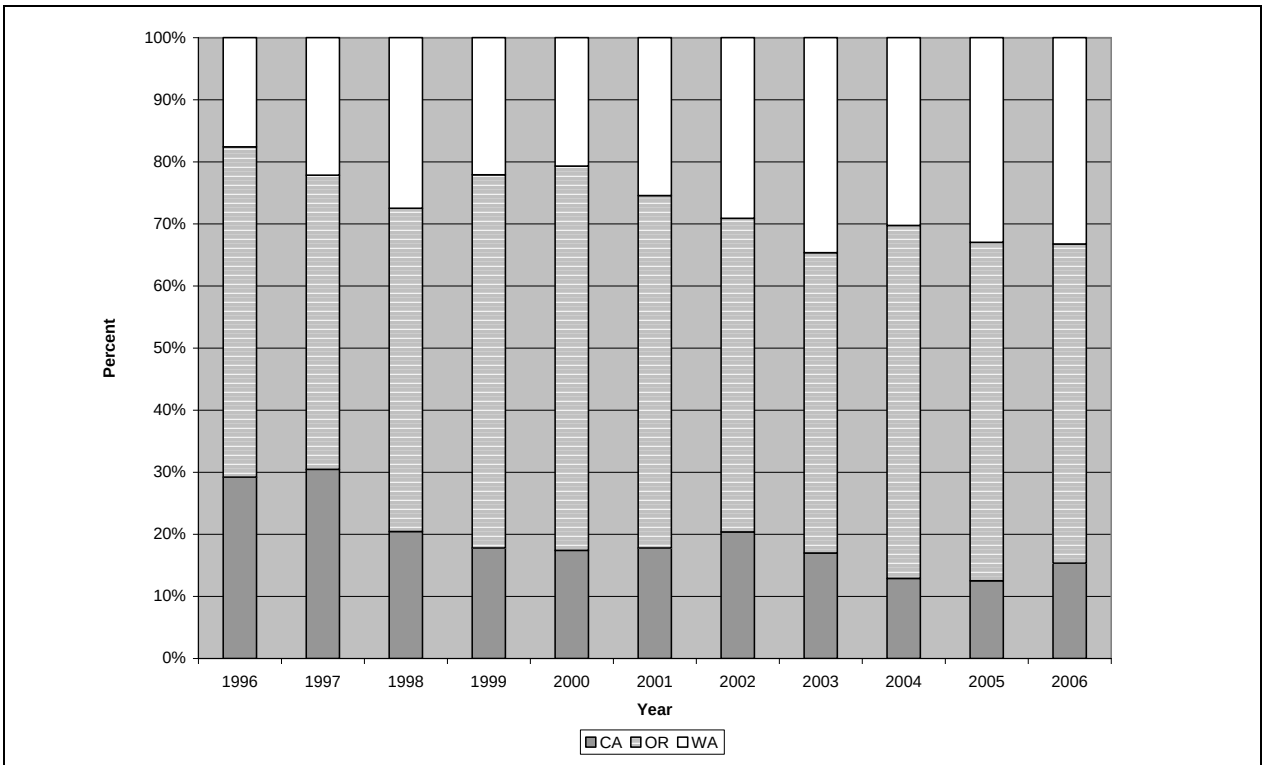
Source: PacFIN vfcmrfd table. July 2008

Limited entry fixed-gear vessels target different species along the coast (Table 3-39). Historically, much of the sablefish had been caught off the coast of California. With the implementation of the LE fixed-gear sablefish tier program, however, much of the sablefish catch migrated north out of California and into Washington and Oregon (Figure 3-20). Inversely, species such as shortspine thornyhead became targeted more heavily off California in the years following the sablefish tier program. As shown in the table below, LE fixed-gear vessels off California tend to target a more diverse set of species, while vessels off Oregon and Washington tend to focus heavily on sablefish and, in Washington, spiny dogfish.

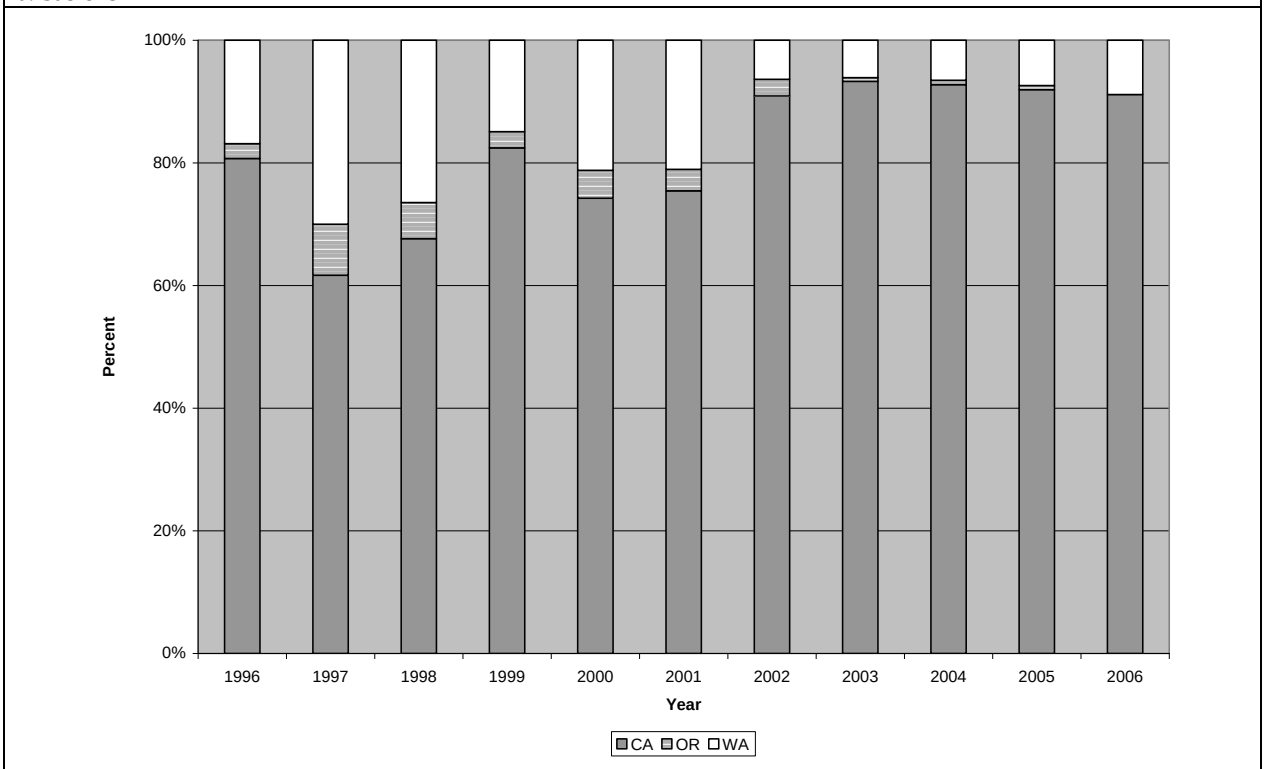
Table 3-39. Landings of select groundfish species in the LE fixed-gear sector by year and state (mt).

State	Species	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
CA	Blackgill Rockfish	111	66	85	18	18	9	44	71	8	23	35
	Lingcod	44	38	12	11	4	3	5	2	4	4	4
	Longspine Thornyhead	97	61	15	29	55	35	12	18	8	15	14
	Shortspine Thornyhead	67	37	46	94	49	43	100	153	128	137	144
	Sablefish	920	1,032	418	581	554	442	351	412	385	397	447
OR	Blackgill Rockfish	C	-	-	C	C	-	-	C	-	C	C
	Lingcod	22	50	27	29	15	17	10	8	9	10	13
	Longspine Thornyhead	C	C	C	C	C	1	C	C	C	C	-
	Shortspine Thornyhead	2	5	4	3	3	2	3	1	1	1	C
	Nor. Unsp. Slope Rockfish	-	-	-	-	18	11	10	6	6	5	6
	Sablefish	1,676	1,605	1,065	1,964	1,970	1,411	870	1,173	1,697	1,728	1,498
WA	Lingcod	C	5	1	13	8	10	5	4	6	9	10
	Longspine Thornyhead	C	1	C	C	C	-	C	C	C	-	-
	Shortspine Thornyhead	14	18	18	17	14	12	7	10	9	11	14
	Nor. Unsp. Slope Rockfish	-	-	-	-	62	25	50	26	52	74	70
	Spiny Dogfish	27	2	1	76	628	431	804	386	262	459	261
	Sablefish	554	750	562	721	658	632	501	840	903	1,045	968

Source: PacFIN vfcmrfd table. July 2008
Note: C indicates data are restricted due to confidentiality



a. Sablefish



b. Shortspine thornyhead

Figure 3-20. (a.) Sablefish and (b.) shortspine thornyhead landings by state, percent of total.

The number of vessels participating in the LE fixed-gear sector has generally declined, especially in recent years. Much of this decline can be attributed to the permit stacking provisions in the sablefish tier program that allow vessels to stack multiple sablefish endorsed fixed-gear permits on a single vessel.

This led to consolidation in the number of vessels participating in the fishery, but an increase in the revenue generated by the average vessel (Table 3-40).

Table 3-40. Groundfish LE fixed-gear landings (lb) and revenue ($) per vessel, by gear group and year.

Gear Group	Year	No. of Vessels	Landed weight per vessel (lbs)	Ex-vessel revenue per vessel
Hook and Line	1996	225	43,194	62,853
	1997	212	46,608	87,998
	1998	186	36,694	43,280
	1999	187	42,171	63,322
	2000	181	39,775	69,170
	2001	154	38,101	68,108
	2002	139	38,839	58,776
	2003	141	38,223	76,074
	2004	130	44,292	84,786
	2005	121	53,264	105,263
	2006	126	44,761	103,139
	2007	130	39,853	88,822
Pot	1996	60	33,279	72,201
	1997	65	22,479	55,885
	1998	58	24,309	37,794
	1999	52	45,604	81,761
	2000	59	40,491	92,421
	2001	43	41,013	89,601
	2002	37	32,425	73,443
	2003	29	63,198	166,074
	2004	26	89,601	157,032
	2005	23	108,724	209,378
	2006	24	96,673	219,506
	2007	20	82,919	195,469

Source: PacFIN vfcmrfd table. July 2008

Limited entry fixed-gear vessels range in size from less than 25 feet in length to more than 90 feet in length. The most common size category is between 30 and 60 feet (Table 3-41).

Table 3-41. Limited entry fixed-gear vessels making deliveries by length category (percent), gear type, and year.

Gear type	Length range	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Hook and Line	< 31	4%	5%	6%	5%	5%	5%	3%	7%	5%	1%	3%	5%
	31 to 40	36%	39%	39%	38%	37%	37%	37%	36%	37%	41%	37%	38%
	41 to 50	35%	32%	37%	33%	34%	37%	34%	33%	34%	32%	38%	30%
	51 to 60	16%	14%	11%	15%	19%	14%	18%	15%	17%	18%	11%	16%
	61 to 70	6%	8%	7%	10%	5%	6%	6%	7%	6%	7%	9%	8%
	71 to 80	2%	1%	0%	0%	0%	0%	0%	1%	0%	0%	0%	1%
	81 to 90	0%	1%	1%	1%	1%	1%	1%	1%	1%	0%	2%	1%
Pot	< 31	2%	0%	9%	8%	7%	6%	4%	13%	0%	0%	0%	0%
	31 to 40	33%	37%	25%	32%	41%	32%	19%	13%	28%	19%	21%	26%
	41 to 50	41%	33%	34%	32%	32%	35%	44%	35%	39%	50%	37%	37%
	51 to 60	14%	18%	20%	18%	15%	10%	19%	26%	11%	6%	21%	11%
	61 to 70	8%	8%	7%	11%	2%	13%	11%	4%	17%	13%	11%	16%
	71 to 80	2%	4%	2%	0%	0%	3%	4%	4%	0%	6%	5%	5%
	81 to 90	0%	0%	2%	0%	0%	0%	0%	4%	6%	6%	5%	5%
	> 90	0%	0%	0%	0%	2%	0%	0%	0%	0%	0%	0%	0%

Source: PacFIN vfcmrfd table. July 2008

3.8.2 Open Access

Open access vessels can be categorized into two types: vessels without Federal LE permits that (a) actively target groundfish or (b) are engaged in nongroundfish activities, but catch groundfish incidentally. While not technically "open access" fisheries, Oregon and California nearshore rockfish fisheries are included in this section.

Table 3-42 illustrates the weight and ex-vessel revenue of open access groundfish caught by gear type and year. This information shows that the open access sector landed much more groundfish prior to the year 2000, and that much of this catch occurred onboard vessels using trawl gear. Open access vessels using trawl gear include California halibut and sea cucumber trawl. The catch of many other gear types has also declined, including groundfish caught by shrimp trawl vessels, troll vessels, and vessels using net gear. The decline in shrimp trawl groundfish catch can largely be attributed to the introduction of excluder devices, which reduce the unintended bycatch of groundfish in that fishery. The catch of groundfish in net gear fisheries was reduced in large part due to regulations off the state of California, which restricted gillnet operations in particular. Two gear types that still have relatively sizeable take of groundfish in the open access sector include hook-and-line and pot gears—the two gear types used by directed open access participants.

Table 3-42. Landed weight (mt) and ex-vessel revenue ($) of open access groundfish landings by year and gear type.

		Hook and Line	Net	Pot	Troll	Trawl	Shrimp Trawl	Grand Total
1996	Landings (mt)	3,227.6	298.7	213.4	205.2	8,137.3	1,272.7	13,356.4
	Revenue ($)	7,070,621	399,430	829,989	241,279	5,208,590	1,170,689	14,923,554
1997	Landings (mt)	3,253.8	274.6	157.1	448.1	7,089.2	478.4	11,701.4
	Revenue ($)	7,660,022	353,084	732,851	494,458	4,775,819	492,575	14,509,117
1998	Landings (mt)	2,379.9	347.5	95.4	284.4	8,697.6	439.8	12,248.3
	Revenue ($)	5,781,414	390,125	506,424	308,968	5,485,113	474,019	12,949,323
1999	Landings (mt)	1,554.9	101.6	80.5	84.0	7,719.0	457.2	9,997.5
	Revenue ($)	5,479,393	163,323	442,295	118,239	5,029,896	504,516	11,739,060
2000	Landings (mt)	1,033.1	53.7	175.4	37.1	72.7	312.0	1,684.4
	Revenue ($)	4,792,748	93,883	902,780	73,732	113,534	472,111	6,450,000
2001	Landings (mt)	1,085.6	62.2	163.2	28.3	168.1	195.3	1,702.7
	Revenue ($)	4,936,922	111,447	803,523	52,042	190,214	298,672	6,393,303
2002	Landings (mt)	1,211.6	51.4	147.2	16.4	14.6	99.3	1,543.1
	Revenue ($)	5,671,205	97,175	751,377	37,689	30,710	147,112	6,760,496
2003	Landings (mt)	1,272.8	61.5	226.7	16.1	6.8	14.1	1,598.7
	Revenue ($)	5,264,571	113,848	1,001,541	34,665	11,443	40,470	6,474,754
2004	Landings (mt)	1,316.8	54.4	209.0	27.0	33.7	16.1	1,658.6
	Revenue ($)	5,275,884	122,297	793,269	56,275	85,345	46,683	6,382,683
2005	Landings (mt)	1,480.4	44.5	438.3	25.5	72.3	15.9	2,079.3
	Revenue ($)	6,845,249	83,099	1,588,790	59,256	50,540	59,639	8,692,616
2006	Landings (mt)	1,292.6	51.8	521.6	14.3	7.9	19.3	1,907.6
	Revenue ($)	6,124,879	115,329	2,230,218	43,212	20,717	53,558	8,588,637
2007	Landings (mt)	974.3	41.2	268.7	19.3	54.8	24.2	1,383.1
	Revenue ($)	5,567,788	99,159	1,069,820	76,002	68,336	44,831	6,934,527

Source: PacFIN vfcmrfd table. July 2008

The number of vessels landing open access groundfish has generally declined since the mid-1990s. For some gear groups, the decline has been fairly substantial, while the decline has been apparent for others, but less substantial. The number of shrimp trawl vessels, troll vessels, trawl vessels, and pot vessels has declined fairly substantially, while the number of hook-and-line and pot vessels has been noticeable, but to a lesser degree.

Table 3-43. Count of vessels making open access landings of groundfish by year and gear group.

	Hook and Line	**Net**	**Pot**	**Troll**	**Trawl**	**Shrimp Trawl**
1996	1,274	97	275	496	87	140
1997	1,327	104	291	495	71	135
1998	1,081	87	201	400	84	126
1999	1,010	104	169	358	92	118
2000	888	100	184	336	42	113
2001	778	78	160	288	43	91
2002	768	70	176	235	41	78
2003	720	57	154	225	26	34
2004	646	55	110	276	17	33
2005	642	46	158	254	16	31
2006	673	52	245	155	13	23
2007	644	57	180	151	19	13

Source: PacFIN vfcmrfd table. July 2008

Open access vessels that make a directed effort at groundfish widely use hook-and-line and pot gear (Table 3-44). In past years, vessels made directed efforts on many types of rockfish species, lingcod, and sablefish, among others. In more recent years, however, directed effort has been largely focused on nearshore rockfish species (the state managed nearshore fisheries) and sablefish (Figure 3-21).

Table 3-44. Weight (mt) of select groundfish species landed by open access vessels using hook-and-line or pot gear.

	Slope Rockfish	Nearshore Groundfish	Shelf Rockfish	Lingcod	Sablefish	Spiny Dogfish	Grenadiers
1996	221.6	848.8	927.9	308.6	637.6	54.8	241.8
1997	127.4	923.3	981.1	351.4	536.2	163.2	85.4
1998	128.5	853.1	1,011.1	111.6	164.7	0.2	16.7
1999	21.6	772.2	381.8	102.9	253.4	9.6	30.0
2000	20.3	557.9	88.4	46.4	428.4	3.1	41.7
2001	17.8	622.1	56.1	74.9	427.5	2.2	16.1
2002	45.4	701.6	20.5	99.7	423.0	8.4	35.1
2003	56.6	493.0	13.0	97.0	703.6	88.0	33.3
2004	33.0	545.3	24.0	108.7	570.2	172.6	50.3
2005	38.9	496.7	22.5	100.4	1,194.6	6.6	31.3
2006	36.3	438.8	32.3	102.9	1,053.6	119.8	7.3
2007	19.6	470.5	37.4	109.3	571.5	2.1	7.5

Source: PacFIN vfcmrfd table. July 2008

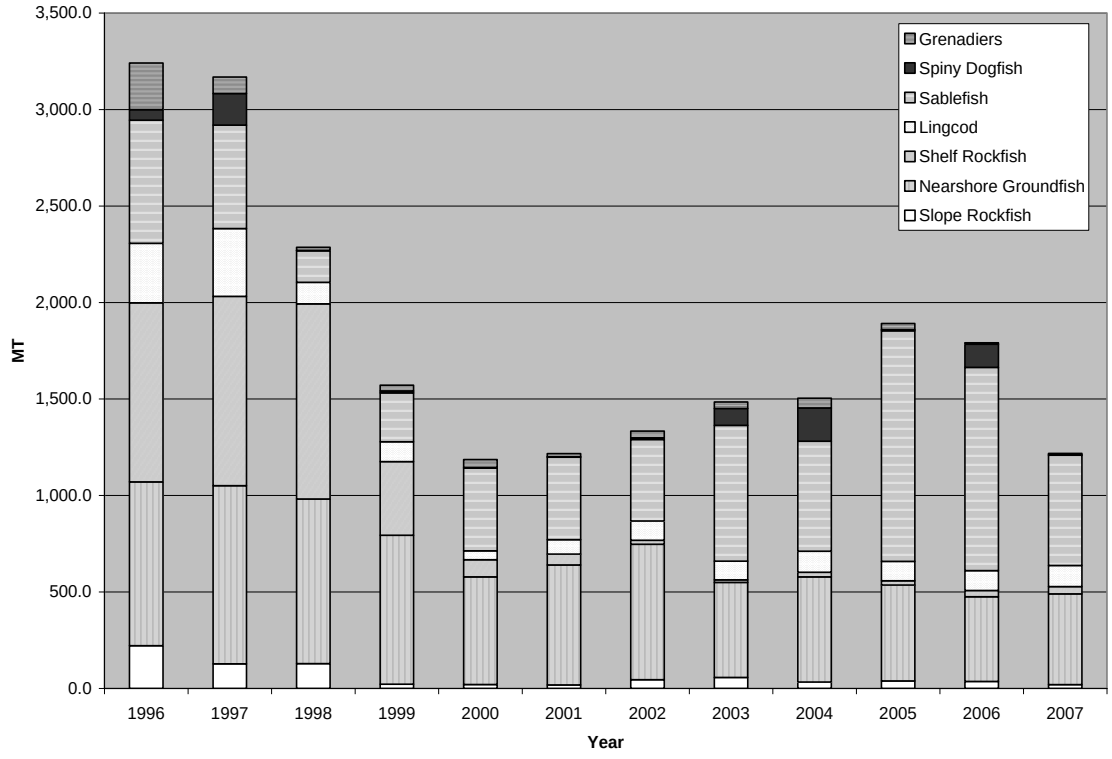


Figure 3-21. Weight (mt) of select groundfish species landed by open access vessels using hook-and-line or pot gear.

3.8.3 Nongroundfish Harvesters

Harvesters target many other types of species in addition to groundfish (Table 3-45). Other types of species include coastal pelagic species (CPS), crab, HMS, salmon, shellfish, shrimp, and other species that do not necessarily fall under these categories. Such other species include many groundfish-like species such as Pacific halibut, California halibut, croaker, and California sheephead. Of these nongroundfish groupings, crab is typically the largest grouping by value, while CPS are typically the largest group by volume.

Table 3-45. Landings (mt) and ex-vessel revenue ($) of nongroundfish species groups, 1995-2007.

		Coastal Pelagic	Crab	Highly Migratory	Other	Salmon	Shellfish	Shrimp
1995	Landings	128,739	19,802	18,613	16,809	15,711	21,201	12,946
	Revenue	38,072,518	72,479,070	28,133,079	46,132,360	26,814,810	99,756,235	23,718,023
1996	Landings	136,617	27,421	29,052	15,768	9,946	45,740	15,571
	Revenue	43,409,706	83,639,398	45,863,486	42,297,793	18,310,425	213,499,470	25,369,113
1997	Landings	151,482	15,986	25,905	14,582	13,828	50,722	19,430
	Revenue	44,768,437	67,299,467	40,793,457	42,126,056	24,145,280	252,829,260	24,270,038
1998	Landings	74,819	15,012	28,603	10,696	8,890	45,418	6,282
	Revenue	10,194,529	59,513,944	39,990,490	28,316,943	16,146,278	232,675,766	15,079,765
1999	Landings	171,140	18,918	16,865	11,452	5,932	19,769	14,868
	Revenue	43,243,651	82,638,200	33,107,613	34,009,381	14,922,845	107,600,680	21,317,512
2000	Landings	226,076	16,922	13,549	11,829	9,785	58,797	16,756
	Revenue	42,246,749	78,665,557	32,981,595	36,037,729	25,010,479	286,033,739	21,850,511
2001	Landings	196,198	15,501	13,943	10,949	17,022	59,476	19,051
	Revenue	32,750,464	68,785,464	31,426,641	31,311,277	24,422,398	303,660,136	17,903,743
2002	Landings	183,394	20,007	12,279	11,663	20,476	51,526	26,696
	Revenue	33,258,508	76,128,768	22,206,223	31,663,828	28,334,342	271,367,784	22,510,006
2003	Landings	125,851	37,793	19,277	9,719	19,014	62,371	14,985
	Revenue	35,731,546	133,659,223	33,927,174	27,662,492	33,054,083	334,892,527	12,612,881
2004	Landings	143,752	31,996	16,288	9,895	19,151	70,937	10,168
	Revenue	32,649,834	117,846,638	33,420,587	30,075,672	49,769,111	418,049,305	12,374,831
2005	Landings	158,239	28,484	10,419	9,745	12,207	82,436	11,855
	Revenue	43,468,320	98,475,750	24,010,310	29,388,293	38,139,748	479,187,288	15,756,906
2006	Landings	160,172	38,834	13,418	9,031	13,583	144,103	9,249
	Revenue	40,807,666	144,293,399	27,327,312	31,101,599	35,750,966	878,194,904	12,497,733
2007	Landings	195,423	24,200	12,297	9,862	10,916	65,870	12,097
	Revenue	45,290,724	124,887,804	25,449,549	30,898,623	34,838,544	437,020,959	17,380,309

Source: PacFIN ftl table. July 2008

Brief descriptions of west coast nongroundfish fisheries follow. Table 3-46 shows recent participation, landings, and ex-vessel revenue information for these fisheries. Figure 3-22 shows the landing information graphically. CPS landings are not shown in the figure because the amounts are so much larger compared to the other fisheries. Shrimp trawl and Dungeness crab pot vessels may also participate in the groundfish LE trawl fishery. Salmon and albacore troll, and coastal pelagic purse seine vessels are not configured so that they could participate in the trawl fishery. However, vessel owners and captain crew in the groundfish LE trawl fishery may participate in the other fisheries from time to time.

Shrimp Trawl Harvesters: Shrimp trawlers target Pacific pink shrimp, ridgeback prawn, and spot prawns with shrimp trawl gear, and many also participate in the west coast groundfish LE trawl fishery. These fisheries are principally managed by the three west coast states; state LE programs limit participation, although many licenses are unused or latent. Although the fishery expanded in the 1970s and 1980s, participation in the shrimp trawl fishery has declined since 1996, especially during the years following the 2004 trawl vessel buyback. The decline in participation is reflected post-2004 landings and revenues. Revenues appear to have rebounded recently, likely due in part to the Pacific pink shrimp

fishery certification as sustainable by the Marine Stewardship Council, and higher prices that may be fetched as a result. Pink shrimp currently makes up the bulk of the shrimp trawl catch and effort because spot prawn trawling, once much more common, is now heavily restricted across the west coast. Most spot prawns are caught incidentally when targeting shrimp. This fishery generally occurs during the late spring and summer months.

Regulations are in place to restrict mesh size, count per pound, and incidental harvest of other species. The 2000 declaration that canary rockfish was overfished led to the states' commitment to reduce their incidental take in these fisheries. In response, finfish excluders are now required on shrimp nets, limiting catches of overfished rockfish. Initially, their use was voluntary to encourage fishermen to experiment with the different types and designs, make modifications, and advise managers on appropriate regulations. Through this program, finfish excluders were made mandatory mid-season in 2001 and 2002 and permanent beginning in 2003. Before their use, rockfish and other species represented approximately 5 percent of the total value of the shrimp fishery, but finfish landings (including canary rockfish) now comprise less than 0.01 percent of the total value (Washington Department of Fish and Wildlife 2008).

Dungeness Crab Pot Harvesters: The Dungeness crab fishery is subject to a LE system, and vessels may range from a small wooden troller with its two-man crew to large steel combination vessels with a four-man crew capable of fishing around the clock for extended periods of time (Oregon Dungeness Crab Commission 2008). Many groundfish LE trawl harvesters also participate in the Dungeness crab fishery. The bulk of the Dungeness crab fishery takes place in December and January. Participation in the crab fishery has been relatively stable over time. Between 1996 and 2007, approximately 1,200 to 1,500 nontribal vessels have landed crab using pot gear along the west coast. Revenues have fluctuated fairly substantially. From 1996 to 2002, revenues fluctuated between approximately $78 million and $51 million, but the fishery has generated substantially more since 2002 with 2005 being the only year the fishery generated less than $100 million in ex-vessel revenue.

Salmon Troll Harvesters: Salmon are caught by nontribal harvesters using troll gear along the west coast. The most frequently harvested salmon are Chinook and coho. The number of participants in the salmon troll fishery has declined since the 1970s. In the 70s and 80s, for example, more than 3,000 vessels reported deliveries of salmon with troll gear off Oregon alone. That number has dwindled to less than 1,000; since 1991, frequently less than 500 vessels participate in a given year. Much of the decline in participation has been due to a decline in the abundance of west coast salmon stocks. The states of Washington, Oregon, and California have effort controls in place to restrict the number of vessels participating in the fishery. Each state has a different set of regulations in place for restricting effort, with Oregon and California being fairly similar.

Albacore Troll Harvesters: Albacore are targeted by troll vessels along the west coast during the summer and early fall months. Albacore landings are made by U.S. trollers originating along the three coastal states and also by trollers from British Columbia who fish albacore in U.S. waters pursuant to international agreements. The revenue attributed to albacore trolling activity has grown in recent years with revenues exceeding $20 million annually since 2003. Throughout the late 1990s, revenues were somewhat lower and varied between $10 million and $19 million depending on the year. The number of vessels in the fishery has varied over time, though, with the exception of 1997, participation has been less than 900 vessels since 1995.

Coastal Pelagic Purse Seine Harvesters target species such as sardines with purse seine gear off the coasts of Washington, Oregon, and California. Traditionally, these fisheries occurred off central and southern California. In recent years, a fishery has developed off the mouth of the Columbia River during the summer and early fall. The volume of landings is much greater than other species, but sardines have a comparatively low price per pound. Nonetheless, only Dungeness crab, the highest value fishery, consistently exceeds the sardine fishery in terms of ex-vessel revenue.

Table 3-46. Participation, landings (mt), and revenue ($) in west coast nongroundfish fisheries, 1995 or 1996 to 2007: (a) shrimp and prawn species from vessels using shrimp trawl gear, (b) crab species by vessels using pot gear, (c) salmon by vessels using troll gear, (d) HMS by vessels using troll gear, (e) CPS by vessels using purse seine.

	No. of Vessels	Landed weight (mt)	Exvessel revenue ($)
1996	277	13,900	20,312,622
1997	265	17,681	18,772,053
1998	229	4,829	10,109,025
1999	219	13,110	17,164,377
2000	209	15,463	17,667,630
2001	171	17,762	13,644,064
2002	174	25,641	18,663,500
2003	112	14,111	8,588,404
2004	88	9,004	7,829,722
2005	85	10,890	10,531,508
2006	71	8,474	6,921,427
2007	75	11,064	11,784,014

a. Shrimp and prawn

	No. of Vessels	Landed weight (mt)	Exvessel revenue ($)
1996	1,515	25,676	77,792,466
1997	1,486	13,984	57,933,282
1998	1,501	13,082	51,165,124
1999	1,469	16,992	72,757,968
2000	1,460	14,717	68,261,323
2001	1,352	13,097	57,969,328
2002	1,432	17,312	64,688,873
2003	1,417	35,234	122,815,510
2004	1,368	28,935	104,200,392
2005	1,251	24,289	81,878,930
2006	1,223	36,042	132,548,794
2007	1,266	20,501	104,015,143

b. Dungeness crab

	No. of Vessels	Landed weight (mt)	Exvessel revenue ($)
1995	1,725	3,994	15,111,176
1996	1,507	2,779	9,067,121
1997	1,301	3,139	9,925,972
1998	1,086	1,510	5,473,374
1999	1,032	2,166	9,173,930
2000	1,153	3,084	13,510,446
2001	1,136	2,582	9,908,692
2002	1,183	4,138	13,742,176
2003	1,113	4,963	20,378,519
2004	1,297	4,411	29,173,552
2005	1,232	3,408	22,723,664
2006	891	799	8,977,506
2007	1,034	1,034	11,496,952

c. Salmon troll

	No. of Vessels	Landed weight (mt)	Exvessel revenue ($)
1995	479	5,986	10,534,691
1996	689	9,887	18,177,773
1997	1,148	10,641	18,784,648
1998	784	12,410	16,875,124
1999	693	5,335	9,669,277
2000	683	8,094	15,273,095
2001	896	10,045	18,666,901
2002	638	7,799	11,210,676
2003	811	15,540	22,859,098
2004	728	13,757	26,085,393
2005	569	8,761	20,270,534
2006	615	12,623	23,475,441
2007	627	11,164	20,859,448

d. Highly migratory species

	No. of Vessels	Landed weight (mt)	Exvessel revenue ($)
1995	373	127,817	37,765,617
1996	396	135,940	42,472,965
1997	397	148,938	42,384,886
1998	281	73,166	9,930,619
1999	318	170,001	42,951,788
2000	339	225,228	42,042,196
2001	284	195,367	32,188,806
2002	273	183,319	32,601,312
2003	248	125,685	35,223,664
2004	227	143,478	32,570,164
2005	205	158,097	43,423,938
2006	206	159,932	40,737,352
2007	168	195,331	45,211,912

e. CPS purse seine

Source for all tables: PacFIN ftl table. July 2008

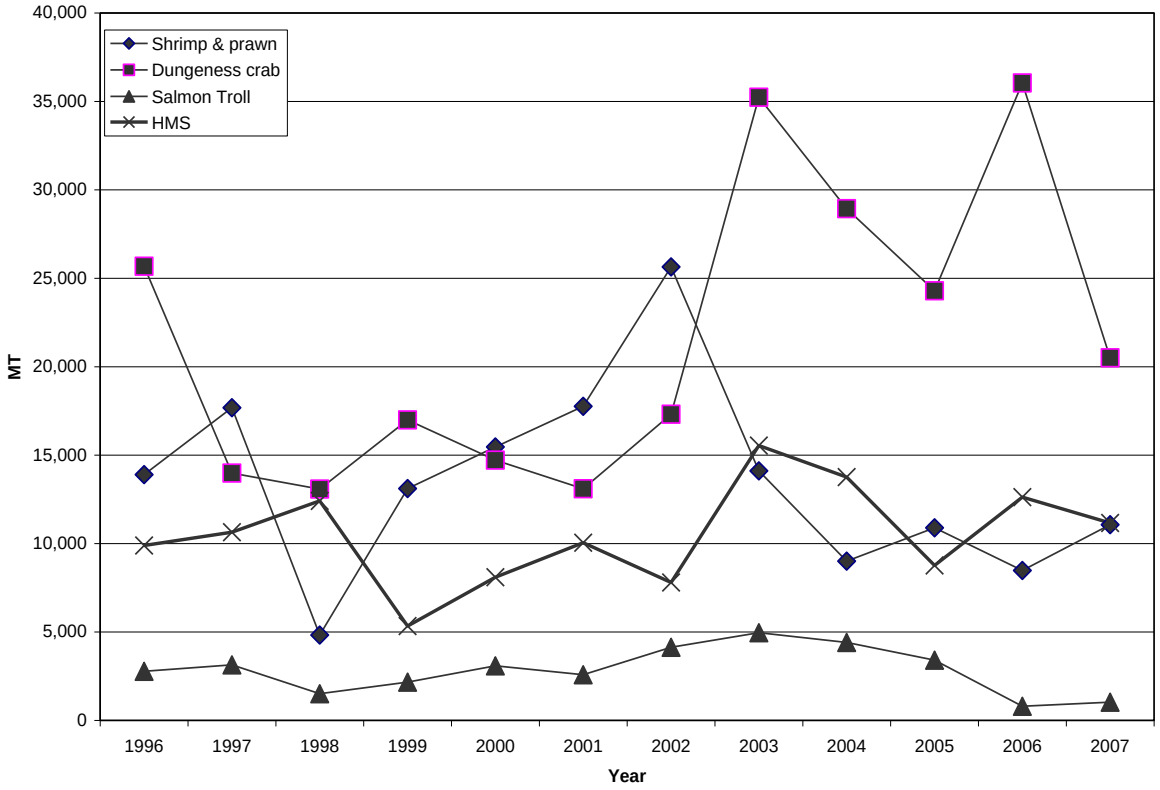


Figure 3-22. Landings (mt) in nongroundfish fisheries, 1996-2007.

3.9 Shoreside Processors of Trawl Groundfish

West coast harvesters are supported by businesses that process and distribute finfish and shellfish products. Some smaller firms are involved with a single species or species group, but most of the industry is diversified. Several of the larger processing companies have multiple plants and/or buying stations. In addition, just as with harvesters, anecdotal evidence, such as company websites, suggests that businesses that process west coast harvests are also involved in Alaska and foreign fisheries as well.[66]

Trawl rationalization will affect the operations of west coast shoreside processing enterprises. This section provides an overview profile of existing shoreside processing companies. The discussion below addresses whiting and nonwhiting processors separately.

3.9.1 Whiting

In 2008, catcher vessels in the whiting shore-based sector primary season whiting landed whiting at 16 Pacific whiting first receivers (see Table 3-48) located in ports in all three states. Between 8 and 16 of these received whiting in any one year from 1997 to 2008.

[66] See, for example, http://www.pacseafood.com/default.aspx?page=30 and http://www.tridentseafoods.com/.

Table 3-47. Pacific Whiting in the Shore-based Sector 1997-2008.

Year	Number of First Receivers	Number of Catcher Vessels	Average Annual Ex-Vessel Price per Pound[1]($)	Total Catch of Pacific Whiting (mt)
1997	12	41	0.042	87,499
1998	12	36	0.021	87,627
1999	14	39	0.036	83,388
2000	14	36	0.040	85,653
2001	13	29	0.036	73,326
2002	8	30	0.045	45,276
2003	9	33	0.045	51,061
2004	9	26	0.035	89,251
2005	10	29	0.052	97,378
2006	14	37	0.062	97,296
2007	14	39	0.070	87,398
2008	16	37	0.102	50,423

Table 3-48. Whiting processing plant locations in 2008.

City	Buyer or Processing Plant Owner
Astoria/Warrenton	Bay Fresh Seafoods
	Bornstein Seafoods Of Oregon
	Da Yang Seafoods Inc
	Delmar Seafoods
Charleston / Coos Bay	Bandon Pacific Inc
	Hallmark Fisheries
	Oregon Brand Seafood Llc
	Pacific Choice Seafood Company
Ilwaco	Jessies Ilwaco Fish Co Inc
Newport	Ocean Beauty Seafoods Inc
	Pacific Shrimp Company
	Trident Seafoods Corp
San Francisco	W F Alber, Inc
Watsonville	Bay Fresh Seafoods
	Del Mar Seafoods Inc
Westport	Ocean Gold Seafoods Inc

Table 3-49 provides details on the quantities (in metric tons [mt] and raw product costs [RPC]) for each year, including totals for all buyers and averages (and cost) received by a buyer in the year. Raw product costs are in nominal form; they have not been adjusted for inflation. An average of 95,901 mt per year of whiting was received from harvesters. The RPC was $13.7 million in 2006, the highest of any year to that point.

Table 3-49. Shoreside whiting receiving characteristics,

	2004	2005	2006	2004-06
Total Received (mt)	92,879.2	97,557.9	97,266.1	95,901.1
Buyers	7	8	11	13
Average Per Buyer (mt)	13,268.5	12,194.7	8,842.4	11,065.5
Raw Product Cost (RPC)	$7,522,999	$11,350,167	$13,718,807	N/A
Average RPC per Buyer	$1,074,714	$1,418,771	$1,247,164	N/A

N/A = Not applicable

The companies that receive whiting vary widely in terms of the volume received. Table 3-50 indicates the quantity of whiting received by buyers. Five firms received more than 10,000 mt each during the period, including three with more than 30,000 mt. At the other end of the scale, 4 of the 13 firms received less than 1,000 mt during the period.

Table 3-50. Counts of companies by total mt of whiting received.

MT Range	2004-06
>0 and <=100	2
>100 and <=200	0
>200 and <=1,000	2
>1,000 and <=5,000	4
>5,000 and <=10,000	0
>10,000 and <=20,000	1
>20,000 and <=30,000	1
>30,000	3

Considering the 26 companies that received whiting during 1994 through 2006, the share of historic receipts that is accounted for by currently active companies is noteworthy. The historic period (1994 to 2003) corresponds with the participation period in the analytical scenarios used in Chapter 4. The count of companies and relative share of historic receipts are shown in Table 3-51; these are presented in terms of the number of years active. For example, within the column headed "Any (>0 mt)," the first row indicates that 13 companies (of 26) had no recent participation, and collectively they represent 13.0 percent of past historic receipts. The column further indicates that five had one year of participation, three had two years, and five had three years. Each column sums to 26 in order to account for all receivers of whiting.

Table 3-51. Count of companies and percentage of 1994-2003 history (mt) by number of years of activity during 2004-06.

No Years	Any (>0 mt)		>1 mt		>100 mt		>1,000 mt		>5,000 mt	
	No. companies	% history	No. companies	% history	No. companies	% history	No. companies	% history	No. companies	% history
0	13	13.00%	13	13.00%	15	25.80%	17	25.80%	22	30.30%
1	5	<0.1%	5	<0.1%	5	<0.1%	3	<0.1%	0	0.00%
2	3	12.80%	3	12.80%	1	0.00%	1	0.00%	0	0.00%
3	5	74.20%	5	74.20%	5	74.20%	5	74.20%	4	69.70%

Shoreside whiting receivers are characterized by several firms with long participation in the industry, along with some recent entrants. This is demonstrated in Table 3-52, which shows the first and last years of participation for companies that received whiting from vessels in the directed fishery. The table indicates that nine companies started participation in 1994 or prior, and that five of those nine also had whiting receipts in 2006 (i.e., remain in the fishery). The column for 2006 also shows four firms entered in each year from 2003 through 2006.

Table 3-52. Entry and exit years for companies receiving whiting from targeted whiting trips.

First Year of Participation	Last Year of Participation			TOTAL
	2004	2005	2006	
1994*	0	0	5	9
1995	0	0	1	1
1996	0	0	0	1
1997	0	0	1	2
1998	0	0	0	1
1999	0	0	0	2
2000	0	0	0	1
2001	0	0	0	1
2002	0	0	0	0
2003	0	0	1	3
2004	0	0	1	1
2005		2	1	3
2006			1	1
Total	**0**	**2**	**11**	**26**

*May have also received whiting prior to 1994.

Whiting is processed in processing plants within each state. Since whiting requires specialized equipment, most of the facilities process whiting only and are not also used for nonwhiting. The plant locations and plant owners are presented in Table 3-53. Several companies listed in Table 3-48 operate more than one processing plant, and the plant listed in Table 3-53 may have a different name than its parent company.

3.9.2 Nonwhiting

From 2004 to 2006, trawl harvesters delivered nonwhiting from targeted trips to 63 shoreside processing companies (Table 3-53) located in all three states. Thirty-six to forty-six of these companies received nonwhiting in any one year from 2004 to 2006. This contrasts with the total of 208 companies that received nonwhiting from 1994 to 2006. The geographic distribution of the companies that received whiting indicates that they operate in each of the three states, with 38 in California, 20 in Oregon, and 10 in Washington. Included in these totals are four companies that received nonwhiting in more than one state; these are displayed in Table 3-54.

Table 3-53. Shoreside companies that received nonwhiting, 2004-06.

Anchor Bay Inc	Fitz	Ocean Gold Seafoods Inc
Arrowhac Fisheries Inc	Fti Produce	Olde Port Fisheries Inc
Bay Fresh Seafoods	Genochio, Thomas	Oregon Gourmet Crab
Bay Ocean Seafood	Giovannis	Oregon Ocean Seafoods
Bayshores Fish Co	Goudeau, Helen M	P & T Flannery Seafoods Inc
Bornstein Seafoods	Greendale Fish Company	Pacific Seafood Group
Boundary Fish Co Inc	Gruhlkey, Milton	Pemberton Fish
Caito Fisheries Inc	High Tide Seafoods	Pennisi, Giuseppe
California Shellfish Co	J M J International Inc	Pham, Sang
Cape Flattery Fishermens Coop	Jessies Ilwaco Fish Co Inc	Princeton Seafood Co
Carvalho Fisheries	K Lyn Fisheries	Royal Seafoods
Caught In Oregon	Ken S Sio Inc	Sea Harvest
Central Coast Seafood Inc	Local Ocean Seafoods Inc	Sea K Fish Co Inc
Chetco Seafood Co	Lucys Fresh Seafood	Solomon
Chucks	Miller, Ken	Stagnaro Bros
Codys Sea To You Seafoods	Monterey Fish Company Inc	Starvin Marvin's
Del Mar Seafoods	Morgan Fish	The Tides
Diamond Meats	Morning Star Fisheries	Three Captains Sea Products
Diller	Next Seafood Co Inc	Tognazzinis Dockside Restaurant
Exclusive Freshness	North Coast	W F Alber
Fishhawk Fisheries	Ocean Fresh Seafood Products, Jv	Waldport Seafood Company Llc

Table 3-54. Shoreside nonwhiting receiving companies operating in multiple states, 2004-06.

	California	Oregon	Washington
Bornstein Seafoods		X	X
California Shellfish Co	X	X	
North Coast	X	X	
Pacific Seafood Group	X	X	X

Table 3-55 provides details on the quantities (mt) and RPC for each year, including the total for all buyers and averages (and cost) received by a buyer in the year. Raw product costs are in nominal form; they have not been adjusted for inflation. An average of 18,807 mt per year of nonwhiting was received from harvesters. The RPC was $23.7 million in 2006, higher than the two previous years, but less than half (in nominal, unadjusted dollars) than the value during the mid-1990s. The average RPC per buyer was $658,653 in 2006.

Table 3-55. Shoreside nonwhiting receiving characteristics, 2004-06.

	2004	2005	2006	2004-06
Total Received (mt)	20,015.7	18,859.8	17,544.8	18,806.8
Buyers	46	44	36	63
Average Per Buyer (mt)	435.1	428.6	487.4	447.8
Raw Product Cost	$22,563,138	$22,275,975	$23,711,514	N/A
Average RPC per Buyer	$490,503	$506,272	$658,653	N/A

N/A = Not applicable

The companies that receive nonwhiting vary widely in terms of the volume received. Table 3-56 indicates the quantity of nonwhiting received by buyers. Nearly 70 percent, or 44 companies, received fewer than 50 mt during the three-year period. A large proportion of these companies receives but does not process nonwhiting; they include restaurants, wholesalers and retailers, or distributors. Of the

remaining 19 companies that received more than 50 mt, only seven received more than 1,000 mt. One received more than 5,000 mt, and one received more than 20,000 mt.

Considering the 208 companies that have received nonwhiting during 1994 through 2006, it is noteworthy to address the share of historic receipts that are accounted for by the currently active companies. The historic period (1994 to 2003) corresponds with the participation period in the scenarios. The count of companies and relative share of historic receipts are shown in Table 3-57; these are presented in terms of the number of years active. For example, within the columns headed "Any (>0 mt)," the first row indicates that 145 companies (of 208) had no recent participation. Collectively, these companies represent 20.0 percent of past historic receipts. The column further indicates that 24 had one year of participation, 15 had two years, and 24 had three years. Each column sums to 208 to account for all receivers of whiting.

Table 3-56. Counts of companies by total of nonwhiting received (mt), 2004-06.

MT Range	2004-06
>0 and <=50	44
>50 and <=100	2
>100 and <=200	6
>200 and <=1,000	4
>1,000 and <=5,000	5
>5,000 and <=10,000	1
>10,000 and <=20,000	0
>20,000	1

Table 3-57. Count of companies and percentage of 1994-2003 history (mt) by number of years of activity during the period, 2004-06.

Number of Years	Any (>0 MT)		>1 MT		>100 MT		>200 MT	
	No. companies	% history	No. companies	% history	No. companies	% history	No. companies	% history
0	145	20.00%	167	20.10%	197	25.70%	199	27.80%
1	24	2.60%	14	2.60%	2	1.50%	2	1.50%
2	15	1.90%	9	1.90%	2	2.10%	0	0.00%
3	24	75.50%	18	75.40%	7	70.70%	7	70.70%
Number of Years	**>300 MT**		**>500 MT**		**>1,000 MT**		**>5,000 MT**	
	No. companies	% history	No. companies	% history	No. companies	% history	No. companies	% history
0	201	29.30%	201	29.30%	203	31.10%	207	57.30%
1	0	0.00%	1	0.60%	1	3.70%	0	0.00%
2	2	5.00%	2	5.00%	0	0.00%	0	0.00%
3	5	65.70%	4	65.10%	4	65.10%	1	42.70%

Shoreside nonwhiting receivers are characterized by several firms with long participation in the industry and many companies with just one or two years of participation since 1994. This is demonstrated in Table 3-58, which shows the first and last years of participation for companies that received nonwhiting from vessels in the directed fishery. The table indicates that nine companies started participation in 1994 or earlier, and five of those nine companies also had whiting receipts in 2006 (i.e., remain in the fishery). The column for 2006 also shows that four firms entered each year from 2003 through 2006.

Table 3-58. Entry and exit years for companies receiving nonwhiting from targeted nonwhiting trips.

First Year of Participation	Last Year of Participation			Total
	2004	2005	2006	
1994*	2	3	19	80
1995	1	2	3	15
1996	1	0	0	15
1997	0	1	0	17
1998	0	0	2	15
1999	0	2	0	9
2000	0	1	1	12
2001	0	1	2	9
2002	1	0	2	16
2003	0	0	1	2
2004	7	1	2	10
2005		4	3	7
2006			1	1
Total	12	15	36	208

*May have also received nonwhiting prior to 1994.

Nonwhiting is processed in processing plants within each state. The plant locations and plant owners are presented in Table 3-59.

Table 3-59. Nonwhiting processing plant locations in 2008. Note: Those processing companies in shaded cells have not been verified to be processing plants.

City	Processing Company
Astoria/Warrenton	Bornstein Seafoods Of Oregon
	Pacific Coast Seafoods Company
Atascadero	Central Coast Seafood
Bellingham	Arrowhac Fisheries Inc
	Bornstein Seafoods Inc
Bodega Bay	The Tides
Charleston / Coos Bay	Bandon Pacificinc
	Hallmark Fisheries
	Oregon Brand Seafood Llc
	K Lyn Fisheries
	Starvin Marvin's Seafood
Crescent City	Carvalho Fisheries Inc
El Granada	Pemberton Fish
Eureka	Pacific Choice Seafood Company
Fort Bragg	Caito Fisheries Inc
Half Moon Bay	Fitz
	Morning Star Fisheries
	Three Captains Sea Products
Hawaiian Gardens	M A Seafood
Monterey	Royal Seafoods Inc
Newport	Pacific Shrimp Company
Port Angeles	High Tide Seafoods
San Francisco	Bugatto Ent Inc
	Next Seafood Co Inc
	Morgan Fish
	Pacific Fresh Sea Food Company
	W F Alber, Inc
	West Bay Seafood Company Inc
Santa Rosa	North Coast Fisheries Inc
Watsonville	Del Mar Seafoods Inc
Westport	Ocean Gold Seafoods Inc

3.9.3 West Coast Processing Centers and Product Flow

Data on where landings of nonwhiting groundfish were processed from 2004 to 2007 was compiled to illustrate the spatial relationships between processing centers and buying locations. Table 3-60 shows the cities where processing occurred, the ports where the fish came from, the distance in road miles between the port of origin and processing city (determined using Google Earth), and the percent of coastwide landings processed in that city. A processing city can also be a port of origin for that city, meaning the fish was processed locally. In such cases, the road distance is zero. There are a few major processing centers on the west coast. Only seven cities processed more than 1 percent of coastwide landings, and the largest processing center, Astoria, Oregon, accounted for more than two-thirds of processing activity by weight of landed fish.[67] The other processing cities above 1 percent are Newport (15 percent), Eureka (15 percent), Bellingham (12 percent), Coos Bay (9 percent), Fort Bragg (7 percent), and Watsonville (2 percent). These seven processing centers accounted for 96 percent of the coastwide total. These ports also tend to import fish from a larger number of ports.

Table 3-61 shows the characteristics of processing centers and related ports. The ports are shown in geographic order, from north to south along the coast. Horizontal lines in the table indicate the three state boundaries. For confidentiality reasons, the numerical value of volumes of processed fish are not given; instead, these data are classified in quartile categories labeled none, low, medium, and high. Fish is either locally processed, meaning that the port of landing and processing location are the same city; "imported," meaning the fish is trucked in from other ports; or "exported," meaning the fish is sent from that port to another location. Ports with no local nonwhiting groundfish processing, such as Blaine, Washington, or Crescent City, California, show no local processing or imports of fish. Processing cities away from the coast, such as Watsonville or Santa Rosa, California, show only imported fish, since they receive fish from coastal ports and, not being a landing site, do not export fish.

Befitting its number one rank, Astoria has the second-highest number of local processors of nonwhiting groundfish (Coos Bay has six) and receiving ports. It processes a high volume of locally landed fish and also imports a high volume, but exports fish. The high volume of imported fish suggests that local processors are trying to optimize plant capacity, which would seem to exceed (at least periodically) the capacity of local nonwhiting landings. Plant capacity may be structured for variable whiting landings and shifted to processing other fish during off-peak periods. It also indicates Astoria's importance as a regional processing center. The other top-ranked processing centers also show high volumes of locally processed and imported fish, but also export fish to other locations.

Figure 3-23 through Figure 3-26 visually represent the processing networks. The road routes (derived from Google Earth) are classified in quartiles by the volume of fish trucked over those distances.[68] Pie charts indicate the proportion of locally processed, imported, and exported fish for each processing city.

Figure 3-23 shows the regional dominance of Astoria in northern Oregon and Washington's Olympic Peninsula. Nearby Ilwaco/Chinook could be considered part of a regional agglomeration that can draw on sources of supply using the Columbia River estuary and a common labor pool. Bellingham is a regional center for the eastern shore of Puget Sound.

[67] The Astoria figures also include those for the adjacent town of Warrenton. In a few other cases, some processing in adjacent or nearby cities has not been aggregated, which is an oversight. For example, South Beach is adjacent to Newport, so its volume should be added to that of Newport, and Harbor is adjacent to Brookings.

[68] Routes between each port and processing city are separately mapped. Because many of these routes overlap, and due to the way the line segments are mapped, in some cases, narrower lines (lower volume routes) may be hidden behind heavier lines (higher volume routes).

As seen in Figure 3-24, Newport is an important processing center on the central Oregon coast. Local landings account for more than half its total processing; it also imports and exports smaller volumes. Newport, South Beach, and Waldport could be considered part of a regional agglomeration. Waldport imports its small volume of fish from Newport. South Beach, adjacent to Newport, imports fish from Florence. Newport exports 12 percent of its landings to Coos Bay, while close to half of the fish landed in Coos Bay is exported to Newport, suggesting a further link between these two processing cities. Coos Bay also exports a very small proportion of its landings to Santa Rosa, approximately 436 road miles away. After Newport, the next-highest volume of Coos Bay imports come from Brookings; no fish is imported from California.

Eureka is a regional center for northern California; imports account for slightly less than half of the fish processed there and are derived from five other locations: Brookings and Crescent City on the Oregon/California border to as far south as San Francisco (although the volume is small). Fort Bragg imports about a third of the fish processed there from Eureka and much smaller amounts of fish from the central California ports of San Francisco and Half Moon Bay. In fact, one-fifth of the fish landed in Eureka is exported to Fort Bragg.

As seen in Figure 3-25 and Figure 3-26, there are many more processing locations south of Fort Bragg, but the amounts of nonwhiting groundfish processed in these cities is generally small. In this region, only the inland city of Watsonville falls within the top seven processing locations listed above. Santa Rosa and San Francisco are important regional processing centers, but they handle much smaller volumes of nonwhiting groundfish. The number, dispersed locations, and small volumes handled in processing locations in central California suggest that groundfish represents a small proportion of the overall activity of these processors. All the processing locations south of San Francisco, including Watsonville, account for a little less than 4 percent of the coastwide total.

Table 3-60. Relationship between processing cities and ports.

Processing City	Port	Distance
Aberdeen	Westport	21
Astoria	Aberdeen	78
	Astoria	0
	Neah Bay	234
	Port Angeles	239
	Tillamook/Garibaldi	66
	Westport	86
Atascadero	Morro Bay	17
Avila	Avila	0
Bellingham Bay	Bellingham Bay	0
	Blaine	21
Bodega Bay	Bodega Bay	0
	Crescent City	224
Charleston (Coos Bay)	Brookings	104
	Charleston (Coos Bay)	0
	Newport	105
	Winchester Bay	28
El Granada	Marshall	4
	Princeton / Half Moon Bay	71
	Rodeo	50
	Vallejo	60

Processing City	Port	Distance
Eureka	Bodega Bay	239
	Brookings	112
	Crescent City	85
	Eureka	0
	Fort Bragg	134
	San Francisco	272
Fort Bragg	Eureka	134
	Fort Bragg	0
	Princeton / Half Moon Bay	199
	San Francisco	172
Harbor	Brookings	3
Hawaiian Gardens	Avila	216
	Moss Landing	412
	Princeton / Half Moon Bay	359
Ilwaco/Chinook	Ilwaco/Chinook	0
Los Osos	Avila	5
Monterey	Monterey	0
	San Francisco	118
Morro Bay	Morro Bay	0
	Moss Landing	143
Moss Landing	Monterey	18
	Moss Landing	0
	Santa Cruz	25
Newport	Charleston (Coos Bay)	99
	Newport	0
	Tillamook/Garibaldi	68
Nipomo	Avila	27
Oxnard	Moss Landing	286
	San Francisco	391
Princeton / Half Moon Bay	Princeton / Half Moon Bay	0
Sacramento	San Francisco	88
San Francisco	Bodega Bay	70
	Crescent City	357
	Dillon Beach	59
	Morro Bay	232
	San Francisco	0
San Jose	Moss Landing	59
	Santa Cruz	34
San Leandro	Moss Landing	34
	Princeton / Half Moon Bay	92
Sand City	Moss Landing	15
Santa Barbara	Santa Barbara	0
Santa Cruz	Santa Cruz	0
Santa Rosa	Brookings	328
	Charleston (Coos Bay)	436
	Moss Landing	158
Scotts Valley	Princeton / Half Moon Bay	54
	Santa Cruz	7
South Beach	Florence	47
Tillamook/Garibaldi	Tillamook/Garibaldi	0
Waldport	Newport	17
Watsonville	Avila	157
	Morro Bay	147
	Moss Landing	9
	San Francisco	91

Table 3-61. Characteristics of processing centers and ports.

Processing City	No. of Processors	No. of Receiving Ports*	No. Processing Cities Exported to	Local Processing	Imported Fish	Exported Fish
Blaine	0	0	1	None	None	High
Bellingham Bay	3	2	0	High	High	None
Neah Bay	0	0	1	None	None	High
Port Angeles	0	0	1	None	None	Medium
Aberdeen	1	1	0	None	Medium	None
Westport	0	0	2	None	None	High
Ilwaco/Chinook	1	1	0	High	None	None
Astoria	5	6	2	High	High	None
Tillamook/Garibaldi	2	1	2	Low	None	Medium
Newport	4	3	2	High	High	High
South Beach	1	1	0	None	Medium	None
Waldport	1	1	0	None	Low	None
Florence	0	0	1	None	None	Medium
Winchester Bay	0	0	1	None	None	Medium
Charleston (Coos Bay)	6	4	2	High	High	High
Brookings	0	0	4	None	None	High
Harbor	1	1	0	None	Low	None
Crescent City	0	0	3	None	None	High
Eureka	1	6	1	High	High	High
Fort Bragg	2	4	1	High	High	High
Santa Rosa	1	3	0	None	High	None
Bodega Bay	2	2	2	Low	Medium	Medium
Dillon Beach	0	0	1	None	None	Low
Marshall	0	0	1	None	None	Medium
Sacramento	1	1	0	None	Medium	None
Vallejo	0	0	1	None	None	Low
Rodeo	0	0	1	None	None	Medium
San Francisco	4	5	6	High	High	High
San Leandro	1	2	0	None	Low	None
Princeton / Half Moon Bay	3	1	5	High	None	Medium
El Granada	6	4	0	None	High	None
San Jose	1	2	0	None	Medium	None
Scotts Valley	1	2	0	None	Medium	None
Santa Cruz	1	1	3	Low	None	Medium
Watsonville	2	4	0	None	High	None
Moss Landing	3	3	8	High	Low	High
Sand City	1	1	0	None	Medium	None
Monterey	1	2	1	High	Medium	Medium
Atascadero	2	1	0	None	High	None
Morro Bay	3	2	3	High	Medium	High
Avila	1	1	4	Low	None	Medium
Los Osos	1	1	0	None	Low	None
Nipomo	1	1	0	None	Low	None
Santa Barbara	3	1	0	Low	None	None
Oxnard	1	2	0	None	Medium	None
Hawaiian Gardens	1	3	0	None	Medium	None

*Including the processing city.

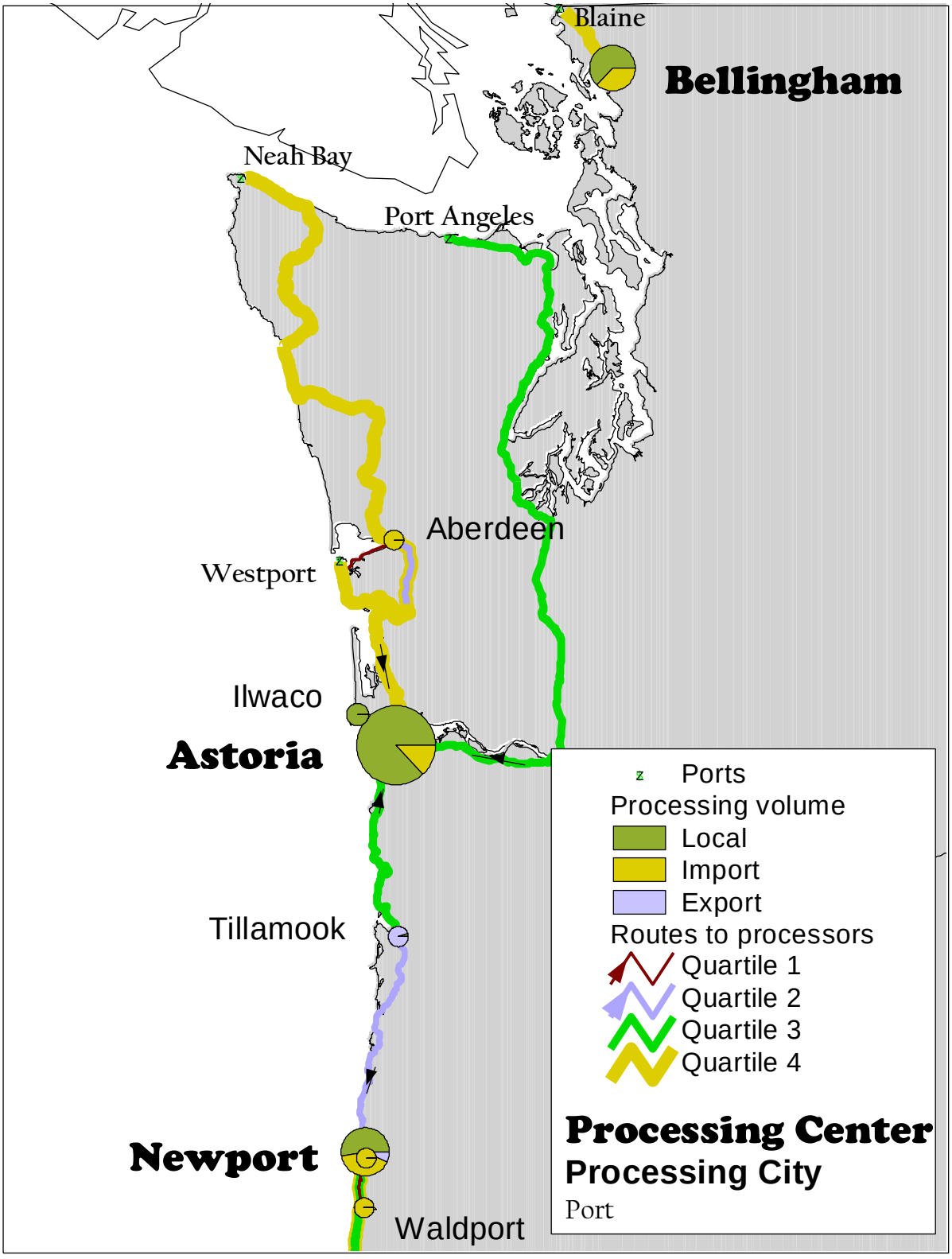


Figure 3-23. Processing relationships in Washington and northern Oregon.

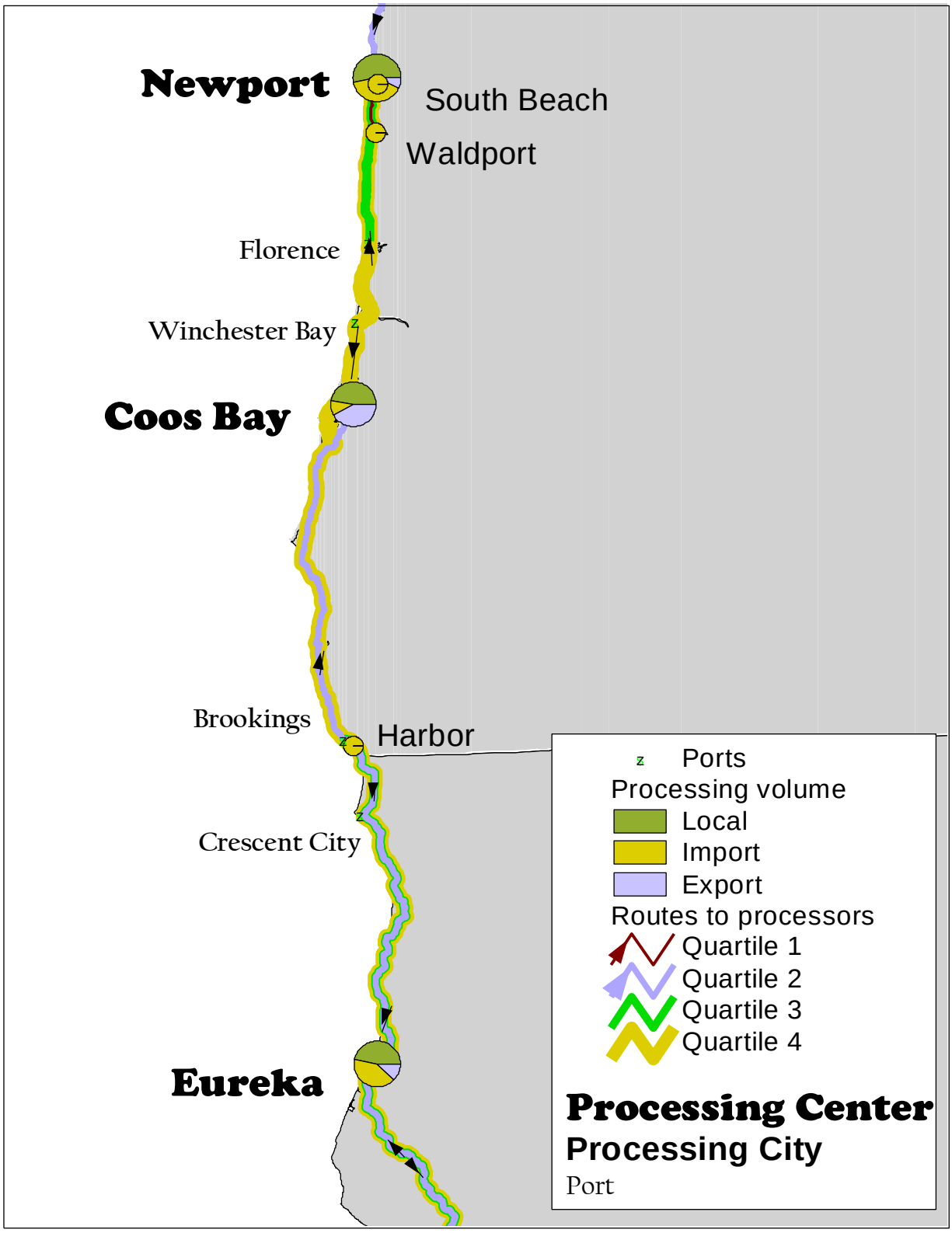


Figure 3-24. Processing relationships in Oregon and northern California.



Figure 3-25. Processing relationships in northern California.



Figure 3-26. Processing relationships in central California.

3.10 Mothership Processors of Trawl Groundfish

Section 3.6.3 describes the Pacific whiting mothership sector focusing on catcher vessels that deliver to the processing vessels. Unlike catcher-processors, which directly harvest and then process on board, mothership vessels receive vessels from catcher vessels for processing, but do not directly harvest the fish. Motherships are relatively large vessels with crews of 65 to 200 people, who mostly work in shifts to keep the factories operating day and night. Some of the processing vessels operate in the Alaska pollock fisheries, but move south to the Washington, Oregon, California area to fish for whiting between pollock seasons. Table 3-20 shows mothership participation since 1994. Although participation has varied from four to nine processing vessels, six or fewer have participated in the recent past. It is expected that these six vessels would qualify for the processor permit proposed under the mothership co-ops that are part of the alternatives presented in Chapter 2.

The AFA, which rationalized the Alaska pollock fishery, eventually led to Council action; the current trawl rationalization proposal supersedes past stopgap measures. It was thought that the AFA management system, by giving participants in the pollock fishery greater flexibility, could result in new entry into the whiting fishery (to participate vessels, only had to be registered to a groundfish LE permit with the appropriate gear and length endorsement). New entry could exacerbate race-for-fish conditions in the fishery that stem from quota-based management. In 1999, the Council began work on Groundfish FMP Amendment 15 to address possible spillover effects, a task mandated by the AFA. When no immediate influx of new participants materialized, however, and other issues became more pressing, further work was deferred. In 2006, the entry into the fishery of additional catcher vessels that had not previously participated, and shifts in participation between the sectors, again raised concerns. The Council adopted Amendment 15 in March 2008 and created qualification criteria for participation in each of the whiting sectors, including criteria for motherships. The amendment was explicitly framed as a temporary measure that would sunset with a more comprehensive set of measures under trawl rationalization.

Since 1995, several different companies have participated as a mothership. Some companies have participated in only one or two years, while others have participated on a consistent basis. The following table illustrates mothership vessel and company participation by year.

Table 3-62. Mothership company and vessel participation by year.

		Year												
Company	Vessel Name	95	96	97	98	99	00	01	02	03	04	05	06	07
All Alaskan	Heather Sea	X												
	Saga Sea	X												
American Seafoods	American Dynasty		X											
	American Triumph		X											
	Ocean Rover	X	X	X	X	X	X	X	X	X	X	X	X	X
Arctic Storm	Arctic Fjord	X	X	X	X	X	X	X	X	X	X	X	X	X
	Arctic Storm	X	X	X	X	X	X	X	X	X	X	X	X	X
Peter Pan/ Nichiro	Golden Alaska	X	X	X	X	X	X							X
Premier Pacific	Ocean Phoenix	X	X	X	X	X	X	X				X	X	X
MV Savage Inc/ Cascade Fishing/ Suisan	Sea Fisher												X	
Supreme Alaska	Excellence	X	X	X	X	X	X	X	X	X	X	X	X	X

The variation in participation by mothership companies can be explained by prevailing market conditions and stock abundance. Throughout much of the early 2000s, conditions were generally unfavorable for Pacific whiting fishery participation. The stock was listed as overfished early in this period, resulting in a decline in available harvest. Shortly thereafter mad cow disease impacted Pacific whiting surimi markets due to the use of beef plasma in the production of whiting surimi. Producers have switched increasingly to H&G product forms and also switched from using beef plasma to using egg yolk in the production process. Furthermore, the Pacific whiting stock was taken off the overfished list quickly, leading to a rebound in harvest levels. The lack of participation by two companies in the early and mid 2000s can be explained by these conditions.

The mothership sector in general is relatively vertically integrated. Based on data available in November 2008, 10 catcher vessel permits can be identified as being wholly or partially owned by companies that also own motherships. On a company level, two companies received most of their catch between 2003 and 2006 from catcher vessels that are described as being wholly or partially vertically integrated, while two other companies received a clear minority of their deliveries from wholly or partially owned catcher vessels over that time.

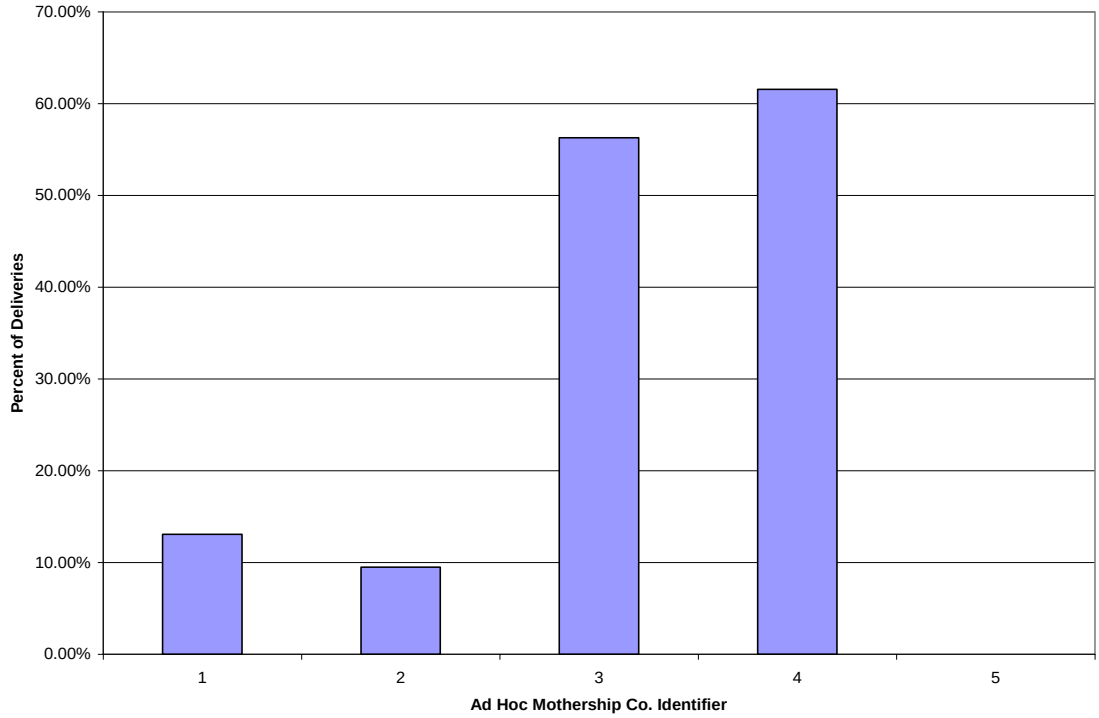


Figure 3-27. Portion of Deliveries Received by Wholly Owned or Affiliated Catcher Vessel Permits by Mothership Company (2003 - 2006).

3.11 Trawl Catcher Processors

Catcher-processor effort in the fishery has varied over time. With the voluntary creation of the Pacific Whiting Conservation Cooperative in 1997, the sector took on the characteristics of a rationalized fishery. The amount of capital in the fishery generally declined as the season became longer, and vessels no longer found it necessary to compete. While the actual number of catcher-processor vessels participating in any given year has not varied tremendously, many vessels spend less time in the fishery and leave the fishery after June (Table 3-63). Beginning in July, only a handful of catcher-processor vessels remain, often into November, to finish off the quota remaining in the fishery. The distribution of catch has become much less concentrated in time following the formation of the voluntary cooperative. Prior to the formation of the voluntary cooperative, catcher-processors operated over a much shorter time period with harvest concentrated in the May and June timeframe (Figure 3-28).

Table 3-63. Count of catcher-processors operating by month and year.

Year	April	May	June	July	August	Sept.	Oct.	Nov.	Dec.
1995	9	9							
1996		10	10						
1997		10	7						
1998		5	7	1	1				
1999		5	6	2					
2000		4	5	5	1	1	1	1	
2001		4	6	1	1	2	2	2	
2002		4		1	1	1	1		
2003		3	1	1	1	2	2		
2004		5	4	1	1	4	2	1	
2005		6	4	1	2	4	4		
2006		6	8	3		3	3		
2007		9	9				3	4	1

Source: PacFIN NPAC4900 table. July 2008
Note: not unique records and should not be summed

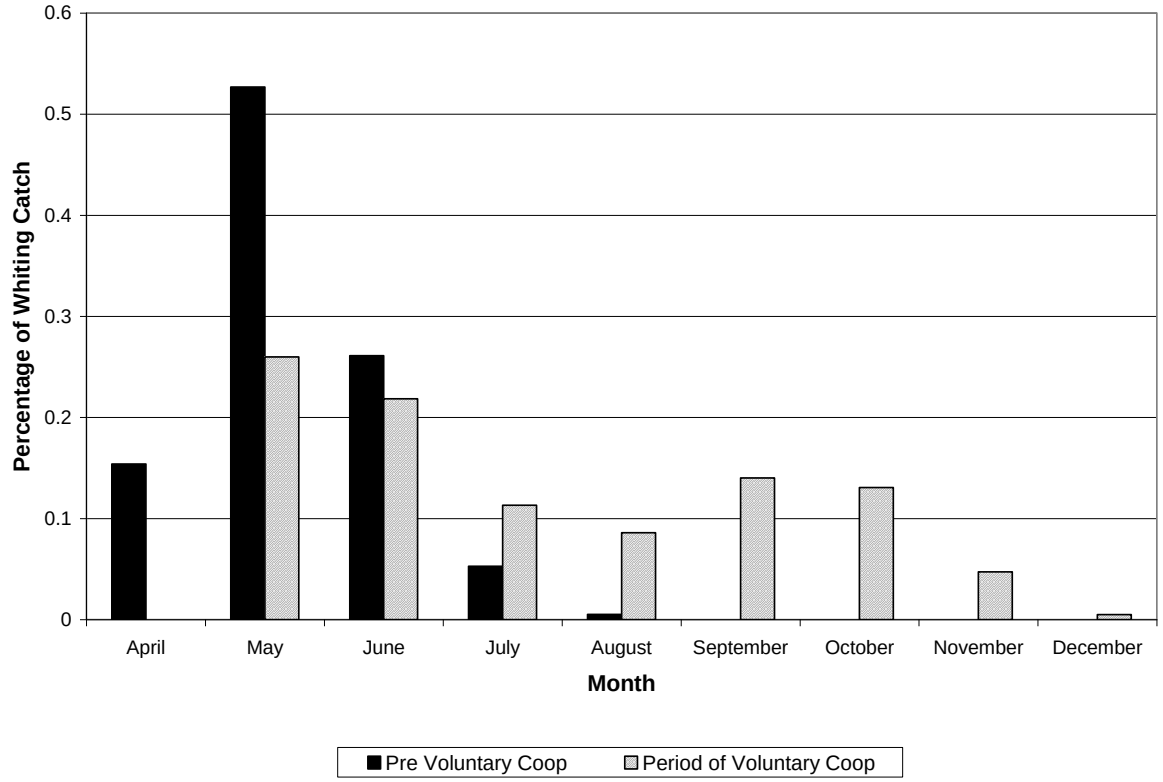


Figure 3-28. Seasonality of whiting harvest in the catcher-processor sector (before and after formation of voluntary cooperative).

Because of the catch sharing agreements created through the voluntary cooperative, participants in the catcher-processor sector do not race for fish, though participants have expressed increasing concern over the fact that another sector could preempt the catcher-processor sector through attainment of a bycatch cap. In other words, because of the common bycatch cap, conditions exist for catcher-processor participants to engage in race-for-fish behavior, although they do not engage in such behavior currently.

3.12 Processors and Labor

Harvesting and processing labor is expected to be affected by changes to these sectors caused by rationalization. Processing requires skilled and semi-skilled labor ranging from general labor (for example, unloading vessels) to more skilled labor (for example, filleting fish, or operating and maintaining processing equipment).

Those employed in managerial positions (as opposed to owner-managers) fall in the labor category. Processing labor also includes people aboard catcher-processor and motherships who are exclusively involved in processing activities. Others aboard these vessels fall in the category of captain and crew. Other labor is undertaken by input suppliers (for example, shop clerks or warehouse workers).

The size of processing facilities, and the degree to which they can switch production to different product forms, will determine how labor is affected by rationalization. Shore-based whiting processors currently must handle large volumes of fish in a relatively short time because the whiting fishery tends to function like a derby, with harvesters competing to catch the available quota. When there is no whiting fishery, processors must diversify into processing other products in order to maximize returns. By the same token, their labor demand varies throughout the year. For example, if a plant cannot be put to another use outside of the whiting season, such as processing nonwhiting groundfish or Dungeness crab, most of the jobs in the facility will be seasonal. This is less of a problem in the at-sea sector because motherships and catcher-processors are mobile and can be deployed to the Alaska pollock fishery. Processors specializing in nonwhiting groundfish deal with lower volumes and a steadier supply because of cumulative trip limits. They may also require different types of labor than whiting processors if their operation is less mechanized, and they deal with a greater variety of species and product forms.

3.13 Input Suppliers

Businesses that support groundfish trawlers may be indirectly affected by a trawl rationalization if the program, depending on the business type, size, and location. Various businesses supply inputs to the trawl sector. For many, however, the trawl sector accounts for a small proportion of sales, either because they sell to firms and individuals across the economy (e.g., grocery wholesalers/retailers), or they sell to harvesters in many other fisheries (e.g., marine electronics retailers). Smaller, specialized retailers located in ports where groundfish trawlers are an important component of the local fleet (in terms of purchases, not necessarily number of vessels) would be more affected by changes in demand for inputs. Those most affected depend on the trawl sector for a large proportion of their sales. The types of suppliers most affected by trawl rationalization would be the following:

- Small retailers of specialized equipment and materials (e.g., ship chandlers, hardware stores)
- Dockside fuel suppliers
- Suppliers of specialized services (e.g., welders, riggers, equipment installers)
- Equipment manufacturers for whom groundfish trawl vessels account for a large proportion of sales (e.g., boat builders, net manufacturers)
- Firms that contract observers to the groundfish trawl sector
- Brokerage firms that handle the sale/transfer of IFQs

The number of input suppliers varies greatly by community. A NMFS NWFSC study (K. Norman, pers. comm., NMFS NWFSC, July 2008) looked at the presence of 61 different types of groundfish businesses in 11 Washington and Oregon communities (Table 3-64). The businesses included suppliers of anchors, bait, cold storage, tackle, ice, nets, and refrigeration, as well as service providers such as boat builders, boat yards, haul-out facilities, permit brokers, and marine surveyors. The study came up with the following numbers of businesses in each community (from north to south):

Table 3-64. Input suppliers in Washington and Oregon.

Community	Number of Fishery-related Suppliers
Washington	
Bellingham	51
Anacortes	36
Neah Bay	1
Seattle	362
Westport	17
Ilwaco	5
Oregon	
Astoria/Warranton/Hammond	36
Newport	25
Coos Bay/Charleston	23
Brookings	2

3.14 Communities and Socioeconomic Groups

3.14.1 General Introduction

This section summarizes the community profiles presented in Appendix H and places relevant fishery activity in a community setting. First, it describes how fishing communities were identified for this document. Next, it discusses general characteristics of west coast fishing communities, including geography, demography, input suppliers, processors and labor, captains and crew, social structure, and the built environment. Section 3.14.4 summarizes a study of dependence, engagement, and vulnerability in fishing communities. Next, it discusses trends that affect fishing communities; summarizes relevant data about fishing communities; and addresses environmental justice concerns.

The information and organization of this discussion of the socioeconomic environment draws upon the community profiles developed by the NMFS NWFSC (Norman, *et al.* 2006), as well as the 2007-2008 groundfish annual specifications EIS (PFMC 2006) and other documents.

3.14.2 Identifying Fishing Communities

Communities can be identified in several ways. They can be defined geographically (i.e., Neah Bay or San Francisco); they can refer to a community of interest (for example, everyone involved in the groundfish trawl fishery), or an occupational community (such as groundfish trawl crew). In accordance with the MSA's National Standard 8, this analysis defines communities geographically. A methodology developed by the NMFS NWFSC was used to identify trawl communities and communities that might be affected by changes in the trawl sector. Particularly vulnerable communities were identified in a vulnerability study conducted by the NMFS NWFSC (PFMC 2006, Appendix A).

Fishing communities, as defined in the MSA, include not only the people who actually catch the fish, but also those who share a common dependency on directly related fisheries-dependent services and industries. In commercial fishing, this may include boatyards, fish handlers, processors, and ice suppliers. Similarly, entities that depend on recreational fishing may include tackle shops, small marinas, lodging facilities catering to out-of-town anglers, and tourism bureaus advertising charter fishing opportunities. People employed in fishery management and enforcement comprise another component of fishing communities.

3.14.3 General Characteristics of West Coast Fishing Communities

3.14.3.1 West Coast Geography and Demography

For the purpose of analysis, west coast fishing communities are organized around regions comprising port groups and ports consistent with the organization of fish landings data in the PacFIN database. There are four port groups in Washington covering 21 named ports; in Oregon there are five port groups covering 20 ports; 10 port groups cover 35 named ports in California. Figure 3-29 shows the location of these ports and port groups. Table 3-65 shows port group and county relationships in Washington and Oregon; Table 3-66 shows the same for California. Communities in Southern California are not discussed in this EIS, because there is no groundfish trawl fishery presence in that area.

Section 5.4.2 in the 2008 groundfish SAFE document (PFMC 2008c) includes updated population data for coastal counties bused on the U.S. Census Bureau's 2006 American Community Survey, which supplements the 2000 census data referenced in Section 3.14.7 of this EIS document. Coastal counties tend to be rural in Washington, Oregon, and northern California. These data are incorporated by reference. The only major urban center in a coastal county in this region is in Puget Sound where Seattle, Tacoma, and their satellite communities comprise a large population and commercial agglomeration. According to 2000 census data, the rural population for Washington State as a whole is 18 percent of the total. Excluding Puget Sound, coastal counties range from 48 to 100 percent rural population. In Oregon, the statewide rural population is 21 percent of the population, while coastal counties, excluding Lane County, which encompasses the inland population center of Eugene, range from 37 to 100 percent rural. The northern California counties of Del Norte, Humboldt, and Mendocino are similarly rural. Coastal areas in central and Southern California are much more urbanized, with 80 to 100 percent of the population in these counties considered urban. Similar to the pattern of urban versus rural population, coastal counties in Washington, Oregon, and California tend to be less racially diverse than the states as a whole. Household median income also tends to be lower and the poverty rate higher in this region compared to statewide averages. Section 8.0 in Appendix A to the 2005-06 groundfish harvest specifications EIS (PFMC 2004a) contains detailed population data for west coast fishing communities based on the 2000 census.

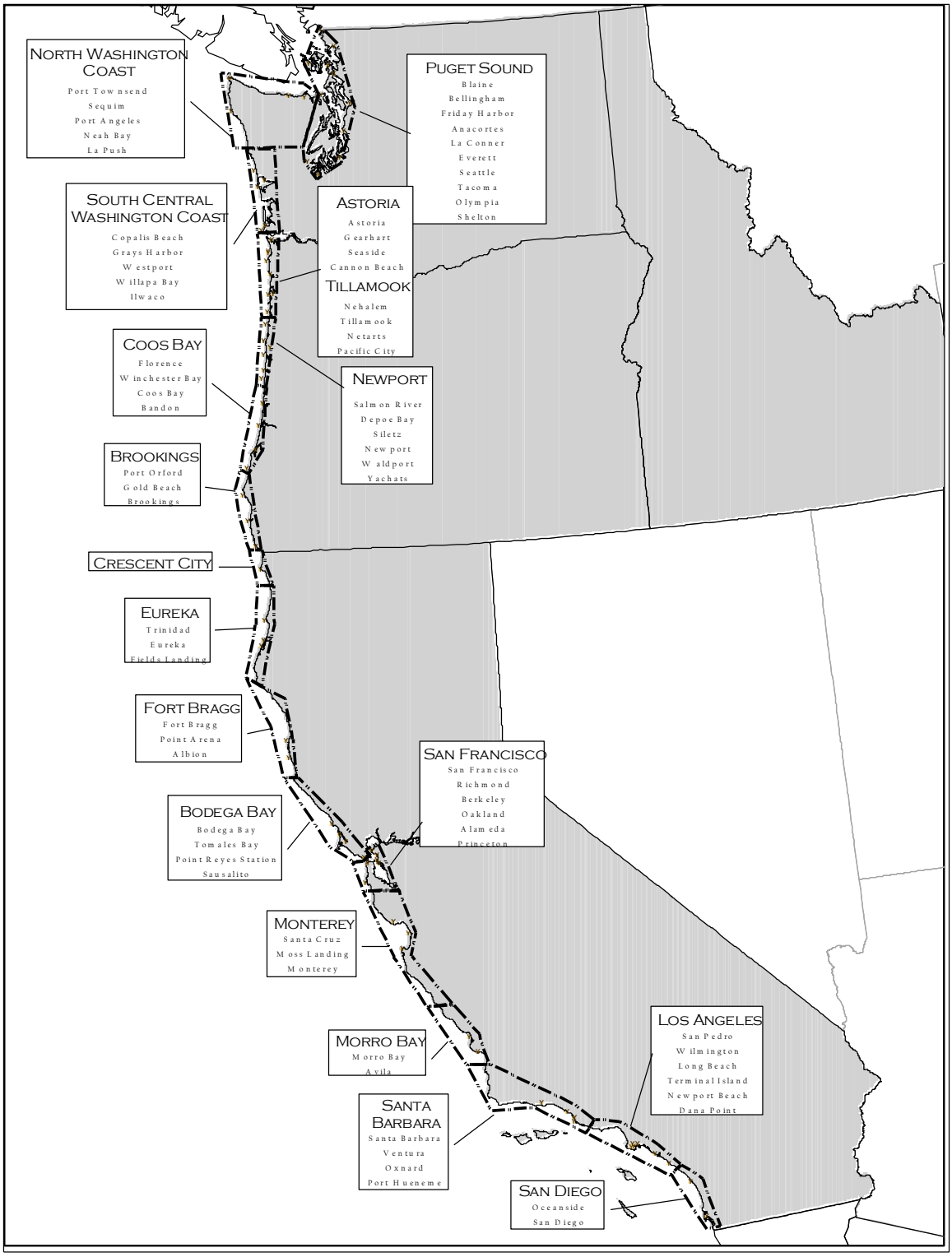


Figure 3-29. West coast ports and port groups.

Table 3-65. Port group, county, and community relationships in Washington and Oregon.

Port Group Area	County	Name
Washington		
N. Puget Sound	Whatcom	Blaine
		Bellingham Bay
	San Juan	Friday Harbor
	Skagit	Anacortes
		La Conner
	Snohomish	Other North Puget Sound Ports
S. Puget Sound	Snohomish	Everett
	King	Seattle
	Pierce	Tacoma
	Thurston	Olympia
	Mason	Shelton
	Unknown	Other South Puget Sound Ports
North Washington Coast	Jefferson	Port Townsend
	Clallam	Sequim
		Port Angeles
		Neah Bay
		La Push
South & Central WA Coast	Grays Harbor	Copalis Beach
		Grays Harbor
		Westport
	Pacific	Willapa Bay
		Ilwaco/Chinook
	Klickitat	Other Columbia River Ports
Unidentified WA	Pacific	Other Washington Coastal Ports
	Unknown	Unknown WA Ports

Port Group Area	County	Name
Oregon		
Astoria	Multnomah	Pseudo Port Code for Columbia R.
	Clatsop	Astoria
		Gearhart - Seaside
		Cannon Beach
	Unknown	Landed in WA; Transp. to OR
Tillamook	Tillamook	Nehalem Bay
		Tillamook / Garibaldi
		Netarts Bay
		Pacific City
Newport	Lincoln	Salmon River
		Siletz Bay
		Depoe Bay
		Newport
		Waldport
		Yachats
Coos Bay	Lane	Florence
	Douglas	Winchester Bay
	Coos	Coos Bay
		Bandon
Brookings	Curry	Port Orford
		Gold Beach
		Brookings

Table 3-66. Port group, county, and community relationships in California.

Port Group Area	County	Name
California Recreational Groupings		
North Coast: Humboldt and Del Norte Counties		
North-Central: Mendocino County		
North-Central: San Mateo County to Sonoma County		
South-Central Coast: San Luis Obispo to Santa Cruz		
South Coast: Ventura to Santa Barbara Counties		
South Coast: Los Angeles to San Diego Counties		
California		
Crescent City	Del Norte	Crescent City
		Other Del Norte County Ports
Eureka	Humboldt	Eureka (Includes Fields Landing)
		Fields Landing
		Trinidad
		Other Humboldt County Ports
Fort Bragg	Mendocino	Fort Bragg
		Albion
		Arena
		Other Mendocino County Ports
Bodega Bay	Sonoma	Bodega Bay
	Marin	Tomales Bay
		Point Reyes
		Other Son. & Mar. Co. Outer Coast Ports
		Sausalito
San Francisco	Alameda	Oakland
		Alameda
		Berkely
	Contra Costa	Richmond
	San Francisco	San Francisco
		San Francisco Area
		Other S.F. Bay & S.M. Co. Ports
	San Mateo	Princeton

Port Group Area	County	Name
California		
Monterey	Santa Cruz	Santa Cruz
	Monterey	Moss Landing
		Monterey
		Other S.C. and Mon. Co. Ports
Morro Bay	San Luis Obispo	Morro Bay
		Avila
		Other S.L..O. Co. Ports
Santa Barbara	Santa Barbara	Santa Barbara
		Santa Barbara Area
	Ventura	Port Hueneme
		Oxnard
		Ventura
		Other S.B. and Ven. Co. Ports
Los Angeles	Los Angeles	Terminal Island
		San Pedro Area
		San Pedro
		Willmington
		Longbeach
	Orange	Newport Beach
		Dana Point
		Other LA and Orange Co. Ports
San Diego	San Diego	San Diego
		Oceanside
		San Diego Area
		Other S.D. Co. Ports
Unidentified CA	Unknown	Unknown CA Ports

3.14.3.2 Groundfish Fishery-related Income

In 2007, economic activities of the LE trawl fleet were estimated to have provided about $81 million in personal income compared with $662 million from all west coast fishing activities (Table 3-67). The port areas for which the trawl fishery generated the most personal income were along the south central Washington coast (i.e., Westport and Ilwaco), Astoria, Newport, Coos Bay, and Eureka. The ports with fishing communities that had the greatest dependence on the LE shoreside trawl fishery were Newport, Eureka, Fort Bragg, and Astoria, all of which relied on the shoreside trawl sector for at least 25 percent (rounded) of their personal income from fishing (Table 3-68). Estimates of personal income were developed using the Fishery Economic Assessment Model (FEAM), which is based on the U.S. Forest Service Impact Analysis for Planning (IMPLAN) model.

Table 3-67. Community income impact ($1,000) baseline (2007) activity by fisheries sectors by port area (local personal income impacts).

Port Area	Fishery Sector							
	Limited Entry Shoreside Trawl	Limited Entry Fixed Gear	Open Access	Non-Groundfish	Treaty Groundfish	Treaty Non-Groundfish	At-Sea Whiting	TOTAL
Northern Puget Sound	2,199.8	2,656.2	66.1	8,137.4	23.2	129.6		13,212.4
Southern Puget Sound		81.0	5.5	2,588.0				2,674.5
North Washington Coast	346.0	1,068.2	187.5	4,476.9	3,801.7	4,448.8		14,329.2
South and Central Washington Coast	18,128.9	1,088.3	218.3	84,278.1	7,313.6	649.5		111,676.7
Unidentified Washington				13.7	706.1	7,886.2		8,606.0
Astoria	21,216.5	697.2	98.4	63,344.7				85,356.8
Tillamook	13.4	0.3	194.5	2,781.2				2,989.5
Newport	13,592.2	2,070.4	129.1	15,247.2				31,038.9
Coos Bay	8,257.2	1,286.1	251.8	27,351.0				37,146.1
Brookings	1,549.8	827.3	1,142.9	3,539.7				7,059.7
Crescent City	2,007.0	322.8	633.9	18,386.7				21,350.4
Eureka	7,177.2	574.3	256.3	12,575.5				20,583.2
Fort Bragg	2,885.5	603.6	697.7	7,262.0				11,448.7
Bodega Bay	80.4	30.0	66.5	10,432.2				10,609.1
San Francisco	2,280.8	236.0	395.9	14,248.3				17,161.0
Monterey	880.7	787.0	513.8	37,817.7				39,999.2
Morro Bay	58.4	64.6	1,844.2	2,186.7				4,153.9
Santa Barbara		398.1	364.7	82,751.8				83,514.7
Los Angeles		1,237.9	184.4	84,285.7				85,708.1
San Diego		513.3	97.6	8,313.0				8,923.9
Unidentified California				298.8				298.8
Catcher Vessel							16,866.3	16,866.3
Catcher-Processor							25,827.9	25,827.9
Tribal CV							1,817.3	1,817.3
TOTAL	**80,674.0**	**14,542.4**	**7,349.2**	**490,316.5**	**11,844.6**	**13,114.1**	**44,511.4**	**662,352.1**

Table 3-68. Baseline on local fishing community dependence (% dependence, 2007), percent of fishery related income impacts by fisheries sector and port area.

Port Area	2007 Income Impacts ()							
	Limited Entry Shoreside Entry Trawl	Limited Entry Fixed Gear	Open Access	Non-Groundfish	Treaty Groundfish	Treaty Non-Groundfish	At-Sea Whiting	TOTAL
Northern Puget Sound	16.6%	20.1%	0.5%	61.6%	0.2%	1.0%		100%
Southern Puget Sound		3.0%	0.2%	96.8%				100%
North Washington Coast	2.4%	7.5%	1.3%	31.2%	26.5%	31.0%		100%
South and Central Washington Coast	16.2%	1.0%	0.2%	75.5%	6.5%	0.6%		100%
Unidentified Washington				0.2%	8.2%	91.6%		100%
Astoria	24.9%	0.8%	0.1%	74.2%				100%
Tillamook	0.4%	0.0%	6.5%	93.0%				100%
Newport	43.8%	6.7%	0.4%	49.1%				100%
Coos Bay	22.2%	3.5%	0.7%	73.6%				100%
Brookings	22.0%	11.7%	16.2%	50.1%				100%
Crescent City	9.4%	1.5%	3.0%	86.1%				100%
Eureka	34.9%	2.8%	1.2%	61.1%				100%
Fort Bragg	25.2%	5.3%	6.1%	63.4%				100%
Bodega Bay	0.8%	0.3%	0.6%	98.3%				100%
San Francisco	13.3%	1.4%	2.3%	83.0%				100%
Monterey	2.2%	2.0%	1.3%	94.5%				100%
Morro Bay	1.4%	1.6%	44.4%	52.6%				100%
Santa Barbara		0.5%	0.4%	99.1%				100%
Los Angeles		1.4%	0.2%	98.3%				100%
San Diego		5.8%	1.1%	93.2%				100%
Unidentified California				100.0%				100%
Catcher Vessel							100%	100%
Catcher-Processor							100%	100%
Tribal CV							100%	100%

3.14.3.3 Social Structure: Networks, Values, Identity

The fishing community on the west coast is composed of many separate communities based on fishery, gear type, targeted species, geography, and, to some degree, cultural background and ethnicity. For example, Astoria, Oregon, has Finnish roots that are celebrated in community festivals, and Native American communities have ties to the fishery that date back thousands of years.

Commercial fishing enterprises in Washington, Oregon, and California are socially and culturally diverse. However, most tend to be family-run businesses. While most fishermen are male, women are often involved in the shoreside aspects of the fishing business and provide an important support and communications network for the fishing community. Few fishing families own multiple boats, and few boats are owned by large corporations. In many communities, families can trace several generations of involvement in the fishing industry.

Recreational fishing is also an important part of many communities' identities. The recreational fishing industry includes charter boats, guides, marinas, gear, bait, and other suppliers. Many of these businesses are also family-owned and operated. In addition to their direct impact on the local community, the recreational fishing industry supports a broad-based community of thousands of individual boat owners and shore fishermen participating in ocean and inland recreational fisheries.

The commercial fishing industry generally places a high value on independence. Fishing necessarily occurs at sea, and frequently attracts people who enjoy solitude and self-direction. This sense of independence and self-reliance contrasts sharply with the increasingly stringent controls being placed on the industry.

Fishing is also known for its high level of danger; it is consistently rated among the most dangerous professions in the U.S. Despite this danger, there are few safety nets for people in the industry. Crew members are not technically employees and are not eligible for unemployment insurance, Workers' Compensation, and other benefits normally associated with workers in other demanding and dangerous occupations. Vagaries of weather, market conditions and regulations demand high levels of flexibility. Many crew members are itinerant, moving from port to port and job to job (Gilden 1999).

The challenges of pursuing and maintaining fishing-based livelihoods have caused fishermen to form organizations to represent common interests. Examples include the Coos Bay Trawlers Association, the Newport Fishermen's Wives Association, the Pacific City Dorymen's Association, the Fishermen's Marketing Association, the Pacific Marine Conservation Council, the West Coast Fishermen's Alliance, the Western Fishboat Owner's Association, and the Women's Coalition for Pacific Fisheries (Gilden 1999). These organizations help the multiple facets of the fishing community represent their interests to policy makers and the general public.

3.14.3.4 The Built Environment

Few coastal communities depend exclusively on commercial fishing. Harvesting, processing, and related support industries (fuel, docks, ice, gear repair, etc.) are part of a complex web of interaction with other economic activities such as sport fishing, whale watching, tourism, and other recreational activities. Commercial and recreational fishermen coexist, and both contribute financially to the businesses and infrastructure that serve and support them. Communities such as Newport, Oregon, celebrate their fishing industry, having turned the port waterfront into a major tourist attraction. This is also true for many other historic ports in Washington, Oregon, and California. Maintenance of port facilities for the fishing fleet provides access for other user groups, such as recreational fishermen and boaters, and draws tourists who are attracted to the sights and smells of a working fishing port.

The presence of a viable commercial fleet helps provide the funding and incentive to dredge harbor entrances and to maintain jetties and port facilities. These activities, in turn, assist the recreational industry and private users to operate safely and efficiently from coastal ports. Seafood processors and shoreside support businesses pay property taxes and license fees to the port cities and surrounding jurisdictions, thereby contributing to the maintenance of the local infrastructure for all area residents.

The following are examples of fishery-related effects on port infrastructure. In ports such as Brookings and Garibaldi in Oregon, reduction in fishing fleets has coincided with the silting of harbor entrances due to reduced dredging. This has restricted access for larger vessels, including trawlers, and made it more difficult for a fleet to become established in the future (Gilden 1999). In another example, the Port of Astoria recently added a new breakwater to provide additional moorage for larger vessels involved in the new sardine fishery (Oregon Coastal Zone Management Association 2002).

3.14.4 Dependence, Engagement, and Vulnerability in Fishing and Fishing-Related Activities

There have been many efforts to determine levels of dependence, engagement, vulnerability, and resilience in natural resource-based communities. Understanding these factors helps managers focus on impacts to specific communities, and determine which communities are least able to adapt to a decrease in harvest as a result of regulatory change.

Most studies use the term "dependence" to mean a community's use of a particular resource (for example, whiting or flatfish). "Engagement" is used to describe a community's use of a more general resource (for example, fisheries). "Resilience" is used to describe a community's ability to adapt to change. "Vulnerable" areas are communities that are highly engaged, highly dependent, or have relatively low resilience.

Appendix A to the 2007-08 groundfish harvest specifications EIS (PFMC 2006) describes an analysis of community vulnerability and resilience (hereafter referred to as the 2006 socioeconomic analysis). This analysis is incorporated by reference. The analysis estimates dependence of west coast fishing communities on fishing activity and the relative resilience those communities have to dealing with change. This information is useful for considering impacts to communities in cases where changes in fishing activity have a different degree of impact to a community. In such cases, a moderate change in fishing activity occurring in a vulnerable community may be considered a substantial impact, while a moderate change in fishing activity in a less vulnerable community may be considered relatively inconsequential. The 2006 socioeconomic analysis includes a detailed description of the methodology (PFMC 2006)

3.14.5 Most and Least Vulnerable Communities

The 2006 socioeconomic analysis identifies 32 communities as vulnerable in terms of commercial groundfish fisheries. Of these, 13 are considered trawl communities (Aberdeen, Bandon, Bodega Bay, Chinook, Everett, Garibaldi, Gold Beach, LaPush, Oakland, Oceanside, Oxnard, Pacific City, Port Angeles, Port Arena, Point Orford, San Pedro, Santa Cruz, Seaside, and Siletz are designated as vulnerable, but are not considered trawl communities). The remaining 13 groundfish trawl communities, plus six groundfish trawl communities not listed as being vulnerable in the 2006 analysis, are shown below in Table 3-69 in order of relative vulnerability. Within categories, they are listed north to south. (Communities designated vulnerable by Quigley are bolded).

Table 3-69. Vulnerable communities.

	Dependence on Groundfish[1]	Lack of Resilience[2]
Most vulnerable communities (medium dependence, least resilience)		
Neah Bay	2	5
Moss Landing	2	4
Relatively lower dependence, but low resilience		
Ilwaco	1	3
Relatively higher dependence, medium resilience		
Bellingham	3	2
Astoria	3	2
Coos Bay	3	2
Crescent City	3	2
Eureka	3	2
Fort Bragg	3	2
Relatively higher dependence, higher resilience		
Newport	3	1
Morro Bay	3	1
Medium dependence but higher resilience		
Westport	2	1
Relatively lower dependence and relatively higher resilience		
Warrenton	1	1
Higher dependence, but high resilience (not considered "vulnerable")		
Brookings	3	0
San Francisco	3	0
Low dependence, high resilience (not considered "vulnerable")		
Anacortes	0	0
Seattle	1	0
Hammond	1	0
Half Moon Bay	1	0

[1] Number of times the city scored in the top one-third of commercial groundfish dependency indicators in the Quigley study

[2] Number of times the city scored in the top one-third (least resilient) of resiliency indicators in the Quigley study

In addition to these communities, 17 counties were identified as vulnerable with regard to groundfish dependence. Clatsop, Coos, Curry, Grays Harbor, Lincoln, and Los Angeles counties score as most highly dependent (scores of two or more) and least resilient (scores of two or more).

In addition to the study described above, Appendix A to the 2005-06 groundfish harvest specifications EIS (PFMC 2004a) looked at a community's engagement in the commercial fishery relative to other opportunities in the regional economy (Table 3-70 and Table 3-71 show engagement-related data). Both the income and employment measures show that the south Washington coast (including the towns

of Grays Harbor, Westport, Willapa Bay, and Ilwaco/Chinook) is the area most heavily invested in commercial fishing relative to its economy. Newport and Astoria-Tillamook in Oregon, and Crescent City, California, are the next most engaged. Brookings and Central Washington coast alternate for fifth and sixth place, depending on whether the income or employment measure is used. By this measure, the least engaged port areas are the large, relatively urbanized centers of Puget Sound, San Diego, San Francisco, and Los Angeles. While these areas certainly include local pockets that are heavily engaged in fishing activities, the size and diversity of the surrounding economies tend to mask the significance of locally important factors.

Table 3-70. Income and employment from commercial fishing activities by port group, Nov. 2000-Oct. 2001 (Source: PFMC 2004a, Appendix A, Table 8-3a).

	All Commercial Fishery						All Groundfish			
Port Group Area	Commercial Fishery-Related Income ($,000)	Fishery-Related Income as a share of Total Personal Income		Commercial Fishery-Related Employment	Fishery-Related Employment as a share of Total Employment		Income ($,000)	Employment	Groundfish-Related Income as a share of Total Fishery Income	
		(Percent)	(Rank)		(Percent)	(Rank)			(Percent)	(Rank)
Puget Sound	14,344	0.01%	17	531	0.03%	16	8,694	322	60.61%	1
North WA Coast	8,262	0.36%	9	357	1.14%	8	4,865	210	58.89%	2
Central WA Coast	29,858	2.03%	5	1,091	4.26%	6	7,442	272	24.93%	10
South WA Coast	21,053	4.78%	1	957	14.24%	1	1,557	71	7.39%	14
Astoria/Tillamook	46,402	3.29%	4	1,959	7.72%	4	24,122	1,019	51.98%	3
Newport	45,709	4.27%	2	1,968	10.76%	2	22,122	952	48.40%	5
Coos Bay	23,476	0.20%	11	948	0.44%	11	9,266	374	39.47%	7
Brookings	8,792	1.77%	6	400	5.76%	5	3,754	171	42.70%	6
Crescent City	19,111	3.90%	3	773	9.43%	3	6,246	253	32.68%	9
Eureka	14,729	0.50%	8	591	1.11%	9	7,501	301	50.93%	4
Fort Bragg	15,740	0.73%	7	650	1.82%	7	6,183	255	39.28%	8
Bodega Bay/San Francisco	39,330	0.02%	15	1,205	0.04%	15	5,744	176	14.60%	13
Monterey	34,174	0.16%	12	1,146	0.39%	12	5,091	171	14.90%	12
Morro Bay	10,348	0.16%	13	374	0.36%	13	2,482	90	23.99%	11
Santa Barbara	98,377	0.26%	10	3,075	0.78%	10	1,396	44	1.42%	16
Los Angeles	149,075	0.04%	14	3,840	0.06%	14	1,148	30	0.77%	17
San Diego	13,431	0.01%	16	367	0.03%	17	625	17	4.65%	15
TOTAL	592,209	0.06%		20,230	0.15%		118,239	4,726	19.97%	

Includes total income and employment impacts: wages and salaries paid to primary producers, processors and suppliers, and the additional income and employment generated when wages and salaries are spent (PFMC FEAM 9/02).

The second block in Table 3-70 shows how much of the total fishery-related income and employment in each region is generated by groundfish activity. This measure shows that Puget Sound, North Washington Coast, Astoria-Tillamook, and Eureka all depend on groundfish for at least 50 percent of fishery-related income and employment. All but four of the port groups generate at least 14 percent of fishery-related income from groundfish.

Table 3-71 splits the groundfish totals into LE trawl and other gear components. The data indicate that, of the regions highly involved in groundfish, Astoria/Tillamook, Puget Sound, Newport, and Eureka derive more than 40 percent of groundfish income from the LE trawl fishery. Only the North Washington coast derives more than one-third of groundfish income from nontrawl sources.

Table 3-71. Income and employment from commercial fishing activities by port group, Nov. 2000-Oct. 2001. (Source: PFMC 2004a, Appendix A, Table 8-3b)

Port Group Area	Groundfish Limited Entry Trawl				Other Groundfish Gear			
	Income ($,000)	Employment	Limited Entry Groundfish Trawl-Related Income as a share of Fishery Income		Income ($,000)	Employment	Other Groundfish-Related Income as a share of Fishery Income	
			(Percent)	(Rank)			(Percent)	(Rank)
Puget Sound	6,558	243	45.72%	2	2,136	79	14.89%	3
North WA Coast	1,318	57	15.96%	10	3,547	153	42.93%	1
Central WA Coast	6,558	240	21.96%	9	885	32	2.96%	14
South WA Coast	1,377	63	6.54%	14	180	8	0.85%	16
Astoria/Tillamook	22,338	943	48.14%	1	1,784	75	3.85%	13
Newport	19,991	861	43.74%	3	2,132	92	4.66%	10
Coos Bay	7,718	312	32.88%	5	1,548	63	6.59%	8
Brookings	1,985	90	22.58%	8	1,769	80	20.12%	2
Crescent City	5,019	203	26.26%	7	1,227	50	6.42%	9
Eureka	6,437	258	43.70%	4	1,064	43	7.23%	7
Fort Bragg	4,503	186	28.61%	6	1,680	69	10.68%	5
Bodega Bay/San Francisco	4,176	128	10.62%	11	1,569	48	3.99%	12
Monterey	2,579	86	7.55%	13	2,512	84	7.35%	6
Morro Bay	1,095	40	10.58%	12	1,388	50	13.41%	4
Santa Barbara	9	0	0.01%	16	1,387	43	1.41%	15
Los Angeles	1	0	0.00%	17	1,147	30	0.77%	17
San Diego	4	0	0.03%	15	621	17	4.62%	11
TOTAL	91,664	3,709	15.48%		26,575	1,017	4.49%	

Includes total income and employment impacts: wages and salaries paid to primary producers, processors and suppliers, and the additional income and employment generated when wages and salaries are spent (PFMC FEAM 9/02).

These findings echo and reinforce the vulnerability findings in the 2006 socioeconomic analysis.

3.14.6 Current Status of West Coast Communities

This section describes the port communities involved in the groundfish fisheries. The identification of communities is based on the ports and port groups identified in PacFIN data. Figure 3-29 shows these ports and port groups. Because groundfish trawl activity is minimal in Southern California, these communities are not described.

3.14.6.1 Washington State

Bellingham, Anacortes, and Seattle are located in Puget Sound. Puget Sound is dominated by the Seattle metropolitan area; the city is a regional population center and economically important regionally and nationally. Seattle has traditionally been an important intermediary center for trade and transshipment for Alaska, and many of the large catcher-processors participating in Alaska fisheries are based there. Blaine and Bellingham, both north of Seattle, have traditionally been important ports for groundfish vessels, though there are currently no groundfish trawlers operating out of Blaine. Table 3-72 shows fishery and demographic indicators for Puget Sound ports.

Puget Sound has a low share of personal income and employment derived from all commercial fishing activities (PFMC 2004a). The relative unimportance of fisheries as a share of total income and employment in the region reflects its economic dynamism, with many industries—notably computer software and commercial aircraft manufacture—providing substantial income and employment. Looking at fishery-related income alone, however, at 61 percent, more of it is derived from groundfish-

fishery-related activities than in any of the other port areas. Thus, groundfish fisheries play an important role in what is a relatively small sector of the total regional economy.

Table 3-73 shows fishery and demographic indicators for the Washington coast ports of Neah Bay, Westport, and Ilwaco

Table 3-72. Fishery and demographic indicators, Puget Sound ports, Washington.

Indicator	Bellingham	Anacortes	Seattle
Vulnerability	Vulnerable	Not vulnerable	Not vulnerable
Dependence on groundfish	Medium dependence	Low dependence	Low dependence
Resilience	Medium resilience	High resilience	High resilience
Population (2000)	67,171	14,557	563,374
Unemployment rate (2000)	10.3	5.1	5.1
Natural resources employment (2000)	0.9	2.3	0.3
Median household income (2000)	32,530	41,930	45,736
Percent below poverty level (1999)	20.6	7.7	11.8
Non-whiting groundfish trawl vessels (2005)	6	0	0
Whiting trawl vessels (2005)	0	0	0
Percentage of fishery revenue from groundfish (2005)	55.3	n/a	16
Groundfish processors (2006)	2	0	1
Federal trawl permits owned by community members (2007)	2 by 2 different owners	1	24, with 11 different owners
Vessels bought back in 2003 buyout	10	0	0

Puget Sound

Bellingham

Bellingham is located on Bellingham Bay in north Puget Sound, in Whatcom County. The closest major U.S. city is Seattle, a 90-mile drive south, while Vancouver, British Columbia, is a 54-mile drive north. Bellingham is a nonwhiting port.

Bellingham is considered vulnerable because it is highly engaged in Pacific fisheries in general, highly dependent on groundfish, and has medium resilience. Bellingham has two processors that process groundfish landed in Bellingham Bay and Neah Bay. Bellingham also has access to a large seafood cold storage facility and has a relatively well-developed level of port infrastructure. Bellingham is located on the I-5 corridor, which enhances access to distribution facilities in the Seattle area.

The Comparative Advantage Model shows that 69.9 percent of Bellingham's nonwhiting trawl catch occurs in an area identified as a high bycatch area. Yelloweye and canary rockfish are the main species of concern, and both are very constraining. Because of this, Bellingham vessels are relatively constrained compared to other ports. In addition, vessels from Bellingham have a much longer travel distance to and from fishing grounds compared to vessels from other ports. This increases cost for those vessels, suggesting that the 4 of 11 vessels that fall within the efficient range may be more appropriately categorized as inefficient. However, the efficiencies created by Bellingham's shore-based infrastructure help make up for the burden created by constraining bycatch species and lack of efficiency.

Anacortes

Anacortes, in Skagit County, is 80 miles north of Seattle and 40 miles southwest of Bellingham. Anacortes is primarily a whiting port; the at-sea whiting fleet docks there, and one at-sea whiting

company has its corporate headquarters in Anacortes. Perhaps because of this, commercial fishing in Anacortes has employed few workers, but has paid some of the area's highest salaries. In 2000, the annual average wage for commercial fishermen in the county was $57,810. That year, the finfish fishery (which includes whiting) employed 53 workers making $83,016 annual average pay. And in the same year, only 91 Skagit County residents identified themselves as commercial fishermen.

Anacortes is not considered vulnerable. It is engaged in Pacific fisheries in general, but it is not considered dependent on groundfish and it is highly resilient.

Anacortes currently has no groundfish processors. Many seafood processors operating in the area have closed. However, several seafood companies from Western Washington come to Cap Sante Boat Haven to purchase product (not groundfish) from local fishermen.

Seattle

Seattle is on the east side of the Puget Sound between Elliot Bay and Lake Washington, in King County. According to the 2000 U.S. Census, Seattle's population was 563,374. The larger metropolitan area (comprising all or parts of Snohomish, King, Pierce, Thurston, and Kitsap Counties) was home to 3,554,760 in 2000.

Seattle is an important whiting port, with docks for the at-sea fleet and corporate headquarters. Most of the 24 Federal trawl permits owned in Seattle are used in the at-sea whiting fishery. Although nonwhiting permit holders live in Seattle, none actively fish out of Seattle, so Seattle's proximity to a high bycatch area is irrelevant.

In 2000, west coast fisheries landings in Seattle were delivered by 909 unique vessels. They include 253 commercial vessels, 498 tribal commercial vessels, and 158 personal use vessels. Nine vessels landed 109 mt of groundfish.

Seattle is not considered vulnerable. It is engaged in Pacific fisheries in general, but it is not considered dependent on groundfish and it is highly resilient. Seattle has a high level of fisheries infrastructure.

Washington Coast

Neah Bay

Neah Bay is at the northwestern-most point of the contiguous United States, across the Strait of Juan de Fuca from Vancouver Island, British Columbia. Situated in Clallam County, Neah Bay is the main settlement on the Makah Indian Reservation. The closest major U.S. city is Seattle, a 165-mile drive and ferry ride southeast.

Neah Bay is considered quite vulnerable. It is not deeply engaged in Pacific fisheries in general, but it is dependent on groundfish and has very low resilience.

There are no known processing facilities of trawl groundfish in Neah Bay. Vessels deliver to buyers who subsequently deliver to processors in Seattle, Bellingham, Astoria, and elsewhere. Port and harbor facilities are limited, and the location is considered remote and removed from distribution and transportation networks. No Federal trawl permits are owned by community members. Vessels fishing out of Neah Bay are owned by nonresidents. As recently as 2005, eight vessels made deliveries to Neah Bay, but anecdotal information indicates that many of these vessels have since left the business due to management restrictions. As of 2008, no trawlers are believed to be operating out of Neah Bay.

Westport

Westport is on the southernmost peninsula in Washington, Point Chehalis, in Grays Harbor County. The closest major U.S. city is Seattle, a 130-mile drive northeast. Westport is primarily a whiting port, though two small nonwhiting vessels also deliver there.

Westport is considered vulnerable. It is deeply engaged in Pacific fisheries in general and is fairly dependent on the groundfish fishery, but it is also fairly resilient.

Westport has a single processor that processes trawl groundfish landed in the community. This facility concentrates primarily on Pacific whiting and is one of the largest shoreside processors for this species. Facilities near the Port of Grays Harbor include vessel fabrication services and supply centers. Westport is somewhat removed from distribution centers. Fish landed in Westport are also processed in Astoria and Ilwaco.

Westport and Ilwaco are the dominant ports for groundfish in the Central and South Coast port group. Most of the larger vessels, in excess of 60 feet, are ported in Westport and Ilwaco (PFMC 2004a). Some of these are likely participants in groundfish fisheries, particularly the industrial fishery for Pacific whiting. These two port groups are sparsely populated, more rural areas. These regions have large Native American populations, at least proportionately.

Ilwaco

Ilwaco is on the Long Beach Peninsula in southwest Washington. Situated in Pacific County, the community encompasses 2.06 square miles of land and 0.31 square mile of water. The closest major U.S. city is Portland, Oregon, a 110-mile drive southeast, while Seattle is a 170-mile drive northeast. Ilwaco is primarily a whiting port.

Ilwaco is considered vulnerable. It is deeply engaged in Pacific fisheries in general, but it is not very dependent on groundfish. Ilwaco is fairly lacking in resilience.

Ilwaco has a relatively small, but has a sufficient amount of infrastructure, with one processor, a marina, a fish wholesaler, and sources for fishing and marine supplies.

Table 3-73. Fishery and demographic indicators, Washington coast ports.

Indicator	Neah Bay	Westport	Ilwaco
Vulnerability	Vulnerable	Vulnerable	Vulnerable
Dependence on groundfish	Medium-low dependence	Medium-low dependence	Low dependence
Resilience	Very low resilience	High resilience	Low resilience
Population (2000)	794	2,137	950
Unemployment rate (2000)	24	7.5	6.2
Natural resources employment (2000)	17.9	10.8	3.7
Median household income (2000)	21,635	32,037	29,632
Percent below poverty level (1999)	29.9	14.3	16.3
Non-whiting groundfish trawl vessels (2005)	8	3	0
Whiting trawl vessels (2005)	0	8	3
Percentage of fishery revenue from groundfish (2005)	64.1	14.5	14.7
Groundfish processors (2006)	0	1	1
Federal trawl permits owned by community members (2007)	0	1	0
Vessels bought back in 2003 buyout	0	2	0

3.14.6.2 Oregon

The north Oregon coast is the most important groundfish region on the west coast in terms of total groundfish landings and revenue. In 2000-01 this area accounted for $12.3 million in ex-vessel groundfish revenue, almost a quarter of the $51.5 million coastwide total, including at-sea deliveries (Table 3-71). The bulk of the at-sea deliveries—which are Pacific whiting delivered to floating processors—are attributable to these port groups. Astoria/Tillamook, grouped as one port area in the fishery-related tables (but split out in the demographic tables), and Newport are at or near the top of all the groundfish species categories, indicating that although the high-volume whiting fishery is centered in this region, other groundfish are equally important, surpassing whiting in terms of ex-vessel revenue (PFMC 2004a).

Astoria and Newport are home to a large fraction of the LE groundfish trawl fleet with 57 of the 243 total vessels in the fleet in 2002 (PFMC 2004a). The vessel buyback program retired 13 LE trawl vessels in Astoria and six trawlers in Newport in 2003 (NMFS 2004b). These port areas have a relatively large number of vessels in the 60-foot-and-above length classes, also reflecting the larger LE trawlers fishing out of these ports (PFMC 2004a).

These port groups are demographically similar. Of these two ports, Newport has the highest percent nonwhite population, and Native Americans represent the largest share of this population with 3.2 percent of the total population. These port groups rank in the middle in terms of educational attainment. Although average income is comparatively modest, poverty rates also rank lower, which could suggest less wealth disparity in these areas. However, looking at rates for individual census places suggests pockets of poverty in some areas. The rate for Astoria is 15.2 percent.

Fishery-related income and employment are important in these port groups (PFMC 2004a). Newport ranked second, while Astoria/Tillamook ranked fourth in terms of contribution fisheries activities made to these economic indicators in 2001. Approximately half of all fisheries income in these port groups was derived from groundfish-fishery-related activities in that year, reflecting the significance of these ports to the west coast groundfish fishery, discussed above.

Table 3-74 shows fishery and demographic indicators for Oregon ports.

Table 3-74. Fishery and demographic indicators, Oregon ports.

Indicator	Astoria	Warrenton	Newport	Coos Bay	Charleston	Brookings
Vulnerability	Vulnerable	Not vulnerable	Vulnerable	Vulnerable	Not vulnerable	Not vulnerable
Dependence on groundfish	Relatively dependent	Low dependence	Relatively dependent	Dependent	Dependent	Relatively dependent
Resilience	Medium resilience	High resilience	High resilience	Medium resilience	Medium resilience	High resilience
Population (2000)	9,813	4,096	9,532	15,374	n/a	5,447
Unemployment rate (2000)	6.7	3.5	9	5.4	n/a	5.8
Natural resources employment (2000)	3.1	3.4	3.8	3.6	n/a	5
Median household income (2000)	33,011	33,472	33,996	31,212	n/a	31,656
Percent below poverty level (1999)	15.9	14.2	14.4	16.5	n/a	11.5
Non-whiting groundfish trawl vessels (2005)	29		23	20		7
Whiting trawl vessels (2005)	5		12	2		0
Percentage of fishery revenue from groundfish (2005)	31.9		35.9		24.6	27.8
Groundfish processors (2006)	4		3		4-5	0
Federal trawl permits owned by community members (2007)	17, with 14 different owners		19, with 16 different owners	13, with 10 different owners		9, with 5 different owners (figures include Harbor)
Vessels bought back in 2003 buyout	12	0	9	8	0	6

Astoria/Warrenton

Astoria and Warrenton are adjacent to one another and are located in Clatsop County on the northwestern tip of Oregon, bordered by the Pacific Ocean on the west and the Columbia River on the north. Portland is the closest major city, 91 miles to the east.

Astoria is considered vulnerable. It is deeply engaged in Pacific fisheries in general, and it is relatively dependent on groundfish. Astoria has medium resilience. Warrenton is not considered vulnerable. It is not very engaged in Pacific fisheries and not very dependent on groundfish. Warrenton is also fairly resilient.

Astoria has the benefit of a relatively efficient fleet, a relatively large presence of shore-based infrastructure, and a low dependence on fishing grounds located in high bycatch areas. However, Astoria is fairly removed from distribution centers.

Newport

Newport is located in Lincoln County at the mouth of the Yaquina River. The northern portion of unincorporated South Beach is within the City of Newport's boundaries. The closest major metropolitan area is Portland, 136 miles to the northeast. Newport is both a whiting and nonwhiting port.

Newport prides itself in and protects its working waterfront, realizing that the seafood industry is at the core of Newport's history and culture. Tourism on the historic bayfront complements its mixed use. While new revitalization plans have enhanced the local tourism economy, they have also increased tensions between the tourism and seafood industries.

Newport is considered vulnerable. It is deeply engaged in Pacific fisheries in general, and very dependent on groundfish, but it is also fairly resilient.

In addition, several support businesses exist in the area, and dock and harbor facilities are fairly well developed. Newport is fairly removed from distribution centers.

Coos Bay/Charleston

Coos Bay and its port, Charleston, are located at the mouth of Coos Bay in Coos County, Oregon. Coos Bay is both a whiting and a nonwhiting port. Charleston, where most of the port activity takes place, is unincorporated. Coos Bay is located 226 miles south of Portland, on Highway 101, and 539 miles north of San Francisco.

Coos Bay is considered vulnerable. It is deeply engaged in Pacific fisheries in general, and very dependent on groundfish; it has medium resilience. Charleston is not considered vulnerable. It is not as engaged in Pacific fisheries or as dependent on commercial groundfish fisheries as Coos Bay (it scored higher on recreational measures, however); it is considered resilient.

There are several support businesses in the area, and dock and harbor facilities are fairly well developed. However, Coos Bay is fairly removed from distribution centers. Coos Bay appears to be at a relative advantage because of fleet efficiency and the relatively large amount of shore-based infrastructure.

The Pacific whiting fishery diminishes in importance, measured by landings and ex-vessel revenue, in southern Oregon. Although still a component of the Coos Bay port group landings, no whiting landings are shown in the Brookings region. Groundfish landings in the Brooking port group for 2002, at 881 mt, were lower than any other port group north of San Francisco (PFMC 2004a). However, with $2.3

million in ex-vessel revenue from groundfish in 2002, the Brookings port group is not substantially smaller than most of the other port groups. The rockfish category contributes most to revenues in Brookings. Because many of these are sold as live fish, which command higher prices, Brookings ports earned more revenue from fewer landed fish compared to the neighboring Coos Bay port group. Live fish deliveries are an important component of California groundfish fisheries, and they are increasingly important in southern Oregon as well. Also, as a proportion of revenue from all fisheries, groundfish are especially important in the Brooking region: the $2.3 million value amounted to just over half the $4.3 million in landings from all fisheries in 2002 (PFMC 2004a).

There are some notable differences in fleet characteristics between these two port groups (PFMC 2004a). Coos Bay had 29 LE groundfish trawlers in 2001 versus only 4 in Brookings. The vessel buyback program retired eight LE trawl vessels in Coos Bay. Five retired vessels are reported for Brookings out of nine (NMFS 2004a), more than the 2001 count (PFMC 2004a). This discrepancy is likely due to differences in the way vessel home ports are determined. Port Orford in the Brookings port group had a fleet of 14 LE fixed vessels in 2001. The table also shows a large number of vessels in the open access category of more than 5 percent of revenue from groundfish in the Brookings port group. Some of these vessels are likely participating in the live fish fishery and contributing to high-value rockfish landings.

These two fairly rural port groups are generally similar to northern Oregon ports in terms of race and ethnicity, or the comparatively small percentage of the population that is nonwhite and Hispanic. Native Americans are the largest minority group at a little over 2 percent in both port groups. These two port groups rank at the bottom for the percent of the population between 17 and 64; Coos Bay ranks first for population 65 years old and up, Brookings third. This reflects the popularity of this part of the Oregon coast as a retirement destination. They also rank at the bottom in terms of average household income and have fairly high poverty rates. Median incomes in constituent census places, however, are higher than in some Northern California communities (see below), ranging from $31,656 in Brookings to $29,492 in Bandon. These values are about two-thirds the statewide value of $40,916. Fisheries made a modest contribution to income and employment in 2001, with Brookings ranking somewhat higher than Coos Bay for the percent share coming from fisheries (PFMC 2004a).

Brookings

Brookings, located in Curry County, is the southernmost coastal city of Oregon. It is situated at the mouth of the Chetco River, approximately 345 miles south southeast of Portland. According to the Port of Brookings-Harbor, it is the busiest recreational port on the Oregon coast with more than 95,000 anglers taking more than 31,000 trips.

Brookings is not considered vulnerable. It is quite engaged in Pacific fisheries in general, and very dependent on groundfish, but it is also considered very resilient. Brookings depends heavily on the recreational salmon fishery, which was closed in 2008; therefore, it may be somewhat less resilient now than it was in the past.

Brookings is fairly removed from distribution networks. The fleet is characterized as relatively efficient because five vessels fall within the efficient category.

3.14.6.3 California

Northern California

Groundfish are an important component of landings, measured by value, in Northern California even if the total amount of groundfish landed in these three port groups is lower than for most port groups in

Washington and Oregon. Groundfish landings accounted for 29 percent of total ex-vessel revenues in these three port groups compared to 34 percent in Oregon and 18 percent in Washington (PFMC 2004a). During this year, these port groups also accounted for a little over half of the value of all groundfish landed in California, but only about a quarter of all fishery landings in California (Table 8-3b). Yet the amount of groundfish landed in these three port groups, 8,303 mt in 2002, is lower than that landed in any one of three port groups in Washington and Oregon (South and Central Washington, Astoria-Tillamook, and Newport) and lower than the sum of any three port groups in those two states. As in southern Oregon, rockfish and lingcod are important components of landings, measured by ex-vessel revenue. In Fort Bragg rockfish were the largest component of groundfish landings (PFMC 2004a). As mentioned above, this likely reflects the importance of high-value live fish deliveries. Eureka represents the southern terminus of the Pacific whiting fishery in terms of landings ports with 2,775 mt landed there in 2002, a small amount in comparison to landings in southern Washington and northern Oregon.

The total number of groundfish vessels in each of these three port groups is lower than in Oregon port groups, although higher than port groups in Washington (PFMC 2004a). However, the highest number of LE trawl vessels was retired by the vessel buyback program in this region. According to the report (NMFS 2004b), 14 vessels each were retired in Crescent City and Eureka. Another four vessels in Fort Bragg were retired. The open access sector also plays a larger role in these ports. In Eureka, for example, of the 98 vessels making groundfish landings in 2001, 68 were in the open access sector with groundfish accounting for more than 5 percent of their revenue for the year. Smaller vessels are more prevalent in the fishing fleets in these port groups; only 7 percent of the vessels are in the 60-foot-and-above size groups, half or less of the comparable percentage in Oregon port groups such as Astoria-Tillamook and Newport.

Hispanics are the largest minority group in these three port groups, although their share of the population is less than in most of the other port groups in California. The next largest minority group after Hispanics is Native Americans, who make up 5.4 percent of the population in the Crescent City area, 4.0 percent in Eureka, and 2.9 percent in Fort Bragg, ranking them first, third, and fifth among the port groups, respectively, for this statistic. Crescent City and Eureka rank low in terms of average household income and have the highest poverty rates among all the port groups. Median incomes in constituent census places are also comparatively low; in fact the median income for Crescent City—$20,133—is less than half the value for California as a whole. Fort Bragg is notable in terms of the comparatively high percentage of the population employed in natural resource related jobs. Estimated employment in fisheries in 2001 was relatively high in Crescent City but more modest in the other two port groups (PFMC 2004a). Groundfish fisheries played a more prominent role in Eureka than the other two port groups in this region, likely because of the shore-based processing of Pacific whiting at this port.

Crescent City

Crescent City is in Del Norte County in northern California, approximately 330 miles south of Portland, Oregon, and 356 miles north of San Francisco. The Crescent City Harbor supports recreational and commercial fisheries, along with tourism. The harbor includes an ice plant, hoist, fuel supplier, boatyard, tackle shops, dry storage, marine supply store, vessel repair and maintenance, and other amenities.

The groundfish vessel buyback program and sales of other local vessels have removed many of the larger rent-paying vessels from the port. The absence of this revenue stream has reportedly caused an increase in rent. A new port master plan aims to attract shops and other business.

Crescent City is considered vulnerable. It is very engaged in Pacific fisheries in general and quite dependent on groundfish, with medium resilience. In addition, Crescent City has been affected by the recent closure of the commercial and recreational salmon fishery.

Eureka

Eureka is the county seat of Humboldt County in northern California on Humboldt Bay south of Redwood National Park. San Francisco is 272.3 miles south. The economic base of Eureka was founded on fishing and timber. Commercial fishing has downsized in recent years, and now the major industries are tourism and timber. Eureka is located on Humboldt Bay, the only deep water port between Coos Bay, Oregon, and San Francisco.

Eureka has one large processing facility engaged in trawl groundfish. This processor also processes fish landed in Bodega Bay, Brookings, Fort Bragg, San Francisco, and Crescent City. Fish landed in Eureka are also processed in Fort Bragg and Watsonville. Eureka's harbor facilities include berthing, dry storage, cold storage, a hoist, a boatyard, fuel facilities, ice, vessel repair and maintenance, electrical services, marine supplies, and other amenities. Eureka is relatively removed from transportation networks and seafood distribution facilities.

Eureka is considered vulnerable. It is very engaged in Pacific fisheries in general and very dependent on groundfish, with medium resilience. Like Crescent City, Eureka has been affected by the recent closure of the commercial and recreational salmon fishery.

Fort Bragg

Fort Bragg is in Mendocino County on northern California's Pacific Coast. The community is bordered on the north by Pudding Creek, which flows into the Pacific Ocean through a narrow inlet. Noyo Harbor is at the southern edge of the city. Noyo Bay provides a natural harbor and access to ocean fisheries.

Fishing has historically been, and remains, an important part of Fort Bragg's economy and community identity. Many boat owners offer private charter services for tourists and sport fishermen. In addition to salmon, commercial and recreational fisherman take rockfish, abalone, crabs, and mussels. Several festivals point to the city's dependence on fishing and logging. The city has two fish processors, a liquid fish fertilizer processing plant, and numerous businesses associated with fishing and coastal tourism. Harbor facilities include berthing, two hoists, dry storage, fuel, ice, marine supplies, vessel repair and maintenance, and other amenities.

Fort Bragg is considered vulnerable. It is very engaged in Pacific fisheries in general, and it is very dependent on groundfish, with medium resilience. As with other California and Oregon communities, Fort Bragg has been affected by the recent closure of the commercial and recreational salmon fishery.

Table 3-75. Fishery and demographic indicators, Northern California ports.

Indicator	Cresent City	Eureka	Fort Bragg
Vulnerability	Vulnerable	Vulnerable	Vulnerable
Dependence on groundfish	Relatively dependent	Relatively dependent	Dependent
Resilience	Medium resilience	Medium resilience	Medium resilience
Population (2000)	4,006	26,128	7,026
Unemployment rate (2000)	6.5	9.7	8.4
Natural resources employment (2000)	3.9	3.2	8.3
Median household income (2000)	20,133	25,849	21,587
Percent below poverty level (1999)	34.6	23.7	40.9
Non-whiting groundfish trawl vessels (2005)	5	14	10
Whiting trawl vessels (2005)	0	3	0
Percentage of fishery revenue from groundfish (2005)	19	52.8	40.6
Groundfish processors (2006)	0-1	1	1
Federal trawl permits owned by community members (2007)	4, with 3 different owners	4, with 3 different owners	8, with 6 different owners
Vessels bought back in 2003 buyout	16	16	5

Central California

In Central California, and Southern California especially (see below), groundfish diminish as a significant component of commercial landings. In 2002, San Francisco ranked below Eureka and Fort Bragg port groups in terms of the amount of groundfish landings, but second only to Eureka in California measured by ex-vessel value. In the fishery-related tables, as opposed to the demographic tables, Bodega Bay ports are included in the San Francisco port group. Rockfish were an important component of landings in all three port groups in 2002; however, in Morro Bay especially, they provided a large portion of ex-vessel revenue. As noted above, this reflects the importance of the live fish fishery. Flatfish are also an important contributor to landings in all three port groups, while sablefish are significant in the Monterey port group.

As in Northern California, open access vessels were an important part of the fleet in these port groups, based on landings at member ports, as shown in Table 8-4. The LE trawl vessel buyback program retired 11 vessels in this region (NMFS 2004a), further reducing the importance of that sector. Taking the three port groups together, 86 percent of vessels making groundfish landings were in the open access sector, and the great majority of these likely targeted groundfish on some trips, given the number for which groundfish account for more than 5 percent of total landings value. In Morro Bay, almost all of these vessels made landings of nearshore species, again suggesting the importance of the live fish fishery—which targets fish in relatively shallow water—in this port group. Table 8-5 shows that these port groups have more small vessels—97.5 percent are less than 60 feet long compared to the coastwide value of 92 percent.

This region is more ethnically diverse, better educated, and wealthier than port groups to the north. Like Seattle in Puget Sound, San Francisco and the Bay Area metropolis dominate this region in terms of population and economic activity. The sparsely populated Bodega Bay port group includes affluent Sausalito, just across the Golden Gate Bridge from San Francisco. Its median income of $87,469 places it above all other communities except for the Newport Coast CDP in Southern California. Yet all of these port groups compare positively in terms of the statistics measuring income and education, with Morro Bay somewhat of a laggard in comparison to the other three port groups. As might be expected, natural-resource-related employment is insignificant in the San Francisco port group and modest in the other three. Table 3-70 further underscores the relatively unimportant role that fisheries play in large

regional economy of Central California. These ports rank near the bottom of the west coast port groups in estimates of 2001 income and employment from fisheries. Groundfish-related activities were also a less important share of fisheries income and employment in the Central California port groups, outranking only Southern California.

Table 3-76. Fishery and demographic indicators, Central California ports.

Indicator	San Francisco	Moss Landing	Half Moon Bay	Princeton	Morro Bay
Vulnerability	Not vulnerable	Vulnerable	Not vulnerable	Not vulnerable	Vulnerable
Dependence on groundfish	Relatively dependent	Somewhat dependent	Low dependence	Low dependence	Medium dependence
Resilience	High resilience	Low resilience	High resilience	High resilience	High resilience
Population (2000)	776,733	300	11,842	489	10,350
Unemployment rate (2000)	4.6	17.4	4	7.8	2
Natural resources employment (2000)	0.1	9.6	2.2	35.1	3.7
Median household income (2000)	55,221	66,442	78,473	40,417	34,379
Percent below poverty level (1999)	11.3	18.8	6.1	21.8	13
Non-whiting groundfish trawl vessels (2005)	16	13		11	8
Whiting trawl vessels (2005)	0	1		0	0
Percentage of fishery revenue from groundfish (2005)	33.6	23		23.1	48.3
Groundfish processors (2006)	6	0		3	0
Federal trawl permits owned by community members (2007)	10, with 4 different owners*	1	4, with 3 different owners		0*
Vessels bought back in 2003 buyout	1	3	0	0	5

*The Nature Conservancy, headquartered in San Francisco, owns 7 permits 1 used in Monterey, 6 used in Morro Bay)

San Francisco

San Francisco is located on the San Francisco Peninsula. A large and diverse city, San Francisco still has active commercial and recreational fisheries. San Francisco-area fisheries, like many west coast fisheries, fluctuate depending on fisheries management decisions, ocean and weather cycles, and economic factors. Fishermen's Wharf is the traditional home of the fishing fleet and still serves commercial fishermen, although to a lesser extent than in the past; it is now primarily a tourist attraction. The Port of San Francisco provides berthing for commercial fishing boats at Fisherman's Wharf. The port offers full service ship repair, two dry docks, fuel, ice and other supplies, and numerous portside facilities. Additionally, the wharf's Pier 45 houses the west coast's largest concentration of commercial fish processors and distributors. It is port policy that commercial fishing vessels have top priority for berths at the harbor. Many of the fishermen in the wharf community are not San Francisco residents due to San Francisco's high cost of living. Fishermen live in the nearby communities of East Bay, South Bay, Sonoma, Peninsula, and others.

San Francisco is not considered vulnerable. It is very engaged in Pacific fisheries in general, and its fisheries are quite dependent on groundfish, but it has very high resilience.

Moss Landing

Moss Landing is in Monterey County on the eastern shore of Monterey Bay at the mouth of Elkhorn Slough. The community is 25.4 miles south of Santa Cruz and 95.8 miles south of San Francisco.

Fisheries in Moss Landing traditionally targeted sardines and other CPS species. After the sardine population collapsed, fishermen and buyers shifted their focus to anchovies, mackerel, and squid. Over time, fisheries for groundfish, halibut, spot prawn, crab, salmon, albacore, and other species developed at Moss Landing. Today, Moss Landing Harbor is one of the largest commercial fishing ports in California. In 2001, it ranked third in pounds landed behind the Los Angeles and Ventura/Port Hueneme/Oxnard Harbor complexes and fourth in ex-vessel revenues behind the San Francisco Bay area. Moss Landing Harbor, Woodward's Marine (a small supply/tackle store and fuel dock), a boatyard

with travelift, a marine electrician, a marine diesel mechanic, a marine covers/upholstery shop, and a metal fabricator/welder provide fishing-related goods and services. Fish landed in Moss Landing are processed in San Francisco, Santa Rosa, Watsonville, and Hawaiian Gardens. Moss Landing's economy is now based on commercial fishing, research, and recreation and tourism.

Moss Landing is considered vulnerable. It is quite engaged in Pacific fisheries in general, and somewhat dependent on groundfish, and it has very low resilience.

Princeton/Half Moon Bay

Princeton, also known as Princeton-by-the-Sea, is one of several unincorporated coastal communities south of San Francisco. It is 25 miles south of San Francisco and 44 miles northwest of San Jose. Half Moon Bay is located nearby. Princeton generally serves as the port for Half Moon Bay.

Neither Princeton nor Half Moon Bay is considered vulnerable. As their relatively high median household income shows, both are quite well off, though Princeton also has a high percentage of residents whose income is below poverty level. Both communities' dependence on the groundfish fishery is low, and both are highly resilient.

Originally envisioned as an ocean resort, Princeton is now known principally for its harbor, Pillar Point. The land adjacent to Pillar Point is primarily industrial for boatbuilding and other marine-related industries. Pillar Point is a working fishing harbor with 369 berths. The harbor was constructed in 1961, and the inner breakwater was added in 1982. Pillar Point offers a modern fish dock, six-lane boat launch ramp, ice-making facility, and serves as a fish-buying hub for local commercial vessels.

Morro Bay

Morro Bay is considered vulnerable. It is quite engaged in Pacific fisheries in general, is very dependent on groundfish, but it also is very resilient.

In 2006, The Nature Conservancy purchased six federal trawling permits and four trawling vessels from commercial fishermen in Morro Bay. In addition to the six permits, the Conservancy purchased four trawling vessels and is exploring alternative uses for them. One vessel associated with the acquired trawling permits remains with its current owner, who holds permits for other types of fishing, but is not trawling at this time. The vessel is legally constrained from bottom trawling for groundfish in the future. Any fisherman who sells his permit to the Conservancy cannot re-enter the trawl groundfish fishery.

There are currently no trawlers operating out of Morro Bay. For now, all but one of The Nature Conservancy permits are inactive. In the future, however, it may lease back permits to central coast fishermen who would use more selective gear; Morro Bay fishermen will be given preference for using these permits. Therefore, it is impossible to predict how efficient Morro Bay's future fleet may be, though The Nature Conservancy materials suggest it is unlikely that much trawling will take place there.

Groundfish landed in Morro Bay are processed in Atascadero (15 miles away), San Francisco, Watsonville, and Port San Luis/Avila. The town is relatively removed from distribution facilities, but infrastructure exists in the harbor area to support commercial fishing operations.

3.14.7 Minority and Low Income Communities

EO 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, requires federal agencies to identify and address "disproportionately high adverse human health or environmental effects of its programs, policies, and activities on minority and low-income

populations in the United States." Fishery management actions promulgated by the Pacific Council and implemented by NMFS can have environmental and socioeconomic impacts over a very wide area; the affected area of many actions covers all west coast waters and adjacent coastal communities involved in fishing. This makes it difficult to identify minority and low-income populations that may be disproportionately affected.

An analysis included in the 2005-06 groundfish harvest specifications used 2000 census data to identify coastal communities that may be considered low income and/or having a large minority population (PFMC 2004a). Impacts of the proposed action on those communities can then be assessed to determine if they are disproportionate. That analysis is incorporated by reference. Five criteria were used to identify low income and minority communities: percent nonwhite population, percent Native American population, percent Hispanic population, average income, and poverty rate. Census block group data encompassing each port were compared to a reference, in this case, the census data for all the ports within a region. Three regions were identified: Washington, Oregon, and Northern California; Central California; and Southern California. Ports that fell into the top or bottom twentieth percentile, depending on the statistic, were identified. Table 3-77 summarizes this information by showing the number of ports in each region that fell within the top or bottom twentieth percentile. Table 3-78 and Table 3-79 indicate which ports fell into the top or bottom percentile, indicated by shaded cells.

Table 3-77. Number of ports in each region falling within the top or bottom twentieth percentile by indicator.

	% Nonwhite	% Native Am.	% Hispanic	Income	Poverty
North	4	15	5	13	12
Central	1	2	1	0	2
South	0	2	2	1	3
Grand Total	5	19	8	14	17

Table 3-78. Demographic indicators related to environmental justice, Washington and Oregon ports.

	% Nonwhite	% Native Am.	% Hispanic	Income	% Poverty
Washington					
Puget Sound					
Blaine					
Bellingham Bay					■
Friday Harbor					
Anacortes		■			
La Conner			■		
Everett					
Seattle	■				
Tacoma	■				
Olympia					
Shelton					
North Washington Coast					
Port Townsend					
Sequim					
Port Angeles		■			
Port Angeles E		■			
Neah Bay	■	■		■	■
La Push	■	■			■
South & Central WA Coast					
Copalis Beach				■	
Grays Harbor		■			■
Westport				■	■
Willapa Bay				■	■
Ilwaco/Chinook					
Oregon					
Astoria					
Astoria					
Gearhart					
Seaside					
Cannon Beach					
Tillamook					
Nehalem Bay					
Tillamook / Garibaldi				■	
Netarts Bay					
Pacific City					
Newport					
Salmon River		■			
Depoe Bay					
Siletz Bay		■			
Newport					
Waldport				■	
Yachats					
Coos Bay					
Florence				■	
Winchester Bay				■	■
Coos Bay		■		■	■
Bandon		■			
Brookings					
Port Orford				■	■
Gold Beach					
Brookings		■		■	

Table 3-79. Demographic indicators related to environmental justice, California ports.

	% Nonwhite	% Native Am.	% Hispanic	Income	% Poverty
California					
Crescent City					
Crescent City		■	■	■	■
Eureka					
Trinidad		■		■	■
Eureka		■			■
Fort Bragg					
Fort Bragg			■		
Albion			■		
Point Arena		■	■		
Bodega Bay					
Bodega Bay					
Tomales Bay					
Point Reyes					
Sausalito					
San Francisco					
San Francisco					
Richmond					
Berkeley					■
Oakland	■				■
Alameda					
Princeton					
Monterey					
Santa Cruz		■			
Moss Landing		■	■		
Monterey					
Morro Bay					
Morro Bay					
Avila Beach					
Santa Barbara					
Santa Barbara					
Ventura					
Oxnard			■		
Port Hueneme		■			
Los Angeles					
San Pedro					
Willmington		■	■		■
Long Beach					■
Terminal Island				■	■
Newport Beach					
Dana Point					
San Diego					
Oceanside					
San Diego					

3.15 Tribes

Section 6.2.5 of the Groundfish FMP describes Indian treaty rights:

> Treaties with a number of Pacific Northwest Indian tribes reserve to those tribes the right of taking fish at their usual and accustomed fishing grounds and stations (U&A) in common with other citizens of the United States. NMFS has determined that the tribes that have groundfish U&A in the area managed by this FMP are the Makah, Hoh, and Quileute Tribes, and the Quinault Indian Nation. Several tribal fisheries exist for species covered by the FMP. The Federal government has accommodated these fisheries through a regulatory process, found at 50 CFR 660.324. Until such time as tribal treaty rights are finally adjudicated or the regulatory process is modified or repealed, the Council will continue to operate under that regulatory process to provide recommendations to the Secretary on levels of tribal groundfish harvest.

Sections 2.2.1.1 and 7.2.6 in the 2009-10 Groundfish Harvest Specifications EIS (PFMC 2008a) describe tribal fisheries pursuant to these treaty rights. Those sections are incorporated by reference. Some species—sablefish, black rockfish, and Pacific whiting—are subject to formal allocations or "set asides." Tribal harvest guidelines have been established for Pacific cod and lingcod. Tribal set asides have also been established for overfished species as part of the biennial harvest specifications process. Other species are not formally allocated; instead, during the biennial harvest specifications process, the tribes recommend management measures, in the form of trip limits, from which their total harvest can be estimated. The Council then works to accommodate these requests within the constraints imposed by the OYs for target and nontarget species, including overfished species. Fishing by a treaty tribe outside its U&A area is subject to Federal regulations applicable to other groundfish fisheries.

During the biennial harvest specifications process, set asides are deducted from the OYs for overfished species for tribal catches. Set asides are also established for scientific research, principally trawl surveys, and catches under EFPs. Once the set asides have been deducted, management measures for nontribal fisheries are modeled to conform to the resulting quantity of fish.

The tribal fisheries are principally longline, with only the Makah Tribe deploying trawl vessels. The longline fisheries target Pacific halibut and sablefish. The Makah Tribe participates in both the bottom trawl fisheries and whiting fisheries. Table 3-80 shows tribal landings by gear type from 1995 to 2007. Hook-and-line has always been an important component of landings but in recent years trawl landings have increased substantially, mainly due to the Makah Tribe's participation in the Pacific whiting fishery. Dungeness crab and groundfish predominate in terms of the value of landings; in 2007 crab accounted for 53 percent of ex-vessel revenue and groundfish 31 percent.

Table 3-80. Tribal landing (mt) and revenue ($) by gear type, 1995-2008.

		Gear group				
Year		Hook and line	Net	Pot	Troll	Trawl
1995	Landed weight (mt)	577	39	144	119	-
	Exvessel rev ($)	3,194,999	47,683	588,088	268,213	
1996	Landed weight (mt)	635	13	478	115	-
	Exvessel rev ($)	3,366,492	22,705	1,650,108	292,701	
1997	Landed weight (mt)	607	9	495	100	-
	Exvessel rev ($)	3,572,272	13,171	2,032,475	207,340	
1998	Landed weight (mt)	428	4	381	119	9
	Exvessel rev ($)	1,733,785	6,907	1,284,397	252,236	10,707
1999	Landed weight (mt)	597	2	439	200	15
	Exvessel rev ($)	2,625,825	5,470	2,150,331	497,457	12,037
2000	Landed weight (mt)	598	21	428	90	36
	Exvessel rev ($)	3,264,873	51,357	2,022,224	226,521	34,420
2001	Landed weight (mt)	638	54	302	298	119
	Exvessel rev ($)	3,297,688	85,410	1,293,899	562,091	123,789
2002	Landed weight (mt)	511	5	818	272	459
	Exvessel rev ($)	2,447,514	8,185	3,242,007	457,701	503,830
2003	Landed weight (mt)	618	2	780	258	4,947
	Exvessel rev ($)	3,423,536	4,636	3,269,302	554,518	1,471,241
2004	Landed weight (mt)	738	2	1,212	519	7,965
	Exvessel rev ($)	3,949,481	4,720	5,704,054	1,696,718	1,605,861
2005	Landed weight (mt)	623	2	2,277	353	13,016
	Exvessel rev ($)	3,406,709	4,552	7,945,838	1,495,075	2,551,583
2006	Landed weight (mt)	583	1	997	295	30,859
	Exvessel rev ($)	3,577,353	3,313	3,875,111	1,413,858	4,652,760
2007	Landed weight (mt)	524	0	1,622	256	12,845
	Exvessel rev ($)	3,692,577	824	8,878,281	1,254,271	2,952,536

Table 3-81. Tribal landings (mt) and revenues ($) by species group, 1995-2007.

		Species Group				
Year		Crab	Groundfish	Highly Migratory Species	Other	Salmon
1995	Landed weight (mt)	104	544	-	91	139
	Exvessel rev ($)	294,191	3,112,506		390,477	301,810
1996	Landed weight (mt)	995,966	1,290,009	57,088	192,080	200,358
	Exvessel rev ($)	1,526,248	3,055,675	48,692	447,144	254,247
1997	Landed weight (mt)	466	544	24	99	78
	Exvessel rev ($)	1,954,136	3,207,092	39,831	452,342	171,856
1998	Landed weight (mt)	367	330	18	129	96
	Exvessel rev ($)	1,205,280	1,330,811	14,170	501,865	235,906
1999	Landed weight (mt)	439	511	6	117	181
	Exvessel rev ($)	2,149,703	2,106,883	10,719	544,134	479,682
2000	Landed weight (mt)	419	523	-	128	103
	Exvessel rev ($)	1,957,757	2,625,799		748,237	267,603
2001	Landed weight (mt)	302	578	7	190	334
	Exvessel rev ($)	1,293,899	2,590,711	11,876	841,566	624,826
2002	Landed weight (mt)	818	760	10	218	260
	Exvessel rev ($)	3,242,007	2,012,410	11,525	948,640	444,655
2003	Landed weight (mt)	780	5,354	17	220	233
	Exvessel rev ($)	3,269,302	3,634,134	33,453	1,272,160	514,172
2004	Landed weight (mt)	1,212	8,479	7	244	495
	Exvessel rev ($)	5,704,054	4,088,613	11,162	1,508,269	1,648,764
2005	Landed weight (mt)	2,277	13,479	6	191	318
	Exvessel rev ($)	7,945,838	4,857,119	12,949	1,177,747	1,410,098
2006	Landed weight (mt)	997	31,295	10	201	233
	Exvessel rev ($)	3,875,103	7,132,410	15,603	1,302,379	1,196,873
2007	Landed weight (mt)	1,622	13,201	33	180	210
	Exvessel rev ($)	8,878,281	5,231,044	51,857	1,456,977	1,160,125

3.16 Management Approach and Management Agencies

This description of status quo management begins with an overview of the groundfish fishery management system, which includes sectors in addition to the LE trawl sector which would be directly affected by the proposed action. Described below are the management approach and measures specific to the LE trawl fishery, with reference to the relevant sections in the groundfish FMP. Although the proposed action only involves changes to the LE trawl fishery management system, abbreviated information on some other groundfish fisheries is included because these sectors may be affected by the proposed action. The 2008 Status of the Pacific Coast Groundfish Fishery, SAFE document Volume 1, Chapter 5, further describes the fishing sectors and communities that participate or are affected by the west coast groundfish fishery (PFMC 2008c).

3.16.1 Current Groundfish Management System

The groundfish fishery is a multi-species fishery including many species of rockfish, flatfish, sharks and skates, and roundfish. Various targeting strategies are pursued using different types of gear, resulting in wide variation in the mix of species caught. Currently the groundfish fishery is divided into sectors: LE trawl (further subdivided into the shoreside sector and at-sea whiting sectors); LE fixed-gear (line gear and pot or trap gear); directed open access using line, pot gear, or other nongroundfish trawl gears; incidental open access (vessels targeting nongroundfish species, like crab, salmon, or California halibut,

but which occasionally catch groundfish); and a tribal groundfish sector, which includes whiting mothership, trawl and fixed-gear vessels.

Allocating harvest opportunity among different fishery sectors is an integral part of the management process. Some stocks, such as sablefish and Pacific whiting, have fixed or "hard" allocations established under the groundfish FMP. Management measures for these species are structured as much as possible to allow particular sectors the opportunity to catch a fixed percentage of the OY. However, allocations for the majority of groundfish species are determined as part of the process of developing management measures. In these cases, rather than establishing a hard allocation, the Council proposes management measures through the biennial harvest specifications process, evaluates the likely allocations resulting from those measures, and modifies the proposed measures. Catch projections (and estimates of total catch inseason) are made using what if often described as the "trawl bycatch model." This model uses discard estimates from the WCGOP and logbook information to develop temporal and spatially stratified bycatch rates for overfished species. The bycatch model can be used to estimate both target species and overfished species catch based on a proposed set of management measures (two-month cumulative trip limits and RCA configurations). The proposed modification takes place on the basis of the expected catches and either establishes an ad hoc allocation (harvest guideline) for the purpose of the period covered by the management measures, or an implicit de facto allocation. In this way, allocation among sectors is achieved, particularly in deciding harvest allocations between commercial and recreational sectors. The objective in setting management measures is to allow for the greatest harvest of healthy stocks within the constraints of overfished species rebuilding.

The harvest of the four Indian tribes in Washington State is also taken into account when OYs are established. For a few species (sablefish and whiting, for example) a share of the OYs for groundfish species taken in these tribal fisheries is explicitly allocated. For most species, expected tribal harvest levels are taken into account in setting regulations for other sectors, but there is no allocation to the tribes. For the species for which they receive an allocation and for other species for which expected harvest levels are identified, the tribes then oversee the prosecution of their fisheries separate from the management of other groundfish fishery sectors.

Since the adoption of FMP Amendment 17 in 2003, groundfish harvest specifications and management measures have been set on a biennial basis. Every even-numbered year, the Council adopts OYs and management specifications covering groundfish fisheries for the following two years. The two-year management cycles began with the 2005-06 fishery. ABCs and OYs are set based on the most recent stock assessments and recommendations from Council advisory bodies and comments from the public. Separate ABCs and OYs are identified for each year in the two-year cycle. Management measures are then crafted to optimize opportunities for commercial and recreational fishermen while keeping harvest within the adopted OYs. Recently this process has become a delicate balancing act between the competing demands for groundfish target species from the different sectors and the additional constraint to minimize mortality of several constraining overfished species, including bycatch (discard) mortality.

Management of commercial fisheries is currently based on four elements: seasons, bimonthly cumulative landings limits, management areas, and exclusion zones or GCAs. Landed species can be caught outside of designated exclusion zones that, for commercial fisheries, generally encompass bottom areas on the continental shelf between approximately 75 fm and 150 fm in depth (varying somewhat with season and year) and are referred to as RCAs. Landings limits are set based on historical landings of target species from fish tickets and discard rates for target and incidental catch species obtained from observer sampling of commercial fishing vessels.

3.16.1.1 Commercial Fishery Management Measures

Groundfish are taken in four different types of fisheries: LE trawl, LE fixed-gear (line gear and pot or trap gear), directed open access (line, pot gear, or other nongroundfish trawl gears), and incidental open access (vessels targeting nongroundfish species like crab, salmon, or California halibut, but which occasionally catch groundfish). A description of the LE fixed-gear and directed open access sectors can be found in the 2008 SAFE document, Chapter 5 (PFMC 2008c).

Seasons

Most groundfish fisheries are managed to achieve a year-round season. In fact, this is one of the key objectives expressed in the Groundfish FMP because buyers and processors regard a continuous and consistent supply of fish as essential to maintaining markets. Recently, managing fisheries to prevent OYs from being exceeded before the end of the year has become increasingly difficult because of the low harvest limits for some overfished species. Consequently, some fisheries have been closed early. A few groundfish fisheries are managed according to shorter seasons. The Pacific whiting fishery is the largest fishery in terms of the volume of landings; it is managed to occur during only part of the year. Its season usually begins on April 1 and runs until the OY has been caught, usually by late October. The Pacific whiting OY is allocated according to a formula between shoreside, at-sea mothership, at-sea catcher-processor, and tribal fleets. Within the catcher-processor fleet, participants coordinate fishing behavior to determine how quickly their allocation will be taken or, conversely, how long the season will last. The LE fixed-gear sablefish fishery is also limited to a primary season from April 1 to October 31. There are separate allocations of sablefish for catch by other sectors. These are managed with cumulative limits.

Cumulative landings limits

Trip limits have been a feature of groundfish management since the inception of the Groundfish FMP. Over time, the regime has become more complex, covering a wider range of species and sectors. The basic concept is to set a limit on how much of a given species (or multi-species complex[69]) an individual vessel may land in a fixed time period. Originally, these limits were on a per trip basis. Currently, to reduce the likelihood of regulatory discards, the limits are cumulative totals for a two-month period (January-February, March-April, May-June, etc.). Two-month cumulative landings limits are set separately for the LE trawl, LE fixed-gear, and open access sectors. For each of these sectors, there are separate limits for U.S. waters north and south of 40°10' N. latitude (approximately Cape Mendocino, California). The Pacific whiting fishery is a significant exception to trip limit management. As noted above, it occurs during a season whose length is determined by how quickly the OY is taken.

Management Areas

The west coast EEZ is divided into several, sometimes overlapping, areas, as shown in Figure 1-1. The five named areas (Vancouver, Columbia, Eureka, Monterey, and Conception) were originally devised by the International North Pacific Fishery Commission (INPFC) as statistical areas for cataloguing fish catch. Although still occasionally referred to as "INPFC areas," this organization is defunct and "management area" is now the preferred term. Landings are sometimes reported by these areas and these boundaries are sometimes used to demarcate the application of different management measures. However, other latitudinal lines have emerged as important management boundaries. The 40°10' N. latitude line (near the Eureka-Monterey boundary) is also one of the most used management boundaries;

[69] Many commercially less important or less frequently caught species are combined in stock complexes for the purposes of management. These species are not generally differentiated in reported landings, and most have not had stock assessments. Multi-species complexes currently in use include the "minor rockfish" (additionally separated into several sub-categories), "other flatfish," and "other fish" categories.

as noted above for cumulative landing limits, landings are regulated differently north and south of this line. Landings limits differ north and south of this boundary. Other boundaries in use for management include latitude lines near significant coastal landmarks, such as Point Reyes and Point Conception in California. The latter represents an important marine biogeographic boundary, and is used to bifurcate some stocks (such as sablefish), as well as to differentiate management measures. Other latitudinal demarcations are used to vary the shoreward and seaward boundaries of GCAs, discussed below.

Groundfish Conservation Areas

Three different types of closed areas have been implemented to limit bycatch of overfished species. A relatively small Yelloweye Rockfish Conservation Area (YRCA) closes a hotspot off the Washington coast. Recreational fishing is prohibited within the YRCA, and the area is designated as a voluntary closure for the LE fixed-gear sablefish fleet and salmon trollers. The YRCA was first implemented in 2003. There are two areas off the southern California coast designated Cowcod Conservation Areas (CCAs), intended to protect cowcod. Recreational and commercial fishing are prohibited within the CCAs, except that rockfish and lingcod fishing have been permitted shoreward of 20 fathoms. The CCAs were first implemented in 2001.

RCAs are by far the most extensive and complex closed areas. First implemented in late 2002 as part of an in-season management action, RCAs extend from the Canadian border to the Mexican border of U.S. waters. The RCAs were implemented to reduce bycatch of overfished species. These species are more frequently caught within certain depth ranges. Based on analysis of observer reports and vessel logbooks, the boundaries of the RCAs were set to prohibit groundfish fishing within a range of depths where encounters with overfished species were most likely. To make enforcement possible, in most cases the actual isobaths—lines of equal depth—are approximated by straight lines between published waypoints. The depths included in RCAs vary by season, latitude, and regulatory sector. Boundaries for LE trawl vessels are different than those for the LE fixed-gear and open access sectors. Figure 3-30 and Figure 3-31 depict the general configuration of the trawl and nontrawl RCAs during January and February 2008 (period 1). The nontrawl RCA has the same configuration throughout 2008, unless changed by an inseason management action. The 2008 period 1 trawl RCA is estimated to cover an area of about 7,800 square miles.

Salmon Conservation Areas

In 2005, NMFS implemented an Ocean Salmon Conservation Zone (OSCZ) during the primary Pacific whiting season to apply to all sectors of the commercial Pacific whiting fishery (70 FR 51682, August 31, 2005.) In that year, incidental catch of Chinook salmon were relatively high, and the OSCZ moved the Pacific whiting fishing offshore of a boundary line approximating the 100-fm (183-m) depth contour. Incidental catch rates of Chinook salmon tend to be higher in the nearshore area. Because the 2005 incidental catch of Chinook salmon had exceeded an 11,000-fish threshold specified in the biological opinion, NMFS reinitiated Endangered Species Act (ESA) section 7 consultation on the groundfish fishery in winter 2005-06. The supplemental biological opinion concluded that, although the 2005 catch of Chinook had been high, continued operation of the groundfish fisheries under the FMP would not jeopardize the recovery of salmon stocks listed as threatened or endangered under the ESA. The supplemental biological opinion also recommended that, as a longer-term management measure, the OSCZ be implemented via Federal regulation as a management measure available for inseason implementation, as needed to constrain salmon bycatch in the Pacific whiting fishery. As part of the 2007-2008 specifications and management measures, the OSCZ was implemented as a potential inseason management tool for the Pacific whiting fishery. Observer data collected on board the mothership processors continues to be the primary data used to estimate salmon catch in the mothership sector and to ensure that the fishery as a whole stays within the guideline set out within the biological opinions.



Figure 3-30. Configuration of the trawl RCA and Cowcod Conservation Area during January-February 2008.



Figure 3-31. Configuration of the trawl RCA and Cowcod Conservation Area during March-October 2008.

Gear Restrictions

Although various gear restrictions were a key feature of groundfish management even before the FMP was implemented, the most important current measures distinguish between large and small footrope gear. This refers to the size of the roller gear affixed to the bottom leading edge of a bottom trawl net. Large footrope gear can allow the net to be fished over rougher ground. Large footrope gear is also preferred when trawling for DTS species on the soft bottom areas offshore, while small footropes are more commonly used to fish in areas shoreward of the RCAs. Since rocky habitat areas nearshore and on the continental shelf are important to a range of organisms, including several overfished rockfish species, the Council developed measures to discourage fishing on these sites. Beginning in 2003, vessels using small footrope trawl gear (and, therefore, more likely to be fishing shoreward of the RCA) at any time during a cumulative limit period are subject to lower DTS species landings limits. So if small footrope gear is used at all during that period, the amount of fish that can be landed during the period is significantly reduced. This restriction is meant to encourage vessels to fish exclusively seaward of the RCA (and using large footrope gear), thereby avoiding bycatch of overfished groundfish species (particularly canary rockfish) that are found on the continental shelf. An exception is SFT gear, which can be used shoreward of the RCA in association with relatively higher cumulative trip limits to target flatfish. To qualify as SFT gear, the net must have a headrope at least 30 percent longer than the footrope, the rise of the net cannot exceed 3 feet, the headrope must not have any floats along the center 50 percent of its length, it must be a two-seam trawl net, and it must otherwise qualify as legal small-footrope trawl gear as defined in Federal regulations. Also, in some nongroundfish (incidental open access) fisheries, such the pink shrimp fishery, bycatch reduction devices (BRDs) are required. These devices are added to the trawl net and divert finfish (such as canary rockfish) out of the codend of the net, where the shrimp catch is accumulated.

Observer Coverage

Vessels participating in the at-sea Pacific whiting fisheries have been voluntarily carrying observers since 1991. NMFS first implemented the WCGOP in August 2001 to directly observe groundfish discards in the commercial fishery. Current groundfish trawl observer programs are discussed in Section 3.3.2.1.

3.16.1.2 Recreational Fishery Management Measures

Recreational fisheries typically occur closer inshore than most commercial fisheries and are actively managed by the states. Thus, recreational management measures, although developed through the Council process, tend to differ between states. The main recreational management measures used are season limitations, and bag limits, which restrict the number of groundfish an angler may land, and size (length) restrictions. Since some overfished species are frequently caught in recreational fisheries, species-specific sub-limits are applied within the overall groundfish bag limit. Closed seasons have also been imposed in response to overfishing. The newest management measures responding to recreational take of overfished species are depth-based area restrictions. Although similar in concept and intent to the RCAs, recreational area restrictions generally limit recreational groundfish fishing to depths less than a specified value (e.g., 30 fm). Boundaries defined by waypoints for these areas generally have not been used.

3.16.2 Tribal Fishery Management Approach

Tribal fisheries include subsistence, ceremonial, and commercial fisheries. Commercial tribal fisheries use the same gear type as nontribal commercial fisheries, including whiting mothership, trawl and fixed-gear vessels. The Makah Tribe is the only tribe to have trawlers and to participate in the Pacific whiting fishery. Tribal commercial fisheries are limited to the U&A areas and cannot move to another location.

Tribes develop tribal rules and regulations to stay within the harvest limits established by the Council. For more information regarding tribal fisheries, see Section 5.2.7 of the 2008 SAFE document (PFMC 2008c).

3.16.3 State Fishery Management Approach

3.16.3.1 California

Management of the commercial groundfish fishery in California is done in conjunction with the Federal government. To facilitate management, California Law (Section 189(b)(8), Title 14, CCR) allows the state to take concurrent action to incorporate changes to Federal groundfish regulations that apply to state waters zero to 3 miles from shore. Although the state has the authority to implement more restrictive management measures than those listed in Federal regulation, none has been implemented at this time except for those species with state authority.

California allows commercial fishing for groundfish in the state's coastal waters using hook-and-line and trap gears (gill net gear is limited by minimum depth and area restrictions). In 2004, directed trawling was prohibited for Federal groundfish in state waters. Limited trawling for California halibut is permitted, but it is restricted to specific California halibut trawl grounds in southern California. A restricted access nearshore permit (shallow and/or deeper) is required to possess or land specific nearshore species. Additionally, a general commercial fishing license is needed to possess or land all groundfish species.

California is also in the process of designing and managing a network of MPAs in state waters to protect marine life and habitats, marine ecosystems, and marine natural heritage, as well as to improve recreational, educational and study opportunities provided by marine ecosystems. MPAs have been implemented in central California (September 2007), and the planning process is nearly completed for the northern California coast.

3.16.3.2 Oregon

The Oregon State Legislature granted the Oregon Fish and Wildlife Commission (OFWC) the authority to adopt regulations under the Oregon Administrative Rules (OAR). The OFWC delegates the authority to adopt temporary rules to the Director (Director) of the ODFW. Temporary rules may be considered for various reasons, including the achievement of quotas, OYs, harvest limits or HGs, as well as to conform to Federal regulations. Temporary regulations can be adopted, filed, and put in effect within a single business day, but in practice, a 72-hour public notice is usually provided. A temporary rule approved by the Director is ratified by the OFWC at its next meeting, usually within 30 days.

Once filed, copies of the temporary rule are distributed to all marine-related ODFW and Oregon State Police offices. The ODFW Information and Education Program creates and distributes a general public news release, and/or specific industry notices are developed and distributed throughout local fishing communities.

Once adopted, temporary regulations are in effect for 180 days. If the regulations have to remain in place for a longer duration, ODFW can adopt a permanent rule through the full OFWC process. This two-meeting process includes public notice of the intent for rulemaking, an economic analysis, and adequate public review.

Federal rules governing commercial groundfish fisheries are adopted in state rule by reference to the Code of Federal Regulations through OAR 635-004-0018. As inseason changes are made through the

Council process, and adopted in Federal regulations, corresponding state temporary rules are adopted through OAR 635-004-0019.

Regulations governing the recreational groundfish fishery are specified in state rule through OAR 635-039-0090. Inseason changes are made in state rule using the temporary rule process described above. Requests may be made by the ODFW representative on the Council to take concurrent action through Federal rule; however, due to the increasing number of inseason adjustments in recent years, flexibility has been maintained for the state to take action outside of the Federal process.

3.16.3.3 Washington

Washington's recreational fishery occurs in state waters from the shore west to 3 miles and in Federal waters outside 3 miles. The Washington State Legislature has granted the Washington Fish and Wildlife Commission (WFWC) the authority to adopt emergency regulations under the Revised Code of Washington (RCW) 77.04.090. The WFWC has delegated the authority to the WDFW Director to adopt regulations that conform to Federal groundfish regulations adopted through Council actions, either through emergency regulation or through a permanent rule-making process.

Washington prohibits commercial fishing for groundfish in the state's coastal waters and requires a state nonLE delivery license to deliver groundfish taken in Federal waters into the state. State regulations incorporate the Federal groundfish regulations by reference and are updated by emergency rule each time NMFS promulgates new groundfish rules. WDFW first prohibited the directed hook-and-line rockfish fishery and limited the size of the trawl footrope that could be used in state waters in 1996 to protect rockfish and other nearshore species. In 2000, WDFW completely prohibited trawling within 3 miles of the shore and also preemptively prohibited the live-fish fishery.

3.16.4 Federal Management Agencies

National Marine Fisheries Service is a branch of the National Oceanic and Atmospheric Administration in the Department of Commerce. NMFS has Regional Offices around the country and a corresponding Science Center. The Northwest Regional Office provides management, regulations and, in conjunction with the Council, policy leadership on fishery management. The Northwest Fishery Science Center conducts research and provides the scientific advice on which policy is based. The NMFS Office of Law Enforcement and NOAA General Counsel are separate branches within NOAA that help with the development, refinement, enforcement and defense of fisheries law, regulations, and policy. The PSMFC is a Congressionally established entity that helps with the coordination of fishery research, monitoring, data collection and management on the west coast.

3.16.4.1 Catch Monitoring

Various state, Federal, and tribal catch monitoring systems are used in west coast groundfish management. These are coordinated through the PSMFC. PacFIN is the commercial catch monitoring database. There are two components to total catch: (1) catch landed in port, and (2) catch discarded at sea. Sorting requirements are now in place for all species with trip limits, harvest guidelines, or OYs, including all depleted species. This provides accounting for the weight of landed depleted species when catches are hailed at sea or landed. Limited entry groundfish trawl fishermen must also maintain state logbooks to record the start and haul locations, time, and duration of trawl tows, as well as the total catch by species market category (i.e., those species and complexes with sorting requirements).

Landings are recorded on state fish receiving tickets. Fish tickets are designed by the individual states, PSMFC coordinates recordkeeping requirements between state and Federal managers. Poundage by

sorted species category, area of catch, vessel identification number, and other data elements are required on fish tickets. Landings are also sampled in port by state personnel to collect species composition data, otoliths for ageing, lengths, and other biological data. Federal observer sample rates vary, but the WCGOP attempts to sample about 20 percent of the landed catch. A suspension of at-sea sorting requirements coupled with full retention of catch is allowed in the whiting fishery. The at-sea whiting fishery has 100 percent on-board observer coverage, while the shoreside whiting sector brings most of its catch to port for sampling. Landings, logbook data, and state port sampling data are reported inseason to the PacFIN database managed by PSMFC. The GMT and PSMFC manage the Quota Species Monitoring (QSM) dataset reported in PacFIN. All landings of groundfish stocks of concern (depleted stocks and stocks below B_{MSY}), target stocks, and stock complexes in west coast fisheries are tracked in QSM reports of landed catch. The GMT recommends prescribed landing limits and other inseason management measures to the Council to attain, but not exceed, total catch OYs of QSM species. Stock and complex landing limits are modified inseason to control total fishing-related mortality; QSM reports and landed catch forecasts are used to control the landed catch component.

Management measures are normally imposed, adjusted, or removed at the beginning of the biennial fishing period, but may, if the Council determines it necessary, be imposed, adjusted, or removed at any time during the period. Management actions range from automatic actions initiated by NMFS to full rulemaking actions requiring a minimum of two Council meetings. Inseason adjustments typically fall under the category of notice actions that are routine (as defined by the FMP) in nature and usually require one Council meeting and one FR notice.

3.16.4.2 Bycatch Reporting

Establishing a standardized bycatch reporting methodology and limiting bycatch to the extent practicable are MSA mandates. Federal west coast programs designed to achieve bycatch reporting goals include the WCGOP, the At-Sea Pacific Whiting Observer Program, and the SHOP. These programs are described in Section 3.3.2.

3.16.4.3 Enforcement

The Northwest Division of the NMFS Office of Law Enforcement (OLE) use traditional methods to ensure compliance with groundfish fishery regulations including dockside sampling, at-sea patrols, air surveillance, and if necessary, investigation. Fishery management regulations that OLE enforces include fishing seasons, closed areas, types of gear authorized, amounts of targeted species, and bycatch species catch. Technologies such as VMS dramatically enhance, rather than replace, traditional enforcement techniques. VMS was initially implemented on January 1, 2004, and is currently required on all vessels participating in the groundfish fishery with a LE permit. In addition to implementing VMS in the west coast ground fishery, other high priorities for OLE are endangered salmon recovery and minimizing marine mammal harassments.

3.16.4.4 Regulations and Permits

NMFS Northwest Region write and update the federal groundfish regulations, which include groundfish harvest levels and fishing restrictions (trip limits, area closures, season lengths, etc.) and are known as the "harvest specifications and management measures." NMFS Service publishes the Pacific Coast Groundfish Biennial Specifications and Management Measures before the start of the fishing year on January 1, every other year, beginning in 2005. Throughout the following two years, NMFS Northwest Region will amend these regulations inseason, either to correct mistakes, to revise trip limits, or other management measures according to recommendations from the Council. These changes are tracked and

documented in the Revised Groundfish Regulations, a document that tracks inseason adjustments throughout the management cycle.

The NMFS Northwest Region's Permits Office and Groundfish Management Branch issue Groundfish Limited Entry Permits (LEP), Scientific Research Permits (SRP), and EFP. The LEP authorizes the holder to participate in the federal LE groundfish fishery in waters off of Washington, Oregon, and California. NMFS no longer issues new LEPs; therefore, entering the groundfish LEP fishery, requires either purchase or lease of an existing LEP. An SRP is required for NMFS controlled scientific research. EFPs are issued by NMFS to allow limited fishing that would otherwise be prohibited. EFP applications must be submitted to the Council for review before the June Council meeting each year. EFPs can be issued to federal or state agencies, marine fish commissions, or other entities, including individuals.

3.17 Fish Resources

There are more than 90 species of groundfish managed under the groundfish FMP, which comprise the vast majority of the catch by the groundfish trawl sector. These species include more than 60 species of rockfish in the family Scorpaenidae, 7 roundfish species, 12 flatfish species, assorted shark, skate, and a few miscellaneous bottom-dwelling marine fish species. The 2008 Groundfish SAFE document and Biennial Harvest Specifications and Management Measures EIS (PFMC 2008a; PFMC 2008c) includes species accounts and description of stock status for groundfish that are commonly caught in fisheries. These descriptions are incorporated by reference.

Seven of the federally managed groundfish species are considered overfished with rebuilding plans governing the amount of allowable incidental fishing-related mortality in west coast fisheries and the duration of rebuilding. These species are bocaccio, canary rockfish, cowcod, darkblotched rockfish, Pacific ocean perch, widow rockfish, and yelloweye rockfish. Of these, only three species are predominantly caught in LE trawl fisheries (darkblotched rockfish, Pacific ocean perch, and widow rockfish).

Three of the federally managed groundfish species are in the precautionary zone, or not overfished, but are below the target spawning biomass (cabezon in waters off California, petrale sole, and sablefish). All other species are either healthy or their status is unknown. The 2008 Status of the Pacific Coast Groundfish Fishery, SAFE document Volume 1, Chapter 1 describes the distributions, life histories and management areas for the groundfish species managed under the groundfish FMP (PFMC 2008c).

The groundfish trawl fishery also catches a wide variety of nongroundfish species, albeit in relatively small quantities.

Table 3-82 reproduces information from Table 3a from the WCGOP 2008 data report (WCGOP 2008), which shows observed catch and discard amounts from the 2007 LE bottom trawl fishery. An additional column has been added that shows the percent of the total observed catch accounted for by each species. The table contents have then been sorted in descending order on this column to show the most frequently caught species. For accounting purposes, Pacific hake (whiting) is included as a nongroundfish species, although it is a groundfish MUS, because it is not a target or retained species in the bottom trawl (nonwhiting) segment of the fishery. It can be seen from the table that whiting is the most common nongroundfish bycatch species as a percent of total observed catch, by weight. Other commonly caught nongroundfish species are tanner crab, Pacific halibut, Dungeness crab, and squid. All these species are the target of other, commercially important, fisheries. Crab, like halibut, may not be retained in groundfish trawl fisheries.

Table 3-82. Observed catch of nongroundfish species, 2007. (Source: WCGOP 2008)

	North of 40° 10' N			South of 40° 10' N			% of Total Observed Catch
	Total Catch (mt)	Discard (mt)	Total % Discarded	Total Catch (mt)	Discard (mt)	Total % Discarded	
Pacific hake	138.59	137	98.90%	52.04	51.67	99.30%	47.04%
Tanneri tanner crab	56.82	56.82	100.00%	24.83	24.83	100.00%	20.15%
Pacific halibut	43.43	43.43	100.00%	1.66	1.65	99.30%	11.13%
Dungeness crab	31.9	31.9	100.00%	1.73	1.73	100.00%	8.30%
Squid (unidentified)	5.05	4.41	87.30%	7.8	2.01	25.80%	3.17%
Tanner crab (unidentified)	6.29	6.29	100.00%	0.56	0.56	100.00%	1.69%
Eelpout (unidentified)	5.81	5.81	100.00%	0.87	0.87	100.00%	1.65%
Brown cat shark	4.26	4.26	100.00%	1.97	1.97	100.00%	1.54%
California slickhead	1.91	1.91	100.00%	1.92	1.92	100.00%	0.95%
Shark (unidentified)	2.38	2.38	100.00%	0.75	0.69	91.40%	0.77%
Pacific flatnose	2.02	2.02	100.00%	0.73	0.73	100.00%	0.68%
Other unidentified nongroundfish	2.31	0.33	14.30%	0.1	0.09	88.50%	0.59%
Octopus (unidentified)	1.3	1.13	87.30%	0.28	0.19	66.50%	0.39%
Brown box crab	0.02	0.02	100.00%	0.9	0.9	100.00%	0.23%
Snailfish (unidentified)	0.79	0.79	100.00%	0.04	0.04	100.00%	0.20%
Pacific sleeper shark	0.6	0.6	100.00%	0.08	0.08	100.00%	0.17%
Bigfin eelpout	0.47	0.47	100.00%	0.19	0.19	100.00%	0.16%
Sea cucumber (unidentified)	0.65	0.65	100.00%	0	0	100.00%	0.16%
Twoline eelpout	0.4	0.4	100.00%	0.06	0.06	100.00%	0.11%
American shad	0.33	0.33	100.00%	0.08	0.08	100.00%	0.10%
Albacore tuna	0.34	0	0.00%		--	--	0.08%
Armored box crab		--	--	0.32	0.32	100.00%	0.08%
Urchin (unidentified)	0.27	0.27	100.00%	0.02	0.02	100.00%	0.07%
Sculpin (unidentified)	0.25	0.25	100.00%	0	0	100.00%	0.06%
Mola mola (sunfish)	0.18	0.18	100.00%	0	0	100.00%	0.04%
Jellyfish (unidentified)	0.06	0.06	100.00%	0.09	0.09	100.00%	0.04%
Ragfish	0.1	0.1	100.00%	0.03	0.03	100.00%	0.03%
California halibut		--	--	0.11	0	0.00%	0.03%
Pacific herring	0.02	0.02	100.00%	0.09	0.09	100.00%	0.03%
White croaker	0.01	0.01	100.00%	0.1	0.01	8.90%	0.03%
Threadfin slickhead	0.09	0.09	100.00%		--	--	0.02%
Filetail cat shark	0.02	0.02	100.00%	0.06	0.06	100.00%	0.02%
Blue shark	0.07	0.01	13.40%				0.02%
Longspine combfish	0	0	100.00%	0.07	0.07	100.00%	0.02%
Jackmackerel	0.06	0.06	100.00%	0	0	100.00%	0.01%
Longnose cat shark	0.06	0.06	100.00%				0.01%
Poacher (unidentified)	0.05	0.05	100.00%	0.01	0.01	100.00%	0.01%
Surfperch (unidentified)	0.02	0.02	100.00%	0.04	0.04	100.00%	0.01%
King (Chinook) salmon	0.05	0.05	100.00%		--	--	0.01%
Plainfin midshipman	0	0	100.00%	0.05	0.05	100.00%	0.01%
Slickhead (unidentified)	0.05	0.05	100.00%		--		0.01%

	North of 40° 10' N			South of 40° 10' N			% of Total Observed Catch
	Total Catch (mt)	Discard (mt)	Total % Discarded	Total Catch (mt)	Discard (mt)	Total % Discarded	
Angulatus tanner crab	0.04	0.04	100.00%		--	--	0.01%
Brown smoothhound shark		--	--	0.04	0.04	100.00%	0.01%
Pacific staghorn sculpin	0.04	0.04	100.00%		--	--	0.01%
Blob sculpin	0.03	0.03	100.00%		--	--	0.01%
Common thresher shark		--	--	0.03	0	0.00%	0.01%
Green sturgeon	0.03	0.03	100.00%		--	--	0.01%
Pink surfperch		--	--	0.03	0.03	100.00%	0.01%
Prowfish	0.03	0.03	100.00%		--	--	0.01%
Scarlet king crab	0.03	0.03	100.00%	0	0	100.00%	0.01%
Tubeshoulder (unidentified)	0.03	0.03	100.00%		--	--	0.01%
Cat shark (unidentified)	0.02	0.02	100.00%		--	--	0.00%
Midshipman (unidentified)	0.02	0.02	100.00%	0	0	100.00%	0.00%
Pacific mackerel	0.01	0.01	100.00%	0.01	0.01	100.00%	0.00%
Pacific sardine	0.02	0.02	100.00%	0	0	100.00%	0.00%
Stone coral	0.02	0.02	100.00%		--	--	0.00%
Threadfin sculpin	0.02	0.02	100.00%	0	0	100.00%	0.00%
Bat ray		--	--	0.01	0.01	100.00%	0.00%
Black eelpout	0.01	0.01	100.00%		--	--	0.00%
Deep-sea spider crab	0.01	0.01	100.00%		--	--	0.00%
Giant wrymouth	0.01	0.01	100.00%		--	--	0.00%
Hair crab	0.01	0.01	100.00%				0.00%
King of the salmon	0.01	0.01	100.00%		--	--	0.00%
Mackeral (unidentified)	0.01	0.01	100.00%		--	--	0.00%
Market squid	0.01	0	0.00%				0.00%
Monkeyface prickleback	0.01	0.01	100.00%	0	0	100.00%	0.00%
Pacific scabbardfish	0.01	0.01	100.00%		--	--	0.00%
Pacific tom cod	0.01	0.01	100.00%		--	--	0.00%
Prickleback (unidentified)	0.01	0.01	100.00%		--	--	0.00%
Red rock crab		--	--	0.01	0.01	100.00%	0.00%
Salmon shark	0.01	0.01	100.00%		--		0.00%
Shrimp (unidentified)	0	0	100.00%	0.01	0.01	88.10%	0.00%
Sixgill shark		--	--	0.01	0.01	100.00%	0.00%
Warty poacher	0.01	0.01	100.00%		--	--	0.00%
Wolf-eel	0.01	0	6.40%	0	0	100.00%	0.00%
Pacific argentine		--	--	0	0	100.00%	0.00%
Spiny king crab		--	--	0	0	100.00%	0.00%

Bycatch of Pacific halibut has received particular management attention under the proposed action, through the requirement to cover all catch by the nonwhiting trawl fishery with IBQ, because halibut is an important commercial and recreational species. Retention in the trawl fishery is prohibited to discourage targeting. As discussed in Section 3.3.4, the allocation to the trawl fishery for IBQ represents a substantial reduction in catch compared to historical levels. The west coast EEZ represents the southern extent of the species' range, and larger, commercially important fisheries are found in

Canadian and Alaska waters. Pacific halibut is managed through IPHC, an intergovernmental organization of Canada and the U.S. The IPHC assesses the Pacific halibut population annually by management area, deriving a management target called the constant exploitation yield, or CEY. Allocation to the groundfish trawl fishery for IBQ is based on the CEY for Area 2A. IPHC computes a fishery CEY, which is determined by making certain deductions, including expected bycatch in the groundfish trawl fishery. The fishery CEY is then used to determine a catch limits for target fisheries. The CEY is based on legal-sized fish—those greater than 81 cm in length. As noted in Section 3.3.4, both legal and sublegal sized fish (those less than 81 cm) must be covered by IBQ under the proposed trawl rationalization program.

The most recent assessment indicates that Pacific halibut exploitable biomass is on a steadily declining trend in Area 2 (Area 2 comprises three subareas—A, B, C—covering waters from Southeast Alaska southward) (Hare and Clark 2008). This is due, first, to two strong year classes (1987-88) passing through the population with subsequent, smaller year classes now representing the bulk of the exploitable biomass. Second, harvest rates in Area 2 have been higher than thought sustainable over the past decade. Figure 3-32 uses recent CEY values to provide some context for the adopted allocation formula for Pacific halibut (see Section 3.3.4). The formula is 15 percent of the total CEY with a ceiling of 130,000 pounds (to be reduced to 100,000 pounds in the fifth year of the trawl rationalization program). Therefore, once the CEY drops below 866,667 pounds (130,000 divided by 0.15), the allocation would begin being reduced by application of the 15 percent fraction. As can be seen in the figure, 15 percent of the CEY exceeded 130,000 pounds until 2009, and the groundfish trawl bycatch levels exceeded what would be the allocation limit had it been in place. The bycatch levels are shown for the year they were applied to the CEY to derive the fishery CEY. These bycatch estimates are from the preceding year. With declining abundance, the allocation level could remain below the 130,000 pound ceiling. However, bycatch levels have also been reduced substantially since 2005.

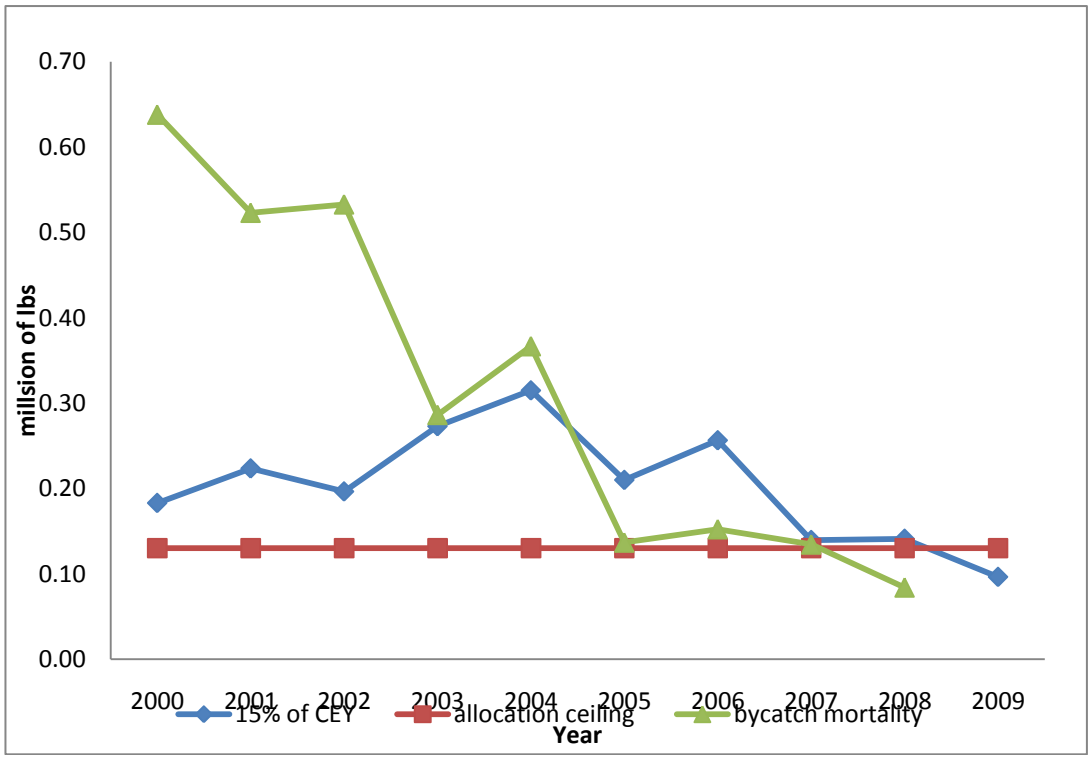


Figure 3-32. Historical Pacific halibut Area 2A CEY used to illustrate effect of allocation for IBQ.

3.18 ESA-listed Salmon

Salmon occurring in the west coast region include Chinook or king salmon (*Oncorhynchus tshawytscha*), and coho or silver salmon (*O. kisutch*), pink salmon (*O. gorbuscha*), Sockeye salmon (*O. nerka*), chum salmon (*O. keta*) and steelhead (*O. mykiss*). Groundfish fishery interception of salmon species other than Chinook is negligible and infrequent (NMFS 2006c). The 2008 Status of the Pacific Coast Groundfish Fishery, SAFE document Volume 1, Chapter 3, briefly describes the management history, ESA consultations, and biological opinions pertaining to salmon bycatch in the west coast groundfish fishery (PFMC 2008c).

The most recent Biological Opinion covering the incidental take of ESA-listed salmon in groundfish fisheries was published in 2006 (NMFS 2006c). That document includes a detailed history of section 7 consultations on the groundfish fishery.

Salmon are caught incidentally in both the at-sea and shore-based segments of the whiting fishery. This bycatch is closely monitored through an at-sea observer program and dockside sorting of shore deliveries. A salmon bycatch reduction plan has also been implemented in this fishery. Past section 7 consultations have established a standard of 11,000 Chinook salmon caught in Pacific whiting fisheries. Although the 11,000 fish threshold is used as a trigger to reinitiate consultations, occasionally exceeding this threshold is not, by itself, a basis for making a jeopardy determination. Chinook bycatch has averaged approximately 7,300 over the last 15 years and exceeded the reinitiation trigger of 11,000 in 1995, 2000, and 2005.

The 1992 Biological Opinion (NMFS 1992) estimated the take of salmon in other, nonwhiting groundfish trawl fisheries at 6,000 to 9,000 fish annually, with most of these taken in waters north of 43° N. latitude. Bycatch levels in 2002 (18,120 salmon) and 2003 (13,862 salmon) exceeded the 6,000 to 9,000 Chinook specified to be taken in the incidental take statements. NMFS reinitiated its consultation on the Groundfish FMP and included an evaluation in the 2006 supplemental Biological Opinion.

The magnitude and distribution of bycatch in the trawl fishery from 2002 to 2004 was affected by significant changes in regulation and management of the fishery to protect overfished groundfish stocks. Because of changing regulations, shifts in fishing areas, reductions in trawl fishery effort from the December 2003 trawl vessel and permit buyback program, and gear innovations (including the new SFT gear) coastwide, it is difficult to pinpoint which of these various factors may be affecting Chinook bycatch numbers negatively or positively.

The supplemental Biological Opinion (NMFS 2006c) evaluates Chinook salmon bycatch by latitudinal and depth strata based on estimates from WCGOP data. The highest bycatch occurs in depths shallower than 125 fm across all latitudinal strata with the highest overall bycatch occurring off the Oregon coast from Cape Falcon to Cape Blanco, followed by the region to the south to Cape Mendocino in northern California. Looking at latitudinal differences alone over the three years, 56 percent of estimated Chinook bycatch occurred in the Cape Falcon-Cape Blanco region; in 2003, two-thirds of estimated bycatch was from that region. The 2006 supplemental Biological Opinion notes that "more bycatch, in the bottom trawl fishery in particular, was shifted south into northern California than was previously thought" (page 30). As a result, Sacramento winter-run Chinook, California coastal Chinook, and Central Valley spring-run Chinook may be disproportionately affected than other runs.

3.19 Protected Species Other than ESA-Listed Salmon

Protected resources are those species or stocks that are regulated by one or more of the following laws, ESA, Marine Mammal Protection Act (MMPA), and the Migratory Bird Treaty Act (MBTA) and EO. For more information on these laws, please refer to page 99 and 100 of the Council's 2008 Fishery SAFE (PFMC 2008c). Three types of protected species are known to be affected by groundfish fisheries: ESA-listed salmon, marine mammals, and seabirds. Therefore, this section describes these species and historical takes in groundfish fisheries in the most detail. Although sea turtles have been sighted off the west coast, no takes of these species have been documented and will not be described here.

3.19.1 Marine Mammal Species

The following marine mammal species or stocks have been known to occur in the California Current ecosystem. The six species/stocks highlighted in gray have known past interactions with west coast groundfish gears (NMFS SHOP & WCGOP 2008). Species/stocks listed at the bottom of the table are not likely to interact with groundfish gears.

Table 3-83. Marine mammals occurring on the west coast; shading indicate stocks observed taken in the groundfish trawl fishery (T = threatened, E = endangered, D = depleted).

Common Name *(Scientific Name)*	Stock	ESA Status	MMPA Status
Pinnipeds			
California sea lion (*Zalophus californianus*)	U.S.		
Pacific harbor seal (*Phoca vitulina richardsi)*	CA; OR and WA		
Northern elephant seal (*Mirounga angustirostris*)	CA breeding		
Guadalupe fur seal (*Arctocephalus townsendi*)	Only one extant population	T	D
Northern fur seal (*Callorhinus ursinus*)	San Miguel Island		
Steller sea lion (*Eumetopias jubatus*)	Eastern	T	D
Sea otters			
Southern (*Enhydra lutris nereis*)		T	D
Northern (*Enhydra lutris kenyoni*)		T (SW Alaska only)	
Cetaceans			
Minke whale (*Balaenoptera acutorostrata*)	CA/OR/WA		
Short-finned pilot whale (*Globicephala macrorhyncus*)	CA/OR/WA		
Gray Whale (*Eschrichtius robustus*)	Eastern North Pacific		
Harbor porpoise (*Phocoena phocoena*)	Morro Bay, Monterey Bay, San Francisco-Russian River, Northern CA/Southern OR, OR/WA		
Dall's porpoise (*Phocoenoides dalli*)	CA/OR/WA		
Pacific white-sided dolphin (*Lagenorhynchus obliquidens*)	CA/OR/WA, northern and southern stocks		
Short-beaked common dolphin (*Delphinus delphis*)	CA/OR/WA		
Long-beaked common dolphin (*Delphinus capensis*)	CA		
The following cetaceans are present within the area managed by the Groundfish FMP but not likely to interact with groundfish fisheries or have not been documented having had interactions in observed groundfish fisheries:			
Bottlenose dolphin (*Tursiops truncates*)	CA/OR/WA		
Striped Dolphin (*Stenella coeruleoalba*)	CA/OR/WA		
Sei whale (*Balaenoptera borealis*)	Eastern North Pacific	E	D
Blue whale (*Balaenoptera musculus*)	Eastern North Pacific	E	D
Fin whale (*Balaenoptera physalus*)	CA/OR/WA	E	D
Sperm whale (*Physeter macrocephalus*)	CA/OR/WA	E	D
Dwarf sperm whale (*Kogia sima*)	CA/OR/WA		
Humpback whale (*Megaptera novaeangliae*)	Eastern North Pacific	E	D
Bryde's whale (*Balaenoptera edeni*)			
Killer whale (*Orcinus orca*)	Eastern North Pacific off-shore, Eastern North Pacific southern resident		
Killer whale	Puget Sound southern resident stock	E	D
Baird's beaked whale (*Berardius bairdii*)	CA/OR/WA		
Cuvier's beaked whale (*Ziphius cavirostris*)	CA/OR/WA		
Pygmy sperm whale (*Kogia breviceps*)	CA/OR/WA		
Risso's dolphin (*Grampus griseus*)	CA/OR/WA		
Northern right-whale dolphin (*Lissodelphis borealis*)	CA/OR/WA		
Mesoplodont beaked whales (*Mesoplodon* spp.)	CA/OR/WA		

Source as of January 2008: NMFS Office of Protected Resources website: www.nmfs.noaa.gov/pr/species/mammals/

The following table shows the known interactions of marine mammals with a groundfish gear type in the west coast groundfish fishery.

Table 3-84. Observed takes of marine mammals in west coast gear types.

	At-sea Whiting	LE Trawl	LE Fixed-gear Sablefish Endorsed	LE Fixed-gear Non endorsed
California sea lion	X	X	X	X
Harbor seal	X			
Harbor Porpoise		X		
Pacific white-sided dolphin		X		
Sea lion UnID		X		
Northern elephant seal	X			
Stellar sea lion	X	X		

A more complete description of those species known to have a past interaction with one or more types of west coast groundfish gear is provided below.

California sea lion (*Zalophus californianus*)-U.S. Stock

California sea lions have a diverse diet, feeding on northern anchovy, market squid, sardines, Pacific and jack mackerel, and rockfish (Reeves, *et al.* 2002). Population estimates are made from pup counts and the proportion of pups in the population, since not all age classes of sea lions are ashore at the same time. California sea lions breed at the Channel Islands, off southern California, at islands along the northern Pacific coast of Baja California, and on the east coast of Baja California in the middle and southern Gulf of California (Reeves, *et al.* 2002). After the breeding season, large numbers, particularly males, migrate north along the Pacific coast. The U.S. stock of California sea lions' population ranges between the United States/Mexico border and extends northward into Canada. Based on a 2005 survey of pups and taking into account the mortality and growth rates, the population abundance estimate for this stock is 238,000 animals with a minimum population estimate of 141,842 (Carretta, *et al.* 2007). The potential biological removal (PBR) for this stock is calculated to be 8,511 animals per year. Estimated mean annual take in commercial fisheries is 159 animals, based on 2000 to 2004 data; however, the set gillnet fishery, which has been responsible for the majority of fishery-related mortalities of California sea lion has not been observed recently. Takes have been documented between 2000 and 2004 in the California/Oregon drift gillnet fishery, the California set gillnet fishery for halibut and angel shark, the west coast groundfish trawl fishery, the California anchovy, mackerel, and tuna purse seine fishery, the Washington/Oregon salmon net pen fishery, and the salmon pen fishery operating out of British Columbia. Other threats to this stock include shooting, entrainment in power plants, marine debris, and boat collisions. The stock is not classified as strategic under the MMPA (Carretta, *et al.* 2007).

Harbor seal (*Phoca vitulina richardsi*)-California Stock

Harbor seals range widely in coastal areas of the North Pacific and North Atlantic. Five subspecies are recognized, based on geographic distribution. Two stocks of harbor seals are found off the U.S. west coast EEZ: the California stock and the Oregon and Washington outer coast stock. Both stocks inhabit nearshore coastal and estuarine waters. Although they do not migrate extensively, they have been documented traveling 300 to 500 km on extended foraging trips or to find suitable breeding areas. There are approximately 400 to 600 harbor seal haulout sites in California, including both the mainland and offshore islands. Harbor seals eat a varied diet, consisting of fish, octopus, and squid (Reeves, *et al.* 2002); . The best estimate of abundance is 34,233 harbor seals in California based on recent harbor seal counts (May to July 2004) and a revised correction factor. Given a minimum population estimate of 31,600 animals in the California stock, the PBR for this stock is 1,896 harbor seals per year (Carretta, *et al.* 2007). Estimated mean annual take in commercial fisheries is 388 animals, based on data from 1998

to 2003. The California stock of harbor seal is not classified as strategic under the MMPA (Carretta, *et al.* 2007).

Northern elephant seal (Mirounga angustirostris)-California Breeding Stock

The California breeding population of northern elephant seals is considered one stock in the stock assessment reports (SAR), separate from the breeding population in Baja California, Mexico. Generally, northern elephant seals breed and pup from December to March. Males then forage further north in Alaska waters, while females forage off Oregon and Washington waters, typically south of 45º N. latitude. Adults return to land to molt between March and August, with males beginning their molt later than females. Northern elephant seals eat mesopelagic fish and squid, though some may forage on the sea bottom and continental shelf for skates, rays, sharks, and rockfish (Reeves, *et al.* 2002). The 2001 estimate of population abundance for the California breeding stock was 101,000, with a minimum population estimate of 60,547 animals. The 2005 estimate was approximately 124,000 (and a minimum population estimate of 74,913) and was based on an estimated 35,549 pups born in California in 2005. The PBR level for this stock was calculated in 2005 at 4,382 (Carretta, *et al.* 2008). Threats to this stock include mortality and injury in fishing gear. Takes have been documented in the California/Oregon drift gill net fishery, the California set gillnet fishery for halibut and angel shark, and the west coast at-sea groundfish trawl fishery, although none have been documented in the west coast groundfish bottom trawl fishery (Carretta, *et al.* 2008). Other threats include boat collisions, collisions with automobiles, shootings, and entanglement in marine debris. Stranding data reported to the California, Oregon, and Washington Marine Mammal Stranding Networks from 2000 to 2004 include elephant seal injuries caused by hook-and-line fisheries (two injuries) and gillnet fisheries (one injury) (Carretta, *et al.* 2008). The average rate of incidental fishery mortality for this stock over the last five years (more than 8.8) is lower than 10 percent of the calculated PBR; therefore, the total fishery mortality appears to be insignificant and approaching a zero mortality and serious injury rate. The population is continuing to grow and fishery mortality is relatively constant. The stock is not classified as a strategic stock under the MMPA (Carretta, *et al.* 2008).

Steller Sea Lion (Eumetopias jubatus)

The northern or Steller sea lion (Eumetopias jubatus) ranges along the North Pacific Ocean from Japan to California (Loughlin, *et al.* 1984). Two stocks are designated in U.S. waters with the eastern stock extending from Cape Suckling, Alaska, to southern California (Loughlin 1997). The eastern stock of Steller sea lion has a threatened listing under the ESA, is listed as depleted under the MMPA, and is, therefore, classified as a strategic stock (Angliss and Lodge 2002). They do not make large migrations, but disperse after the breeding season (late May to early July), feeding on rockfish, sculpin, capelin, flatfish, squid, octopus, shrimp, crabs, and northern fur seals (Fiscus and Baines 1966). Eastern stock Steller sea lions were observed taken incidentally in west coast groundfish trawls and marine set gillnet fisheries (Angliss and Lodge 2002). Total estimated mortalities of this stock (44) are lower than the 1,396 Steller sea lions allowed under the PBR formula (Angliss and Lodge 2002).

Harbor porpoise (*Phocoena phocoena*)

They are coastal animals, often found in fjords, bays, estuaries, and harbors. They are limited to northern temperate and subarctic waters. In their Pacific range, they occur from Monterey Bay and Japan, north to the Chukchi Sea, but they have been seen as far south as Point Conception. They are often encountered singly, in pairs, or in groups of five or ten. The principal mating season is reportedly summer, from June to possibly October, and gestation lasts for about 10 to 11 months (Leatherwood 1983). Most seasonal movements seem to be inshore-offshore rather than north-south. Schooling fish such as herring, capelin, sprat, and silver hake form the bulk of their diet.

Pacific white-sided dolphin (*Lagenorhyncus obliquidens*)

They are most often seen in the deep inshore waters of Alaska, British Columbia, and the states of Washington and Oregon during the late spring. During the winter months (November through April), they are often seen off Southern California. Pacific white-sided dolphins are opportunistic feeders, foraging on available small schooling fish, squid, and other species associated with the nightly deep scattering layer. They are often seen in groups of 10 to 50 animals, but thousands have been seen traveling together on occasion (Reeves, *et al.* 2002). There appears to be a north-south seasonal migration in the eastern North Pacific. Although there is clear evidence that two forms of Pacific white-sided dolphins occur along the U.S. west coast, it is not currently possible to distinguish animals without genetic or morphometric analyses. Thus, the SAR grouped Pacific white-sided dolphins into two discrete, noncontiguous areas, waters off Californa/Oregon/Washington (northern and southern stocks) and Alaska waters. The 2006 SAR stated the following:

> The most recent estimates of abundance for Pacific white-sided dolphins are based on two summer/autumn shipboard surveys conducted within 300 nmi of the coasts of California, Oregon, and Washington in 2001 and 2005 (Barlow 2003) (Forney 2007). The distribution of Pacific white-sided dolphins throughout this region is highly variable, apparently in response to oceanographic changes on both seasonal and interannual time scales (Forney and Barlow 1998). As oceanographic conditions vary, Pacific white-sided dolphins may spend time outside the EEZ, and therefore a multiyear average abundance estimate including California, Oregon and Washington is the most appropriate for management within U.S. waters. The 2001-2005 geometric mean abundance estimate for California, Oregon and Washington waters based on the two most recent ship surveys is 20,719 (CV = 0.22) Pacific white-sided dolphins" (Forney 2007).

The 2001 to 2005 average abundance estimate is 17.201 for the CA/OR/WA stock which is used as the minimum population estimate. The calculated PBR is 155 animals per year (Carretta, *et al.* 2008).

The mean annual serious injury and mortality in U.S. commercial fisheries for this stock is estimated to be 1.4 animals per year (CV = 0.86), based on data from 2000 to 2006. The primary commercial fishery that takes Pacific white-sided dolphins is the California/Oregon thresher shark/swordfish drift gillnet fishery, although overall cetacean entanglement rates in this fishery dropped considerably in recent years due to a take reduction plan, skipper education and required gear modification (Barlow and Cameron 2003). Low levels of mortality for Pacific white-sided dolphins have also been documented in the west coast groundfish trawl fisheries (Perez 2008; Perez and Loughlin 1991). Between 2000 and 2004, with 80 to 100 percent of the fishing effort observed, one Pacific white-sided dolphin was reported killed in the at-sea processing portion of the Pacific whiting trawl fishery. Fishery-related strandings of Pacific white-sided dolphins in California/Oregon/Washington between 2000 and 2004 totaled three animals. In 2001, two white-sided dolphins were stranded in southern California within a week, one animal had its flukes cut off; the second animal had yellow nylon line around the caudal peduncle and apparent bullet holes on each side of the head. A third animal stranded in 2004 with net-like markings. This California/Oregon/Washington stock of Pacific white-sided dolphins is not classified as strategic under the MMPA (Carretta, *et al.* 2005). The total fishery mortality and serious injury for this stock is lower than 10 percent of the calculated PBR and, therefore, can be considered to be insignificant and approaching zero mortality and serious injury rate.

3.19.2 Seabird Species

The highly productive California Current System, an eastern boundary current that stretches from Baja California, Mexico, to southern British Columbia, Canada, supports more than two million breeding

seabirds and at least twice that number of migrant visitors. Tyler et al. (1993) reviewed seabird distribution and abundance in relation to oceanographic processes in the California Current System and found that more than 100 species have been recorded within the EEZ, including albatross, shearwaters, petrels, storm-petrels, cormorants, pelicans, gulls, terns, and alcids (murres, murrelets, guillemots, auklets, and puffins). In addition to these "classic" seabirds, millions of other birds are seasonally abundant in this oceanic habitat including waterfowl, waterbirds (loons and grebes), and shorebirds (phalaropes). Not surprisingly, there is considerable overlap of fishing areas and areas of high bird density in this highly productive upwelling system. The species composition and abundance of birds varies spatially and temporally. The greatest seabird biomass is found over the continental shelf, and bird density is greatest during the spring and fall when local breeding species and migrants predominate.

The U.S. Fish and Wildlife Service (USFWS) is the primary Federal agency responsible for seabird conservation and management. Three species occurring in the California Current Ecosystem are listed under the ESA, and one species is a candidate for ESA listing, as shown in Table 3-85. Brown pelican is currently undergoing the delisting process. In 2002, the FWS classified several seabird species that occur off the west coast as Bird of Conservation Concern (BCC), and these are also noted in Table 3-85. Short-tailed albatross (*Phoebastria albatrus*), Hawaiian petrel (*Pterodroma sandwichensis*), and Newell's shearwater (*Puffinus auricularis Newell*) are ESA listed seabird species that primarily occur around Hawaii and the U.S. Pacific Islands.

Three species of albatross are known to occur within the west coast region. Short-tailed albatross, ranging from Japan to California, are listed as endangered. The black-footed albatross is the most abundant albatross off the west coast of Canada and the United States, ranging throughout the North Pacific between 20° N. latitude and 58° N. latitude, but more eastern in its at-sea distribution than the laysan albatross (Cousins and Cooper 2008). The estimated number of black-footed albatross worldwide is approximately 290,000, of which 58,000 pairs (116,000 birds) bred in 2001-02 (USFWS 2005). The conservation status for black-footed albatross under the World Conservation Union (WCN) criteria for threatened species is "Vulnerable" due to an observed 20 percent or more population decrease over three generations (approximately 45 years). While the laysan albatross is less common in the west coast EEZ, it is the most abundant albatross Pacific-wide, with an estimated 2,200,000 individuals (USFWS 2005), with centers of concentration in the WCPO (Cousins and Cooper 2008). Numbers of breeding laysan albatross have declined over the last five years in the two largest colonies of this species (USFWS 2005). WCN status for the laysan albatross is "Lower Risk-Least Concern." Both the black-footed and laysan albatross nest principally in the Hawaiian Islands, mate for life, and lay only one egg in a single season. The black-footed albatross occurs off the west coast primarily from spring through fall, but it can be found year-round; breeding birds begin returning to the Hawaiian Island chain in October. During egg-laying, incubation, and early chick feeding, which lasts from December through March, these birds are generally more concentrated near the breeding islands, although some may still travel considerable distances. The laysan albatross also occurs uncommonly off the west coast year round, primarily in summer during the nonbreeding season.

The MBTA implements various treaties and conventions between the U.S. and Canada, Japan, Mexico, and Russia for the protection of migratory birds. Under the Act, taking, killing, or possessing migratory birds is unlawful. In addition to the MBTA, an EO, Responsibilities of Federal Agencies to Protect Migratory Birds (EO 13186), directs Federal agencies to negotiate Memoranda of Understanding with the USFWS that would obligate agencies to evaluate the impact on migratory birds as part of any NEPA process. The USFWS and NMFS are working on a Memorandum of Understanding concerning seabirds.

In February 2001, NMFS adopted a National Plan of Action (NPOA) to Reduce the Incidental Take of Seabirds in Longline Fisheries. This NPOA contains guidelines that are applicable to relevant groundfish fisheries and would require seabird incidental catch mitigation if a significant problem is

found to exist. During the first two years of NPOA implementation, NMFS regions were tasked with assessing the incidental take of seabirds in longline fisheries. In the LE groundfish longline fleet off the coasts of Washington, Oregon, and California during September 2001 to October 2002, there were no incidental seabird takes documented by west coast groundfish observers. During the assessment period, approximately 30 percent of landings by the LE fixed-gear fleet had observer coverage. The Northwest Region of NMFS, in partnership with Sea Grant, is implementing a seabird bycatch reduction program intended to reduce the seabird take in the longline groundfish fishery.

Table 3-85. Rare seabirds of the west coast.

ESA-listed Endangered
California brown pelican (*Pelecanus occidentales*)
California least tern (*Sterna antillarum browni*)
ESA-listed Threatened
Marbled murrelet (*Brachyramphs marmoratus*)
ESA Listing Candidate
Xantus's murrelet (*Synthliboramphus hypoleucus)*
USFWS Bird of Conservation Concern (BCC)
Ashy Storm-petrel (*Oceanodroma homochroa)*
Arctic tern (*Sterna paradisaea)*
Elegant tern (*Sterna elegans)*
Western gull-billed tern (*Sterna nilotica)*
Black skimmer (*Rynchops niger)*
Xantus's murrelet (*Synthliboramphus hypoleucus)*
Cassin's auklet (*Ptychoramphus aleuticus)*
Caspian tern (*Sterna caspia)*

Source: (USFWS 2005)

The following table shows seabird observed interaction with the different groundfish gear types.

Table 3-86. Seabird known/recent interaction with in west coast gear types.

	At-sea Whiting	LE Trawl	LE Fixed-gear Sablefish Endorsed	LE Fixed-gear Non endorsed
Bird UnID			X	
Black Foot Albatross			X	
Brandts Cormorant		X		
Brown Pelican				X
Auklet/Murrelet UnID				
Common Murre		X		
Cormorant UnID		X	X	X
Gull UnID		X		
Leachs Storm Petral		X		
Northern Fulmar		X		
Shearwater UnID				
Seabird UnID				
Sooty Shearwater				
Storm Petral UnId		X		
Western Gull			X	X

3.20 Habitat and Ecosystem

3.20.1 California Current Ecosystem

The term "ecosystem" is generally defined as a "functional unit of the environment" within which the basic processes of energy flow and cycling are identifiable and can be (relatively) localized. In this sense, marine ecosystems are extremely difficult to identify, as most are relatively open systems, with poorly defined boundaries and strong interactions across broad spatial scales. The California Current ecosystem, like other eastern boundary current ecosystems, is especially difficult to define, as they are characterized by tremendous fluctuations in physical conditions and productivity over multiple time scales (Mann and Lazier 1996; Parrish, *et al.* 1981). Food webs tend to be structured around CPS that exhibit boom-bust cycles over decadal time scales (Bakun 1996; Schwartzlose, *et al.* 1999). Similarly, the top trophic levels of such ecosystems are often dominated by HMS such as salmon, albacore tuna, sooty shearwaters, fur seals and baleen whales, whose dynamics may be partially or wholly driven by processes in entirely different ecosystems, even different hemispheres.

The California Current is essentially the eastern limb of the Central Pacific Gyre. It begins where the west wind drift (or the North Pacific Current) reaches the North American Continent. This occurs near the northern end of Vancouver Island, roughly between 45° and 50° N. latitude and 130° to 150° W longitude (Ware and McFarlane 1989). A divergence in the prevailing wind patterns causes the west wind drift to split into two broad coastal currents, the California Current to the south and the Alaska Current to the north. As there are really several dominant currents in the region, all of which vary in geographical location, intensity, and direction with the seasons, this region is often referred to as the California Current System (Hickey 1979).

The California Current itself is a year-round feature consisting of a massive southward flow of the cool waters of the west wind drift. The current is best characterized as a shallow, wide, and slow-moving body of water, ranging from the shelf break to 1,000 km offshore, with the strongest flows at the sea surface, and in the summertime (Dodimead, *et al.* 1963; Hickey 1979; Lynn and Simpson 1987). This surface current is matched in the summer by the California Undercurrent, which moves water northward from the south in a deep yet narrow band of subtropical water typically found just off of the shelf break at depths of 100 to 300 m. The undercurrent flows from Baja California to Vancouver Island, transporting warmer, saltier southern water north along the coast (Hickey 1979). On average, the California Current flow volume reaches a maximum in spring and summer, when the flow moves inshore, closer to the shelf break. The California Undercurrent develops in late spring through early summer and persists into the fall. During late summer and fall, there is considerably more mesoscale variability in flow patterns, with fields of cyclonic and anticyclonic eddies and considerable mixing of water masses between shelf and offshore waters (Brink and Cowles 1991). Beginning in the fall, and through the winter, the northward flowing Davidson Current is the dominant feature over the shelf and beyond the shelf break (Hickey 1998).

Additional information on the physical and oceanographic features of the California Current ecosystem and the interannual and interdecadal climate forcing occurring there, please refer to the 2008 SAFE document published by the Council (PFMC 2008c).

Widely recognized biogeographic patterns of the California Current ecosystem are distinct zoogeographic provinces extending North and South of Point Conception, California, known as the Oregonian and San Diego Provinces. The Oregonian Province extends from the Strait of Juan de Fuca in the north to Point Conception in the south. The San Diego Province begins at Point Conception and runs south past the terminus of the EEZ (NMFS 2004a).

Patterns of adult groundfish distribution based on depth have been observed to occur between nearshore, continental shelf, and the continental slope and have been used to form discrete management units. Field and Ralston (2005) showed that 51 to 72 percent of the year-to-year variability in recruitment for three winter spawning rockfish (yellowtail, widow, and chilipepper) seems to be shared coastwide, over a spatial scale of 500 to 1,000 km. The major differences in recruitment strength seemed to be associated with Cape Blanco and/or Cape Mendocino, and some evidence suggests differences in relative year class strength north and south of Point Conception as well. With respect to genetic evidence for biogeographic boundaries, Hedgecock (1994) found that fish and invertebrates with planktonic larvae generally maintain low spatial genetic variance over large (500 to 2,000 km) regions in the California Current. Analysis of a range of Sebastes species also suggests little genetic differentiation within the California Current region (McGauley and Mulligan 1995; Rocha-Olivares and Vetter 1999; Wishard, *et al.* 1980), although some nearshore species may exhibit greater spatial patterns of population substructure, particularly north and south of Cape Mendocino (Cope 2004).

Williams and Ralston (2002) found that Cape Mendocino (and the Mendocino Escarpment) was one of the most noteworthy barriers to the latitudinal distribution of rockfish species diversity. Most stock assessments for groundfish tend to be either coastwide assessments, or are relative to the stocks north or south of Cape Mendocino (occasionally Cape Blanco). Both Cape Mendocino and Point Conception are key management boundaries for the Council. In general, evidence suggests wide to very wide dispersal of larvae and juveniles for most groundfish, with modest to limited movement of adults (general on the scale of thousands of kilometers for most species, with limited examples of small numbers of some populations moving in the hundreds of kilometers). There are strong seasonal inshore and offshore migrations for many species, particularly flatfish, and some evidence for ontogenetic movement in some species by both/either depth and latitude. Pacific hake are the only confirmed highly migratory groundfish species in the FMP, with a clear seasonal migration from southern spawning grounds off of northern Mexico and Southern California to northern foraging habitat off of Oregon, Washington, and British Columbia (Bailey, *et al.* 1982). There is an ontogenetic component to this migration, as juveniles tend to be found off of central and northern California, with larger, older fish tending to travel further north. Similarly, the distribution of hake tends to be more northerly in warm years (Dorn 1995; Swartman and Hickey 2003), reflecting interannual shifts in marine habitat conditions.

While the physical and bathymetric features associated with these general biogeographic boundaries are fixed in space, the physical characteristics of water masses and associated plankton communities are clearly highly dynamic in space and time. Fulton and LeBrasseur (1985) described a transport-driven shifting subarctic domain in the northern reaches of the California Current System, the margin of which was characterized by abrupt declines in zooplankton biomass south of the subarctic boundary. Although the physical dynamics are thought to be more complex than their model, it is clear that climate-driven changes in transport and ocean conditions dramatically alter both the species composition and productivity of zooplankton throughout the California Current to a considerably greater extent than static boundaries based on geography (Mackas, *et al.* 2005; McGowan, *et al.* 1998; Peterson, *et al.* 2002; Peterson and Schwing 2003).

For example, a subtropical species of copepod was more abundant through the 1980s and early 1990s, and were almost completely dominant during the 1997-98 El Niño, at which time standing biomass was near all time lows (Peterson, *et al.* 2002). Since 1999, a northern (colder water) copepod species has again dominated numerically during spring and summer, and the standing biomass of zooplankton off of Oregon has been roughly double that observed prior to 1999 (Peterson and Schwing 2003). This rapid transition from the 1997-98 El Nino event to the cool conditions of 1999 to 2002 was also associated with tremendous recruitment in virtually all west coast groundfish, as evidenced by the age and size composition data available in stock assessment models in both the 2005 and 2007 stock assessment cycles. For most stocks in which recruitment events are reasonably well specified by the data

(recruitment tends to be poorly specified over time, with slow growth rates and/or little age data), the 1999 recruitment was estimated to be as great or greater than any recruitment over the preceding 10 to 20 years; for example, the 1999 bocaccio year class was the largest since 1989, resulting in a near doubling of stock spawning biomass between 1999 and 2005; the 1999 Pacific hake year class was the largest since 1984, which effectively doubled the stock biomass between 2000 and 2003; and the 1999 and 2000 lingcod year classes were the second and third largest since the early 1970s, resulting in greater than a tripling in abundance between 1999 and 2005. While there are signs of reasonably strong year classes in 2003 for some stocks, recent indices of recruitment from midwater trawl surveys and other sources have tended to indicate poor recruitment for most stocks since 2003, with particularly low levels of juvenile rockfish abundance observed in 2005 through 2007, a year in which low secondary productivity, anomalous upwelling conditions, and widespread dieoffs of some seabirds reflected unusual and generally unfavorable ocean conditions for many elements of the ecosystem (Goericke, *et al.* 2007; Sydeman, *et al.* 2006). As the production of eggs and larvae for most west coast groundfish appears to be only modestly related to interannual changes in ocean conditions (Harvey 2005), the causes of these strong year classes are thought to be related to post-spawning (or post-parturition) survival of larval and juvenile life history stages, although the mechanism remains elusive.

EFH for groundfish is described as all waters from the high tide line (and parts of estuaries) to 3,500 meters (1,914 fathoms) in depth. HAPCs are a subset of EFH used to focus management and restoration efforts. The current HAPC types are estuaries, canopy kelp, seagrass, rocky reefs, and areas of interest (a variety of submarine features, such as banks, seamounts, and canyons, along with Washington State waters). In addition to identifying EFH and describing HAPCs, the Council also adopted mitigation measures directed at the adverse impacts of fishing on groundfish EFH. Principal among these are closed areas to protect sensitive habitats. There are three types of closed areas: bottom trawl closed areas, bottom contact closed areas, and a bottom trawl footprint closure. The bottom trawl closed areas are closed to all types of bottom trawl fishing gear. The bottom trawl footprint closure closes areas in the EEZ between 1,280 m (700 fm) and 3,500 m (1,094 fm), which is the outer extent of groundfish EFH. The bottom contact closed areas are closed to all types of bottom contact gear intended to make contact with the bottom during fishing operations, which includes fixed-gear such as longline and pots. A more complete description of groundfish EFH is contained in the EFH EIS (NMFS 2005), which is incorporated herein by reference.

MPAs are a principal ecosystem management tool. In addition to the closed areas described above, there are marine MPAs distributed throughout the project area. The EIS for Pacific Coast Groundfish EFH (NMFS 2005) contains a complete analysis of these sites and is incorporated here by reference. Section 3.3.5.3 of this FEIS provides background on MPAs. The following is a brief summary of these areas.

3.20.2 Trophic Relationships and Other Potential Effects of Fishing on the Food Web

Although far from conclusive, the empirical evidence and theoretical considerations suggest some potential for top-down impacts or intraguild competition, as a result of declines in higher trophic level species such as cowcod, bocaccio, and yelloweye rockfish over small spatial scales. It is reasonable to expect that similar impacts could potentially be associated with fishery-induced declines in stocks of healthy species (those reduced from their equilibrium abundance, but not to levels below overfishing limits), such as sablefish, Pacific halibut, petrale sole, shortspine thornyhead, Pacific hake, and other piscivorous or higher trophic level species. Such impacts are often referred to as trophic cascades, in which declines of high trophic level species (keystone predators) have cascading impacts through food webs to the abundance, productivity, and species diversity of lower trophic levels. Empirical examples of trophic cascades tend to be more common for semi-enclosed ecosystems such as lakes, or highly structured (two dimensional) environments, such as intertidal or sub-tidal ecosystems (Paine 1966;

Simenstad, *et al.* 1978; Tegner and Dayton 2000). As one ventures further from these environments, the evidence for top-down control, or trophic cascades, becomes considerably spottier, although (Van der Elst 1979) reported a classic example of top-down control of a coastal ecosystem off of the Natal Coast in South Africa.

In coastal upwelling ecosystems such as the California Current, most evidence suggests that the primary forcing factor for ecosystem productivity and structure over the scale of the entire system tends to be either "bottom-up" (based on the amount and variability of primary or secondary production) or "middle-out." For example, (Ware and Thomson 2005) proposed that the carrying capacity of north Pacific coastal ecosystems was primarily determined by bottom-up control, based on correlations between latitudinal variability in primary production and commercial fisheries yields. Alternatively, bottom-up control in these ecosystems could be a function of secondary production through variability in the productivity and species composition of the zooplankton community. The California Current seems to experience higher secondary production during periods of stronger southward transport and cooler sea surface temperatures. Zooplankton, particularly euphausiids, are the principal prey item for most of the mid-trophic level organisms in the California Current, including Pacific hake and most rockfish.

An alternative to bottom-up control is "middle-out" control, also referred to as "wasp-waist" control, in which a small number of key mid-trophic level species represent a bottleneck of energy flow between lower and higher trophic levels. It has long been noted that food webs in coastal upwelling ecosystems tend to be structured around CPS, such as krill, sardine, anchovy, and hake, that exhibit boom-bust cycles of abundance over decadal time scales (Bakun 1996; Parrish, *et al.* 1981; Schwartzlose, *et al.* 1999). Such dynamics have long been thought to be a consequence of the energetic and highly variable oceanographic processes that shape the physical environment and drive production throughout pelagic and benthic food webs in coastal upwelling ecosystems (such as the California Current system) over a range of time scales (Mann and Lazier 1996; Parrish, *et al.* 1981). The idea of wasp-waist control was first suggested by Rice (1995) and developed in greater detail in Cury et al. (2000). The premise is that the low species diversity often observed in the middle of many upwelling ecosystems results in a vast majority of the energy in the food web flowing through CPS such as sardine, anchovy, and mackerel. Many of these seem to feature weak links in their life cycles related to sensitivity to climate forcing, such that climate conditions determine the productivity of these stocks, and indirectly drive the dynamics of both higher and lower trophic levels.

Empirical evidence for any of these types of control is typically limited for large marine ecosystems (Hunt and McKinnell 2006). However, where trophic interactions among exploited species are documented or suspected, ecosystem modeling can provide a template to evaluate both the magnitude and consequences of removals of either predators or prey in the system of interest (Christensen and Walters 2004; Hollowed, *et al.* 2000). Although such models are unavoidably constrained by conceptual shortcomings and data limitations, most critical reviews of multispecies modeling approaches indicate that ecosystem models can augment contemporary single species models by confronting an array of interactions and dynamics that are more difficult to address with single-species models, such as competition, predation, and environmental variability (Fulton, *et al.* 2003; Hollowed, *et al.* 2000; Plagányi and Butterworth 2004).

Dynamic simulations of an ecosystem model of the Northern California Current were developed by Field et al. (2006a), who modeled the continental shelf and slope ecosystem between Cape Mendocino and Cape Flattery between 1960 and 2004. The results of the ecosystem model are consistent with what is known of the life histories for many of the rockfish, roundfish and longer-lived flatfish in the California Current where low mortality rates are indicative of low predation rates and presumably weakly coupled trophic interactions. In other words, species with a low natural mortality rate are unlikely to be a key prey species for higher trophic level predators and are, consequently, less likely to

affect significant bottom-up control in the energy flow or structure of the ecosystem. Therefore, the effects of severe declines in the overfished species that were explicitly included in this model (canary rockfish, widow rockfish, and Pacific ocean perch) relative to other elements of the ecosystem appear to be minimal. The model indicated considerably stronger interspecific interactions in species such as shrimp, salmon, and small flatfish where there is high turnover and high predation coupled with substantial changes in many of their key predators (such as hake, sablefish, marine mammals) over the last 40 years.

A comparable, but considerably more complex model, with greater population (demographic) structure, spatial complexity, and explicit physical forcing (Fulton, *et al.* 2004) is the Atlantis model for the California Current (Brand, *et al.* 2007; Kaplan and Levin 2007). Like the Field et al (2006b) model, the Atlantis model suggests that the fisheries' removal of slow growing, low turnover species such as rockfish has not led to obvious changes in ecological structure or to strong changes in interspecific interactions; hake predation on shrimp appears to be one exception to this general lack of top-down control. However, recent modeling results do indicate a key role for forage species and the possibility of bottom-up effects. Future research will be required to identify how these effects play out across space.

CHAPTER 4 EFFECTS OF THE ALTERNATIVES

This chapter examines the environmental and socioeconomic impacts of the alternatives considered for rationalization of the west coast groundfish trawl fishery. The impacts of the alternatives are compared to the Alternative 1 (no action or status quo): the fishery without the implementation of a rationalization program.

The impacts described in this chapter are the best estimates of what is expected to occur under a rationalization program. We use analytical tools to describe what the affected environment is likely to look like under example rationalization programs that encompass the range of alternatives described in Chapter 2. These tools are based primarily on social and economic theory, known relationships between harvested species and other parts of the natural and human environment, and empirical data that show how affected stakeholders will respond to the incentives created by rationalization. This information is used to illustrate how the affected environment will be affected by rationalization and how those impacts differ between the alternatives.

This chapter begins by describing the framework used to analyze effects. This framework uses an additive approach to assess the cumulative effect of the alternatives. This additive model is best described as the sum of existing conditions, reasonably foreseeable actions, and the effect of the alternatives. The impacts of these categories on the affected environment are assessed independently, and the sum of these effects results in the overall, or cumulative, effect. The cumulative effect is not an independent impact in and of itself, but rather the combined effect of past and present conditions, reasonably foreseeable actions, and the alternatives. Therefore, the cumulative effect is assessed as a summary of the factors affecting each environmental component.

This chapter also describes a series of possible rationalization programs, or alternatives, that serve as the basis for estimating impacts. These alternatives were created to illustrate the effects of rationalization from a programmatic perspective and to show how the options under consideration will act in concert with one another when combined into a single rationalization program. We then describe some of the tools used to assess the effects of the alternatives. Finally, we estimate the effect of the alternatives on each portion of the affected environment described in Chapter 3.

- Description of the Analytical Framework and Timeline—Section 4.1
- Description of Analytical Tools used to Assess Impacts—Section 4.2
- Effects of Rationalization—Sections 4.3 to 4.20

4.1 Analytical Framework

4.1.1 Additive Model for Analyzing Effects, Including Cumulative Effects

CEQ regulations at 40 CFR 1508.25 identify three types of impacts that must be considered in an EIS: direct, indirect, and cumulative effects. Direct effects are directly related to the action (occurring at the same time and place); for indirect effects, there is some intermediate cause-and-effect between the proposed action and the actual effect being evaluated (occurring at a distance in time and/or place). The regulations also define a cumulative impact as "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable actions regardless of what agency (Federal or nonfederal) or person undertakes such actions." Although the regulations and guidance identify cumulative effects as a separate, third class of impacts, all effects can be viewed as cumulative to the extent that they are part of some causal chain that results in an ultimate effect on an environmental component. Using this concept of cumulative effects, this EIS frames the analysis in terms of an additive model. To arrive at the final, cumulative effect on an environmental component, the effects in a causal chain are traced out and measured qualitatively or quantitatively, in terms of the metrics that have been identified in this EIS. The components in this additive model include baseline conditions, RFFAs, the effect of the proposed action, and any mitigation that is proposed separately from the alternatives. Each is described below.

Table 4-1. Components included within the additive model for determining cumulative effects.

Components of Additive Model	Description
Baseline Conditions	These are past and present status of environmental components and the future status of those components under Alternative 1 management measures.
Reasonably Foreseeable Future Actions	These are actions that are anticipated to occur in the future and generally include proposals that are in the planning and development stage.
Effect of the Alternatives	This is the predicted impact of the alternatives being considered.
Mitigation	These are proposals separate from the alternatives that are designed to mitigate the effects of the alternatives. They are added to—or subtracted from—the baseline to arrive at the cumulative effect.

Within the framework of the EIS, this additive model is applied to the affected environment described in Chapter 3. The affected environment is, thus, a summary of current conditions and is described in terms of the same metrics used in Chapter 4. In addition, Section 4.1.3 catalogues RFFAs in terms of the metrics. This projects the affected environment, or environmental baseline, forward in time by considering the interaction of these foreseeable actions with natural phenomena.

Chapter 4 evaluates the impacts of the alternatives. In it, we describe how the alternatives affect the environmental components, and summarize these effects in combination with projected environmental conditions; this represents the cumulative impact assessment. The alternatives are also compared to the no action alternative (Alternative 1), which represents baseline conditions if the current management program remains in place. The next section summarizes baseline conditions described in Chapter 3, including baseline conditions; Section 4.1.3 describes RFFAs; and Sections 4.5 through 4.20 evaluate

the effects of the alternatives on various environmental components. These are all components of the additive model. An analytical timeline showing various aspects of groundfish fishery management and policy implementation from the present date through 2016 is shown in Table 4-1.

4.1.2 Baseline Conditions

The baseline used as the reference point for determining the incremental effect of each alternative on resource and stakeholder groups of interest is provided in Chapter 3. Chapter 3 of this document contains a comprehensive description of the human (physical, biological, and socioeconomic) environment potentially affected by the alternatives under consideration for each of the resource or stakeholder groups used to analyze the impacts of the alternatives. The baseline incorporates the past and present status of environmental components and the future status of those components under the existing management framework. In general, the baseline condition for this analysis is the expected future status of resource and stakeholder groups absent RFFAs or implementation of a rationalization program. The baseline conditions provide a benchmark against which the specific effects of each alternative, including Alternative 1, are compared.

The baseline does not necessarily represent a static snapshot of the resource and stakeholder groups. To the extent feasible, trends in the data from the description of historical conditions are used to depict baseline conditions more accurately (e.g., by incorporating variation over time) and to put those conditions into a broader perspective. The cumulative past and present effects of groundfish fishery activity, as well as effects external to the groundfish fishery, such as other human-induced impacts and climatic events influencing the resource and stakeholder groups, all contribute to the baseline condition.

The following list summarizes the assumptions made regarding trends in the affected environment that are expected to continue post-implementation and are considered part of the baseline:

- Human population increases in affected communities.
- Increased tourism and recreational opportunities in affected coastal communities.
- Increased demand for retirement destinations in affected coastal communities.
- Increased demand for seafood.
- Continued growth and scope of the aquaculture industry.
- Increased public awareness and scrutiny of the fishing industry.
- Increased demand for ecosystem-wide fishery management approaches.
- Widow rockfish stocks will be declared rebuilt in the short term and will be removed from overfished status.
- Fishery patterns from 2004 to 2006 are used for vessel and permit delivery patterns and vessel-processor relationships.
- Bocaccio (2023), darkblotched rockfish (2030), Pacific ocean perch (2011) will be rebuilt over the longer term (more than 10 years), but within the time-line of analysis.

The following bulleted list summarizes assumptions regarding past and present actions (regulations) that will continue in the foreseeable future and are considered part of the comparative baseline:

- RCAs and Essential Fish Habitat Conservation Areas will remain in place.
- Sector bycatch limits for overfished groundfish will continue to be used for the nontribal whiting fishery under Alternative 1 management.

- All other enforcement, monitoring, catch accounting, and observer coverage levels will be equivalent to those seen in 2007 under Alternative 1 management.
- ABCs and OYs in effect for 2007 and 2008 will be used for fishery analysis purposes. Projections of stock abundance will be based on the most recent assessments available at the end of 2007.
- The future OYs of rebuilding species will be assumed to be as constraining to Alternative 1 fishing activity as the OYs set during the 2007-08 management cycle.[70]

While it would be more desirable to use the 2009-10 ABCs and OYs, the 2009-10 OYs may not be known in time to complete much of the analysis for decisionmaking. Therefore, 2007-08 OYs will be used and updated, where possible and relevant, to reflect 2009 and 2010 ABCs and OYs. Potential variations in groundfish species ABCs and OYs are also treated as a source of uncertainty, and the impacts of these variations are displayed.

4.1.3 Catalog of Reasonably Foreseeable Future Actions

Chapter 3 describes ongoing actions (Section 3.3) and trends in the baseline environment (Section 3.4). This section catalogs RFFA that have the greatest bearing on the effects of the proposed action. RFFAs will be implemented after the proposed action is implemented, although they are at different stages of development. Only future actions that can be reasonably expected to occur are included. In general, RFFAs are actions that have reached the proposal stage as defined in CEQ regulations at 40 CFR 1508.23.

The following list of RFFAs was developed based on Council workload priorities and the agenda topics for Council meetings through June 2009, as well as RFFAs that may be undertaken by entities unrelated to the Council. This list represents the assumed actions that will be put in place that are not part of Alternative 1 or baseline conditions:

1) Amendment 10 will be approved and implemented creating an at-sea monitoring system for the shore-based whiting fishery (currently this system is implemented through an EFP).
2) The Groundfish Essential Fish Habitat five-year review will occur and may add new closed areas or modify existing closed areas.
3) Amendment 21 (Intersector Allocation) will be approved and implemented creating sector-specific allocations of groundfish species.
4) Ongoing biennial harvest specifications will continue, including the 2010-11 specifications and beyond.
5) Amendment 15 to the groundfish FMP will be implemented, creating sector specific limitation in the three nontribal sectors of the Pacific whiting fishery.
6) Wave energy projects will be developed on the Pacific coast, creating conflicts over space and access to fishing grounds.

[70] The allowable catch levels (OYs) of rebuilding species constrain harvest activity of target species. In the 2007-08 biennial harvest specifications process, the Council selected various rebuilding species OYs that have varying levels of constraints on harvest activity. In general, the OY of canary rockfish predominately constrains harvest activities along the continental shelf and slope in areas off northern California, Oregon, and Washington. Yelloweye is expected to become equally, or more, constraining to trawl harvest activities in the near future as the OY for that species decreases. Darkblotched rockfish and Pacific ocean perch constrain harvest activities along the continental slope in the same general latitudinal area. In areas to the south off central and southern California, cowcod and bocaccio constrain harvest activities along the continental shelf.

7) The Groundfish FMP will be amended to authorize an AMP[71] and CFAs[72] as part of the trawl rationalization program. Although the AMP is described as part of the proposed action, trailing actions will occur to further define the program and implement it. For that reason, it may also be considered an RFFA.
8) The allowable harvest of Pacific halibut in area 2A will decline from current levels.
9) The Groundfish FMP will be amended to comply with the ACL provisions of the MSA.

4.1.4 Analytical Timeline

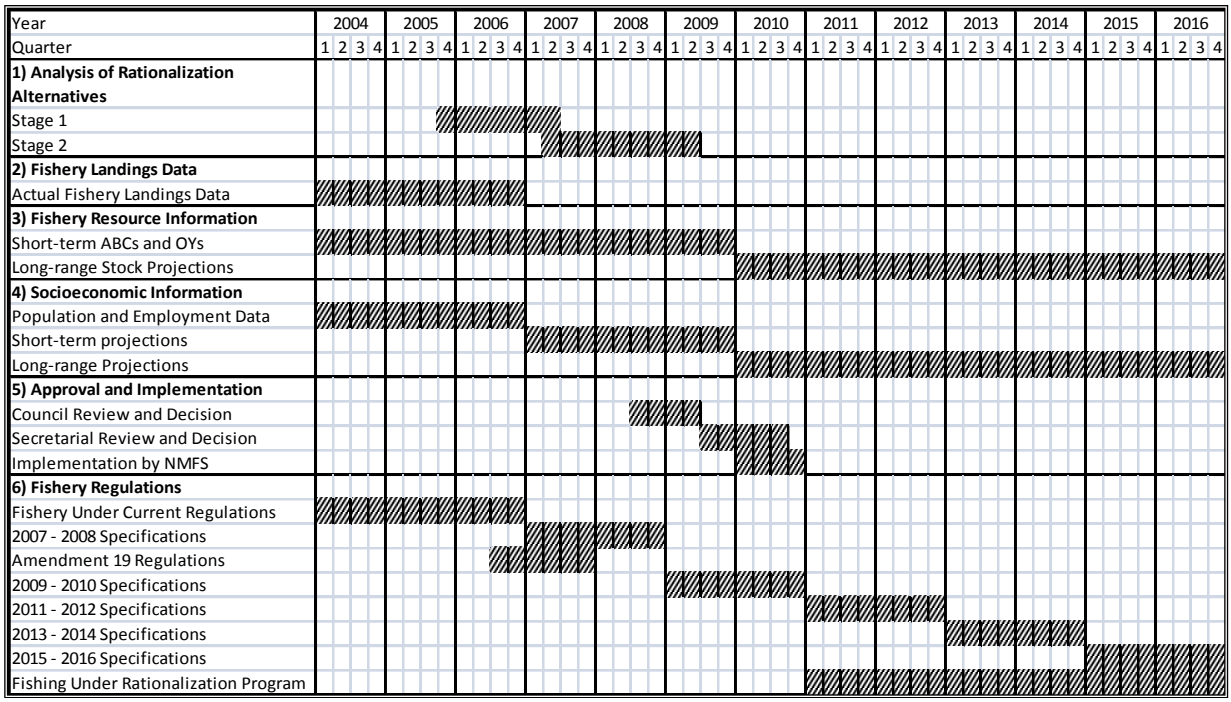
As in any analysis that tries to predict the effects of future actions, it is critical to examine the time periods covered by the available historic and current data, the period during which the analysis will occur, and the period over which the analysts must make projections. In general, there is a substantial time lag between the period during which the analysis is undertaken and the period in which the effects of a proposed action will occur. Specifically, the DEIS was scheduled to be released in the fall of 2009.[73] If approved, the effects of the proposed action are not expected to occur until 2011, because of the time needed for Secretarial approval, the development of necessary infrastructure and personnel, and the time needed for initial issuance and appeals. Those effects most likely will not be fully realized until some years later because of the time necessary for fishery participants to adjust and adapt to the new regime.

Figure 4-1 is a quarterly timeline for analysis and implementation of the trawl rationalization program from 2004 to 2016. The first section of the figure, labeled "Analysis of Rationalization Alternatives" indicates the timeframe over which the analysis of the trawl rationalization program takes place. Sections 2 through 4 show the availability of key data sets that will be necessary for the analysis. Section 5, Approval and Implementation, shows the timeframe for the Council and Secretarial decision process and implementation of the proposed program by NMFS. The last section of the figure, Fishery Regulations, indicates the timing of regulatory changes that are projected to occur during the first years of fishing under the program.

[71] Alternative 4b (Council preferred) assumes that the AMP is put in place in year three of the trawl rationalization program and achieves the objectives outlined by the Council for the AMP. Alternative 4b assumes there is no AMP in the first two years of trawl rationalization.

[72] For analytical purposes, it is assumed that Community Fishing Associations act in a manner that may impact communities, harvesters, processors, and new entrants, and that these associations are allowed to hold quota in excess of accumulation limits.

[73] The reauthorized MSA states that the Council shall submit a plan for rationalization of the west coast groundfish trawl fishery within two years of reenactment of the Act. An analysis prepared to support the Council's choice of a preferred alternative in November 2008, along with supplemental information on the preferred alternative, was submitted to Congress to comply with the MSA mandate.



Note: The fact that the timeline begins in 2004 does preclude using data from earlier periods in the analysis.

Figure 4-1. Trawl rationalization program analytical and implementation timeline.

As seen in the first section, Stage 1 of the analysis (development of the analytical framework and outline) runs slightly over one and a half years. The second stage of the trawl IFQ program analysis begins in the second quarter of 2007 and runs through the second quarter of 2009.

Section 2 of the figure shows the period over which actual fishery landings data will be available. By the time the Stage 2 analysis was underway, fishery data for 2006 were available. Information for earlier years will also be available and will be used to describe historical conditions of potentially affected resource and stakeholder groups, but it is not shown in the figure.

The figure's third section describes the availability of stock assessment information. Under the current management regime, the groundfish stock specifications cover two-year periods, and Council recommendations are made at the end of the second quarter each even-numbered year. This means that ABC and OY specifications for 2009 and 2010 were not recommended by the Council until June of 2008, which is the same time that the preliminary draft analysis of trawl rationalization was scheduled to be completed. Therefore, actual ABC and OY specifications for the 2009 and 2010 fishery were not available early enough to inform much of the trawl rationalization analysis. Harvest specifications for 2007 and 2008 provide an indication of the stock levels and OYs for the near term and also provide long-range projections. As indicated in the figure, these long-range projections of stock sizes are likely to be generally available through 2016 for most species. In cases where new information on species stock status is available during the course of the analysis, it is used if appropriate.

The fourth section of the figure deals with available socioeconomic information. In general, population and employment estimates through 2006 were available at the community or county level by the time Stage 2 of the analysis was underway.

The Council received a preliminary draft analysis of the trawl rationalization program at the end of the second quarter in 2008 (June Council meeting), and another analysis described as a Decision Document at the November 2008 Council meeting, during which many decisions on trawl rationalization occurred. Additional analyses were completed between the November 2008 Council meeting and the June 2009 Council meeting which supported further Council decisions and clarifications in March, April, and June of 2009. At the November 2009 meeting, the Council made a further revision of its final preferred alternative by changing the initial allocation formula for canary rockfish, an overfished species. For this species alone, the Council introduced an equal sharing element based on the buyback permits' history. Following Council decisionmaking, the draft EIS was released to support Secretarial review. Secretarial review of the proposal, including proposed plan amendment language, Federal rulemaking (promulgating regulations), developing the necessary tracking and monitoring infrastructure, and allowing time for QS issuance and appeals is expected to take more than a year (from completion of Council decisionmaking in November 2009 and continuing through 2010 with a target implementation date of January 1, 2011).

The sixth and final section of the figure shows the major regulatory regimes under which the fishery will operate between 2004 and 2016. The current regulations are expected to remain in effect through 2008. In early 2009, new biennial groundfish stock and harvest specifications were implemented. Some additional regulations, such as Amendment 10 are presumed to also go into place. It is assumed that fishing would continue under those regulations through 2010. In 2011, it is anticipated that fishing under the trawl rationalization program would begin.

While not shown in the table, the analysis takes into account 20 years beyond the implementation of the rationalization program. The end of 2016 is used as the "end point" for the short-term period of analysis, while the long term is assumed to extend to the end of 2031. The time horizon of the analysis is more than a few years after implementation of an alternative management regime in order to include fleet consolidation and other possible effects.

4.1.5 Review of Alternatives

The six action alternatives described in Chapter 2 are briefly illustrated in Table 4-2 for reading convenience. These alternatives are referred to throughout Chapter 4 to illustrate the impact of a trawl rationalization program on the affected environment. Alternative 1 is not shown in the table, but is considered in the analysis and is referred to as Alternative 1, Status Quo, or No Action. Throughout Chapter 4, the alternatives other than Alternative 1 are often referred to as "rationalization alternatives" or "action alternatives." Either term is used to imply an alternative different from status quo.

Table 4-2. Overview of action alternatives.

ELEMENT	ALTERNATIVES					
	Alternative 2a	**Alternative 2b**	**Alternative 2c**	**Alternative 3**	**Alternative 4a**	**Alternative 4b (Preferred Alt)**
Catch Control Tool	IFQ for all Trawl Sectors	IFQ for all Trawl Sectors		IFQ for Nonwhiting Trawl	IFQ for SS Trawl	IFQ for SS Trawl (trip limits for nonIFQ species)
				Co-ops for Whiting Trawl	Co-ops for At-Sea Trawl	Co-ops for At-Sea Trawl
Initial Allocation and Qualification	Based on permit landing history	Based on permit landing history		Equal sharing of buyback history in Nonwhiting (all groundfish	Equal sharing of buyback history in SS (all groundfish)	Equal sharing of buyback history in nonCP sectors (all nonoverfished spp. & canary rockfish)
				Rebuilding stocks allocated on a bycatch rate/pro rata (whiting)	Rebuilding stocks allocated on a bycatch rate/pro rata (whiting)	Rebuilding stocks and Pacific halibut allocated on a bycatch rate/pro rata
				CV co-op endorsement & allocation 97-03	CV(MS) endorsement & allocation 97-03	-CV(MS) endorsement & allocation based on 94-03 -MS permit: at least 1,000 mt in 2 years from 97 - 03
Accum. Limits	SS nonwhiting grnd: 3% ctrl & 6% per vessel	SS nonwhiting grnd: 3% ctrl & 6% per vessel		SS grnd: 1.5% ctrl & 3% per vessel	SS grnd: 2.2% ctrl & 4.4% per vessel	SS grnd: 2.7% ctrl & 3.2% per vessel
	SS whiting: 12% ctrl & 25% per vessel	SS whiting: 12% ctrl & 25% per vessel		CV(SS) whiting: 15%	SS whiting: 25% ctrl & 12% per vessel	SS whiting: 10% ctrl & 15% per vessel
	MS: 25% ctrl & 50% per vessel	MS: 25% ctrl & 50% per vessel		Mothership: 20% usage	Mothership: 30% usage	Mothership: Cannot process more than 45%
	CP: 60% ctrl & 75% per vessel	CP: 60% ctrl & 75% per vessel		CV(MS): 10% ctrl	CV(MS): 15% ctrl	CV(MS): 20% ctrl, 30% usage
				CP: none	CP: none	CP: none
Grandfather clause	Grandfather clause exists	Grandfather clause exists		None	Grandfather clause exists	None, but entities must divest overage QS at the end of year 4
Processor Initial Allocation / Co-op Affiliations	None	None	25% of groundfish, 50% whiting to SS and MS	100% Processor affiliations in MS and SS whiting sectors.	50% Processor affiliation in MS sector	Annual mothership declaration requirement
				25% SS processor alloc of SS groundfish	50% SS processor allocation of SS whiting	20% SS processor allocation of SS whiting
					No processor allocation of SS groundfish	No processor allocation of nonwhiting
Species Covered	All groundfish and Pacific halibut	All groundfish and Pacific halibut		All groundfish in nonwhiting sector	All groundfish in SS sector	Select groundfish species and Pacific halibut in shoreside sectors.
				Select species at sea. Bycatch pools are common across all whiting sectors	Select species at sea. At-sea sector bycatch is allocated at co-op level	Select species at sea. At-sea sector bycatch is allocated at co-op level
Number of Trawl Sectors	Three	Three	Three	Four	Three	Three
Adaptive Mngmnt	None	10% A.M. set aside	None	10% A.M. set aside for all sectors	10% A.M. set aside for SS	10% A.M. set aside for SS nonwhiting species
Area Mngmnt	None	None	None	Species split at 40 10 N lat	Species split at 40 10 N lat	None
Carry-over	Carry-over exists	Carry-over exists		No carry-over	Carry-over exists	Carry-over exists. Allowance decreases if OY declines

1) For analytical purposes, the adaptive management provision will be assumed to be used to A) mitigate against the effects of the program on adversely impacted communities, B) provide incentives to use habitat and bycatch friendly gear, and C) to mitigate against adverse effects of the program on processors (this is specific to Alternative 2b). For Alternative 4b, the Council's goals and objectives specified for AMP are used.
2) Under the Council's preferred alternative (Alternative 4b), comtrol limits apply to quota shares, and vessel limits apply to quota pounds (though QS control limits may indirectly constrain transfers of QP in some situations).
3) Assumptions regarding the sector level allocations of groundfish species and Pacific halibut differ between Alternative 4b and other Alternatives. Alternative 4b uses the Council's Final Preferred Alternative for Intersector Allocation.

A general description of each alternative, its focus, and rationale is included below.

- **Alternative 1** is No Action.

- **Alternative 2a** is market-centric with a high level of individuality and individual accountability. This alternative is intended to illustrate the effect of market incentives on the program. Illustrating the effect of the market without special provisions serves as a benchmark to help inform other decisions, such as whether to include provisions to hedge against market influence. In other words, before considering special provisions, it is worthwhile to understand why they should or should not be incorporated.

  In this alternative, a focus on market outcomes is achieved by issuing QSs to entities and by requiring that all groundfish species and Pacific halibut be covered with QSs. This means that market incentives apply to all groundfish catch and Pacific halibut. If species were not covered by QSs, the market would not have an effect on the catch, because they would not be directly managed by the rationalization system, which by definition is market-based. Issuing QSs (instead of establishing co-ops) is intended to isolate the effect of the market to individuals by holding them accountable for their own catch. Co-ops may result in a slightly different outcome because of their collective, community nature. This alternative also focuses on market outcomes by establishing three trawl sectors (versus four), allowing more market influence over the harvest strategies of fishing entities. This alternative does not include an AMP because such a provision would be designed to directly influence, or modify, outcomes that are driven by market incentives. A carry-over is included to provide flexibility in making harvesting choices across years, consistent with a market-driven approach. Accumulation limits are set at the high end of the range specified in the alternatives[74], and there is also a grandfather clause. These provisions would allow more consolidation in the fishery than other options.

  Although as constructed, harvesters receive the entire initial allocation, this alternative would not preclude an allocation to processors. The harvester-only allocation illustrates the effect of the market on the program, while disentangling the harvester and processor initial allocation issue and the effects on the program caused by splitting the initial allocation between harvesters and processors. Since the current suite of alternatives has an option to allocate 100 percent to harvesters, but not an option to allocate 100 percent to processors, this alternative allocates 100 percent to harvesters to better isolate the influence of market incentives on the program.

  The focus on individuality in this alternative is accomplished by issuing QSs (versus co-ops) for all sectors of the fishery. This creates a more individualistic perspective based on the notion that IQ tends to make participants focus on their personal perspective, whereas participants in a harvest cooperative act within a type of community.

- **Alternative 2b and 2c** are similar to Alternative 2a, but address the Council's request to compare and contrast two methods for responding to processor concerns. One method is to make an initial allocation of QSs to processors. The other method is to use an adaptive management system to assist processors that are adversely impacted by rationalization. These two mechanisms have substantially different philosophies—and presumably impacts—that are explored in the analysis. It is expected that the initial allocation of QSs to processors would leave many aspects of the outcome up to private industry and the market; whereas an AMP would allow the Council to mitigate some of the impacts of the program. The differences between these two approaches are explored in this alternative.

[74] The alternatives analyzed prior to the Council's adoption of a preferred alternative

- **Alternative 3** uses market-mitigating factors and harvest cooperatives (instead of issuing QSs) for the whiting fishery. This alternative places constraints and controls on market outcomes through sector divisions, not having a grandfather clause, an adaptive management mechanism, relatively small accumulation limits, and area management. This alternative gives more influence to processors by giving them relatively large IQ allocations and requiring that co-ops be linked to shore-based processors and motherships.

  Imposing harvest cooperatives on three sectors of the fishery is expected to result in different outcomes than issuing QSs for all sectors. Harvest cooperatives are like a community where members collectively decide the allocation of fishing opportunities. The effect of this type of system is expected to be somewhat different than an IFQ system where harvesters may be more likely to engage in fishing opportunities independently.

  In this alternative, the species covered in the whiting fishery are limited to whiting and bycatch species. This means that the market-based program does not directly influence how many of the species are caught that do not fall under the whiting or bycatch species category. This lessens the impact the market has on harvests and changes the degree of individual accountability associated with the harvest of groundfish species.

  Overfished stocks are allocated based on either the bycatch rate allocation approach, or on a pro rata to the whiting allocation. The approach depends on the sector, but the intention is to establish a more equitable initial allocation than using catch history.

- **Alternative 4a** is intermediate to Alternatives 2 and 4 by allowing for more market-driven outcomes than Alternative 3. This alternative imposes harvest co-ops for the at-sea portion of the trawl fishery instead of all whiting sectors. Shoreside whiting and nonwhiting activity is covered through IQ on all species. A more moderate degree of market influence is achieved by allowing carry-over provisions, allowing for three trawl sectors, establishing accumulation limits that are between Alternative 2a and 4, and requiring that 50 percent of a vessel's catch history in a co-op program be linked to a mothership (instead of 100 percent of catch history).

- **Alternative 4b (Council Preferred)** is the Council's preferred alternative for rationalizing the west coast LE trawl fishery. The Council's preferred alternative establishes IFQs for both shoreside sectors of the trawl fishery and allows them to trade IFQs between one another, effectively combining both shoreside sectors into one. Under the preferred alternative, shoreside processors are allocated 20 percent of the shoreside IFQ for whiting. Under the preferred alternative, shoreside processors would not receive credit for nonwhiting species that have been landed with whiting. Furthermore, a subset of species is covered with IFQs in the shoreside fishery and with bycatch limits in the at-sea fishery, rather than all species in the Council's ABC/OY table for groundfish. Those species which are not covered with IFQs or bycatch limits are excluded because the incidental catch of those species is small relative to management targets and the inclusion of those species may have negative economic implications with little to not benefit to management.

  The mothership sector is managed with harvest cooperatives, and each catcher vessel wanting to participate in a cooperative must declare a mothership to which it will deliver in the upcoming year. Unlike harvest cooperatives with linkages in the other alternatives, the cooperative declaration in the Council's preferred alternative allows vessels to freely switch motherships from year to year without penalty. However, catcher vessels cannot fish for more than one mothership within a year, unless it is participating in the noncooperative fishery. This

declaration element was adopted by the Council after hearing from NOAA General Counsel that a mothership linkage may raise some legal issues. The Council departed from the linkage provision adopted as part of the preliminary preferred alternative (in June 2008) and, instead, recommended a declaration provision as a method of providing some degree of certainty to foster business planning among motherships.

The catcher-processor sector is managed with a LE system designed to facilitate the continuation of the voluntary cooperative in that sector. In the event that the voluntary cooperative breaks apart, each permit is allocated an equal number of QSs, and the catcher-processor sector becomes an IFQ-based sector.

Other provisions of Alternative 4b include initial allocation that allocates bycatch species based on a bycatch rate (in the nonwhiting portion of the fishery) and on a pro rata distribution for the whiting portion of the fishery. The initial allocation of IFQ to the shoreside sectors divides the buyback portion of catch history equally and is based on the years 1994 to 2003, where the two worst years are dropped. This equal division only applies to non-overfished species and canary rockfish. The other overfished species would be allocated based on current permits' landing history alone. In the mothership sector, the best 8 out of 10 years are used between 1994 and 2003 for calculating catch history. Analytical Alternative 4b does not include a grandfather clause provision. An adaptive management provision does exist for nonwhiting species in the shoreside sector.

Unless otherwise specified, certain assumptions regarding each alternative include the following:

- Gear switching is allowed in all IFQ programs (gear conversion is assessed within Appendix A).
- All existing processors that participated during the allocation years qualify to receive QS under the IFQ alternatives except under Alternative 4b. Under Alternative 4b, a whiting processor will have had to receive 1 mt or more of deliveries from whiting trips in each of any two years from 1998 to 2004.
- Nonwhiting species are allocated to harvesters with whiting history on a pro rata basis, where the percentage of nonwhiting species received is equivalent to the percentage of whiting received.
- Under the shoreside whiting co-op, the processor linkage is based on 2000 to 2003 history.
- Under the mothership co-op, the processor linkage is based on the most recent year.
- The qualification for the catcher-processor endorsement is one delivery from 1997 to 2003.
- To qualify for the mothership permit the entity must have received more than 1,000 mt in any two years from 1997 to 2003.
- To qualify for the shoreside processor permit in the shoreside whiting coop alternative the entity must have received more than 1,000 mt in any two years from 1998 to 2003.
- In general, those eligible to own QS include anyone who is eligible to own a U.S. documented fishing vessel but there are some additional restrictions and allowances. All other potential elements of the program are analyzed in Appendix A or B.

4.1.6 Uncertainty in Predicting Outcomes

Given the complexity of the environment in which the west coast groundfish trawl fishery occurs, the impact of trawl rationalization is somewhat uncertain. To some degree, the areas and magnitude of uncertainty can be identified to enable discussion of the degree to which actual impacts deviate from estimated impacts.

Several sources of uncertainty affect the analysis, including the timeline (long-term versus short-term impacts). The impact of trawl rationalization over the long term is less certain due to changes in the biological status of stocks, the allowable trawl sector catch (OY/ACL), and the level of trawl sector allocations that were not decided under Amendment 21.

Sources of uncertainty are identified in advance in order to illustrate the potential range of impacts associated with uncertainty. Some of these sources can be quantified. In these cases, uncertainty is characterized with a sensitivity analysis that brackets the range of likely outcomes. Known sources of uncertainty with effects that can be reasonably well quantified include the following:

- Future ABC/OYs (ACLs) of groundfish species
- Trawl sector allocations of some groundfish species
- The ability of trawl vessels to successfully avoid overfished stocks

Sources of uncertainty that are known to exist but whose effects cannot necessarily be quantified include the following:

- The likelihood that a stock will become overfished
- The potential that an overfished stock is rebuilt
- Climate change and the associated effect on fishery resources

These factors are considered as part of the impact of the alternatives. In some cases, other areas of uncertainty may be pertinent to an individual environmental component. In such cases, these are addressed within the analysis.

4.2 Analytical Tools for Assessing the Impacts of Trawl Rationalization

Preliminary analysis and public scoping have indicated that rationalization could result in substantial impacts to various aspects of the social and natural environment. In addition, shifts in the location of fishing effort and changes in the amount of fishing-induced groundfish mortality are expected to impact groundfish stocks and the marine ecosystem. In this section, we describe the analytical approaches used to assess these and other impacts of trawl rationalization.

Due to changes in profit motivation and individual accountability, rationalization changes the way fishermen prosecute fishing activities. Effort (both spatial and in total magnitude), the volume and type of species harvested, and the number of vessels will all be affected. These changes have social and economic impacts, biological impacts, and ecosystem impacts. Table 4-3 summarizes these causal links.

Table 4-3. Causal linkages informing the analysis.

Drivers that Cause Changes under Rationalization	Factors Changing under Rationalization	Resulting State	Impact
• Defensibility of Harvest Privileges • Profit motivation • Total catch accountability • Ability to consolidate • Market conditions • Resource accessibility • Gear switching	• Fishing Behavior • Overall Fishing Effort • Spatial Fishing Effort • Length of Fishing Season • Fleet Size • Processing Capital • Catch Disposition • Catch Quantity	• Number of Vessels • Location of Vessels • Amount and Location of Processing Capital • Fish Population	• Net Economic Impact ○ Impact to harvesters ○ Impact to processors • Community Impact ○ Economic ○ Social • Fish Abundance

Substantial impacts may be realized on the harvesting side via changes to the status of trawl catcher vessels, permit holders, captains, and crewmembers. Impacts may also be realized on the processing side via changes in the utilization of processing plants, processor access to groundfish landings, changes in the demand for processing labor, and impacts to the processing companies as a whole. Among other things, these changes occur as a result of changes in the quantity of catch, the type and quality of fish retained, and negotiations between harvesters and processors over ex-vessel prices. Impacts to harvesters and processors have a secondary effect on west coast fishing communities because of changes in the economic status of harvesters and processors, as well as the level, type, and location of employment in both sectors.

The individual accountability and market-based trading aspects of rationalization are expected to result in shifts in harvesting activity that will alter the quantity of fish caught and the location of fishing effort. These changes could impact the status of fish stocks as harvest rates change, and there is a resulting change in the removals of some species.[75] Changes in fishing effort and fishing-induced mortality may also alter the ecosystem because of trophic interactions and changes in the location and intensity of fishing effort, which can affect biogenic benthic marine habitat.

Models were developed or referenced to support the analysis of several issues, including the following:

- The impact of the initial allocation of IFQ
- The amount of fleet consolidation expected to occur
- The potential for shifts in the location of fishing effort
- The potential for changes in revenue and catch as a result of changes in bycatch rates
- The comparative advantage of ports and regions in a rationalized fishery
- The biological effect of groundfish stocks from changes in harvest
- The effect on the California current ecosystem resulting from changes in trawl activity

[75] ABC and OY levels are determined externally through the biennial harvest specifications process. The analysis assumes that overall harvest levels in a rationalized trawl fishery are bounded by the ABCs and OYs adopted in that process.

4.2.1 Tools for Estimating Impacts

4.2.1.1 Theory for Illustrating Negotiation Outcomes

Game theoretical[76] approaches for illustrating the concept of negotiation and bargaining power are used to illustrate the negotiations between harvesters and processors over ex-vessel prices. This information is useful for showing how the negotiation stance of each player changes as the initial allocation of quota is divided between harvesters and processors. The logic developed through this approach exposes the relative strength that harvesters and processors have in ex-vessel price negotiation based on the control each aspect of the industry has over harvesting privileges. We compare the different negotiation stance each industry has in the initial allocation alternatives to the Alternative 1 regime. While this tool does not result in a prediction, it is useful for illustrating the tradeoffs that exist between the potential allocation alternatives.

4.2.1.2 Information Collection and Existing Analyses

Lessons learned from other rationalization programs

The rationalization of the west coast trawl fishery can benefit from experience in other rationalization programs around the world. An in-depth literature review has been ongoing since 2004 to document the intended and unintended consequences of rationalization programs. This information has demonstrated impacts to communities, catcher vessels, fishery resources, and processors, and it can be used to show empirically how various policies have impacted portions of the affected environment.

Identification of community vulnerability and resilience

As part of the 2007-08 Annual Specifications and Amendment 16-4 Groundfish Rebuilding Plan EIS, an analysis of community vulnerability and resilience was conducted. The evaluation estimated dependence of west coast fishing communities on fishing activity and their resilience in dealing with change. This information is useful for analyzing community impacts due to changes in fishing activity. For example, a moderate change in fishing activity occurring in a vulnerable community may be considered a substantial impact, while a moderate change in a less vulnerable community may be relatively inconsequential.

Documentation of processor ownership, plant location, and port-to-plant product flow

This data collection exercise documented the location and ownership of trawl groundfish processing plants, the ports from which that those plants receive their groundfish, the number of trawl groundfish plants owned by seafood processing companies, and whether those plants process whiting and/or nonwhiting groundfish. This information is based on PacFIN data, as well as data provided by state port samplers, fisheries information specialists, and industry members. This information is used to show the geographic location of plants and product flow, which helps to illustrate impacts on processors resulting from a change in the location of landings. This information can also be used to evaluate regional and community impacts.

Table 4-4 illustrates a hypothetical example of the information collected in this exercise. This table shows the name of a plant, the company that owns the plant, the ports of landing from which the plant derives its catch, and whether the plant processes whiting and/or nonwhiting groundfish.

[76] "Game theory" is defined as a theory of competition stated in terms of gains and losses among opposing players.

Table 4-4. Hypothetical example of processor plant information being collected.

Plant name	Location	Company	Source ports	Whiting port	Groundfish Port
A groundfish plant	Astoria, OR	A groundfish company	Astoria	Yes	Yes
			Westport	Yes	Yes
			Neah Bay	No	Yes

By documenting this information, it is possible to illustrate the relationships between processing plants and regional patterns of landings, between processing plants and individual seafood companies, and between whiting and nonwhiting harvest levels and individual processing plants. Second and third order effects can also be developed and described. This illustrates the effect on regions and communities that result from an impact on processing plants. For a more in-depth description of the information collected in this exercise, the reader is referred to Appendix C.

Documentation of fishing infrastructure and support business

The NWFSC is updating the community profiles that were published in 2006. This update shows the presence of fishing infrastructure and fishing support businesses, such as net manufacturers and vessel fabricators. This information is useful for showing the level of involvement of the fishing industry and for understanding the concept of "agglomeration economies," where a large number of similar businesses in one place creates economic efficiencies through information sharing and a decrease in the cost of conducting day-to-day operations. A larger number of fishing businesses tends to represent agglomeration and provides an indicator of economic efficiencies that are present or lacking in fishing communities.

Tracking and monitoring program and cost development

This EIS discusses the major elements of a tracking and monitoring program. NMFS will continue to refining this program during the regulatory process that converts the Council's preferred alternative into regulation. NMFS will seek recommendations from the industry on how to lower program costs. NMFS will also consult with the states to discuss state needs and how to integrate the elements of this program with existing state programs. Options are being researched to determine program costs that can be borne by industry versus those that have to be borne by government agencies. This information has implications for the profitability of participants in the rationalized fishery and implications for management agencies that lack adequate resources for enhanced tracking and monitoring systems.

Groundfish stock status under varying harvest levels

Available stock assessments were used to estimate possible changes in abundance of affected groundfish species due to changes in the amount of species caught in a rationalized fishery. Various potential alternatives were simulated with these assessments to indicate a range of possible stock status by species over time.

Impact on nonharvested species as a result of changes in mortality of harvested species

Information presented in Kaplan and Rothschild (2009) is used to illustrate how west coast marine species may be impacted indirectly due to changes in the mortality of species harvested in a rationalized fishery. This document estimates changes in nonharvested species due to predator prey interactions that are known to exist in the marine food web.

4.2.1.3 Models

This subsection describes the models being developed to understand impacts on the affected environment. The choice of models depends upon the amount and quality of information available. Some of the data issues complicating model development for this analysis are as follows:

- Cost and earnings data for individual harvesters are available only for a single year.
- Cost and earnings data for individual processors are unavailable.
- Comprehensive primary data on processed products and product prices are unavailable.
- Final market demand for groundfish products is not well known.
- Data showing the total catch (landings plus discard) of groundfish by individual vessels are unavailable.

Given the amount of data available, a comprehensive predictive model would not be feasible for development and use in the effects analysis. Instead, a set of models designed to focus on specific issues was developed, or are already available. These include the following:

- A model showing the effects of the initial allocation of QS in a trawl IFQ program
- A model assessing the expected amount of fleet consolidation
- A model illustrating the potential for geographic shifts in fishery patterns
- A model illustrating the potential to reduce the catch rate of overfished species and the associated potential for increased target species catch and revenue
- A qualitative comparative advantage model illustrating the potential for regions to be negatively or positively impacted by rationalization
- Available stock assessments showing stock abundance over time under various harvested quantities
- An ecosystem-based model describing the impact on the biological and ecosystem components of the environment resulting from changes in fishing behavior and catch

In addition to these models, available literature and theory are useful for identifying impacts that a model may not be able to predict, but that can be assessed qualitatively. These qualitative evaluations are based on the expertise of analysts and a review of available literature.

Model to assist in assessing the effects of the initial allocation of QS

The initial allocation of QS may have a large impact on the way trawl groundfish harvesters and processors prosecute the fishery, especially in the first few years under an IFQ program. An examination of how quota recipients fare under the initial allocation options relative to the Alternative 1 indicates the socioeconomic impacts resulting from the initial allocations. The initial allocation model is designed to calculate allocations under alternative formula options and to compare the value of those allocations with recent experience of both permits and processors. Key components of the model include the following:

- PacFIN fish ticket-level data on LE trawl landings by permit, year and species from 1994 to 2006. The model also includes data indicating the ex-vessel purchase of trawl groundfish by buyers or processors. Each trip is categorized by which IFQ "sector" to which it belongs. Compared with the original PacFIN file, the data are also transposed so that each species category is represented by two numeric data fields, one for round weight of the landing and one for ex-vessel revenue.

- Specific allocation rules included in the alternatives (e.g., relative pounds calculated annually from 1994 to 2003, dropping a certain number of years, and recent participation requirements). Allocation options currently on the table for permits include no recent participation requirement, dropping the three worst years from the calculation for nonwhiting fishery permits' QSs, and dropping two years from the whiting fisheries permits' QS calculation.
- Rules on alternative treatment of the buyback vessels' portion of total QSs. Current options include allocating the buyback portion equally among all permits receiving QSs, or allocating it in the same proportion as the permits' catch history-based QSs.

Results are generated for each permit and processor eligible to receive QSs under each allocation option. Results are rolled up to the business entity level in cases where owners control multiple buyer/processor codes and/or LE trawl permits. It is also possible to combine processor and permit allocations to show total QS amounts that would be allocated to entities with eligible history from both buying/processing activities and landings.

These results are used to assess QS concentration implications of the initial allocation and to compare the annual catch value of allocated QSs with the value of harvest and/or buying activity exhibited in recent years. Average 2004 to 2006 ex-vessel revenue is used for this comparison.

Model to assist in assessing the expected amount of fleet consolidation

Consolidation under the alternatives will be a key impact mechanism. This model provides projections of consolidation in the fishery and the effects of that consolidation. The model is based on work published by Weninger and Waters (2003).

Ex ante benefit estimates (estimates prior to the action) are obtained using a two-step methodology. The first step predicts the harvesting practices expected to prevail under an IFQ system. This first step will predict post-QS allocation equilibrium harvesting practices including the following:

- Groundfish harvest per vessel
- Number of vessels needed to harvest LE trawl groundfish catch
- Which vessels remain in the groundfish fishery and which vessels exit
- Nongroundfish harvest per vessel

A directional distance function model of a multiple output harvest technology is used for analysis. The directional distance function is well-suited for characterizing fishing practices under alternative regulatory systems. The model is being estimated using data collected in the recently completed West Coast Limited Entry Cost Earnings Survey.

In the second step, estimates of potential economic benefits are generated based on the predicted harvesting practices from the first step analysis. Because the west coast nonwhiting groundfish fishery is not a derby fishery, it is expected that economic benefits will come through cost reductions and increased access to target species that arise from modifications in fishing behavior (overfished species avoidance). The key output of the second step in the analysis is an estimate of post-rationalization equilibrium harvesting cost.

Changes in harvesting costs can arise from three sources. First, the total fixed costs incurred by the groundfish trawl fleet change as the size of the fleet changes. Since many LE trawlers incur annual fixed costs of at least $100,000, reductions in fleet size can result in substantial cost savings. In other words, fewer vessels in the fishery will lead to decreased costs through a decrease in annual fixed costs.

Second, costs may change as fishery participation changes, and participants no longer incur diseconomies of scope (such as the costs of frequently switching gear for participating in multiple fisheries). Third, costs may change as vessels are able to buy and sell quota to take advantage of economies of scale and operate at the minimum point on their long-run average cost curve (i.e., the strategy that minimizes the cost of harvesting).

Using the model developed through this project, it is possible to compare the following:

- Harvesting costs under the current regulatory system
- Harvesting costs under an unconstrained IFQ system
- Harvesting costs under an IFQ system where fleet rationalization is constrained through program design features such as quota accumulation caps

This information can be used to help determine community impacts, revenue associated with fishing opportunities under a rationalization program, and the number of boats engaged in the fishery. A prediction of the number of vessels engaged in the fishery has repercussions for estimating the cost of monitoring the fishery.

A comparative advantage model illustrating the potential for regions to be made better or worse off by rationalization

Several variables determine the amount of fishing activity occurring in different ports, including access to fishing grounds, port infrastructure, and fish purchasing and processing. In a rationalized fishery, the incentives created by market-based management and individual accountability may impose additional forces that will alter the decision that vessel operators make regarding the location of fishing activity, the delivery location, and home-port location. Assuming profit is the motivating factor for commercial fishermen, the decision framework created by a rationalized fishery will tend to shift the location of fishing and delivery activity.

Under Alternative 1 management, vessels are not held individually accountable for the amount of fish they catch, provided their landings are within their cumulative landing limit. In addition, operators cannot choose to grant their cumulative limit to another, potentially more profitable, operator. Under a rationalized fishery, both alternatives change, fishermen are held individually accountable, and they can transfer their fishing privilege to another vessel. Individual accountability will put pressure on operators to fish in areas with lower encounter rates of constraining overfished species, and the ability to transfer catch privileges allows the fleet to consolidate to fewer, but more profitable, vessels as the market directs quota in a manner that is more economically efficient.

In a rationalization program, more economically efficient vessels are expected to remain in the fishery, while less efficient vessels are expected to drop out of the fishery. Economic efficiency is determined by several variables including the ability of the operator to generate gross revenues and the vessel's cost structure. Cost structure is determined by variable costs such as fuel, fixed costs, transfer costs, and the cost of day-to-day operations. Ports with a higher degree of fishing support businesses (agglomeration) tend to make it easier and more efficient for operators to conduct day-to-day activities, making the cost of running a fishing business, acquiring parts, and negotiating work relationships lower than in other ports.

Given these arguments, it is reasonable to expect that ports are at a disadvantage when compared to other regions if they have vessels that have a relatively long travel time to fishing grounds, relatively unsuccessful operators, relatively costly vessels, and relatively few support businesses. In addition, ports adjacent to fishing grounds with high constraining overfished species abundance would also tend

to be at a disadvantage because the presence of constraining overfished species would encourage operators to move to areas with lower abundance. Given enough disadvantaging (or advantaging) factors in a port, that port may find itself losing (or gaining) trawl groundfish activity after rationalization, absent some mitigation tool that the Council may elect to implement as part of the program.

We use available information to describe the comparative advantage of west coast ports in a rationalized fishery. Four variables are developed, and each port is scored based on the relative presence of those variables in those ports as shown in Table 4-5. For a more complete description of this model, see the appendix that describes the analytical tools.

Table 4-5. Hypothetical Example of Relative Comparative Advantage Information.

Hypothetical Port	Relative Bycatch Rate	Fishing Infrastructure	Economic Efficiency of Local Fleet	Initial Distribution of Quota
Hypothetical Washington port	-	-	+	+
Hypothetical Oregon port	+	-	+	-
Hypothetical California port	+	-	-	+

A sub-model illustrating the potential for geographic shifts in fishery patterns

The regional comparative advantage structure will also influence the geographic nature of fish harvesting activities. When the variables described above are combined, the comparative advantage of different ports will influence the level of fishing effort occurring in waters adjacent to those ports and regions.

The model indicating geographic shifts in fishing effort in the nonwhiting trawl fishery is constructed to show areas and regions that are more likely to experience less fishing effort and areas that are likely to experience more fishing effort. This model uses much of the same information as described in the above section.

The geographic shift in fishing effort in the mothership and shore-based sectors of the whiting fishery is more difficult, but can be informed—to some degree—by catch patterns that have been exhibited in the catcher-processor sector of the whiting fishery, which voluntarily formed the Pacific Whiting Conservation Cooperative. This association acts like a rationalized fishery, and clear differences in fishing patterns occurred after the cooperative was formed. Similar changes in fishing practices will occur in the mothership and shore-based sectors of the whiting fishery, though almost certainly not to the same degree.

A model illustrating the potential to reduce the catch rate of overfished species and the associated potential for increased target species catch and revenue

The reduction in bycatch of overfished species is expected to be a principal outcome of trawl rationalization. One major implication of reductions is the ability to access more target species and generate higher levels of revenue than under Alternative 1. In some cases, opportunities to catch species that have historically been targets of the trawl sector have been eliminated because of their high correlation with overfished species (yellowtail and chilipepper rockfish). In many cases, species that are not correlated with overfished species have also seen target opportunities reduced. For example, the

catch of sablefish (one of the main targets for the trawl sector) has been less than the total trawl allocation by several hundred tons in recent years, representing a substantial economic loss. Rationalization should encourage fishermen to avoid overfished species more than under the Alternative 1 regime due to the individual accountability aspect of rationalization and the fact that they are rewarded (by access to target species) for decreases in the bycatch rate. Harvesters may avoid bycatch by changing the location and time of fishing.

Nonwhiting fishery bycatch

Several sources of information show how the bycatch rate of overfished species can change in a rationalized fishery and the implications of that bycatch rate reduction. This information can be used to modify the NMFS/GMT trawl bycatch model,[77] which predicts overfished species catch, target species catch, and ex-vessel revenue given an estimated overfished species bycatch rate and a set of assumed ex-vessel prices. By modifying the bycatch rate, the model can be used to simulate potential changes in harvest outcomes that will occur in a rationalized fishery.

The Washington Arrowtooth Flounder EFP occurred over four years with requirements nearly identical to what would be expected under a rationalized fishery. In this EFP, vessels carried observers and were given an overall cap and individual vessel limits on overfished species. Vessels that could stay within their limits had access to arrowtooth flounder and petrale sole in excess of the normal two-month limits that were in place, as well as access to areas within the trawl RCA. When a vessel reached or exceeded the individual cap, it was no longer allowed to participate in the EFP and was required to fish under normal two-month limits and RCA restrictions while still carrying an EFP observer. In other words, observations were collected while fishing under the EFP and while the vessel was fishing under Alternative 1 regulations (the latter serves as the control in the experiment). In addition to information collected on overfished species and target species catch, information on nonmarketable discards was collected during the first year of the program. This information can be used to show order of magnitude estimates regarding the amount of regulatory discard occurring under Alternative 1 management and the increased amount of revenue that can be attributed to the fishery via an elimination of regulatory discards.

Figure 4-2 illustrates the recorded canary bycatch rates for vessels participating in the EFP by year. It shows the bycatch rate when those vessels were participating in the EFP and the rate when those vessels were fishing under normal (non-EFP) fishing conditions. As is shown from the figure, EFP activity resulted in a lower bycatch rate in all years. This information is described in more detail in Appendix C.

[77] The Trawl Bycatch Model was originally developed by staff at the Northwest Fisheries Science Center for use in setting regulations that manage the nonwhiting trawl fishery. This model was reviewed and endorsed by the SSC in 2003.

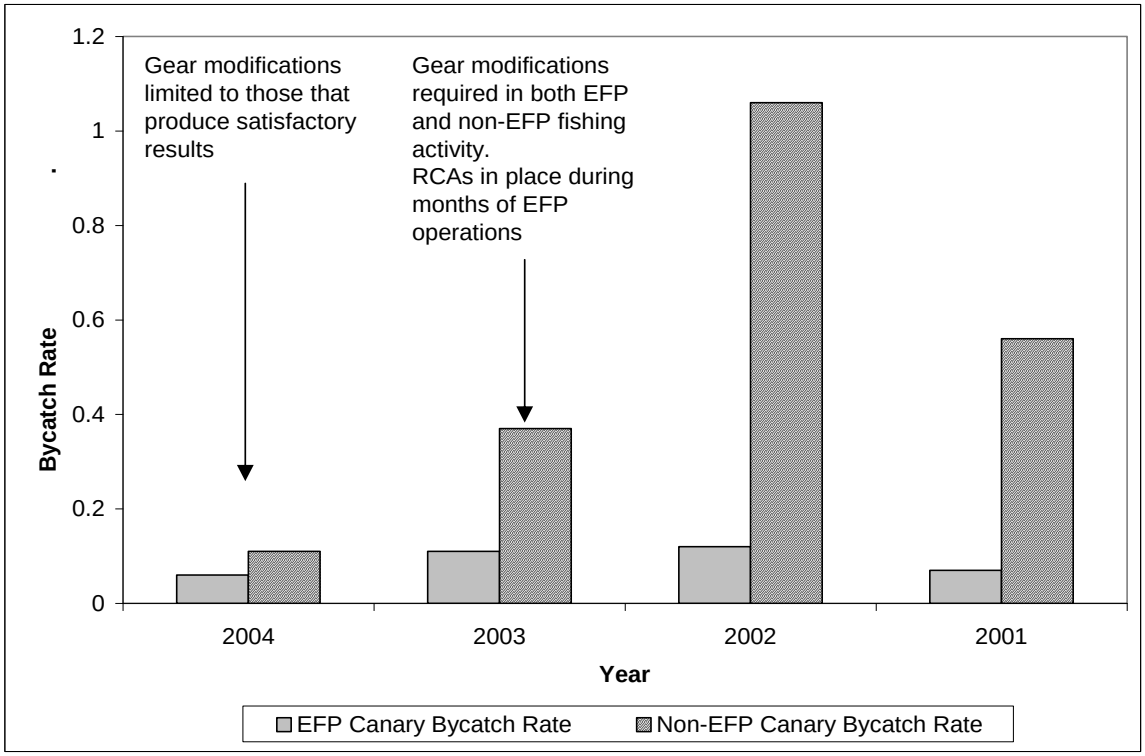


Figure 4-2. Observed canary bycatch rates in the Washington Arrowtooth EFP.

The data from the Arrowtooth EFP project are used to develop a set of overfished species bycatch rates that may occur in a rationalized fishery. These bycatch rates are used in the GMT/NMFS trawl bycatch model to simulate potential harvest outcomes in a rationalized fishery. For more information on this methodology, the reader is referred to the appendix describing the analytical tools (Appendix C).

Pacific whiting fishery bycatch

It is likely that overfished species bycatch rates will also change in the mothership and shore-based sectors of the whiting fishery because those fisheries are operating as an Olympic-style fishery under Alternative 1 management. The whiting fishery operates under bycatch limits that can close an individual sector and/or all sectors of the fishery if reached. Each sector has demonstrated a reduction in bycatch rates since bycatch limits were put in place; however, the catcher-processor sector has demonstrated a lower rate of bycatch in general. Examining trends in bycatch rates in the catcher-processor sector, we can infer whether changes in the bycatch rates in the mothership and shore-based sectors of the whiting fishery will occur if those sectors of the fishery are rationalized. It is not appropriate to assume that the mothership and shore-based sectors of the whiting fishery would have the same bycatch rates as the catcher-processor sector for a variety of reasons including vessel capacity, horsepower, and others.

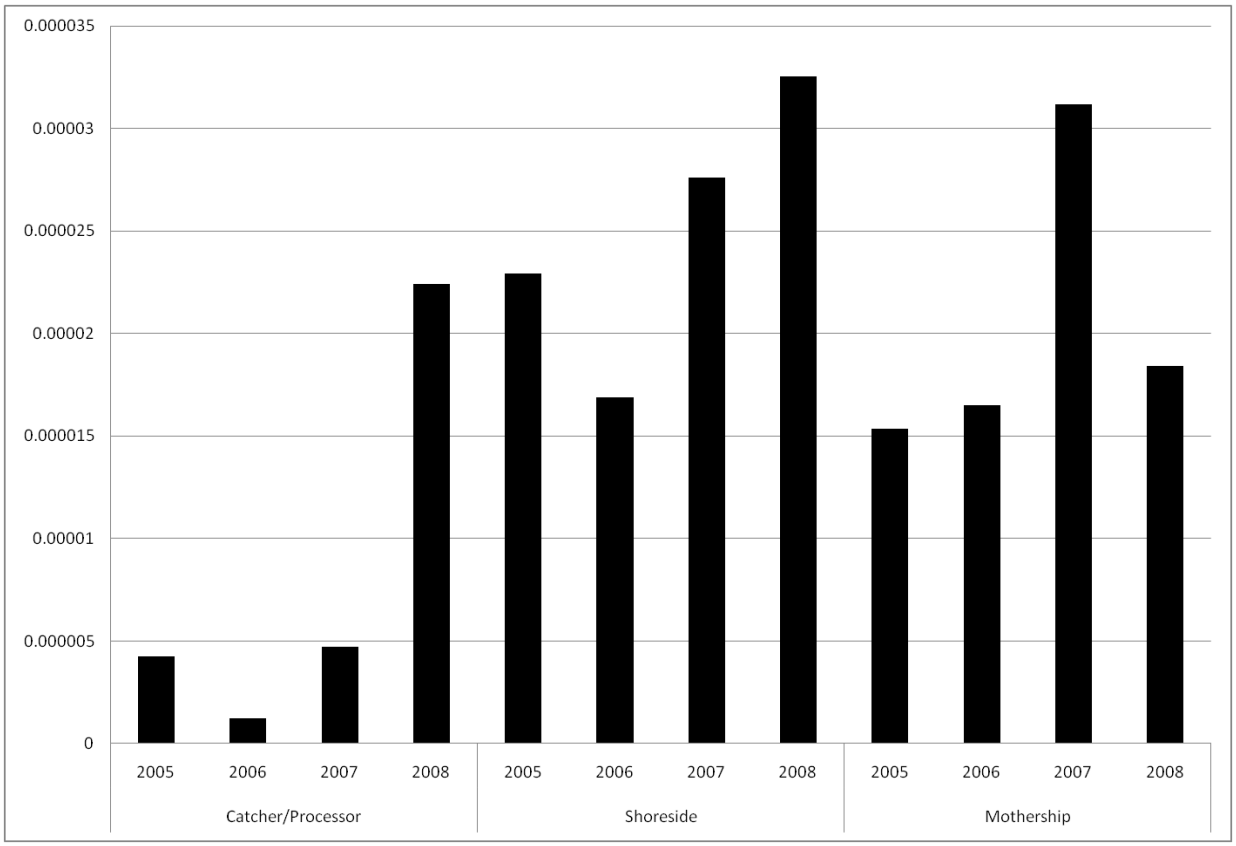


Figure 4-3. Canary bycatch rate by year and whiting sector.

Model to Measure the Regional Economic Impacts of Trawl Rationalization

Income impacts under trawl rationalization were estimated using the Council's economic impact methodology, which is based on the FEAM. A detailed description of FEAM and the underlying methodology is found in Appendix D to the 2005-06 Groundfish Harvest Specifications (PFMC 2004a). A brief summary of that discussion highlighting features unique to this analysis is provided below.

The Council income impact model uses reported landings from recent PacFIN vessel summaries combined with regional economic response coefficients generated by FEAM. The model estimates local income impacts resulting from commercial fishing, seafood processing, and associated indirect and induced activities for a base year or alternative and then measures impacts resulting from a change in the distribution of landings under alternative fisheries management alternatives against this baseline. Key assumptions underlying the basic model include the following:

1. The impact model relies on response coefficients generalized from IMPLAN. IMPLAN is an economic modeling and data software package that uses local data and a set of econometric relationships to "regionalize" national average production coefficients to the local level. Impact coefficients in the current version of FEAM were derived using dollar flows from 1998 IMPLAN data for west coast states and coastal counties.

2. Average economic impacts from harvesting, primary processing, and associated activities are calculated per landed pound at the port level. Variability in types of harvesting and processing conducted along the coast is captured by the included mix of species, gear, and ex-vessel price

combinations observed in each port. The range of these combinations used in the current model was based on detailed PacFIN data from 2000.

3. It is assumed that everything landed in a port group is also processed there; that is, there is no cross hauling of raw product between ports.

4. Exprocessor sales prices are estimated using cost calculations from the FEAM model or using published sales price information for the product form sold in an area.

5. Marginal impacts are assumed to be a constant percentage of average impacts. To estimate marginal impacts per pound, the average impact results from the model are multiplied by 89 percent.

For this analysis, the model was updated using PacFIN landings and ex-vessel revenue data from 2007. Since the proposed action affects only the LE trawl fleet, it was assumed there would be no change in the level of income impacts generated by the nontrawl commercial fleet and recreational fishing sectors. Other key features of the analysis include the following:

1. Three catch alternatives were analyzed based on alternative assumptions regarding nonwhiting fishery participants' relative success at avoiding bycatch of constraining overfished species under trawl rationalization. Under the low bycatch avoidance scenario, bycatch rates are assumed to be 55 percent of currently observed levels. Under the moderate bycatch avoidance scenario, bycatch rates are assumed to be 30 percent of currently observed levels. Under the high bycatch avoidance scenario, bycatch rates are assumed to be 15 percent of currently observed levels. The better participants are at avoiding contact with constraining overfished species, the greater the expected harvested and utilization of available target species quota. Landings of target species are projected to be highest under the high bycatch avoidance scenario, somewhat lower under the moderate bycatch avoidance scenario, and lowest of the three, but still higher than status quo, under the low bycatch avoidance scenario. Although not modeled here, bycatch avoidance in the Pacific whiting fishery is also expected to occur. However, whiting is considered fully utilized. Thus bycatch avoidance in the whiting fishery is not expected to lead to higher whiting harvests per se.

2. Not shown in this analysis are the effects of shifts in the composition of harvesters' expenditures under a rationalized quota fishery. The rationalized fishery will likely have fewer operating vessels than the current fleet and, thus, should see a reduction in total expenditures associated with the fixed costs of mooring, insuring, and maintaining vessels. However, it is anticipated that increased (actual or implicit) payments to owners of the QS will offset much of the reduction in fixed costs. Total wages paid to crew may not change much under the rationalized fishery. While a smaller operating fleet will hire fewer crew members overall, average wages for the remaining crew will increase substantially.

3. Since this analysis cannot predict where the anticipated consolidation of the harvesting sector is likely to occur, the results are aggregated into two broad geographical regions for display purposes: north of 40°10' N. latitude, and south of 40°10' N. latitude. The former includes all west coast ports north of the Eureka area in California, while the latter includes all California ports from Eureka south to the Mexico border. The line at 40°10' N. latitude forms the boundary between the Eureka and Monterey Pacific fishery management areas and similarly defines the biological boundary for assessed stocks of several species of managed groundfish.

4.2.2 Utilization of Analytical Tools in Assessing the Effects of the Alternatives

Each of the analytical tools on described in the previous sections is used to illustrate the impact of the alternatives on portions of the affected environment. In some instances, these models can provide quantitative outputs that differ between each of the alternatives; in other cases, however, the models may provide a range of likely outputs that are not necessarily tied to a specific alternative. In this case, the relationship of the outputs to the alternatives is characterized based on a qualitative estimate of the likelihood of where each alternative may fall within that range.

Several analytical methods described here are closely related to one another. Some are related because one measures the direct effect of trawl rationalization, while another measures the indirect effect and, therefore, relies on the outputs of the model estimating the direct effect. For example, this occurs when rationalization changes the way catcher vessels prosecute the fishery, which has an indirect, or second-order, impact on the biological status of fish stocks and on the state of the California current ecosystem.

Table 4-6 illustrates the relationship of the analytical methods to the alternatives and their use in determining their respective impact on each of the environmental components.

Table 4-6. Data and models used to assess impacts.

Data Collection/ Model	Env. Component Informed by Data/Model	Utilization of Information in the Assessment of Alternatives
Processor Plant and Company Info	• Processors • Communities	Primarily used as descriptive information and as supporting information within various analyses.
Community Infrastructure	• Communities • Catcher vessels	Primarily used as descriptive information and as information within various analyses.
Lessons Learned	• All environmental components	Provides empirical examples of impacts where alternatives under consideration have been implemented in other areas.
Community Vulnerability	• Communities	Identifies communities that are vulnerable and dependent on fishing. Alternatives are assessed based on the likelihood of impacting communities and whether those communities are vulnerable or not vulnerable.
Tracking and Monitoring Program and Cost	• Agencies • Catcher Vessels	Alternatives are assessed based on the amount of consolidation allowed or expected to occur and the associated cost of monitoring that fleet size.
Initial Allocation of IQ	• Communities • Processors • Catcher Vessels	Illustrates the distribution of initial allocation and the implications of doing so at the vessel, processor, and community level. Alternatives are assessed based on the initial allocation rules specified in those alternatives.
Fleet Consolidation	• Communities • Processors • Catcher Vessels • Agencies • Captain and Crew • Input Suppliers	Fleet consolidation is illustrated based on model projections and the amount of accumulation limits that are specified as part of each alternative.
Geographic Fishing Patterns	• Groundfish Resources • Nontrawl Harvesters • Ecosystem • Groundfish resources • Recreational harvesters	Identification of geographic shifts in fishing patterns is assessed based on the incentives within each alternative for doing so.
Change in Bycatch Rate, Catch, and Revenue	• Catcher Vessels • Processors and Labor • Captain and Crew • Groundfish Resources • California Current Ecosystem	Changes in catch and revenue are portrayed as a likely range. Alternatives are analyzed based on the likelihood of whether each alternative would tend toward the lower or upper bound. The impacts on components of the environment are estimated through the impact of the upper and lower bound.
Regional Economic Impacts	• Communities	Income impacts estimated from the FEAM model are used to show the regional economic impact of rationalization. These effects do not appear to vary by alternative, except for a comparison between Alternative 1 and the action alternatives.
Regional Comparative Advantage	• Communities • Processors • Ecosystem	Elements within the alternatives may mitigate the comparative advantage of some regions. The mitigating factors in each alternative are used to characterize the outputs of this model in terms of the likelihood that comparative advantage will make a region better or worse off under rationalization.
Groundfish Stock Assessments	• Groundfish Resources	Changes in the mortality of groundfish stocks will influence their status. Possible catch alternatives are run through available stock assessments to provide indications for how the status of affected stocks may change under rationalization
Atlantis Ecosystem Model	• West Coast Marine Ecosystem	Information contained in Kaplan et al. (2009) is used to generally inform how changes in the quantity, mix, and location of groundfish catch due to rationalization will impact other species due to connections in the food web.

4.2.3 How the Analysis in this Chapter is Organized

The analysis in this EIS is organized according to several different tiers. This approach was taken because of the dynamic change that is expected to occur to the affected environment if one of the action alternatives is chosen. As a result of these expected dynamic effects, itemizing the analysis in different tiers was undertaken to assist the reader in understanding the effects of the alternatives in a linear fashion. This approach was discussed with the Council's Scientific and Statistical Committee, which stated that such an approach was necessary to make the analysis "meaningful and tractable."

The way in which this analysis is structured can be viewed in several different levels.

- The first level of analysis discusses how rationalization programs impact fisheries and what has occurred in other systems around the world. This is necessary to provide the reader with necessary background regarding the types of effects that occur when a fishery is rationalized.
- The second level of analysis describes the differences between the two types of systems being considered for the west coast trawl fishery (IFQs versus harvest cooperatives), when each of those systems may be appropriate, and how they tend to work under different conditions that may be present in west coast groundfish. This is necessary to provide the reader with the background of the different institutions conceptually and the reasons why one might be chosen over another. A similar level of analysis focuses on ex-vessel price bargaining dynamics between harvesters and processors and how those dynamics play out given different circumstances. This analysis was presented here due to the controversy surrounding the initial allocation of QSs and the fact that such controversy often centers around the initial allocation of QSs between harvesters and processors.
- Next we proceed with an assessment of each resource category, or each portion of the affected environment. Within the analysis of impacts to each environmental component, we begin with an assessment of how any of the action alternatives will tend to impact that environmental component. We call this section "broad level effects" and treat the discussion generally so that the reader is versed in the types of effects that can be expected as a result of moving from status quo conditions to a rationalized fishery.
- Following this general description of the impacts on each piece of the affected environment, we focus on elements of the alternatives and the impact of each alternative. In the alternatives analysis, we describe how the variations in the alternatives will cause effects that may begin to deviate from the general types of effects one may otherwise expect.
- Finally, included within Appendices A and B is a detailed analysis of each of the elements of the alternatives considered. The approach to these appendices is to examine each element largely independently, explain the rationale for each element, and describe how the elements will impact various portions of affected environment.

4.3 Description of Rationalization Programs and Implications for the West Coast Trawl Fishery

4.3.1 Overview

In this section, we draw heavily on available literature to describe the reasons for implementing rationalization programs in other fisheries, their effects, and the likely implications of rationalization for the west coast trawl fishery. Several sources were used in this review including *Sharing the Fish* and *The Drama of the Commons* by the National Research Council (NRC) (Dietz, *et al.* 2002; 1999), various EISs from the NMFS Alaska Regional Office, documents produced by the staff of the NPFMC, documents produced by the staff of the South Atlantic Fishery Management Council (SAFMC), and

informal discussions with experts familiar with programs in New Zealand, British Columbia, and Iceland.

Rationalization of a fishery creates harvest privileges that, in many cases, resemble the creation of a private property right. While the MSA clearly states that such privileges are not property rights, many rationalization programs rely on fishery participants operating as if their QSs are similar to property rights[78].

The definition of property rights includes the right of the owner to dispense with the property, the right to use or not use the property, the right to exclude others, and the right to transfer ownership. Arguably, three components responsible for many of the effects of rationalization are the aspects of exclusion, individual accountability, and transferability.

One principal assumption of a rationalization program is that fishery participants will act as if their behavior does not impact the behavior of other fishery participants, and vice versa. The belief that actions of one harvester cannot impact the actions of another will tend to change the behavior of fishery harvesters from one that is partially based on the actions of other fishery participants, to a set of actions that are largely independent of the actions of other fishery participants. When fish harvesters are acting in a mutually dependent fashion (that is, when what each harvester does affects the opportunities of another), the tendency is to engage in competition for catch. This tendency to compete leads to Olympic-style fisheries, economic inefficiency, and safety concerns. A fishery that operates in this manner is often called an irrational fishery, though participants are operating exactly as should be expected, given the incentives presented to them.

A system that administers fishing privileges that are defensible from the actions of others will tend to limit the impact of one individual harvester on another. Under this framework, harvesters will engage in behavior that is in their own economic interest, and they will adjust their behavior in a manner that generates a more optimal amount of net revenue. Empirical evidence has shown that this change in behavior on the part of individual harvesters results in less intensive fishing, an extension of harvest timing, and less capital involved in harvesting the stock. A fishery with harvesters operating in this manner is often called a rationalized fishery.

Two models for rationalization are being considered for the west coast trawl fishery: 1) IFQs and 2) harvest cooperatives. Both systems are intended to create conditions where harvesters believe the actions of others will have limited effects on them. Administration of IFQs will often rely on Federal monitoring and enforcement efforts. This protects the interests of individual parties involved in fish harvesting. Harvest cooperatives rely heavily on private/civil contracts between harvesters who establish agreements and policies for harvesting the available fish. The bylaws and agreements established in that private contract define the harvesting opportunities of individual vessels (and the penalties for exceeding those opportunities) and establish the conditions necessary for harvesters to act "rationally." Enforcement of these bylaws and contracts is typically not enforced by the Federal executive.[79] NMFS' role is largely limited to monitoring catch levels at an aggregate level (which may be the fishery, sector, or co-op level) and closing that portion of the fishery when an aggregate catch limit has been met.

Harvest cooperatives and IFQs have many similarities and are likely to affect the west coast trawl fishery in a similar manner. Arguably, the largest drivers for change are the incentives created through

[78] Though this is often done in practice, it is arguably not necessary to implement a system of harvest privileges that resemble property rights in order for a rationalization program to be successful.

[79] If disputes arise, cooperative contracts may be adjudicated in the courts.

the right of exclusion, the individual accountability for total catch, and transferability. These measures create flexibility, enhance rewards and penalties for individual actions, and establish new incentives for harvesters compared to Alternative 1, altering the socioeconomic environment and changing the manner in which fisheries are prosecuted. This change will have corollary impacts on the natural environment that can—in many instances—be anticipated. This section describes the broad-level effects expected to occur on various social and environmental components from rationalization.

4.3.2 A Review of Impacts in Other Rationalization Programs

Before considering the effects of rationalization on the west coast fishery, it is useful to review the type of effects of other rationalization programs. In many cases, the focus of rationalization has been on ending problems associated with Olympic (derby-style) fisheries. The NRC (NRC 1999) identified three general motivations for implementing rationalization programs: improving economic efficiency, improving conservation by creating incentives to reduce bycatch and lost gear, and improving safety.[80] The underlying problems are often the result of derby fisheries where the incentives focus on catch maximization and competition, which results in overcapitalization, gear loss, fishing in hazardous conditions, and fishing more intensively than necessary.

Rationalization programs have resulted in substantial changes in the structure of fisheries around the world. Many impacts of rationalization are based on fisheries that converted from a derby system to a rationalization system. A change of this magnitude dramatically alters the incentives faced by fishermen, and the outcomes are often driven by the fact that fishermen switch from the objective of catch maximization with little or no individual accountability for catch to an objective of profit maximization with a high level of individual accountability. Such changes often mean a reduction in the catch of nontarget, nonmarketable, or prohibited species (because sorting and discarding is time consuming and costly); a reduction in safety-related incidents (because fishermen no longer feel the need to compete and to fish in undesirable conditions); and an increased probability that overall allowable catch levels will not be exceeded (because fishermen have individual catch limits).

Several outcomes have been documented consistently in the literature, including a reduction in the number of vessels engaged in the fishery, increased probability of staying within allowable catch levels, an increase in the length of the fishing season, an increase in ex-vessel prices and revenue, and a decrease in harvest sector employment. Available literature indicates that other impacts have occurred, including a reduction in safety-related incidents and a change in bargaining power between harvesters and processors. While most of these outcomes are social and economic, biological and ecosystem impacts also occur, but typically as a second-order effect. Behavioral changes resulting from rationalization can change the level of fishing intensity, type and amount of gear used to harvest fish, and removals of fish species (either in quantity or in type). These changes can impact the ecosystem by way of habitat impacts (through changes in gear and effort) and trophic interactions (through changes in the quantity and type of fish removals). Biological impacts also occur via changes in the type of fish harvested and the quantity of fish mortality.

In addition to the fact that overfishing of fish stocks is typically eliminated under rationalization, some evidence supports the concept that environmental benefits of rationalization programs occur through the "stewardship effect." The stewardship effect is an argument that has been made routinely as a mechanism for decreasing the environmental impact of fishing in a rationalized fishery. Through the granting of long-term privileges to harvest a share of fishery resources, fishermen will begin to act like share-holders of a company and be interested in the long-term sustainability of the fishery resource

[80] The Pacific Fishery Management Council has identified goals, objectives, and guiding principles for rationalization of the west coast trawl fishery that generally include these motivations as well as others.

because it is in their interest to do so. This results in voluntary measures that minimize the negative environmental impacts caused by fishing and increases the sustainability of the fishery.[81] The NRC (NRC 1999) explicitly addressed this argument and makes reference to other incentives created by rationalization, including the incentive to high-grade (to target and retain large fecund fish while discarding small fish) and to misreport catches. If these incentives are greater for harvesters than the incentive to minimize environmental impacts, then the rationale for engaging in voluntary behavior to encourage sustainability may not exist. Effective monitoring and enforcement counters the incentive to misreport catches and to high-grade and discard. A high degree of scientific research and understanding would tend to discourage the targeting of large fecund fish if there are negative repercussions. In other words, if a rationalization program is constructed with long-term fishing privileges, adequate monitoring of catch, robust enforcement, and a high degree of scientific research and understanding, the stewardship effect might exist. The fundamental source of this effect is long-term economic self-interest. Aligning economic interests with desired environmental outcomes can be achieved, but several conditions for such an alignment appear to be implied, including that economic interests in the fishery be long term, that quota holders clearly understand the science, that quota holders be actively engaged in harvesting, and that quota holders be able to collectively agree on voluntary measures. On this latter point, if one quota holder elects not to fish an area where fecund rockfish are found, but another quota holder does fish that area, the first fisherman's voluntary effort is not likely to have any environmental effect. Only if both quota holders elect not to fish on fecund rockfish will there be an environmental benefit.

The perceived benefits of rationalization are often associated with negative effects. Fleet consolidation is an example. A reduction in the number of fishery participants often leads to fewer jobs for crewmembers, a reduction in demand for fishery support business and infrastructure, and a net loss of fishery-based economic activity in a community. These effects can be substantial in communities that rely heavily on fishing as a source of economic activity and community identity. In many cases, these implications are not homogeneous, meaning they may be more pronounced in some communities than others. These drawbacks have often led fishery managers to adopt provisions that limit consolidation, or otherwise mitigate the perceived negative implications of rationalization. In addition to community effects, other effects may be negative. In some fisheries, discards have increased as a result of rationalization due to high-grading; this can be explained in part because some programs have not held individuals accountable for discard. Systems based on total catch (landings and discard) with adequate monitoring have typically shown reductions in discard.

4.3.2.1 Case Studies and Lessons Learned

The 1999 NRC study (NRC 1999) reviewed economic and social outcomes of U.S. IFQ programs on communities.[82] The IFQ programs and their effects on communities are summarized below. Unless otherwise noted, all data come from the NRC report; in addition, two general reviews of quota programs (GSGislason & Associates Ltd.. 2008; Redstone Strategy Group and Environmental Defense 2007) are summarized last. Unfortunately, detailed data on community impacts is often missing; as the Government Accountability Office (GAO) noted (2004):

[81] One important element of this hypothesis that relates to the west coast fishery in that future economic returns create the incentive for fishermen to behave as good stewards of the resource. In a mixed stock fishery such as the west coast groundfish fishery, nontarget species may not receive the same level of stewardship because they do not necessarily provide economic benefit (revenue). In other words, if the stewardship effect exists, it may be more relevant for target species rather than nontarget species.

[82] IFQ, individual fishing quotas, are often referred to as ITQs, individual transferrable quotas, to emphasize transferability. For consistency, the acronym "IFQ" is used throughout this case study section, although, in other contexts, "ITQ" may be used to refer to the specific programs described.

> Fishery managers have not conducted comprehensive evaluations of how IFQ programs protect communities or facilitate new entry, because few IFQ programs were designed with community protection or new entry as objectives. This lack of information, combined with the concerns about economic efficiency and fairness, makes it more difficult to decide which community protection and new entry methods to use. . . . Without collecting and analyzing data on the effectiveness of the approaches used, fishery councils will not know if the program is meeting its intended goals and if mid-course adjustments need to be made.

Surf clam/ocean quahog fishery

This mid-Atlantic surf clam and ocean quahog fishery was the first in the U.S. to be managed under IFQs, beginning in 1990. It is managed by the Mid-Atlantic Fishery Management Council (MAFMC). Prior to IFQs, the fishery was managed through size limits, annual and quarterly quotas, and (for surf clams) fishing time restrictions intended to even out product input to processors. A moratorium on new entrants into the fishery began in 1977, allowing 140 permitted vessels. The moratorium was considered a success, reducing overharvest of surf clams and fostering development of the quahog fishery. However, the regulatory system was costly and difficult to enforce, and the rules restricting fishing time led to unused fishing capacity and health and safety problems resulting from fishermen feeling they had to fish in bad weather. Cheating was alleged to have been rampant, and financial institutions were reluctant to support fishing ventures.

The IFQ program put in place in 1990 has two components: transferable QSs (a percentage of the TAC) and "allocation permits," or cage tags, which are valid and can be transferred only within a calendar year. The initial allocation was to owners of permitted vessels that had harvested surf clams or ocean quahogs between 1970 and 1988. Different formulas were used in different regions, and, according to McCay et al. (1995), the initial allocation came close to Alternative 1, although some smaller holders found themselves with nonviable levels of quota. There is no accumulation limit or maximum holding; planners argued that U.S. antitrust laws could be invoked to constrain monopolies (McCay et al. 1995). Anyone qualified to own a fishing vessel under U.S. law may purchase IFQs.

McCay et al. (1995) notes two sources of conflict over the initial allocation. First, some fishery interests who were marginally involved in the fishery ended up with low allocations. Second, a small, distinct fishery for inshore ocean quahogs in the Gulf of Maine was "discovered" post-implementation. No one in the fishery had recorded individual landings and, thus, could not quality for IFQs. Each vessel would, thus, have to purchase IFQ from others in the fishery. Managers resolved the situation temporarily by treating the Maine fishery as an experimental fishery.

TACs have not been exceeded since implementation of the IFQ program. As a result of the program, the MAFMC suspended the minimum size limit on surf clams, and discard of small clams has decreased. The number of vessels active in the surf clam fishery went from 128 in 1990 to 33 in 1997, a 74 percent reduction. In the ocean quahog fishery, active vessels went from 52 in 1990 to 31 in 1997, but the vessels involved are rarely used for any other fishery. McCay et al. (1995) estimated a one-third decline in labor in the Atlantic surf clam and ocean quahog fishery between 1990 (when rationalization was implemented) and 1992.

Economic efficiency in the fishery has increased, and excess harvest capacity has declined since the introduction of IFQs. Some small, resilient firms purchased more QSs, while many other small firms sold out in the first two years after implementation. Medium-sized firms were most likely to purchase more QSs, while the largest firms remained "essentially constant in their holdings" (NRC 1999). Many

participants stopped fishing and leased their QSs to other firms. For ocean quahogs, ownership became increasingly concentrated, but it did not change significantly for surf clams. Monopolization does not appear to have occurred in either fishery, but after implementation, a few buyer-processors became dominant, and the processing sector began moving to southern New England. There has also been a northward shift in landings, due in part to declining catch per unit of effort (CPUE) in the southern region and due to the shift in processing. Reliance on a single buyer increased the likelihood of exiting the fishery by the end of 1993.

In communities, employment in the clam industry declined due to the reduction in vessels and a decline in the bargaining power of crew and captains, "symbolized and to some degree exacerbated by changes in the share system of returns to owners and crew"(NRC 1999). No research on community impacts has been done. Although improved safety was a justification for the IFQ program, nine clam boats and fourteen lives were lost between 1990 and 1999, comparable to the 1980s. The role of IFQs in mitigating or enhancing the danger of the fishery is unknown.

Brandt (2005), studying the rationalization of this fishery, found that many small-scale fishermen transitioned to a new business model based on leasing IFQs to other harvesters. The firm-level analysis (as opposed to vessel-level analysis) showed "little evidence that the small-scale harvester was disadvantaged relative to the larger-scale harvester" (2005). In addition, Adelaja et al. (1998) , in a short-term study conducted in 1993 and 1994, found that monopolies did not develop in the surf clam and ocean quahog fishery.

South Atlantic wreckfish fishery

The fishery for wreckfish (*Polyprion americanus*) takes place in a small area of the South Atlantic region, in deep water, using specialized gear, and for a niche market. The fishery has less than 50 participants and was put under an IFQ program within five years of its inception.

The fishery began in 1987 under the SAFMC. Prior to implementation of the IFQ program in 1992, the fishery was managed through a TAC, trip limits, a permit system, a spawning closure, restricted offloading hours, and a bottom longline restriction. Most vessels participating in the fishery were larger than 50 feet and were used primarily in other fisheries.

Catch in the wreckfish fishery increased from 29,000 pounds in 1987 to more than four million pounds in 1990 (NRC 1999). Little was known about the biology of the stock. At the same time, the number of vessels increased from 2 in 1987 to 80 in 1991. This rapid growth and lack of information, coupled with the shortening of the season and derby nature of the fishery, were driving factors in developing an IFQ program.

The goals of the IFQ program were to create incentives for conservation and regulatory compliance by fishermen; to promote stability and facilitate long-range planning and investment; to allow the marketplace to drive harvest strategies and product forms; to minimize gear and area conflicts; to minimize overcapitalization in harvesting, processing, and distribution; and to allow fishermen to make adequate returns by controlling entry. The IFQ program is based on percentage shares in the TAC; initial allocation was restricted to permittees who had landed more than 5,000 pounds of wreckfish in 1989 or 1990. Fifty percent of shares were distributed in proportion to a permittee's landings within a given period, and 50 percent were distributed equally to all eligible permittees. No single business entity could receive more than 10 percent of initial shares. However, there was no limit on accumulation.

Since the implementation of the IFQ program, landings have been significantly lower than TAC every year, primarily due to a reduction in fishing trips caused by low market prices. The number of

shareholders decreased from 49 in 1992 to 25 in 1996, only 8 of whom landed wreckfish in the 1996-97 season. Most shareholders are engaged in other fisheries. The small IFQ program is much easier to administer, enforce, and monitor than the system in place prior to IFQs.

The relatively small number of participants in the wreckfish fishery comes from dispersed communities throughout the South Atlantic region. No single community is significantly dependent on the fishery, so community impacts are difficult to discern. The NRC notes that "presumably some flexibility has been lost for other, nonIFQ fishermen who might wish to fish for the unused portion of the quota. The other perspective is that these fish are being 'banked' by quota holders and they or their offspring could be caught in later years" (1999).

Alaska halibut and sablefish fisheries

Fisheries for Pacific halibut and sablefish occur off the coast of the Pacific Northwest, British Columbia, and Alaska. The directed fishery for halibut uses longline gear. The directed fishery for sablefish uses longline and pot gear. Most vessels engaged in these fisheries are catcher vessels, but there are catcher-processors in both fisheries. Most vessels are based in the Pacific Northwest and Alaska.

Problems that led to consideration of an IFQ fishery included allocation conflicts, gear conflicts, ghost fishing (lost gear), bycatch loss in other fisheries, discard mortality, excess harvesting capacity, problems with product quality, safety issues, and a lack of economic stability in the fishery and communities. In the halibut fishery, the number of participating vessels grew from 1,000 in 1975 to approximately 3,700 in 1993, with a season length shrinking from 150 days in 1970 to 2 days in the mid-1980s (Knapp 2000). This predominantly small-boat fishery is based in rural, coastal communities. The extremely short season for halibut averaged two to three days per year from 1980 to 1994 in the areas where most of the fish were caught.

The NPFMC goals in developing the IFQ program were to end the derby-style fishery and costs associated with the race for fish, to develop a permanent solution to the problems in the fishery, and to reduce management costs. The Council began considering IFQs in 1988 and implemented the program in 1995. The halibut program applies to all commercial hook-and-line harvests in state and Federal waters off Alaska. The sablefish program is limited to longline and pot gear fisheries in Federal waters off Alaska. Halibut shares were allocated to 5,484 vessel owners and leaseholders with commercial landings in given years (crew and hired captains did not receive initial allocations). Specific allocations were based on the five best years of landings for each individual during a given time period. Sablefish shares were allocated to 1,094 owners and leaseholders, using a similar formula. In general, IFQ owners are required to be on board the vessel when the IFQ is being fished. Rules on accumulation and transfer are still evolving, but, in general, there are limits on both, with low accumulation caps (1 percent). Individuals whose initial allocation exceeded the ownership limit were not required to sell the excess quota, but they could not acquire more. Transferability is restricted across vessel sizes and categories.

In addition to accumulation caps and transfer limits, the allocation included an adjustment for implementing the CDQ program in the western Bering Sea region.

As a result of the IFQ program, season length has increased from 5 to 245 days per year for both species, and landings are broadly distributed throughout the season. It is unclear how costs and revenues have been affected. A lack of studies and data makes it impossible to determine the net economic impact of the program. The top five halibut ports and top sablefish ports have remained the same. The QS market has been active, with more than 3,800 transfers in the halibut fishery and 1,100 in the sablefish fishery. This has led to some consolidation, with the number of quota holders declining by 24 percent in

halibut and 18 percent in sablefish between 1995 and 1997. In both fisheries, most consolidation has taken place among smaller holders. There is anecdotal evidence that fishermen have reduced crew size and that shareholders are crewing for each other, but lack of data makes it difficult to determine effects on crew.

The NRC study offers little data about community impacts. Low prices for salmon have made halibut and sablefish catches more important for regional economies. There is some dissatisfaction about the exclusion of crew members and processors from the initial allocation; crew members and processors believed the initial allocation rewarded vessel owners and changed market power in favor of shareholders. There is also dissatisfaction about the delay between the qualifying years and the implementation of the program, which resulted in excluding some fishermen who were active immediately prior to implementation. In addition, there are ongoing concerns about enforcement and community impacts.

Knapp(1999) found that, in general, Alaska fishermen felt that the rationalization program had made fishing for halibut safer. However, in a 2000 study, he noted that fishermen were sharply divided in their attitudes about the program, but that attitudes are becoming more favorable over time, as those with negative attitudes are leaving the fishery. Not surprisingly, attitudes towards IFQ management were correlated with initial allocations of quota.

Iceland's IFQ program

The highly productive waters around Iceland have hosted a flourishing fishing industry for several hundred years. Iceland began an ambitious vessel construction program in the 1970s that rapidly expanded with the displacement of foreign fleets and the establishment of Iceland's EEZ. This was quickly followed by overcapacity of the fleet and overexploitation of Icelandic fish stocks, particularly cod. Beginning in 1977, attempts were made to limit the size of the fishing fleet, but the numbers continued to increase by 2.6 percent annually and the TAC for cod was consistently exceeded. A desire to improve conservation and efficiency while improving safety and simplifying administration led to the development of IFQ programs in the 1970s and 1980s. At first, the program was seen as a temporary emergency measure. In 1990, however, most stocks around Iceland were incorporated into a quota management system.

When cod was put under an IFQ program in 1984, access was given to those who were boat owners when the system was introduced, primarily based on their fishing record during the preceding three years (Palsson and Helgason 1995). Each fishing vessel over 10 tons was allotted a fixed proportion of future TACs of cod and five other demersal fish species. New vessels could only enter the fisheries if one or more existing vessels equivalent in size were eliminated in return.

Quota allocations are of indefinite duration and can be revoked at any time. To be eligible to hold quota, a person or company must have access to a vessel to which the quota is allocated. QSs can now be leased or permanently sold, but to retain their quota allocations, holders must fish at least half of their quotas every second year. Twenty percent of a year's groundfish quota can be shifted to the next year, and an overage of five percent is permitted in any year without penalty.

If a quota is leased or sold to a vessel operating from a different place, the consent of the municipal government and the local fishermen's union is required. However, trading of quotas is brisk.

The government set up a new agency to issue permits and QSs, to collect data, and to conduct monitoring and enforcement. Management of herring has been very successful, but management of cod has not, possibly due to an excessive TAC. Overruns of the cod TAC resulted because of fisheries that

were exempted from the quota program and possibly because of discards of small and immature fish. However, the IFQ program seems to have improved the profitability of the fishery considerably, with large increases in quota price. The total productivity of capital and labor in the fishing industry increased by 67 percent between 1973 and 1990, despite less plentiful fish stocks. In the herring fishery, the number of vessels decreased from more than 200 vessels in 1980 to 29 in 1996, while the total catch increased from 53,000 mt in 1980 to 140,000 mt in 1994-95. In general, there has been a trend toward fewer and larger vessels. The Icelandic government implemented a buyback program in 1994 to remove vessels from the fishery, suggesting the problem of overcapacity was not solved completely by rationalization.

The Icelandic economy depends heavily on fisheries; in 1996, approximately 73 percent of the value of goods exported from Iceland consisted of fish and fish products. In 1995, approximately 11 percent of the population was employed in fishing and fish processing. Fishing is a dominant industry in towns and villages throughout the island.

As of 1999, 24 large firms owned almost half the total quota, and the share of the largest quota holder was 6 percent. Some companies sold their quota to companies located elsewhere, and, when TACs are decreased, some quota holders sell out because their share is no longer viable. Palsson and Helgason (1995) found that "many of the smaller operators that still hold IFQs are increasingly entering into contracts with larger IFQ holders—'fishing for others'—arrangements that are profitable for the lessors but entail a significant loss of profits for the lessee boat owners and a reduction in the wages of their crews."

The increasing concentration of fishing quota in the hands of large companies has had devastating effects on small fishing communities, leading to unemployment and eroding the tax base. Small communities with fewer than 500 inhabitants have lost a much larger share of quota than larger communities. In some cases, they have tried to reduce the decline by buying or leasing quota or investing in local firms.

There is considerable dissatisfaction about the initial allocation of quota only to vessel owners. The NRC notes that "prior to the program, fishing was typically regarded as a 'co-venture' of vessel owners and crews and many crew members now feel disenfranchised" (1999). Fishermen are concerned about "the emergence of the relations of dependency associated with 'fishing for others,' prompting at least three strikes by fishermen in the past five years" (1999). Palsson and Helgason (1995) found that fishing rights were increasingly concentrated in the hands of the biggest companies and that "public discontent with the concentration of IFQs and the ensuing social repercussions of this process are increasingly articulated in terms of feudal metaphors, including 'tenancy' and 'lords of the sea.'" In addition, there is concern about the concentration of IFQs in the hands of large vertically integrated companies and resistance to profit-oriented exchange of fishing rights. The bureaucracy associated with fishery management has not been significantly reduced, and there is concern about municipal bankruptcy in fishing villages that have lost most or all of their quota, with massive unemployment and dissolution of communities.

New Zealand's IFQ program

New Zealand's IFQ program began in 1986, in response to overcapitalization, decreasing productivity, declining economic performance and excessive management intervention. The aims of the IFQ program were to rebuild fish stocks; ensure that catches would be limited to sustainable levels; ensure that catches would be harvested efficiently, with maximum benefits to fishermen and the nation; allocate catches equitably; manage the fishery to allow security and flexibility; integrate the IFQ programs of the

deepwater and inshore fisheries; develop a regional management framework; restructure the harvesting sector; and enhance the recreational fishery.

Quota was allocated among fishermen based on catch history during a two-year qualifying period. Ten fishery management areas were set up, with TACs established for each area (Dewees 1998). Thirty species were covered. The initial allocation was made free of charge; IFQs were allocated in perpetuity and authorized holders to take specific quantities of each species annually in each quota area (as opposed to a percentage of the TAC). In 1990, this was changed to a proportional IFQ system to reduce the need for government intervention to adjust the TAC (Dewees 1998). Accumulation limits were set in the 20 to 35 percent range. IFQs may not be held by nonresidents of New Zealand or by companies with overseas control. They are transferable.

Several developments not directly related to rationalization took place in New Zealand during the same period, making this example difficult to compare to the current west coast process. For example, an extremely valuable snapper fishery underwent significant declines in TAC, and attempts were being made to allocate 40 percent of the commercial catch to the recreational sector. At the same time, there was a trend toward "New Zealandization" of the fishing industry, with more harvesting and processing taking place in New Zealand. Catches of some species increased by 40 percent during this period. In addition, settlement of native Maori claims reduced the quota holdings of several large vertically integrated companies. As of 1998, Maori interests owned or leased approximately 40 percent of the New Zealand quota (Dewees 1998).

Several conservation measures were included in the program. The ability to carry forward overages to the next year was abolished, and a more precautionary approach to setting TACs was adopted (Dewees 1998).

The IFQ program resulted in improved biological status of fish stocks and the development of an open, transparent stock assessment and TAC-setting process. The goals of reduced overcapitalization, increased flexibility, market orientation, greater industry responsibility, and increased efficiency and profitability were achieved. Dewees (1998) notes that "five of the six vertically integrated companies in the 1995 interviews had very positive responses to the IFQ system. These companies stated that their firms' relatively secure fish supplies resulting from the IFQ system enabled them to do long-term planning and value-added product development. The small-scale quota owners interviewed had mixed feelings." No details were available about impacts on communities.

British Columbia halibut quota program

Wilen and Casey (1997) reviewed impacts on crew from the B.C. halibut longline quota program. Prior to rationalization, the B.C. halibut fishery was a classic derby fishery with very short seasons (4 to 5 days), similar to the Alaska halibut fishery prior to rationalization. A LE program was adopted in 1979, restricting participation to 435 vessels, which subsequently became the core group of quota holders under the rationalization program. Rationalization was implemented in 1991.

The allocation formula was derived by the industry, based on prior catch records (70 percent) and vessel length (30 percent). An observer company was hired and funded with a self-imposed landings tax. During the first two years, quotas could not be transferred permanently or leased. In 1993, leasing was allowed, but consolidation was limited. Each vessel's allocation could be split into two equal units, which quota holders could lease out. Quota holders could lease up to two units from others. This effectively constrained quota stacking, and Dewees (1998) notes that "this gradual transition to transferability also allowed fishery participants time to adjust to the new system and think through their participation decisions."

The rationalization program resulted in some important changes in product handling and quality. The halibut season became longer (eight months), allowing halibut to be sold fresh, as opposed to frozen. During the first year, the percent of the harvest marketed fresh jumped from about 40 percent to 94 percent, generating 55 percent more in ex-vessel prices. The Department of Fisheries and Oceans instituted a hotline where fishermen could find out how many others were fishing, in order to time trips so that the fresh market was not periodically glutted. In addition, fishing was reduced during the Alaska halibut season.

Wilen and Casey (1997) found that some consolidation had taken place, but that it had been limited by the program's design. Dewees (1998) reported "a transfer of market share from large traditional processing firms to smaller firms specializing in halibut. The number of firms processing halibut increased from 57 to 69 and the locations of landings became less concentrated." Most vessels continued to fish for other species such as groundfish, salmon, and herring, and they did not fish substantially longer after rationalization than before. The rate of fishing slowed dramatically compared to the pre-rationalization derby fishery. The average number of days at sea per trip declined, but there was a slight increase in the number of trips per season.

At the same time, both the importance of the specialized skills that crew members contributed during the derby fishery, and the need for additional crew to reduce risk during the derby setting, declined. Crew size per vessel was reduced, usually by one person, among 44 percent of those surveyed. Wilen and Casey (1997) and Dewees (1998) estimated that the quota program reduced the total number of crewmembers employed by 32 percent, but that the total days of fishing had increased marginally. Of the 44 percent who reported reducing crew size, 59 percent reported that individual shares for the remaining crew went up. Wilen and Casey report (1997) that "remaining crew members are likely to be substantially better off than before even if the individual crew shares have been reduced."

Bering Sea crab rationalization

Bering Sea crab rationalization began during the 2005/2006 fishing season. Lowe and Knapp (2006) studied the impacts of rationalization on the three small Alaska communities of False Pass (population 40), King Cove (population 80), and Akutan (population 500). All three communities relied on both commercial and subsistence fisheries. False Pass and Akutan were designated CDQ communities, giving them economic protections lacking in King Cove. Both King Cove and Akutan had fish processing plants owned by major seafood companies.

Although these communities do not closely resemble the communities that will be affected by west coast trawl rationalization, it is worthwhile to note some of the impacts they experienced from crab rationalization. In the first year of rationalization, dramatic consolidation occurred. Vessel registration declined by about two-thirds for the Bristol Bay Red king crab fishery and about one-half for the Bering Sea snow crab fishery. A corresponding decline in the number of crab fishing jobs occurred, with a loss of about 900 King Crab jobs and 450 snow crab jobs. About 15 percent of this decline was due to a corresponding crab vessel buyback program. The remaining jobs changed, with employees generally working longer seasons and earning more total income. However, the share of ex-vessel value going to crew declined, because a portion of the ex-vessel value was used for royalty payments on leased quota. In other words, total crew earnings declined "because the increase in earnings per job has not been sufficient to offset the decline in the number of jobs" (Lowe and Knapp 2006).

Rationalization also decreased sales for some support businesses, such as pot storage, welding, marine supplies, hotels, and taxis. In general, "processors have benefited from greater certainty of supply but some face higher operating costs from extended operating seasons" (Lowe and Knapp 2006).

Lowe and Knapp note (2006) that "among the most important long-term effects may be changes in the options available to individuals and communities to participate in crab fisheries… The economic viability of the communities has depended upon the ability of residents to participate in multiple local fisheries and to switch between fisheries as resource and market conditions change. Crab rationalization has restricted the ability of residents of these communities to continue to do this in the future." They note that the effects of crab rationalization will affect, and be affected by, what happens in other fisheries and their management.

Bering Sea Pollock—American Fisheries Act

The American Fisheries Act was signed into law in October of 1998. The purpose of the AFA was to tighten U.S. ownership standards that had been exploited under the Anti-reflagging Act and to provide the BSAI pollock fleet the opportunity to conduct their fishery in a more rational manner while protecting non-AFA participants in the other fisheries (NPFMC Staff 2002). The passage of the AFA resulted in the rationalization of the BSAI pollock fishery by establishing harvest cooperatives for various sectors of the pollock fishery. This cooperative structure was created with the intention that "both harvesters and processors benefited from rationalization" (Stevens and Gorton, 1999 in Matulich, *et al.* 2000). The result of the AFA was a reduction in bycatch, increased utilization, increased economic returns, and improved safety among others. Reports indicate other outcomes as a result of the cooperative structure created through the AFA. The flexibility provided by the cooperative structure allowed the AFA fleet the ability to spread their effort in time and space to accommodate Steller Sea Lion conservation measures, and shifted the monitoring and enforcement burden to the cooperatives and their members (NPFMC Staff 2002).

Several negative impacts of the AFA were reported. Those vessels that had recently moved into the fishery were excluded because their years of participation did not match those years necessary to qualify as an AFA vessel. Spill-over of AFA vessels into other fisheries was also reported as AFA vessels had improved opportunity to time operations and, therefore, participate in additional fisheries. Several fishery participants voiced concerns that being locked in to a particular fishery would reduce the flexibility necessary to adapt as the abundance of various fish species increases and declines over time.

Community effects appear to have varied. Community members directly engaged in the pollock fishery generally benefited through the implementation of the AFA, but some evidence supports the notion that less shoreside infrastructure and support business was utilized in some communities and fishing-related activity became more concentrated in certain ports and less concentrated in others. One particular benefit of the AFA as it relates to small and vulnerable communities is that CDQ programs invested in various seafood companies engaged in the pollock fishery. The CDQ program allocated a percentage of BSAI species to certain eligible communities in western Alaska. The purpose of the CDQ program was to provide villages the opportunity to participate and invest in fisheries, to support economic development, to alleviate poverty and provide economic and social benefits, and to achieve sustainable and diversified economies in western Alaska. Following the passage of the American Fisheries Act, CDQ groups bought in to various seafood companies engaged in pollock. The accumulation of assets can lead to self-sustaining fishing economies in those CDQ communities.

Summary study of Canadian IFQ programs

In a report prepared for Canada Fisheries and Oceans, GSGislason & Associates (2008) reviewed five Canadian Pacific IFQ fisheries: the halibut longline fishery, the sablefish longline and trap fishery, the groundfish trawl fishery, the geoduck dive fishery, and the red sea urchin dive fishery. They developed

ten "lessons learned" that echo many of the more positive lessons presented in the previous case studies (2008:iv-v), summarized here:

1. The situation in many fisheries prior to introducing IFQs was untenable. Change was mandated by poor conservation, business, and people practices.
2. Changes in the economy usually involve the substitution of capital for labor. This is what happened in IFQ fisheries, where each active vessel/operating unit caught more fish—but each IFQ crew member worked much longer and generally earned more money over the season.
3. IFQs create an incentive for fishermen, processors, and buyers to cooperate in identifying market needs and ensuring appropriate catch timing/handling to meet those needs.
4. IFQs allow the production of high value products, building a demand niche that is more insulated from broad supply and demand trends.
5. IFQs have led to better monitoring of port offloads and at-sea activities. IFQs have also led to much better science in most fisheries considered, science for which industry has paid.
6. The long-term benefits of IFQs are generally greater than the short-term benefits, e.g., it takes time for the fleet to consolidate to an economic size, and time for the market to accept new products.
7. IFQs shift the balance of power between the license/vessel owner and the vessel crew and the processor-buyer. The license/vessel owner appropriates a greater share of the increase in "industry value" than does the processor or crew. "We argue, nevertheless, and this study substantiates this, both crew and processor interests are better off in total under IFQs" (2008:v).
8. Certainty of access is a necessary condition to the success of an IFQ program.
9. Commercial fishing licenses under IFQ fisheries management do not necessarily gravitate to interests in large urban centers at the expense of rural interests.
10. It is difficult to analyze the employment, wage, and community impacts of IFQs in isolation of resource conservation, fisheries management, market/revenue, and cost impacts. Future analysis of the employment impacts of IFQ fisheries should be one component in a more broad based review of IFQ programs.

Summary study of U.S. and British Columbia programs

A summary report of U.S. and B.C. LAPPs (Redstone Strategy Group and Environmental Defense 2007) looked at the impacts of the Mid-Atlantic surf clam/ocean quahog program; B.C. sablefish, halibut, and groundfish trawl programs; South Atlantic wreckfish program; Alaska halibut, sablefish, pollock, and king crab programs; and the Pacific whiting co-op program. The study presented five major conclusions:

1. In these fisheries, LAPPs were usually implemented after traditional management had failed.
2. Overall, the fisheries experienced major economic improvements, clear environmental gains, and a mixture of social changes.
3. Compliance with TAC increased, discards decreased, and habitat destruction decreased across the board.
4. Improved fishing practices allowed better management of biomass, ecosystem health, and commercial landings.
5. There were positive and negative social effects.

In regard to community and social impacts, the study found (2007) that "positive effects included increased safety and a higher percentage of fishermen employed full time. Negative effects included community, processor, and job losses; private economic gains at public expense; and in some cases increased ownership concentration and consolidation. Generally newer LAPPs addressed these concerns through improved LAPP design." The study further notes (2007): "Overall, concentration was often

focused in fisheries with significant economies of scale (for example, those requiring large capital investments in vessels or equipment). Nevertheless, it appears that statutory concentration limits have significantly limited fisheries' ownership concentration in fisheries. . . . However, these limits may have also limited the economic potential of consolidation."

4.3.3 A Comparison of Harvest Cooperatives and Individual Fishing Quota Systems and Their Appropriateness to Fishery Characteristics

As discussed above, the Council considered the implementation of harvest cooperatives and IFQs as tools for rationalizing the west coast trawl fishery. Because the Council considered both cooperatives and IFQs, it is useful to understand the differences and similarities between the two types of programs. Understanding these differences is necessary in order to understand the effects of the alternatives.

Individual fishing quotas and harvest cooperatives have many similarities, but they also have many differences that make one system appropriate for certain fisheries and the other system appropriate for others. To determine the appropriate application, it is important to understand these differences.

While harvest co-ops and IFQ systems both explicitly or implicitly create fishing privileges in the form of the opportunity to catch a share of the allowable catch, their approach for managing the prosecution of fishery resources between the two programs can be quite different. An IFQ system often requires that an agency track and monitor each vessel's catch, execute quota transfers between vessels or permits, and enforce the allowable catch levels of individual vessels. In contrast, harvest cooperatives are essentially a hands-off approach on the part of the agency, except that NMFS monitors the catch that occurs, compliance with accumulation limits, and fishing activities. The enforcement of those activities is primarily done through private contracts within and across the harvest cooperatives themselves. In other words, NMFS generally limits its scope of interaction to cooperative organizations in a cooperative system, while NMFS may interact with individuals in an IFQ system.

Harvest cooperatives are organizations made up of vessels that work together to harvest a fishery resource. These organizations are sometimes made up of several vessels that negotiate catch sharing arrangements among themselves without needing agency involvement. In other cases, harvest cooperatives are created by several vessels with catch history assignments that each vessel brings to the cooperative. The vessels typically have the privilege to harvest that share, but can lease all or a portion of that share to another vessel through a private agreement without needing agency involvement. The administration and enforcement of harvest activities among member vessels is primarily done through the cooperative organizations and through private contracts. The regulatory activities of the agency are generally limited to monitoring for sector or co-op catch levels, monitoring compliance with accumulation limits, and closing when a sector or co-op reaches the allocation or OY.

An example of a harvest cooperative already exists on the west coast. The Pacific Whiting Conservation Cooperative is a voluntary association of catcher-processors who have negotiated catch sharing arrangements among themselves without agency and Council involvement. The necessary ingredient for this cooperative to form is an allocation of whiting to the sector and a barrier to entry by other catcher-processors who are not part of the arrangement. The mothership and shore-based cooperative proposals are similar to the second example described above. In the mothership proposal, each mothership catcher vessel permit would have a share of the sector allocation based on catch history, and those holding permits for catcher vessels would form cooperative arrangements with other such permit holders. The cooperative organization would coordinate harvest activities of its member vessels, and these activities would include leasing of shares between members without agency involvement.

An IFQ program creates privileges to harvest fishery resources in the form of a percentage of the allowable catch. These shares may be gifted or auctioned to individual entities and are privileges to harvest a portion of fishery resources. Quota can be made transferable, allowing them to be bought and sold, and enforcement and monitoring of individual harvest levels and quota trading is typically done by the management agency.

Arguably the principal difference between the two programs is the coordination of harvest activity and the level at which NMFS is involved. Often vessels in an IFQ program do not coordinate their harvest activity. In a co-op program harvest coordination occurs among members of industry; the government is often not involved to the same degree. This coordination occurs because of the collective nature of the co-op and the collective burden placed upon the co-op to constrain catch by members to the co-op's allocation of the allowable catch. If one vessel acts irresponsibly, the entire cooperative may suffer, and this collective burden fosters communication to enhance the success of harvesting.

Co-op programs can take on many characteristics of IFQ programs and vice versa. The justification for the selection of the type and specific design of the program can depend, in large part, on the characteristics of the fishery and fishery participants. In general, the level of similarity among vessels in the fishery, the level of similarity among markets for participants in the fishery, and the number of vessels in a fishery may help determine the appropriate mix of cooperation and independence for a rationalization program. The purest form of a cooperative (one where the government makes no vessel or permit-specific allocations) will most likely have vessels with similar objectives, similar catch histories, similar constraints on their harvesting activity, and a barrier to entry (the catcher-processor sector is one example of this arrangement). Alternatively, the purest form of an IFQ program may have many participants with a wide array of vessel characteristics, markets, catch histories, and regions. As participants in an IFQ program acquire similar objectives, constraints, markets, etc., that fishery may very well take on characteristics that are similar to co-op-type rationalization programs. Alternatively, as participants in a co-op program acquire dissimilar markets, and have variation in the opportunities available, that fishery may very well take on characteristics that are similar to IFQ-type rationalization programs with more numerous and diverse co-ops. In the end, choosing the most appropriate program depends on the characteristics of the fishery and fishery participants.

The appropriate institution (whether it be individually focused through IFQs or collectively focused through co-ops) depends in large part on conditions present in the fishery, whether those conditions foster or hinder cooperative behavior, and to what degree. Nine variables have been identified which influence cooperation in commons dilemmas: social motives, gender, payoff structure, uncertainty, power and status, group size, communication, causes, and frames (NRC 2002). Because of the characteristics of the groundfish fishery and the alternatives under consideration, the variables most applicable in this case are social motives, payoff structure, power and status, group size, and communication.

In theory, social motives are categorized in four orientations: individualism—the motivation to maximize one's own gains; competition—the motivation to maximize relative gains; cooperation—the motivation to maximize joint gain; and altruism—the motivation to maximize other parties' gains. These theories can be categorized into proself motives (individualism and competition) and prosocial motives (cooperation and altruism) (NRC 2002). Social and psychological research has shown that individuals exhibit different behaviors and preferences depending on which of the two categories they fall into. Proself individuals tend to harvest more of a common pool resource, while prosocial individuals tend to act in a way that achieves a more collective and equitable outcome. Both types of individuals can be said to be behaving rationally when engaging in these activities, but their objectives are different. Proself and prosocial perspectives are important when considering whether to implement

harvest cooperatives or IFQs in a fishery. Proself fishermen may be less likely to operate successfully in a harvest cooperative system than in an IFQ system. In addition, the fact that harvest cooperatives rely on the presence of a non-co-op fishery (a derby fishery for participants who are not in a co-op), the successful prosecution of the fishery may depend on non-co-op participants being prosocial so that they do not close the co-op portion of the fishery, through a disaster tow[83] for example.

In cases where there are likely to be collective problems in an IFQ program (such as those problems created by disaster tows of low OY species), successful prosecution of the fishery may require some collective effort on the part of fishery participants. A fishery composed of prosocial individuals is likely to form voluntary arrangements to solve those problems in an IFQ fishery relatively easily, while a fishery composed of proself individuals may face difficulties in developing a voluntary collective management program. Such characteristics speak to the appropriateness of establishing mandatory co-ops, or of establishing a program where cooperative institutions may form voluntarily. For sectors where it appears that collective problems may be present and there is a relatively high likelihood of voluntary cooperative arrangements forming to deal with such problems, establishing a simple LE program, may be sufficient for those sectors to develop voluntary cooperative agreements. Alternatively, in sectors where collective problems may be present and participants tend to be either prosocial or proself individuals, depending on circumstance, there may be cases where mandatory cooperatives are appropriate. In cases where participants are extremely proself individuals, a cooperative arrangement (either voluntary or mandatory) may not be successful, because those participants may face extreme difficulties in working collaboratively. In such cases, implementing IFQs instead may be the best decision; however, multiple other considerations play into the appropriateness of co-ops or IFQs.

Another variable influencing social motives is culture. Individuals from a prosocial culture will tend to behave cooperatively with members in their own group while competing with members from another group. Individuals from a proself culture will tend to focus on their individual objectives and consider the impact on others very little.

The payoff structure can be described as rewards or penalties of acting cooperatively, or of not acting cooperatively, in a commons problem. Payoffs can be financial and social. A social payoff structure is one where an individual receives approval from their counterparts for various activities. Psychological research suggests that individuals who have an opportunity to meet their counterparts ahead of time, and remain in contact with their counterparts during activity, were more likely to engage in cooperative behavior than individuals who did not previously meet their counterparts, or who did not stay in contact. The potential social payoff structure is linked to the culture variable described above. When considering whether to implement IFQs or harvest co-ops in a fishery, it may be worthwhile to consider whether the fishery sector has a culture where participants know each other ahead of time and are likely to continue to stay in contact while engaged in harvesting.

Power and status imbalances within groups make it difficult for individuals to reach cooperative agreements. Individuals in a group with power and status imbalances tend to focus more on their own well-being. Research has shown that collective groups with power imbalances tend to make less efficient use of available resources, are more likely to begin the exercise distributing resources to a subset of the group, include fewer people in resource utilization across multiple rounds, and exert more effort to reach agreements on resource distributions (NRC 2002). In the context of west coast groundfish trawl rationalization, power and stature are closely related to the initial allocation of QS and

[83] A disaster tow is generally described as an unexpected catch event of a large magnitude. This term is often used to describe cases where the catch event is so large that it may put the fishing opportunities of an entire sector or fishery at risk.

catch history. In groups where there are wide differences between catch history and status, the likelihood of cooperation is lower than in groups where catch history and stature are more similar. Mannix's (1991) finding that power imbalances in a group make it more difficult to reach agreements on resource distributions can be solved by making resource distribution decisions for them. In a fishery, this can be done by assigning an initial allocation of QSs—or catch history as may be the case in cooperatives—to individuals instead of relying on the organization to arrive at a resource distribution decision. When considering the implementation of IFQs or harvest co-ops, the difference in power and status among participants in the fishery may be a useful consideration because those sectors with power and status imbalances may face challenges when trying to form cooperative arrangements.

Group size theoretically influences the likelihood of successful collaboration in groups. Theory has suggested that the smaller the number of individuals in a group, the more likely it is that group will form cooperative relationships. This logic is consistent with the theories put forth by Nash (1950). One hypothesis is that individuals in smaller groups believe that their contributions are more effective; therefore, they feel rewarded because of self efficacy. Empirical studies have both challenged and supported this hypothesis. One study indicated that larger groups achieve outcomes more optimally than smaller groups, while another study indicated that a reduction in the number of common resource consumers actually increased the consumption of that common resource (Isaac, *et al.* 1994; NRC 2002). However, Rose (2002) finds that factors such as group size influence the ability of group members to monitor one another (NRC 2002). Specifically, smaller group size enhances the ability of individuals to monitor one another at relatively low costs. Given the envisioned structure of harvest co-ops under the existing alternatives, this point is particularly relevant because it is envisioned that agencies will monitor overall harvest levels (either at the fishery, sector, or co-op level). In addition, participants in harvest co-ops would self-monitor the catch of each harvester to ensure adherence to catch-sharing agreements. This information is applicable to rationalization of the fishery because the number of individuals in a group may affect the outcome and success of an IFQ or co-op system, and the number of vessels that will continue to operate because of accumulation limits will impact group size.

Among the most consistent findings in the experimental social dilemma literature is that a period of discussion among participants yields positive cooperative effects (NRC 2002). Social research suggests one reason discussion yields positive effects is that discussion leads to commitments, and these commitments are largely held by individuals. Another study found that discussion can lead to consensus (collective commitments), and this creates cooperative behavior. One additional reason discussion may yield these positive effects is that discussion leads to a positive sense of group identification, though this effect arguably is not sufficient for cooperation. Associated with this concept is the question of whether information flow will help foster cooperation. Bohnet and Frey (1999) addressed this question and found that two-way communication had positive effects on behavior. This may suggest that fostering communication among harvesters of a common resource may improve the likelihood of cooperation. These findings have implications for rationalization of the west coast trawl fishery because they suggest that communication must occur between participants if they are to operate in a harvest cooperative, and information sharing (sharing of catch data for example) should occur among participants to foster cooperative behavior.

This information still begs the question of which system is the most appropriate for the west coast groundfish trawl fishery. We address issues that may help decision makers answer this question. To begin with, we identify some known characteristics of the LE trawl fishery and relate that information to the paragraphs above. We show that each sub-sector of the trawl fishery has different characteristics that may suggest the appropriateness of an IFQ or a harvest cooperative program for each of those sectors. Second, we review available literature in an attempt at outlining the various characteristics exhibited by collective environmental management systems and individual transferable quota-based environmental management systems. We find that there are some differences between the two

institutions that have relevance to the west coast groundfish trawl fishery. In particular, the two institutions display differences on the following issues: large versus small markets and environmental issues; the complexity of the resource and management system; the economic practices fostered by each institution; the social structure of each institution; and the adaptability of each institution to shifts in environmental or social conditions. There are other differences, such as the response to particular aspects of commerce; however, they do not appear relevant to the alternatives under consideration or to the west coast groundfish fishery.

The sub-sectors of the trawl fishery differ in terms of their fleet size, species targeted, historic participation in the fishery, and some information that hints at the willingness to collaborate over common problems.

- Fleet size is smallest in the catcher-processor sector, followed by the mothership sector, the shoreside whiting sector, and the shoreside nonwhiting sector, respectively. Since the literature suggests that group size influences the success of collaboration in groups, this information suggests that collaboration may be fairly pronounced across the entire catcher-processor sector. Collaboration may also occur across the other sectors, but it is more likely that there will be multiple collaborative groups within each of the other sectors.
- The species targeted in the three whiting sectors are largely the same across each participant in those sectors, but the species targeted in the nonwhiting sector can differ substantially across vessels. For instance, some vessels may specialize in shelf flatfish opportunities, while others may specialize in deepwater slope species. This suggests that the objectives of participants in the nonwhiting sector may differ substantially, while the objectives in the whiting sectors may be more similar.
- Historic participation varies depending on the sector. In the catcher-processor sector, historic participation is quite similar, and participants in this sector have stated that this is one of the reasons for the successful formation of the voluntary cooperative (because decisions over resource sharing were relatively easy). In the mothership and shoreside whiting sector, historic participation is more diverse and likely provides some of the justification for the catch history assignments found in the mothership and shoreside whiting sector cooperative alternative. Finally, in the shoreside nonwhiting sector, historic participation is substantially different across participants. This is because of the number of species targeted in the fishery and also because of the relative difference in the historic timeline of participation in the fishery by existing participants.
- The willingness of each sector to collaborate over common problems can be informed, to some degree, by past actions. In the catcher-processor sector, the voluntary cooperative has taken action on its own accord to avoid overfished stocks and, at times, has elected to stop fishing to halt the catch of those stocks. The mothership and shore-based sectors of the whiting fishery have also taken some voluntary actions to avoid overfished stocks, but the actions appear to be less stable and may have lasted for a shorter time. This could be because such actions are not part of a contract that would presumably exist in a voluntary cooperative. Limited information exists to suggest the level of willingness of nonwhiting fishery participants to collaborate over common problems. Anecdotal information suggests that some participants in the nonwhiting sector are avoiding areas of known overfished species abundance because catch of those stocks is a collective problem, but this information has not been verified.

In addition to the different characteristics of participants in each sector, the characteristics of each of the potential programs can differ quite substantially. Table 4-7 was partially adapted from Rose (NRC 2002; 2002) and summarizes the different characteristics of IFQ and cooperative programs that may be

worthwhile when considering a system of IFQs or harvest cooperatives. These characteristics are explained in more detail in the paragraphs below.

Table 4-7. Characteristics of IFQ and co-op programs.

	IFQ Characteristic and Compatibility	Co-op Characteristic and Compatibility
Scale of market and fishery management issue	Better in larger, thick markets and large environmental management issues	Better at dealing with thin market situations and smaller management issues
Resource and management complexity	Better in simple systems	More adept at dealing with—and evolving into—complex systems
Economic practices	Participant focus on profitability and innovation	Participants with more perspective on long-term stability and risk sharing
Social structure	Loose and stranger relations among participants	Close-knit relations among participants
Ability to deal with new entrants	Better able to deal with new entrants	Not as adept at dealing with new entrants

IFQs and collective management institutions are used to handle different sized scenarios. IFQ-based institutions are typically used to handle large-scale environmental management issues, while collective management institutions are used to handle smaller scale environmental management issues. These systems are also more or less adept at dealing with large and thick markets versus small and thin markets. Defining what are large and small issues is somewhat subjective; however, the literature suggests that large-scale management issues (in this context) are those where the overall objective is determined by a government, and standards are imposed on individuals so that the collective whole achieves the overall objective. A small issue is one where a group can determine an objective and take collective action to achieve that objective. An example of a large-scale environmental management issue is air pollution. A community may decide to undertake actions to reduce air pollution, but that community cannot independently solve air pollution problems if others contribute to the problem. Solving that problem is likely to require government intervention. IFQs and collective management institutions also deal with large and small markets differently. IFQ systems work effectively in markets that are thick; i.e., where there are enough potential transactions available at any time so that individuals cannot hold out or engage in strategic bargaining. Collective management institutions do not necessarily rely on price signals and individual ownership, so they do not present opportunities for holdouts and strategic bargaining alternatives. Therefore, collective institutions may be better suited for dealing with thin market conditions; i.e., when allocations of some groundfish species are so small that there is a very limited number of suppliers and a very limited number of transactions occurring on the market. This concept may be particularly relevant to issues facing the west coast groundfish trawl fishery where the trawl allocation of some species may potentially create thin markets in an IFQ system.

IFQs and collective management institutions also differ in the way they deal with resource and management complexity. Individual transferable privileges rely on price signals to influence outcomes. Price signals and efficient setting of prices are most effective in systems that are relatively simple and in which expectations can be reasonably well established and met. Collective management institutions do not necessarily rely on price signals and may instead rely on a series of social and community-based rewards and standards. These collective institutions tend to develop into—and be more adept at dealing with—complex and interactive systems.

The types of economic practices that tend to be encouraged by both systems also differ. IFQ-based systems tend to promote profitability and innovation, while collective systems tend to promote long-term stability and risk-sharing. However, it is important to note that the literature contrasts IFQs and

community-based management institutions on this topic. While harvest cooperatives can be loosely described as a type of community, the literature generally refers to community-based management systems as those tied to a geographic place, or town. Members of a harvest cooperative do not cooperate in marketing aspects, only in harvesting. Therefore, it may be reasonable to state that harvest cooperatives also act in a way that promotes profitability, like IFQ systems, because of the competition that exists in the marketplace. This being said, it is almost certainly the case that harvest co-op systems foster risk sharing. Such risk sharing may have an influence on innovation.

The social structure of IFQ and collective systems is fairly different. IFQ systems tend to be made up of individuals with looser and less familiar relations than collective institutions. Collective institutions tend to be more close-knit. This concept is related to the degree of complexity in the system and the ease of entry and exit. Since collective institutions tend to develop into more complex arrangements, those institutions must be close-knit to foster relationships, communication, and understanding. In addition, collective institutions rely on there being a slow turnover of individuals, or barriers to entry and exit, because this enhances the connectivity of individuals in that collective organization. Because individuals in a collective system typically are stuck with one another, they have more opportunities to engage on multiple fronts and deal with complex issues. In order to develop and sustain the relationships necessary to deal with these complex issues, it may be necessary to ensure that individuals do not have opportunities for easy entry and exit. Based on this information, when considering whether cooperatives are appropriate for a fishery sector, it would be worthwhile to consider the culture of participants in the sector and determine whether that culture has relationships that appear necessary for collective management. In addition, since relationships appear necessary to sustain collective institutions, it may be necessary to impose rules that make entry and exit difficult. Such rules may include not making catch history divisible in a co-op program. This issue may also be relevant to the question of whether to establish linkages between harvesting and processing entities if the relationships between the two entity types are necessary for the success of the collaborative institution.

The literature also suggests that IFQs and co-ops differ in their adaptability to social and environmental conditions. IFQs tend to be more adept at dealing with social change (primarily demand conditions), whereas collective-based systems tend to be more adept at dealing with environmental change (shifts in resource abundance). These findings may not be entirely applicable to the alternatives being considered for rationalization (especially the response to environmental conditions) because such standards (allowable catch levels) are set by the government regardless of whether IFQs or harvest co-ops are put in place. However, one finding in the literature is that IFQ systems are better able to deal with social change that comes in the form of new entrants. This is because such a system can afford to deal with new entrants and does not rely on the same level and type of social relationship that is necessary for the successful operation of collective management institutions, like harvest co-ops. A collective institution may rely on stronger relationships and closer ties, which may be difficult to establish and maintain with new entrants.[84]

4.3.3.1 Harvest Cooperatives and Individual Fishing Quota Systems in Weak Stock Management Conditions

In this section, we consider the difference between the co-op and IFQ institutions under weak stock management conditions. In particular, we consider weak stock management issues that have been discussed in the Council arena, which some believe may generate Olympic-style competition among trawl harvesters. This belief is contrary to the traditionally expected outcome of no competition;

[84] While it may prove difficult for new owner-operators to enter the fishery in a harvest co-op system, new employees may join a company that comprises a portion of the cooperative organization and work their way up the ranks to a skipper and/or shareholder, thus becoming a "new entrant" into the fishery.

nevertheless, conditions and alternatives may exist that may create Olympic fishery conditions. Some argue that an Olympic fishery could develop under IFQs or co-op management because of species with low OYs or low trawl allocations and the way they would be managed under the two programs. In the case of harvest cooperatives, the existing alternatives call for setting bycatch limits that would close the fishery, the sector, or the co-op when a bycatch limit is met. One fear is that, since the non-co-op portion of the fishery is constructed to be a competitive fishery, participants in that fishery could fish irrationally. Because of this irrational behavior, there is a risk of a disaster tow, which could take a substantial portion of the sector or fishery allocation of a constraining bycatch limit species. In this event, the fear is that the entire fishery would turn into an Olympic fishery via a race for bycatch. To address the likelihood of this alternative, we consider the likely response of the co-op fishery in the event of a non-co-op fishery disaster tow and assess whether the most likely response from the co-ops is to continue fishing collaboratively, or whether the most likely response is to engage in an Olympic fishery.[85]

Theoretically, one could address this question in a manner that is similar to a prisoner's dilemma where the potential reward that one individual faces depends on the actions of another. However, in order to construct that framework, the outcomes of making each decision must be known. In this case, we do not know the outcome associated with making the decision to engage in an Olympic fishery or to fish collaboratively. Therefore, we cannot construct a model to show whether a race-for-fish would ensue or whether co-ops would work collaboratively in the event of a non-co-op fishery disaster tow. However, we do have some empirical information from the Pacific whiting fisheries that suggests a certain response to these conditions.

During the 2005 fishery, there was a disaster tow of canary rockfish in the whiting fishery that put Pacific whiting fishing opportunities at risk for the remainder of the year. The response of the whiting fishery was to attempt fishing in a way that reduced bycatch so that the whiting OY could be attained. The catcher-processor cooperative was maintained, and the whiting fishery continued throughout the year with the three sectors taking all, or the majority of, their whiting allocation. This suggests that collaborative behavior can occur within the whiting fishery under conditions similar to a potential disaster tow in a non-co-op fishery. Furthermore, since the mothership and shore-based sectors of the whiting fishery are competitive fisheries under Alternative 1 conditions (as would be the case in a non-co-op fishery), this suggests that participants in a non-co-op fishery may also work collaboratively to avoid bycatch, even though they will be in competition among themselves for the whiting resource. On the other hand, experience in the 2007 fishery suggests that under conditions that are too constraining, fishermen will begin fishing in an Olympic manner because of the race for bycatch. This empirical information suggests that the likelihood of an Olympic fishery occurring because of a disaster tow in the non-co-op fishery depends on the magnitude of the disaster tow relative to the bycatch cap. If the disaster tow is relatively large, fishermen may not believe that collaborative behavior will be successful in avoiding those species and may, therefore, engage in behavior that is similar to a race for fish. However, if the disaster tow is not large relative to the overall bycatch cap, then fishermen may continue fishing collaboratively.

In an IFQ fishery, some have hypothesized that a race for fish via a race for bycatch could ensue as well. The argument is that because of the low availability of quota for low OY species, fishermen may not be able to find or afford to purchase QPs if they have a disaster tow that puts them into a deficit. If fishermen do not cover their deficit, yet NMFS closes all or a portion of the fishery upon attainment of

[85] Another issue that may generate Olympic fishery conditions is the level at which bycatch is managed in the whiting sectors—either at the fishery, sector, or co-op level. This issue is closely related to the size-of-group issue discussed in previous sections and whether collaboration can be successful if groups become too large. We address this issue in the Alternatives instead of addressing it here.

the allocation, then this would essentially short-change or preempt someone. Under these conditions, the actions of one harvester can impact another harvester, and this begins to break down one of the necessary conditions for harvesters to fish rationally. Under this condition, the response of harvesters could be to fish earlier in the year to minimize the risk of being preempted by such an event. Under the most extreme example, this could turn into an Olympic fishery because of the fear of preemption over bycatch. Unfortunately, empirical information does not exist in the nonwhiting fishery that would suggest one response over the other; however, in this example, the response is likely to depend on the ability of harvesters to work collaboratively.

In summary, some empirical evidence suggests that harvesters in the whiting fishery will continue to work collaboratively among themselves (i.e., fish rationally) even if a disaster tow occurs in a fishery with a collective bycatch limit. Furthermore, experience in the fishery suggests that non-co-op fishermen may collaborate with other harvesters to successfully avoid bycatch, even though they are fishing competitively for whiting. At some level, however, harvesters may not believe that such collaborative behavior will be successful in avoiding and managing bycatch, and, under this alternative, harvesters may begin to act competitively. Unfortunately, information does not exist in the nonwhiting fishery that would help inform the likely reaction that harvesters in this sector would have disaster tow events. Furthermore, it is uncertain whether empirical evidence from the whiting fishery can be extended to the nonwhiting fishery, because many have argued that substantial differences exist between the two fisheries, and, therefore, substantial differences likely exist between the culture of the two sectors and the relationships that harvesters in each sector have between themselves. Regardless, since a disaster tow in the nonwhiting fishery will create a fishery-wide concern, the likely success of harvesters in the nonwhiting fishery continuing to fish rationally in such an event is likely to require collaboration in some fashion.

4.3.3.2 Summary Comparison of Harvest Cooperatives and Individual Fishing Quota Systems in the West Coast Trawl Rationalization Process

Figure 4-4 illustrates a spectrum outlining some of the various factors determining whether a harvest cooperative system may be appropriate for a fishery, or whether an IFQ system may be appropriate for a fishery.

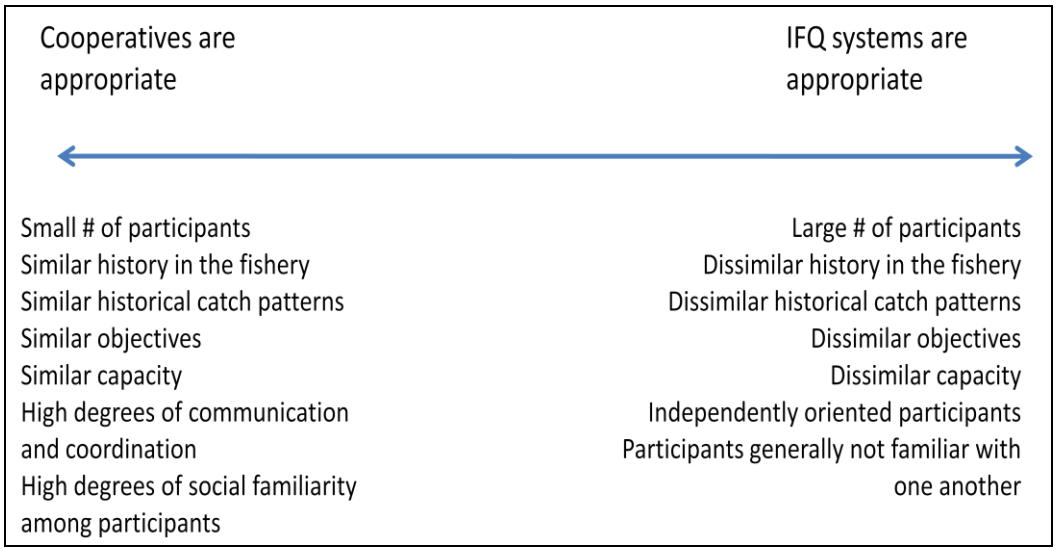


Figure 4-4. Comparison of factors favoring co-ops versus IFQs.

The alternatives for the various sectors of the west coast trawl fishery fall at different places in the spectrum described above, as illustrated in Figure 4-5. The cooperative alternative for the catcher-processor portion of the fishery can be described as a relatively pure cooperative model. In the catcher-processor cooperative alternative, the sector allocation is maintained, and the only tool put in place is a LE permit for the catcher-processor sector (which is an extension of measures put in place through Amendment 15). The mothership sector cooperative alternative is somewhat of a hybrid between a cooperative and an IFQ system. In the mothership sector cooperative alternative, MS(CV) permits are allocated a portion of the mothership sector allocation. This was done as it is largely believed that the catcher vessels in the mothership sector would not be able to arrive at a resource sharing arrangement on their own. In order to foster the creation of cooperatives, the mothership sector cooperative alternative calls for the Council to solve the resource sharing dispute and allocate portions of the mothership sector allocation to MS(CV) permits. The shoreside IFQ alternatives are close to what may be considered to be a pure IFQ program. In this alternative, shoreside permit holders are allocated highly divisible shares of the shoreside trawl groundfish allocation. These permit holders are expected to operate largely independently of one another and are expected to rely heavily on market-based mechanisms to transfer QSs. However, harvesters in this fishery are likely to have to engage in some types of collective-minded behavior to solve weak stock management issues. Therefore, while the shoreside IFQ alternative is close to a pure IFQ model, the fact that some collective actions may be necessary in this fishery makes it not quite so.

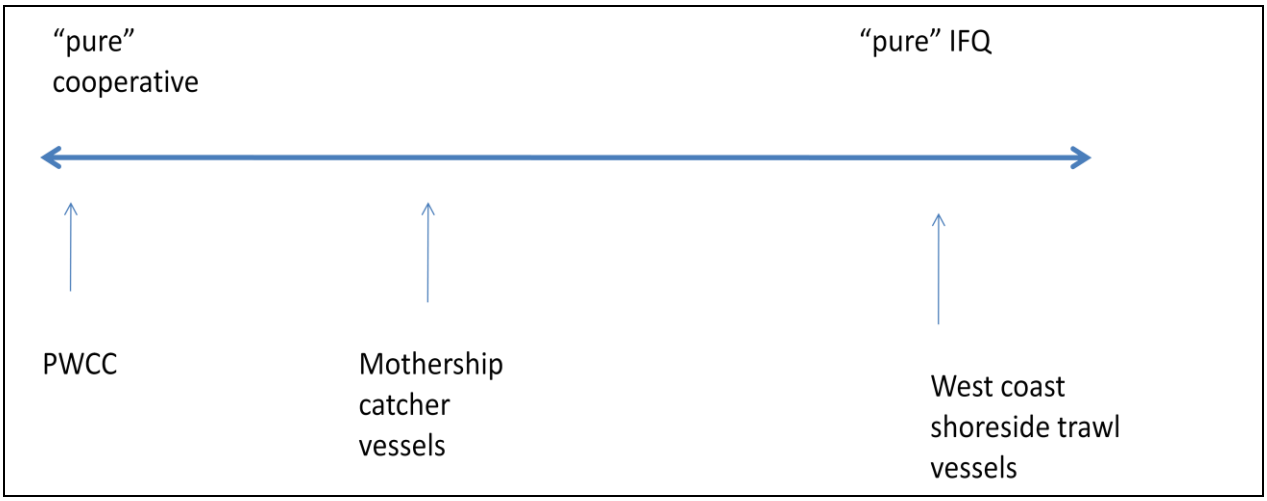


Figure 4-5. West coast trawl fisheries on co-op/IFQ continuum.

4.4 Ex-vessel Price Negotiations in a Rationalized Trawl Fishery

Through the implementation of a system of harvest privileges, it is argued that profits will accrue, or be enhanced, for participants in a fishery. Several reasons for such profitability exist, including consolidation of harvesting activity and improvements in the quality of harvested fish. Such changes reduce the cost of engaging in fishery activities and increase the value of harvested fish. Despite its advantages, relatively few fisheries have implemented IFQs or similar rights-based management systems. Among the most important reasons are concerns over how profits in the fishery that accrue because of the implementation of IFQs are shared among participants in the fishery. One focus of such concerns deals with ex-vessel prices and the ability of harvesters or processors to set prices in their respective favor, thus acquiring much of the profit that accrues as a result of implementation of a rationalization program. The possibility of significant changes in bargaining power between harvesters

and processors over ex-vessel prices has been one focus of several recent studies, including Matulich et al. (1996), Matulich and Sever (1999), and Wilen (2007).

The effect of rationalization on ex-vessel price negotiations between harvesters and processors ultimately impacts the profitability of harvesting and processing operations. The degree of profitability associated with processing and harvesting operations will directly influence the value of capital assets associated with fishing and processing. In other words, the value of a capital asset is a function of the profit generated by that asset. Therefore, when considering the influence of rationalization on ex-vessel prices paid by processors and received by harvesters, it is appropriate to consider the secondary effects those changes have on the value of fishing and processing assets.

Implied in this section is that either harvesters or processors hold the QSs necessary for prosecuting fishery activities and that they are negotiating with one another over ex-vessel prices[86] as a means of securing revenue from the fishery. On one hand, processors view ex-vessel prices as a cost that, if lowered, could improve the revenue they generate from processing activity. On the other hand, harvesters see ex-vessel prices as benefits that, if raised, could improve revenue generated from harvesting activity. If a third party held the QSs, both harvesters and processors may be negotiating with that third party, and the outcome on profits to harvesters and processors may be vastly different from the outcome described in this section.

The expectation is that this program will lead to increased profits in the harvesting and processing components of this fishery. Whether harvesters, processors, or both will accrue these profits will depend, among other things, on how ex-vessel prices are determined. Ex-vessel prices are determined by the relative "bargaining" power of the two groups. In competitive circumstances, harvesters seek to sell to those processors who offer the highest prices, while processors seek to buy from harvesters who are willing to receive the lowest prices.

Based on these and other factors, this process will generate some equilibrium market price based on the relative bargaining strength of harvesters and processors. This equilibrium is strongly influenced by the cost structures of harvesters and processors, the number of harvesters and processors, the ability of these groups to act collectively or in concert, the overall demand for fish, and the total amount of fish that can be caught—the OYs and the trip limits designed to keep harvests below or at these OYs and encourage a year-round fishery. With the imposition of QSs, this equilibrium changes as new factors are being added to the profit equations of the harvesters and processors—the costs and revenues associated with obtaining the right to harvest the fish associated with the quota shares. In this system, to harvest the fish, participants must own, lease, or buy QSs rather than simply obtain a limited entry permit, trawl under the trip limits. Participants must also find a processor or buyer for the harvested fish. The holder of QSs can now put up a specific amount of fish for bid and, thus, determine when and who harvests the fish (and possibly where and how).

Economic theory suggests that the holder of QSs should be able to realize all or a large proportion of the profits associated with harvesting and processing activities because the participant will be seeking the highest bidder for his QS, unless it makes more financial sense to harvest his own QSs. QS owners will undertake short-term and long-term analyses of their options that will take into account estimated profit levels of current and future buyers of the quota shares, just as happens with other financial assets like real estate or shares of company stocks. The initial receivers of these QSs may reap most of the benefits of this program as they did not have to pay for the QSs. Once the QSs are allocated, other factors may influence the resulting prices. For example, if harvesters were to hold all the QSs, they could bid up ex-vessel prices because their bargaining position relative to processors has now been strengthened.

[86] Ex-vessel prices are the prices paid by processors to harvesters for a pound of fish at the dock.

However, harvesters would not be able to bid up ex-vessel prices beyond the point that cost of purchasing fish exceeds the costs of the processor's costs of operations, as the processor would be operating at a loss.

If processors receive some QSs, the harvesters' bargaining position would be weakened, as now processors have some say in who harvests the fish and when the fish is harvested. For example, rather than purchase fish from an independent harvester, the processor may choose to have his quota shares harvested by a company vessel, thus strengthening the processor's bargaining power with the independent harvesters. Because quantifying the current levels of bargaining power between processors and harvesters is not possible, it is unclear how to allocate quota shares to these groups in ways to create balanced negotiation power between harvesters and processors.

Harvest cooperatives with processor linkages have the effect of creating two powerful entities involved in negotiation. Literature has described this relationship as a "bilateral monopoly" as it relates to bargaining between the harvester and processor tied to one another through the linkage provision. Neither the harvester nor the processor can walk away from the negotiations and act independently in the short term. The harvester cannot prosecute fishing activities without a simultaneous action on the part of the processor. Inversely, the processor cannot engage in processing activities without a simultaneous action on the part of the harvester. In this case, both entities are in a strong position in the negotiation, and profits become shared between both entities. It is not clear whether profits would be shared equally.

In order for harvesters to be able to acquire all profits from processors, harvesters must have a clear advantage in negotiations over processors after the fishery is rationalized. During public scoping and public testimony, several comments were made stating the belief that processors may retain negotiation power over ex-vessel prices even if harvesters receive all of the QSs. In order for harvesters to be able to leverage all profits from processors, several conditions would be necessary, including the presence of a large number of buyers, and a cost of new entry into the processing sector that is minimal, or close to zero. Clearly many industries do not meet these conditions, and information is available that indicates the processing sector on the west coast may be no exception. Several factors indicate this point including 1) a limited number of buyers, 2) large costs of entering into the processing aspect of the industry, and 3) a relative concentration of production into a small number of processors. Based on this information, we assess the likelihood and degree of relative negotiation power between harvesters and processors in a rationalized fishery based on empirical evidence as it pertains to the harvesting and processing sectors on the west coast.

The information and analysis in this section is based on an assessment of the structure of the existing harvesting and processing sector, empirical evidence of competition in the harvesting and processing sectors, and application of economic theory.

4.4.1 Pacific Whiting Trawl Industry

The Pacific whiting resource competes in a global whitefish market and with other similar products such as Alaska pollock and blue whiting. In this market, whiting producers can be considered "price takers," meaning they generally do not have influence over the price they receive for final products. Pacific whiting is often converted to surimi where it is used to form products such as imitation crab. Increasingly, however, Pacific whiting is sold in headed and gutted or fillet product forms to places like eastern Europe and India. Many harvesters in the Pacific whiting fishery also participate in the Alaska pollock fishery. These vessels can be described as being relatively large trawl catcher vessels with an average capacity that exceeds the capacity of those vessels engaged in nonwhiting activities. Several

vessels in this fishery have reported hold capacities that range from 350,000 to 500,000 lb. Harvesters in this sector use midwater trawl gear and harvest relatively large volumes of whiting in a trip. Such volume is necessary to justify harvest activity because whiting have a relatively low price per pound (less than $0.10 in recent years).

Participation in the harvesting portion of this fishery recently increased, leading to the Council's action to implement Amendment 15 to the groundfish FMP, which effectively established LE for the Pacific whiting fishery. The harvesting of Pacific whiting occurs in an Olympic fishery. Although capacity has been limited by the implementation of Amendment 15, harvesters in this sector still compete with one another for a common quota. While harvesters can legally coordinate their bargaining activities over ex-vessel prices through the Fishermen's Collective Marketing Act, forming and maintaining such relationships are difficult in a competitive, Olympic-style fishery. In such a structure, one harvester can "cheat" and go fishing; when this occurs, that harvester is having a direct effect on the harvest available to other vessels in that fishery. Such a possibility makes it very difficult to maintain relationships intended to enable negotiation with processors over ex-vessel prices. This inherently makes the harvesting portion of this fishery a highly competitive sector, and such competition would tend to lead to lower ex-vessel prices for harvesters than would be the case if harvesters collectively negotiated higher prices. Anecdotal information suggests that ex-vessel price negotiations in the mothership portion of the whiting fishery are influenced by activities in the Bering Sea pollock fishery. Those harvesters who participate in the mothership portion of the Pacific whiting fishery often maintain relationships that exist in the Bering Sea pollock fishery. Revenue generated through mothership fishing operations is often subject to profit-sharing arrangements between the mothership and harvester entity, though at other times price contracts are specified prior to the start of the season (B. Paine, pers. comm., Executive Director United Catcher Boats, May 2008).

Shoreside processors of Pacific whiting utilize equipment that can be described as relatively specialized. The processing of Pacific whiting is highly mechanized in order to handle large volumes, and such mechanization is possible because the whiting fishery targets a single species which is relatively uniform in size and shape compared to harvest in the nonwhiting fishery. Pacific whiting processing can involve many steps that require several pieces of mechanized equipment: head and gut machines, fillet machines, de-boning machines, large tanks for leaching, and freezing equipment, among others. From a Pacific coast perspective, the Pacific whiting fishery has grown in importance in recent years. The price per pound of whiting has improved, and, as a result, an increasing interest has developed among harvesters and processors alike. In the processing sector, interest has grown as evidenced by continued development of Pacific whiting processing capacity in ports like Westport, Washington, and Astoria, Oregon.

Several companies process shoreside whiting, though five companies have handled most the volume harvested between 2003 and 2007. Two companies (Ocean Gold and Pacific) identify themselves as "strategic partners," though it is not immediately clear what this identified relationship entails.[87] Three other companies (Trident, Jessie's of Ilwaco, and Ocean Beauty) round out the remaining top five companies by volume in recent years. Three of these companies (Ocean Beauty, Pacific Seafood, and Trident) also participate in North Pacific fisheries such as Alaska pollock, Pacific halibut, and salmon. Entry by other companies has occurred in recent years, but that entry has been somewhat sporadic with companies like Da Yang, Del Mar, and Bornstein's handling whiting in a few of the last several years, with much of that new interest beginning recently in 2006. This information suggests that entry into the Pacific whiting processing sector is possible and does indeed occur. The possibility of new entry would tend to make a sector competitive. In a competitive structure where processing companies compete with one another for harvest, the company bidding the highest ex-vessel price would theoretically receive all,

[87] Ocean Gold's website lists Pacific Seafood as a strategic partner.

or the majority, of the harvested resource. Empirically speaking, capacity will restrict the processing ability of a company; nevertheless, the shoreside whiting processing industry appears to have aspects of competition in the purchasing of fish from harvesters. This is verified to some degree by the following figure that illustrates variation in export price and ex-vessel price. The fact that there appears to be a relationship between the two—in particular that increases in export price are paralleled by an increase in ex-vessel price—suggests that harvesters are able to realize benefits from improvements in the wholesale market for Pacific whiting. In other words, this information suggests that competition exists between processors for deliveries from harvesters. If competition among processors did not exist, it is reasonable to expect that export price may increase while ex-vessel prices remains flat. Identifying these ex-vessel and export price relationships in the mothership and nonwhiting portions of the fishery is not possible due to data limitations.

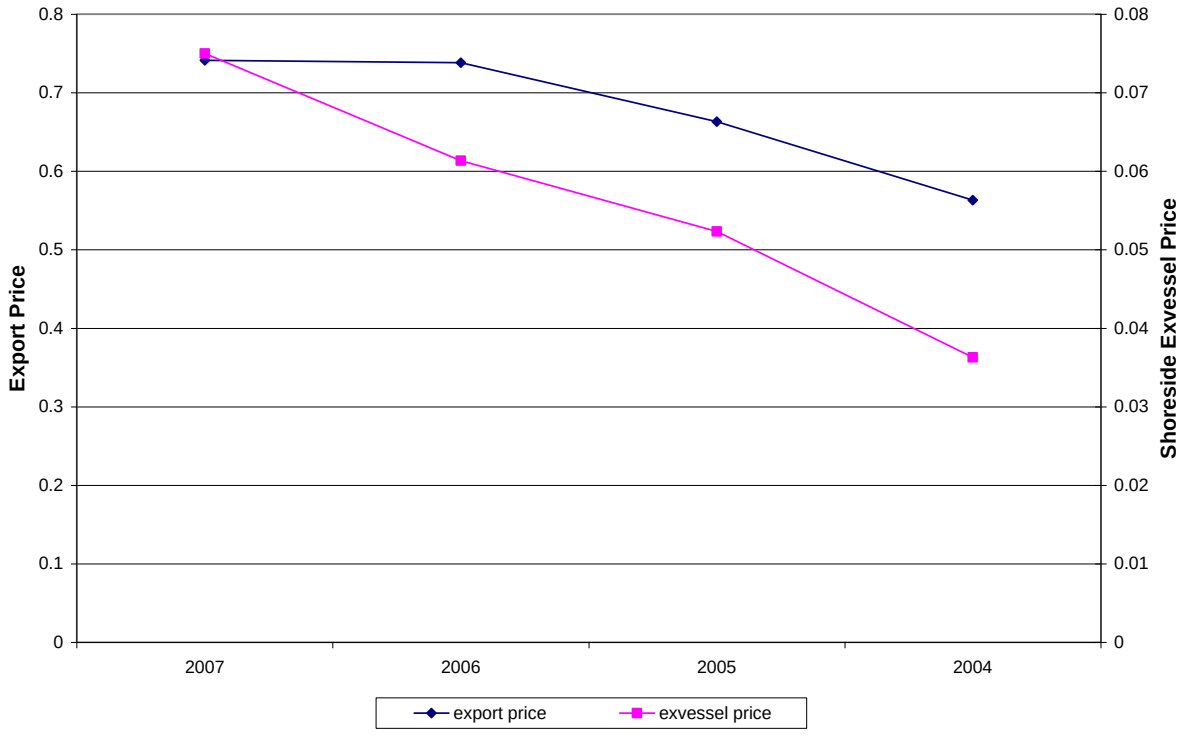


Figure 4-6. Variation in hake export price and ex-vessel price.

Table 4-8 is intended to be a representative set of information describing the companies that process shoreside whiting, the location where those companies process shoreside whiting, and the ports from which whiting is purchased.

Table 4-8. Shoreside whiting processors.

Processing Company	Processed City	Buyer City
Bornsteins	Astoria/Warrenton	Astoria
Da Yang	Astoria/Warrenton	Astoria
Del Mar/Olde Port	Astoria/Warrenton	Astoria
Jessies Of Ilwaco	Ilwaco	Ilwaco Westport Crescent City
Ocean Beauty	Newport	Newport
Ocean Gold	Westport	Westport
Oregon Brand	Charleston (Coos Bay)	Charleston (Coos Bay)
Pacific Seafood	Astoria/Warrenton	Astoria
	Charleston (Coos Bay)	Charleston (Coos Bay)
	Eureka	Eureka
	Newport	Charleston (Coos Bay)
		Newport
Trident	Newport	Newport
W F Alber	San Francisco/Ilwaco	Crescent City

Vertical integration in the shoreside whiting fishery is somewhat less than in the mothership and nonwhiting sectors. Three processing companies currently (as of January 2008) hold permits that participate in the whiting fishery; however, rationalization may have the effect of lessening the degree of vertical integration in the shoreside whiting sector. Only one permit held by shoreside processing companies would stand to receive whiting quota that could be described as sufficient for engaging in directed whiting activity. Over time, processing companies may acquire additional shoreside whiting quota depending on the accumulation limits. Vertical integration is important for determining the effect on price negotiation, because it essentially acts as an allocation to processors, though it is specific to certain processors that have vertically integrated.

The mothership portion of the whiting fishery is characterized by a handful of firms that operate motherships. Three of the four largest firms have participated in mothership operations in every year since 1995. Other firms have participated sporadically during the 1995 to 2007 period. The number of motherships in the sector has ranged from eight to four depending on the year. Following the implementation of differential management between CPs and motherships in the at-sea fishery, the number of motherships has not exceeded six. The lowest years of participation occurred during the 2002 to 2004 period, which experienced relatively low prices for whiting. Table 4-9 illustrates the mothership company and associated vessel operating during specific years.

Table 4-9. Mothership processors' company name, vessel name, and participation by year in the west coast Pacific whiting fishery.

Company	Vessel Name	Year												
		95	96	97	98	99	00	01	02	03	04	05	06	07
All Alaskan	Heather Sea	X												
	Saga Sea	X												
American Seafoods	American Dynasty		X											
	American Triumph		X											
	Ocean Rover	X	X	X	X	X	X	X	X	X	X	X	X	X
Arctic Storm	Arctic Fjord	X	X	X	X	X	X	X	X	X	X	X	X	X
	Arctic Storm	X	X	X	X	X	X	X	X	X	X	X	X	X
Peter Pan/ Nichiro	Golden Alaska	X	X	X	X	X	X							X
Premier Pacific	Ocean Phoenix	X	X	X	X	X	X	X				X	X	X
MV Savage Inc/ Cascade Fishing/ Suisan	Sea Fisher												X	
Supreme Alaska	Excellence	X	X	X	X	X	X	X	X	X	X	X	X	X

Vertical integration in the mothership sector is the largest relative to the other sectors. Based on available information, 10 LE permits that operate in the mothership sector are wholly or partially owned by four companies that operate motherships. This represents approximately 50 percent of the number of active mothership catcher vessels in any given year, and these permits stand to receive approximately 41 percent of the mothership sector allocation. Two companies have received more than 50 percent of their deliveries from affiliated catcher vessels over the 2003 to 2006 period, while the other two companies have received around 10 percent of their deliveries from their affiliated catcher vessels. This degree of vertical integration has important implications for negotiation between harvesters (those not vertically integrated) and motherships. Companies that own catcher vessels essentially pay themselves for catch from these vessels, making variations in ex-vessel price irrelevant. Vertical integration under a rationalized fishery will operate as if processors receive an initial allocation of quota.

In addition to the above factors, the structure of the existing fishery is an important element in determining the outcome of rationalization. The Pacific whiting fishery is generally considered to be an Olympic fishery, with a large amount of volume occurring over the course of several weeks. Such conditions generally lead to more processing and harvesting capital being utilized in the fishery than would be necessary if the fishery was spread out over a longer time. If the fishery were to occur over a longer time, less capital would be necessary, and this would tend to decrease the cost of engaging in Pacific whiting opportunities.

Olympic fishery conditions, like those in the whiting fishery, typically lead to high levels of competition among harvesters and processors alike. While harvesters can form bargaining arrangements through the Fishermen's Collective Marketing Act, which would allow them to hold out for favorable prices, the ability of these arrangements to be maintained over the long term is difficult because each harvester has a large incentive to cheat and go fishing. Under these conditions, it is likely that other harvesters will, in turn, go fishing, reducing the ability of these harvesters to negotiate prices. Rationalization should make it easier for harvesters to form and maintain bargaining arrangements.

4.4.2 Nonwhiting Trawl Industry

The nonwhiting portion of the fishery is a multi-species fishery with a focus on several types of soles, sablefish, and some rockfish. Other species were historically targeted in this fishery, but regulations have limited access to these stocks because of their association with depleted species. Harvesters in this sector primarily use bottom trawl gear on the continental shelf and slope and tend to have a lower capacity than Pacific whiting vessels. Harvest in this fishery has declined over the last decade, and inseason management of the fishery has become relatively unstable compared to previous decades. The reduction in harvest volume led to an erosion in the economic status of trawl harvesters and processors alike. This led to the implementation of a federal trawl vessel buyback intended to reduce harvest capacity in this fishery and improve the status of vessels remaining. There were 163 nonbuyback permits with some landings during the qualification period of 1994 to 2003, and 123 permits were active in 2006 with approximately $25 million in ex-vessel revenue.

In the shoreside processing industry, several plants have closed down over the past decade, leading to consolidation among shoreside processors and relatively fewer companies processing a greater percentage of the harvest. The harvest that occurs in this fishery is principally destined for fresh markets; therefore, little of the harvest is frozen. Harvesters and processors alike may focus primarily on this fishery or engage in this fishery part time while focusing on other seasonal fisheries like Pacific whiting and Dungeness crab. Opportunities in this fishery are intended to accommodate year-round harvesting and processing activity, which fills voids that exist between harvest opportunities in other seasonal fisheries, or otherwise offers a year-round source of employment (for those who specialize in the nonwhiting fishery). Harvesters and processors alike repeatedly indicate the importance of this year-round fishery for maintaining crew and processing labor.

Since harvest in this fishery is composed of several different species, which are primarily sold into a fresh market, processing activity is relatively labor intensive. Processing relies on relatively skilled personnel that manually head and gut and fillet species that are harvested by trawlers in this sector.

In order to foster the year-round goal of this fishery, regulations are created with the intention of spreading the harvest throughout the year. These management tools evolved into two-month catch limits, which effectively act as a two-month nontransferable quota for vessels in the fishery. Because of this two-month quota system, Olympic conditions do not exist in this fishery, and large pulses of harvest over a short time generally do not occur, except in cases where prolonged episodes of poor weather have restricted harvest opportunities. The two-month limit structure and elimination of Olympic fishery conditions make it possible for harvesters in this sector to collectively negotiate over ex-vessel prices with processors compared to harvesters in the whiting fishery. However, the ability for these negotiations to occur appears to be somewhat limited by the length of the two-month period. If harvesters strike for more than 60 days, they risk foregoing the harvest available to them during that two-month period. While managers may increase opportunities later in the year to make up for lost harvest, history has shown that often this is not possible because of time-sensitive interactions with rebuilding stocks and the fact that protecting rebuilding stocks often leads to a reduction in harvest opportunity for healthy stocks. This means that, while harvesters have a greater likelihood of collectively negotiating higher prices in the nonwhiting fishery, the ability to do so may break down quickly as the end of a two-month limit approaches.

In general, since Olympic conditions do not exist, capital in this fishery should be expected to be more in line with available harvest (compared to the whiting sector, which may have more capital than necessary); however, because of regulations, and due to the reduction in harvest volumes over the past decade, it is generally accepted that the harvesting sector remains overcapitalized. Indeed, research by Lian et al. (2008), indicates the nonwhiting trawl fleet may be overcapitalized by more than 50 percent.

It is unclear whether and to what degree the shoreside nonwhiting processing sector is overcapitalized, however, information from the 2001 Groundfish Harvest Specifications EA (PFMC 2001) indicated the number of fillet stations available at shoreside processors and the number of those fillet stations that were actively used. In 1997, approximately 83 percent of the available fillet stations were used, while in 2000, 51 percent were used. This information suggests that in 2000, the shoreside processing industry was overcapitalized by as much as 49 percent. However, because of recent consolidation in the processing industry, it may be reasonable to expect that this same degree of overcapitalization no longer exists (meaning the processing sector may be less overcapitalized than the harvesting sector). Nonetheless, it is generally accepted that excess capacity remains in the shoreside processing industry.

Based on available information, the processing sector for nonwhiting trawl groundfish is characterized by a relatively small number of processing companies processing most of the harvest. The three largest companies handle approximately 80 percent of the nonwhiting trawl landings, while the fourth through sixth largest companies handle just over 10 percent of the landings.

As indicated previously, a relatively small number of companies handle the majority of nonwhiting trawl volume. The plants operated by these companies acquire volume through satellite buying stations, as well as acquiring deliveries at their main processing center. This means that those companies handling most of the volume also cover a wide geographic area. This pattern may very well exist because of the need to acquire sufficient volume to justify plant operation, but also to hedge against fluctuations in landings at individual ports. Radtke and Davis (2000) provide additional insights into the structure of the shoreside processing industry and reasons for consolidation:

> Processing is being centralized to occur at plants in only a few regional commercial fisheries centers. The expense for equipment and refrigeration to meet new quality standards balanced against business risk makes it unlikely this trend will change.

Table 4-10 illustrates this information by showing the company engaged in processing of nonwhiting trawl groundfish, the city in which those fish are processed, and the port where those fish are purchased.

Table 4-10. Processors of nonwhiting trawl groundfish.

Processing Company	Processed City	Buyer City
Arrowac	Bellingham	Bellingham Bay
Bornstein	Astoria/Warrenton	Astoria
	Bellingham	Bellingham Bay Neah Bay
C - K FISH (out of business)	Blaine	Blaine
Caito	Fort Bragg	Fort Bragg San Francisco
	San Francisco	Bodega Bay San Francisco
Cal Shell	San Francisco	Bodega Bay
Central Coast	Atascadero	Morro Bay
Del Mar/Olde Port	Astoria/Warrenton	Astoria
	Avila	Avila Morro Bay
	Watsonville	Avila Eureka Morro Bay Moss Landing San Francisco
Fitz	Half Moon Bay	Princeton / Half Moon Bay

Processing Company	Processed City	Buyer City
Hallmark	Charleston (Coos Bay)	Brookings Charleston (Coos Bay) Newport
K Lyn	Charleston (Coos Bay)	Charleston (Coos Bay)
Morning Star	Half Moon Bay	Princeton / Half Moon Bay
Next Seafood	San Francisco	Moss Landing San Francisco
North Coast Fisheries	Santa Rosa	Bodega Bay Brookings Charleston (Coos Bay) Fort Bragg Moss Landing Oakland Princeton / Half Moon Bay
Oregon Brand	Charleston (Coos Bay)	Charleston (Coos Bay)
P & T Flannery	San Francisco	San Francisco
Pacific	Astoria/Warrenton	Aberdeen Astoria Garibaldi (Tillamook) Neah Bay Port Angeles Westport
	Charleston (Coos Bay)	Charleston (Coos Bay) Brookings
	Eureka	Bodega Bay Brookings Crescent City Eureka Fort Bragg San Francisco
	Newport	Charleston (Coos Bay) Garibaldi (Tillamook) Newport
	San Francisco	San Francisco
Pemberton Fish	El Granada	China Camp Princeton / Half Moon Bay
Royal Seafoods	Monterey	Monterey
Starvin Marvins	Charleston (Coos Bay)	Charleston (Coos Bay)
Three Captains	Half Moon Bay	Princeton / Half Moon Bay Santa Cruz Vallejo
W F Alber	San Francisco	Crescent City Dillon Beach Morro Bay San Francisco

Vertical integration in the nonwhiting industry exists, though not to the same degree as in the mothership sector. Available data at the time of this analysis indicate that 17 permits were held by eight shoreside processors, but 1 permit may be appropriately classified as a whiting permit because of the type of QSs that would be allocated to it. These 17 permits represent 14 to 17 percent of the number of active permits in the fishery in recent years. This means that the nonwhiting sector has a moderate

degree of vertical integration if compared to shoreside whiting (less than nonwhiting) and the mothership sector (more than nonwhiting).

4.4.3 Factors Influencing Negotiations in the Harvesting and Processing Sectors

The amount of competition between processors in a sector and between harvesters in a sector is an important element in determining the effect rationalization may have on ex-vessel prices. A high degree of competition across a large number of processors would tend to favor harvesters if harvesters own QSs. This would occur because of processors bidding among themselves for the catch that may come from harvesters. The more processors, the more the bidding is likely to result in higher ex-vessel prices. Alternatively, fewer processors are likely to result in less bidding and, therefore, play less into the hands of harvesters.

The degree of competition among harvesters under Alternative 1 will have implications for what would be expected to occur after rationalization. Harvesters who are able to form bargaining groups with relative ease under Alternative 1 may not have that ability enhanced to much of a degree under rationalized fishery conditions. Alternatively, harvesters who currently are unable to find much success in forming bargaining groups under Alternative 1 are likely to have the ability to do so enhanced to a relatively large degree under rationalized conditions. This is because in a rationalized fishery, the actions of one harvester do not affect the catch available to another; therefore, the impact of one harvester in a bargaining group cheating does not have the same effect as would be the case in a derby fishery.

Negotiation factors in the nonwhiting trawl harvesting and processing sectors

- Consolidation in the nonwhiting processing sector appears to have been the consistent pattern over the past several years. This pattern appears to indicate consolidation into fewer geographic locations, as well as consolidation at an overall scale. Astoria has become increasingly more important as a regional center of processing and harvesting activity in the Pacific Northwest. Consolidation into fewer regional centers may indicate less competition among companies at a regional level.

- While much consolidation has occurred in other areas, some new investment has been made in the processing industry near Astoria. One company recently made investments in a new facility in Astoria designed to handle groundfish, salmon, sardines, albacore tuna, Dungeness crab, and shrimp.

- Based on results from Lian et al. (2008), harvesters in the nonwhiting sector generate no economic profit from harvest activity. While it is unclear whether processors generate any economic profit from processing of nonwhiting groundfish, it is clear that if profits exist in the industry, harvesters are not realizing those profits. This suggests that, if profits exist in the harvesting and processing of nonwhiting groundfish, harvesters lack much bargaining power in negotiations over ex-vessel prices with processors.

- Harvesters in the nonwhiting trawl sector do not operate in Olympic conditions; instead they operate under a system of two-month cumulative limits. Such conditions make it easier and more likely for harvesters to form negotiation agreements to bargain with processors over ex-vessel prices. This is because if one harvester in a negotiation arrangement cheats, it does not influence the harvest available to others. The catch available to each harvester is only available to each harvester during a two-month period. In spite of this structure, harvesters apparently

make no economic profit, meaning that they have apparently not leveraged any profits from processors (assuming profits are being generated by processors).

Negotiation factors in the shoreside whiting trawl harvesting and processing sectors

- As indicated above, new processing firms have entered the shoreside whiting industry in recent years. Much of this recent interest has focused around the Astoria area, though several processors in California have recently made attempts to process shoreside whiting. Such new interest and entrance into the shoreside whiting industry may be indicators of competition.

- Participation in the shoreside whiting fishery has increased in recent years, leading to the passage of the Groundfish FMP Amendment 15 to limit access to the fishery. Such increases in the number of participants suggest that profits are available to harvesters in the shoreside whiting fishery.

- The shoreside whiting fishery is generally considered to be an Olympic fishery where harvesters compete among one another for the available harvest. Such conditions make it more difficult for harvesters to form and maintain negotiation relationships designed to leverage higher ex-vessel prices from processors. This type of structure generally leads to high degrees of competition among individual harvesters.

Negotiation factors in the mothership whiting trawl harvesting and processing sectors

- Information indicates one new mothership entered the fishery in recent years, but did not participate again in 2007. Three catcher vessels recorded deliveries during the 2005 to 2007 period that had not recorded deliveries during a previous period. This new entry suggests that profits are generated in mothership sector.

- The degree of vertical integration in the mothership sector appears to be relatively large compared to other sectors. Vertical integration reduces the need for motherships to bid up ex-vessel prices to receive catch from independent harvesters, because they can receive volume from their company-owned catcher vessels and hold out against independent harvesters.

- Anecdotal information suggests that many of the relationships in the mothership sector are extensions of relationships that exist between entities in the Bering Sea pollock fishery. Industry representatives have indicated that profit-sharing arrangements exist between motherships and catcher vessels. It is difficult to determine the effect these relationship extensions have; however, it may be reasonable to expect that the effect rationalization has on relationships in the mothership sector may be minimized to some degree by the effect Bering Sea pollock has on the sector.

4.4.4 Implications of Existing Negotiation Factors on Ex-vessel Prices in a Rationalized Fishery

The information described above suggests that rationalization may have a larger effect on ex-vessel price relationships in the shoreside whiting sector than in the nonwhiting sector. This is because rationalization will make it easier for harvesters in the whiting fishery to form bargaining groups useful for negotiating with processors over ex-vessel prices. In addition, rationalization may have the effect of lessening the degree of vertical integration in the shoreside whiting sector because of the allocation

formula, effectively reducing the harvest controlled by processing industries (based on ownership data dated January 2007).

Ex-vessel prices in the nonwhiting sector may not be impacted to the same degree because the current two-month, cumulative limits structure of the fishery makes it relatively easy for negotiating groups to form among harvesters in this sector. Under rationalized fishery conditions, the ability for these harvesters to form negotiation groups may not be enhanced to the same degree as harvesters in the whiting sector. Nevertheless, if harvesters receive all of the initial allocation of QSs, there is reason to expect their negotiation power to increase. The fact that the two-month limit structure is replaced with quota that is available for a year extends the time horizon harvesters have to negotiate over prices without losing available fishing opportunity. However, new entry by nonwhiting processors may occur if harvest volumes or the type of species delivered change in the nonwhiting sector, and this may increase the degree of competition among processors of nonwhiting trawl groundfish, expanding the negotiation power of harvesters.

These factors have further implications for the allocation of quota among harvesters and processors in the shoreside whiting and nonwhiting trawl fisheries. The fact that it appears rationalization may influence ex-vessel prices in the shoreside whiting fishery more than in the nonwhiting fishery means that allocating 100 percent of the QSs to harvesters in the whiting sector may increase ex-vessel prices relatively more in that sector than if 100 percent of the QSs is allocated to harvesters in the nonwhiting sector. However, these implications depend on there being profits in the fishery to negotiate over in the first place. If economic profits are not being realized, then there is no room for ex-vessel price negotiation, and, therefore, no reason to expect an increase in ex-vessel prices.

The mothership sector is relatively more vertically integrated compared to the shoreside whiting and nonwhiting sectors, effectively meaning that mothership companies stand to receive QSs regardless of whether an explicit allocation is made to processors. Furthermore, information suggests that ex-vessel price relations between motherships and catcher vessels are influenced to a large degree by activities in the Bering Sea pollock fishery. This is evidenced by the profit-sharing arrangements that apparently exist between harvesters and motherships (which is an outcome possible under rationalization). However, anecdotal information indicates that negotiations do occur in some instances between harvesters and motherships that involve negotiating price contracts. In these instances, rationalization may influence these negotiations by perhaps folding them into a system of profit-sharing arrangements, or by influencing the negotiation power between harvesters and motherships. It is not immediately clear how much these negotiations may be influenced by rationalization, but a system with processor linkages will likely lead to a different outcome than a system of IFQs with an initial allocation to processors.

For those harvesters and motherships that currently negotiate prices in the mothership fishery, rationalization may lead to changes in the way profits and prices are negotiated. A system of IFQs imposed on the mothership sector will likely lead to a similar outcome as in the shoreside whiting fishery where an allocation to permits will tend to favor the negotiation stance of harvesters while negotiating over ex-vessel prices. However, the fact that more vertical integration exists in the mothership sector means that ex-vessel prices may not change as favorably toward the harvesters if IFQ is allocated to harvesters. If IFQ is allocated to motherships, it will tend to increase the negotiating stance of those motherships. A system of harvest cooperatives with linkages may lead to a different outcome. Under a cooperative system with mothership linkages, the operation of the harvester and mothership should begin to take on the operational characteristics of a vertically integrated firm where the goals of both the harvester and mothership become more aligned, largely out of necessity. The harvester will have to take into account the needs of the mothership and vice versa. Under this type of structure, it is more likely that a profit-sharing arrangement will develop between harvesters and processors.

Table 4-11. Effect of rationalization on ex-vessel prices if allocation made to permits.

Sector	Effect
Shoreside whiting	Relatively large: Shifting from an Olympic fishery to a rationalized fishery should allow harvesters to more easily form and sustain groups for negotiating ex-vessel prices. In addition, rationalization will have the effect of reducing vertical integration that currently exists because of the allocation formula.
Nonwhiting	Relatively small: Bargaining power of harvesters could change, but not as substantially as in shoreside whiting because they currently have two-month quotas that make it relatively easy for bargaining groups to form.
Mothership whiting	Relatively small and/or case-dependent: May have no effect in cases where relationships between harvesters and motherships are extensions of the BSAI pollock fishery. May have an effect in cases where harvesters and motherships do not have relationships from BSAI pollock activity. In these cases, the effect may be similar to that in shoreside whiting because of the elimination of derby fishery and formation of bargaining groups among harvesters. However, the effect is likely to be lower than in shoreside whiting because of the degree of vertical integration in this sector.

4.5 General Effects on Environmental Components Where No Significant Impacts are Anticipated

During scoping, a wide range of groups and resources were identified that could potentially be affected by trawl rationalization. These were incorporated into the Stage 1 Document, which was a proposed analytical framework and an EIS outline released in September 2006 (NEI 2006) as separate sections of Chapter 4 that would be evaluated in detail. Subsequently, the analytical team reviewed the analytical framework and outline and made a variety of revisions. Through this process, it became apparent that it is very unlikely that these groups or resources would be significantly affected by the proposed action. Furthermore, as with some of the environmental components that are evaluated in more detail because adverse effects are more likely (input suppliers, labor), only broad effects can be identified. In those cases, only Alternative 1 and the overall implementation of a trawl rationalization program can be compared; the alternatives do not reveal noticeable differences in terms of anticipated impacts. This is also the case with the resource components discussed in this section.

The following sections qualitatively describe potential effects to each component. Since only broad-level effects can be discerned, any comparisons are between Alternative 1 and the implementation of a trawl rationalization program incorporating any combination of the program features described in Chapter 2. Some attention is also given to the reasons to expect that the impacts will be modest and, therefore, unlikely to be found significant.

4.5.1 Fisheries Managed by Adjacent Fishery Management Councils

Fisheries managed by adjacent Councils include those under the jurisdiction of the WPFMC and the NPFMC. Vessels that participate in west coast groundfish fisheries also commonly participate in North Pacific fisheries. Participation by west coast groundfish vessels in Western Pacific fisheries is relatively uncommon for a variety of reasons, including the fact that species, gear types, and necessary capital can be quite different. Therefore, changes in west coast groundfish fishery management are not expected to affect Western Pacific fisheries. Some effect may be felt in North Pacific fisheries, with the most likely impact being on the Bering Sea pollock fishery and the GOA rockfish fishery. Many participants in the Pacific whiting fishery also participate in the Bering Sea pollock fishery and the GOA rockfish fishery. Rationalization of the Pacific whiting fishery may lead to a change in the timing and participation within

the Pacific whiting fishery, which may, in turn, affect the timing and participation in the pollock fishery and the GOA rockfish fishery. However, because both the Bering Sea pollock and GOA rockfish fisheries are rationalized (as are other North Pacific fisheries that may have some limited overlap with west coast fisheries) the effect of rationalizing the west coast groundfish fishery is not expected to have adverse consequences to North Pacific fisheries. Common concerns over rationalization's effect on other fisheries include the potential for effort spillover to occur, resulting in increased competition for fishery resources. Because many North Pacific fisheries are rationalized, it is not possible for effort spillover to result in increased competition over fishery resources. Therefore, rationalization of the west coast groundfish fishery is not expected to have any appreciable effect on fisheries managed by adjacent Councils.

4.5.2 Buyers and Processors that do not Purchase Trawl-caught Groundfish

Because they do not purchase trawl-caught groundfish, these buyers and processors will not be directly affected by the proposed action. Three types of indirect effects are described below.

First, the distribution of IFQ to processors could increase barriers to entry to the trawl groundfish processing sector for those processors who want to diversify (or switch) into that sector. They would not benefit from the windfall of initial allocation and would have to pay for all of the IFQ they may wish to acquire. It would be difficult to enter the sector without purchasing IFQ because they would likely have to pay higher ex-vessel prices than those that could use IFQ as leverage in price negotiations.

Second, if trawl-caught groundfish buyers and processors increase their market power and consolidate, they may subsequently expand the scope of operations (by horizontally integrating) and enter markets for nontrawl-caught fish. If they have more access to capital and operate more efficiently they would be able to out-compete existing operators, either forcing them out of business or purchasing their operations. More likely, it would be a combination of these two strategies, where they enter the market, and by out-competing, make existing operators sell out for a price below their opportunity cost.

Third, the overall viability of some west coast ports for fishing-related activities could be compromised by consolidation. Groundfish trawl vessels could relocate operations to fewer ports that offer advantages in terms of distance from favored fishing grounds and infrastructure. This could have a ripple effect whereby processors and input suppliers relocate or go out of business. If this, in turn, makes it difficult for other fishing vessels to use the port, even those processors who do not buy from the groundfish trawl fleet could be affected. This can be related to the concept of economies of agglomeration whereby related businesses cluster in a geographic area because of the positive externalities of having input suppliers, skilled labor, and other factors of production collocated. Such effects may be modest, however, because most west coast ports are small, so the attendant scale of agglomeration is limited.

4.5.3 Recreational Harvesters

Recreational harvesters are unlikely to experience discernable effects from trawl rationalization. Trawl rationalization by itself will not affect fishing opportunity, because the allocation of harvest opportunity to the trawl sector (and potentially between the nontrawl sectors) is addressed through separate actions. One action establishes fixed allocations between trawl and nontrawl sectors. A draft NEPA document has been prepared evaluating the impacts of these intersector allocations (PFMC and NMFS 2008). A second, ongoing process, biennial harvest specifications, will continue to be used to establish short-term allocations for severely constraining overfished species, minor shelf rockfish, and the Other Fish complex. The effects of biennial harvest specifications have been evaluated in either an EA or EIS

(since 2003, EISs have been prepared); future harvest specifications will be similarly evaluated. Both allocation processes seek to maintain recreational fishing opportunity, taking into account constraints imposed by stock abundance.

Recreational fisheries could be affected by consolidation-related impacts to fishing communities discussed elsewhere in this document, such as the loss of input suppliers that depend on groundfish trawl vessels for a substantial proportion of their business. It is unlikely, however, that this would have a substantial impact on recreational harvesters. First, the types of services and amenities that recreational harvesters depend on (e.g., charter operations, boat ramps, bait suppliers, and tackle shops) are unlikely to be so substantially affected by the loss of trawl vessels in a port community that they would cease to function. Second, most recreational harvesters do not live in coastal communities. They, therefore, have some flexibility regarding where they make purchases and where they may fish.

4.5.4 Consumers of Groundfish Products

Consumers of groundfish products could benefit from greater availability of target species, greater availability of product throughout the year, and new product forms. New markets that may develop as a result of trawl rationalization would benefit those who previously were unable to consume groundfish. Although the allocation of IFQ between harvesters and processors is likely to affect ex-vessel prices, any increase in those prices is unlikely to be passed on to the consumer because groundfish products face price competition from a wide variety of fish products. Prices could decrease if the supply of target species increases due to the development of successful bycatch avoidance strategies. Related to this, there is probably no one who consumes groundfish exclusively; consumers readily switch between fish products based on price and availability. Overall, trawl rationalization is expected to have modest beneficial impact for consumers.

4.5.5 General Public

The general public refers to nonconsumptive resource users (e.g., wildlife viewers), and nonusers (e.g., members of the general public who derive value from knowing that a species is being maintained at a healthy biomass level). Effects on consumptive users (commercial and recreational fishermen, processors, consumers of groundfish) are addressed in other sections. Of course, consumptive users may also derive value from nonconsumptive and nonuse resource attributes. Therefore, it is more appropriate to consider the general public in terms of how directly engaged individuals are with the resource. Consumptive users depend directly on the groundfish resource for their livelihood (commercial fishermen) or satisfaction (recreational fishermen). Nonconsumptive users may gain a livelihood from environmental amenities (e.g., whale watching charter operations) or enjoyment of the natural marine environment of which groundfish are but one part. Nonusers have an abstract relation to the resource that is expressed through broad social or public policy preferences, such as a desire for more rigorous regulation of consumptive activities to preserve existence, option, or bequeathal values. An individual will exhibit variation across these attributes expressed in terms of their prioritization and commitment to different uses and values. For example, a commercial fisherman is likely to prioritize consumptive use, but may also have nonuse values, albeit at a lower priority and level of commitment (i.e., be more willing to trade off long-term existence value for short-term consumption value). On the other hand, a nonuser who does not interact with groundfish directly (through consumptive or nonconsumptive use) may prioritize environmental preservation, but have a low level of commitment to advocating for specific social preferences or public policies to manage groundfish fisheries in a way that would produce a different suite of benefits (favoring nonuse of the resource over consumption).

Trawl rationalization could affect nonconsumptive and nonuse values if it led to substantial declines in stock abundance and, secondarily, if these declines had a clearly discernable effect on ecosystem function. Effects on groundfish, other fish, protected species, and the marine ecosystem are described in other sections of this chapter. Substantial adverse effects on these environmental components are not expected. Considering that groundfish are just one of a suite of amenities that support nonconsumptive use and nonuse, even moderate changes in stock abundance (through greater access to target stocks) would have a minor to negligible effect on these values.

Coastal communities provide services to nonconsumptive users (e.g., experiencing a working waterfront) and existence value for nonusers. As discussed in the section on communities, the character of some coastal communities could change as an indirect effect of fleet consolidation. However, any such changes, such as the disappearance of trawl vessels and related infrastructure, are unlikely to be discernable to most nonconsumptive users and nonusers. For communities with a diversified economy or substantial tourism, some of these changes might even be beneficial for nonconsumptive users. For example, wharfs and waterfront facilities could be converted to uses more directly related to tourism. While this could further alter the fundamental character of the built environment, the effect on nonconsumptive users is mixed since it represents a tradeoff between authenticity and amenities directly supporting nonconsumptive resource use.

4.5.6 Effects of the Preferred Alternative

The components of the preferred alternative incorporate various options and program features identified in the action alternatives. Therefore, the effects on the environmental components discussed in this section are not expected to differ substantially from the broad-level effects identified above. In summary, these effects are as follows:

- Fisheries managed by the NPFMC and WPFMC are not expected to be discernibly affected.
- Nongroundfish buyers and processors could face increased barriers to entering the groundfish market and increased market competition from consolidated and more efficient groundfish buyers and processors.
- Nongroundfish buyers and processors could be affected by any reduction in commercial infrastructure in ports losing fishing vessels and processors due to consolidation.
- Recreational harvesters are unlikely to experience discernable effects except indirectly due to consolidation-related reduction in commercial infrastructure.
- Groundfish consumers could benefit from increased availability of groundfish products.
- The general public (nonconsumptive users and nonusers) could experience adverse or beneficial impacts due to changes in stock status and commercial infrastructure in port communities.

4.5.7 Cumulative Effects on Environmental Components Where No Significant Impacts are Anticipated

The following actions and trends may contribute to cumulative effects on nongroundfish buyers and processors, recreational harvesters, groundfish consumers, and the general public:

- Groundfish harvest management (recreational harvesters, groundfish consumers, general public)
- Intersector allocation (recreational harvesters)
- Groundfish habitat protection and other changes in ocean use (recreational harvesters, general public)
- Population increase and increased demand for protein (nongroundfish processors, groundfish consumers)

- Changes in prices and costs (nongroundfish processors, recreational harvesters, groundfish consumers, general public)
- Increased consumer awareness (nongroundfish processors)
- Overfished species rebuilding (recreational harvesters, groundfish consumers, general public)
- Climate change (nongroundfish processors, recreational harvesters, groundfish consumers, general public)

4.5.7.1 Cumulative Effects on Buyers and Processors who do not Purchase Trawl-caught Groundfish

- Barriers to entry could be strengthened or weakened due to increased demand and price inflation. If product prices for these buyers and processors increase faster than input prices, they could be at a competitive advantage.
- Increased consumer awareness could improve nongroundfish buyers and processors competitive advantage in relation to trawl groundfish buyers if consumers perceive their products are more environmentally friendly and are, therefore, willing to pay a price premium.
- If climate change results in changes in resource availability, nongroundfish buyers and processors could be adversely affected. Adverse effects would occur if they specialize in fish species that become less available compared to trawl-caught groundfish species.

4.5.7.2 Cumulative Effects on Recreational Harvesters

- Recreational harvesters are affected by permanent or periodic allocation of yield and related management measures, because these actions affect fishing opportunity. As discussed above, these actions are evaluated in other NEPA documents.
- Habitat protection and other ocean uses could have beneficial or adverse impacts on recreational harvesters related to fishing opportunity. Adverse effects would result if preferred fishing areas could be closed de jure (e.g., MPAs) or de facto (displacement by other uses). Habitat protection could have beneficial impacts if it results in increased resource availability due to spillover.
- Price inflation would increase input costs relative to the perceived benefit of the recreational experience, reducing the net value of fishing opportunity.
- Overfished species rebuilding will increase fishing opportunity.
- Climate change could have beneficial or adverse effects depending on the resulting availability of preferred recreational species.

4.5.7.3 Cumulative Effects on Consumers of Groundfish Products

- Groundfish harvest management affects the availability of products in the market. Past misspecification resulted in overfishing and subsequent harvest restrictions, reducing product availability. Harvest management that rebuilds and/or maintains stocks at or near MSY will maximize availability of products. Rebuilding overfished species will be beneficial in this respect.
- Increased demand and related price increases would adversely affect consumers and offset the potential gains resulting from rationalization.
- Climate change could have beneficial or adverse effects depending on the resulting availability of preferred products.

4.5.7.4 Cumulative Effects on the General Public

- Nonconsumptive users and nonusers would benefit from increased abundance of groundfish species due to harvest management policies and improvements in habitat quality due to protection measures.
- Price inflation of inputs could diminish the net value of nonconsumptive use.
- Climate change is likely to have adverse impacts on nonconsumptive users and nonusers by changing habitat and ecosystem characteristics.

4.6 Impacts to Limited Entry Trawl Groundfish Harvesters

In this section, we describe the impacts of rationalization on LE trawl groundfish harvesters. This group is composed of individuals owning or operating groundfish trawl catcher vessels, individuals holding or owning LE trawl permits, or some combination thereof. In several cases, entities holding LE trawl permits may be processors of LE trawl-caught groundfish. Such entities are not examined in this section, but are examined under Section 4.9, describing impacts to processors of trawl groundfish.

We begin the section describing methods used to assess effects on groundfish trawl harvesters and the metrics used to illustrate those effects. This initial section is intended to assist the reader by establishing expectations about what is measured and identified so that the reader can anticipate some of the variables that can be compared and contrasted between the alternatives. Following the description of methodology, we discuss broad-level effects of rationalization on groundfish trawl harvesters. This section serves as a description of the big-picture issues that are implied by the alternatives, which the analysts believe may play a relatively important role when assessing the impacts of rationalizing the fishery. For some issues, there is no contrast available between the alternatives because the effect is limited to rationalizing the fishery or maintaining Alternative 1. In other cases, there are contrasts between the alternatives, and, if so, they are identified.

Following the description of broad-level effects, we assess the impacts of the alternatives (Section 4.6.3). This section begins by identifying the impacts that are expected to occur from each of the elements of the alternatives independently (Section 4.6.3.1). This is done to provide the reader with background on the motivations that exist within the alternatives and the fundamental reasons why the alternatives are expected to have different impacts. Following Section 4.6.3.1, the effect of each alternative on groundfish trawl harvesters is assessed. This assessment is designed to be fairly programmatic in nature and examines the ways groundfish trawl harvesters are affected by the combined suite of options contained in each alternative. After this, Section 4.6.3.8 provides a side-by-side summary comparison of the effects of each alternative on groundfish trawl harvesters. Finally, Section 4.6.4 assesses cumulative effects. This cumulative effects section briefly summarizes the past and present actions and trends with ongoing effects on groundfish trawl harvesters, as well as the RFFAs that are expected to have effects. The effect of these past, present, and RFFAs are combined with the effect of the alternatives to arrive at the cumulative effect.

4.6.1 Methods for Assessing Impacts

In this section, we describe the methodology for assessing the impacts of rationalization on groundfish trawl harvesters. We briefly summarize the expected impacts of rationalization in order to put the methodology into a better context, but the reader is referred to the subsequent sections for a complete description of the expected effects and why those effects are expected to occur. In this section, we describe the ways each of the expected impacts is measured and assessed. This section summarizes the potential impacts, the reasons why those impacts occur (the mechanisms), and the way in which the

analysis and models measure those impacts (the metrics). Table 4-12 provides an overview of the approach used to estimate the impacts of the alternatives on trawl catcher vessels. The analytical approach includes 1) potential impacts, 2) mechanisms that relate the proposed action to the potential impact, 3) measurement criteria or indicators used in assessing each type of impact, and 4) models and data sets used in the analysis. This table shows that the expected impacts to trawl catcher-vessels are changes in vessel profits and fleet efficiency, individual and collective risk, and changes in vessel safety. The mechanisms that are driving changes in vessel profits include the distribution of harvest privileges, the pace of harvesting activity, changes in vessel catch, elimination of regulatory discard, ex-vessel price negotiation with processors, monitoring cost, harvesting cost, and fleet consolidation. Effects on individual and collective risks are driven by the probability of unexpected catch events, the presence of thin market conditions, and the cost of covering deficits. Changes in vessel safety are driven by fleet size, vessel operational flexibility, and the financial ability to invest in equipment and conduct vessel maintenance. Changes in the economic efficiency of the trawl catcher-vessel sector as a whole are primarily driven by fleet consolidation. Each of these mechanisms that is a driver for the potential impacts is measured through listed criteria (third column), which are estimated through the methods described in the final column. Many of these methods are described in detail in Appendix C.

Table 4-12. Overview of impacts, mechanisms, and metrics used to compare the effect of the Alternative 1 and the alternatives on trawl catcher vessels.

Potential Impacts	Reasons or Mechanisms for Impacts	Metrics or Indicators for Informing Impact Mechanisms	Data, Models, and Methods Used for Assessing Impacts
Changes in vessel profits and fleet efficiency	Fleet consolidation	Number of active vessels	Model of fleet consolidation
		Fleet-wide costs	
	Distribution of harvest privileges	Number of initial QS recipients	Model of the effects of initial allocation of IFQ
		Ex-vessel value of QPs allocated to participants	
	Pace and location of harvesting	Length of season	Capacity analysis and timing of resource accessibility
		Geographic distribution of fishing effort	Model of geographic shifts in fishery patterns
	Changes in vessel catch	Catch from increased access to target species via a reduction in bycatch of overfished species	Model of changes in bycatch rate, catch, and revenue
	Changes in the amount of regulatory discards	Increased retention of currently discarded species	EFP documentation of nonmarketable discard
	Ex-vessel prices and negotiation with processors	Relative changes in ex-vessel prices	Utilization of microeconomic and game theoretical arguments
	Flexibility in harvest timing	Opportunities for modifying harvest timing	Qualitative assessment
	Monitoring costs	Cost borne by trawl catcher-vessels to meet monitoring requirements	NMFS research on tracking and monitoring programs
	Harvesting costs	Annual cost of harvesting activity	Model of fleet consolidation
	Ability to conduct business planning	Relative certainty over future fishing opportunities	Qualitative assessment
Change in value of capital assets	Value of quota distributed to permit owners	Receipt of transferable quota	Initial allocation data and qualitative assessment
	Change in the value of vessels and permits	Fleet consolidation and need for surplus fishing capital	Fleet consolidation model and qualitative assessment
Individual and collective harvesting risk	Likelihood of catch events that are greater than QPs	Relative risk to harvesters of exceeding QPs	Qualitative assessment
	Cost of covering deficits	Availability of quota for covering deficits	Qualitative assessment
	Risk associated with the presence of thin market conditions	Risk posed by trading quota in volatile markets	Qualitative assessment
Changes in fishing vessel safety	Fleet size; vessel operational flexibility; and financial ability to invest in vessel maintenance and safety equipment	Occurrence of safety-related incidents	Qualitative assessment based on literature and expertise of analysts

4.6.1.1 Potential Impacts, Mechanisms, and Metrics

Fleet consolidation: Under any of the action alternatives, fleet consolidation is expected to occur. Fleet consolidation is driven by the incentives to reduce cost and increase average catch per vessel. This, in turn, is expected to result in greater cost efficiencies and higher profits for trawl harvesters, all else being equal.

Distribution of harvest privileges: The way in which harvest privileges are initially distributed will impact operations at an individual level. Some recipients of QS may see their harvest opportunities increase, while others may see opportunities decrease. This initial distribution impacts individuals at the start of the program and over the longer term. Those who purchase quota to regain opportunities that are potentially lost will be relatively worse off than those who receive more quota than they have historically harvested.

Pace and location of harvesting: Any of the action alternatives will change the incentives faced by harvesters. A well designed rationalization program will eliminate the race for fish conditions that exist in the whiting fisheries, and this may tend to elongate the season in that fishery. This tends to increase product quality and decrease cost. Furthermore, holding vessels accountable for constraining species will impose an incentive that may cause vessels to move from current fishing grounds. By moving from grounds where constraining species are found, vessels may increase their harvests of target species. However, the effect of this accountability may tend to disadvantage those vessels in areas where constraining species are relatively abundant.

Changes in vessel catch: The individual accountability created through the action alternatives encourages vessels to reduce their encounter rate with constraining species. Evidence indicates that this effect will enable nonwhiting vessels to prosecute more underutilized target species, leading to an increase in gross revenues generated by the fishery. Based on past production levels for many species (from the 1990s), it is expected that markets will be able to absorb increased production from the trawl fleet.

Changes in regulatory discard: The existing management structure causes regulatory discard. Much of this discard exists due to trip limits that are constructed to reduce incentives or opportunities for fishing in areas where rebuilding species may be abundant, or to directly reduce opportunities for targeting rebuilding stocks. Vessels work within the system by being held accountable for landings, but freely discarding species in volumes above the trip limit. In the action alternatives, these tools become unnecessary, because vessels will be held individually accountable for their landings and discard, thus marketable species that are currently being discarded are more likely to be retained, increasing revenues.

Ex-vessel prices and negotiations with processors: There is a negotiating relationship between processors and harvesters with respect to ex-vessel prices. The alternatives would result in, at one extreme, 100 percent of shares going to permit owners. At the other extreme, processors may receive up to 50 percent of the QSs, or have a full processor-harvester linkage. As the amount of QSs held by processors increases, the ability for harvesters to negotiate prices to their favor will tend to decrease, thus impacting revenue generation.

Flexibility in harvest timing: Under existing management, harvesters have very little leeway in adjusting their harvest timing. In the whiting fishery, adjusting harvest timing may mean missing the season entirely, while in the nonwhiting fishery, adjusting harvest timing may mean missing opportunities in one cumulative period. Under any of the action alternatives, harvesters have the ability to time harvesting operations in a manner that responds to more favorable market conditions and more favorable cost conditions, providing a mechanism for increasing revenues.

Monitoring costs: It is envisioned that vessels participating in a rationalized fishery would be required to have full at sea observer coverage or monitoring of some kind. This is an added expense that vessels must pay above what occurs under existing conditions for many vessels and in addition to the maximum 3 percent fee that may be charged to recover Federal costs under LAPPs. If done through a third party system, this will mean added costs to vessels participating in the fishery.

Harvesting costs: Each of the action alternatives allows for fleet consolidation and adjustments to harvest timing. This allows vessels to reduce their average cost structure as annual costs are reduced and the average vessel harvests more species. Due to timing flexibility, harvesters can also prosecute species at times where they may be more aggregated or closer to shore, reducing the cost of fishing.

Business planning: The implementation of a rationalization program tends to increase the certainty about one's fishing opportunities in the future—provided they are holders of QSs or have catch history. This increased certainty allows for greater ability to conduct business planning, and more accurate business plans tend to increase the operational efficiency of the business. Such efficiency is translated into higher levels of revenue and lower costs.

Value of quota distributed to permit owners: If QS is gifted to permit owners, the QSs will act as the gift of a capital asset. The value of that quota is tied to revenues that can be generated in the fishery. If revenues improve under the action alternatives, then the value of the QSs will be higher than the existing value of the LE permit, tending to increase the value of assets held by harvesters, all else being equal.

Value of vessels and permits: If consolidation occurs in the fishery under the action alternatives, then the value of vessels could be expected to decline simply because there will be more vessels than necessary to prosecute fishing activity. The value of permits will be replaced by the value of the QSs simply because permits are currently the key to accessing the resource, whereas QSs will largely be the key to accessing the resource under the action alternatives. Unless harvesters receive a sufficient initial allocation of QSs to offset the decline in value of vessels and permits, harvesters may stand to see a decline in their asset value.

Likelihood of catch events exceeding QPs: Since fishing is a rather inexact method of extracting resources, there is some risk that a harvester could catch more than he/she has QPs for. This is tied to the types and number of species covered in the rationalization program. As the number of species in the program increases, there is an increasing possibility that a harvester could inadvertently catch an amount that exceeds the QPs of one or more of those species. Furthermore, if species are added to the program that are infrequently encountered in the fishery (and the amount allocated to the sector is similarly small), there is a possibility that a harvester could have a chance encounter with those species and not be able to find QPs to cover that catch.

Cost of covering deficits: The cost of covering deficits will depend on the species. In the case of constraining species, the cost of that quota will be substantial as it limits access to all other species. For other, more abundant species that are underutilized, the cost of acquiring quota to cover a deficit is likely to be very small.

Risks associated with thin markets: If infrequently encountered species are covered in the program, there is a possibility they will become a thinly traded species. In such cases, the appropriate price for buying and selling will be difficult to ascertain, and trades may be made more on personal relationships and negotiation skill than other conditions. This poses risks to harvesters who are not well versed in

trading in such conditions as they may end up selling quota for too low of a price, or buying at too high of a price.

Fleet size, vessel operational flexibility, and financial ability to invest in vessel maintenance and safety equipment: Under any of the action alternatives, the size of the fleet is expected to decline, operational flexibility to improve, and profitability to improve. Each of these factors will tend to improve safety conditions in the fishery as maintenance improves on vessels and as harvesters no longer feel the need to fish in hazardous weather conditions.

4.6.2 Broad-level Effects of Rationalization on Limited Entry Groundfish Trawl Harvesters

Limited entry trawl catcher-vessels and permit owners may be substantially affected by rationalization through a variety of mechanisms. These impacts are driven by the individual accountability for total catch (landings and discard) associated with rationalization, aspects of the existing alternatives that allow for consolidation, and the mechanisms that allow for harvest privilege transfers that are associated with the existing suite of alternatives.

In most instances, the LE trawl permit owner and catcher vessel owner is the same person; occasionally they are different people. Regardless, it is most straightforward to analyze the owners of catcher-vessels and permits in the same section because the impact on both parties is largely driven by the productivity of, and regulations applicable to, the vessel.

4.6.2.1 Impacts to Groundfish Trawl Harvesters in the Nonwhiting Trawl Sector

Trawl harvesters in the nonwhiting sector may be substantially affected by the rationalization of the west coast trawl fishery. The individual accountability measures and harvesting privileges associated with the rationalization alternatives are likely to induce substantial changes in the way vessels prosecute fishing activities. In the nonwhiting trawl fishery, substantial impacts are likely to occur because of the constraining nature of overfished species and the perceived reward that is associated with avoiding those stocks that may come in the form of increased catch of target species, which are currently underutilized because of weak stock management. The bycatch rate change model is used to show the amount of additional target species that can be leveraged as the nonwhiting trawl fleet reduces encounters with overfished species. The output of this model indicates that the fleet may generate several million dollars in additional ex-vessel revenue under a rationalization program compared to Alternative 1 activity if ex-vessel prices remain constant.

Increased profits and fleet consolidation

Some of the expected increase in ex-vessel revenue is likely to occur almost immediately after the fishery is rationalized. However, the fleetwide estimates are best perceived as a longer term outcome of rationalization that will occur as the fleet modifies gears and fishing location, the flow of quota through the market occurs in a way so that it reaches the more successful vessels, and processing companies find buyers for the potential increase in product quantity. For many species, the market's ability to handle an increase in volume is indicated by the levels of production generated in the mid-1990s, which ran from approximately 50 percent to more than 100 percent above recent levels in the nonwhiting fishery (Table 3-18). This is likely to be a gradual effect where ex-vessel revenue increases over time before reaching full potential. The length of time it takes for the increased harvest volume to be absorbed by the processing sector may also depend on the number of processing entities to whom harvesters have the opportunity to sell their catch. The requirement that the entire catch be off-loaded at a single processor

restricts—to some degree—the number of processing companies to which harvesters deliver. By relaxing this requirement, harvesters may be able to sell their catch to more than one buyer at a time. If these buyers have relatively different access to markets, harvesters may be able to sell catch to more than one buyer, making it more likely that an increase in catch can be absorbed by the market more quickly.

Figure 4-7 illustrates the potential range of ex-vessel revenues in the nonwhiting trawl fishery generated under a rationalization program compared to Alternative 1 if ex-vessel prices remain unchanged. The range of values presented is meant to bracket the range of uncertainty within the model while still providing realistic estimates.

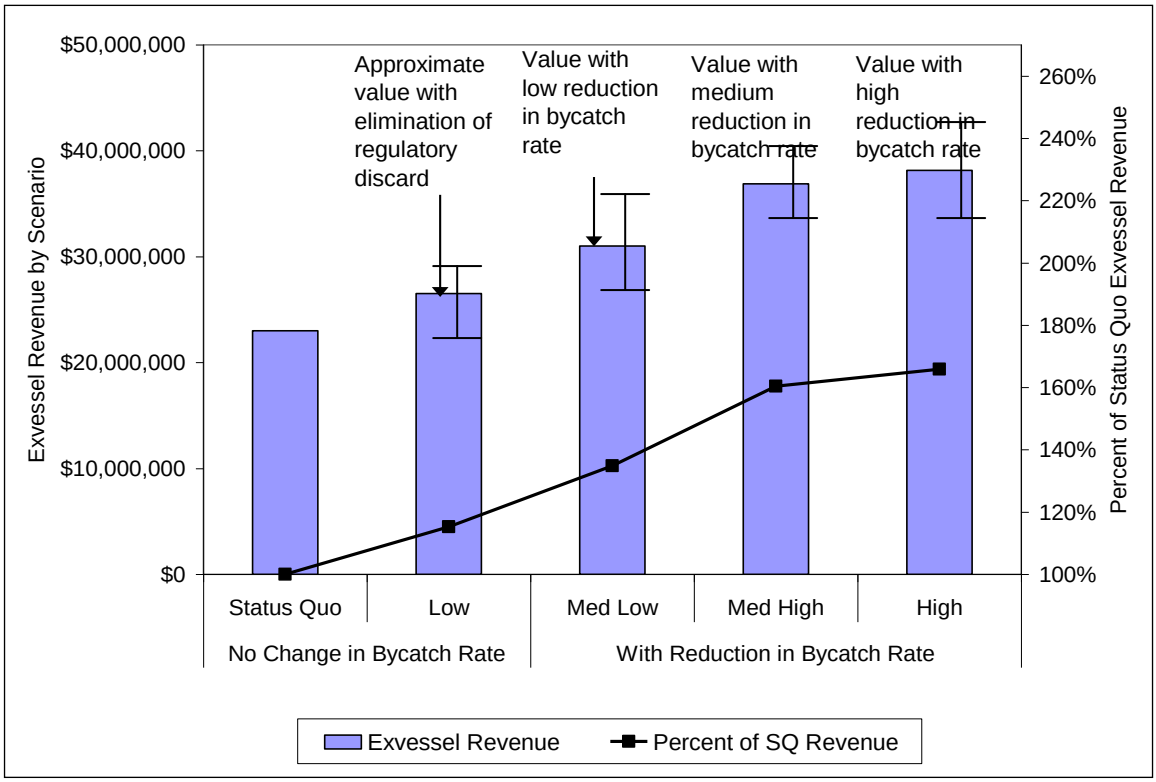


Figure 4-7. Potential ex-vessel revenue in the nonwhiting trawl fishery under rationalization.

Note: Bars are intended to represent uncertainty due to potential variations in ABCs and OYs. The uncertainty presented in this figure does not capture the risk posed by thin market conditions that may be present in an IFQ program because of species with low trawl allocations.

In addition to increased revenue being generated in the fishery, the consolidation likely to occur in the nonwhiting sector is expected to lead to substantial cost savings. Cost savings occur because of less capital, but also because the fleet is expected to consolidate toward the most efficient vessels. The fleet reduction and cost efficiency model shows the consolidation that may occur could diminish the number of vessels by 50 to 66 percent, or to a nonwhiting fleet size that is somewhere on the order of 40 to 60 vessels. This predicted cost savings is fairly sensitive to the design elements of the program and is also dependent on the quantity of species harvested. This consolidation is predicted to decrease costs of harvesting nonwhiting groundfish by as much as 60 percent annually (before incorporating the cost of at-sea monitoring). Using information from recent years, this may mean a cost savings of approximately $13.8 million. Imposing accumulation limits can restrict the amount of expected cost savings substantially. Retaining the vessel length endorsement may restrict cost savings by 10 percent,

though this may be lower since harvesters can bundle permits and change the length endorsement. If a 1 percent accumulation limit is placed on vessels, cost reductions may be restricted by approximately 20 percent.[88] At-sea monitoring costs add an additional cost burden to vessels that is not currently incurred. If at-sea monitors cost vessels $350 per day, this may tend to reduce the size of the fleet from the 40 to 60 vessels expected and increase the average size of vessels remaining. This is because additional costs of fishing will mean the optimal fleet size is smaller. The average size of vessels in the fleet is increased with a daily observer cost because such costs comprise a larger portion of small vessels costs than that of larger vessels. At-sea observers will also reduce fleet-wide profits. The fleet reduction and cost efficiency model illustrates that at-sea observers may cost the nonwhiting fleet $2.2 million if all vessels in the fishery operate near capacity. If some relatively marginal producers remain in the fishery, the cost will be higher.[89] Table 4-13 illustrates the effect of various factors on profitability.

Table 4-13. Factors affecting profitability.

Effect of Consolidation	Improves harvesting cost efficiency. May allow the fleet to realize profits of ~$14 to $23 million compared to $0 or less under Alternative 1.
Effect of Accumulation Limits	No effect unless vessel limit is smaller than ~2.5 percent. A 1 percent vessel limit restricts potential cost efficiency by ~20 percent
Effect of Permit Length Endorsement	Restricts cost efficiency by ~10 percent, or imposes costs of ~$1.5 to $3 million[a]
Effect of At-Sea Observers	Increases average vessel size slightly. Decreases fleet size slightly. May reduce profits by ~$2.2 million depending on fee structure.

a) This estimate was modeled based on the idea that QSs would be restricted from trading across vessel size classes. That restriction is not part of the options contained in the existing alternatives. Therefore, this estimate does not apply to the existing alternatives for rationalization of the trawl fishery.

Figure 4-8 shows potential fleet-wide profit if all vessels are operating at their most cost effective point. The results in this figure use the fleet-wide revenue estimates shown above in conjunction with the cost-savings and consolidation model. The results show profit under unconstrained cost conditions, profit with a vessel length restriction (i.e., retaining the permit length endorsement), and profit with a vessel length restriction and at-sea observers. Although not shown in the figure, for reference purposes Alternative 1 profits in the fleet are estimated to be between zero and a loss of approximately $2 million annually.

[88] The lowest accumulation limit of 3 percent in the alternatives is not expected to impose cost inefficiencies on the nonwhiting trawl sector so long as prices and available harvest volumes do not decrease.

[89] Section 4.16 on page 574 discusses impacts to management agencies, including initial and ongoing implementation costs in addition to the maximum 3 percent fee that may be charged to recover Federal costs for limited access privilege programs. Those cost estimates, developed by NMFS NWR and the WCGOP, also include observer costs, which are expected to be borne by harvesters. The daily cost estimate provided by the WCGOP is $500, higher than the $350 estimate used by Lian, et al. (2008).

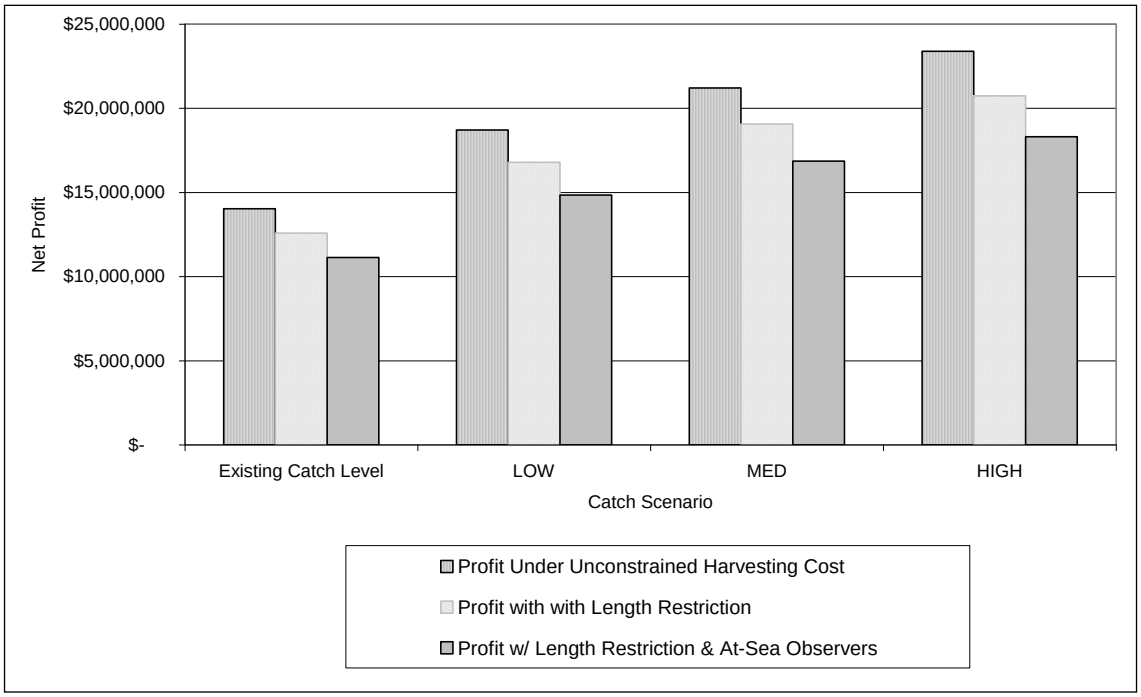


Figure 4-8. Estimated fleetwide profit in a rationalized nonwhiting trawl fishery.

The above information shows that when potential cost savings are combined with the projected increase in gross revenue displayed in Figure 4-7, actual revenues to catcher-vessels and permit holders may increase by several million. Empirical evidence from other programs suggests that consolidation and the associated cost savings could occur quite rapidly after the fishery is rationalized.

The consolidation and cost efficiency model shows that the most efficient vessels for harvesting nonwhiting trawl groundfish are approximately 60 to 70 feet in length. Smaller vessels tend to be limited by the effectiveness of harvest capacity per vessel size, while larger vessels tend to operate in an area where costs are increasing more rapidly per scale compared to harvest effectiveness. Vessels that are larger or smaller may find it more profitable to sell QSs and leave the fishery rather than remain in the fishery.

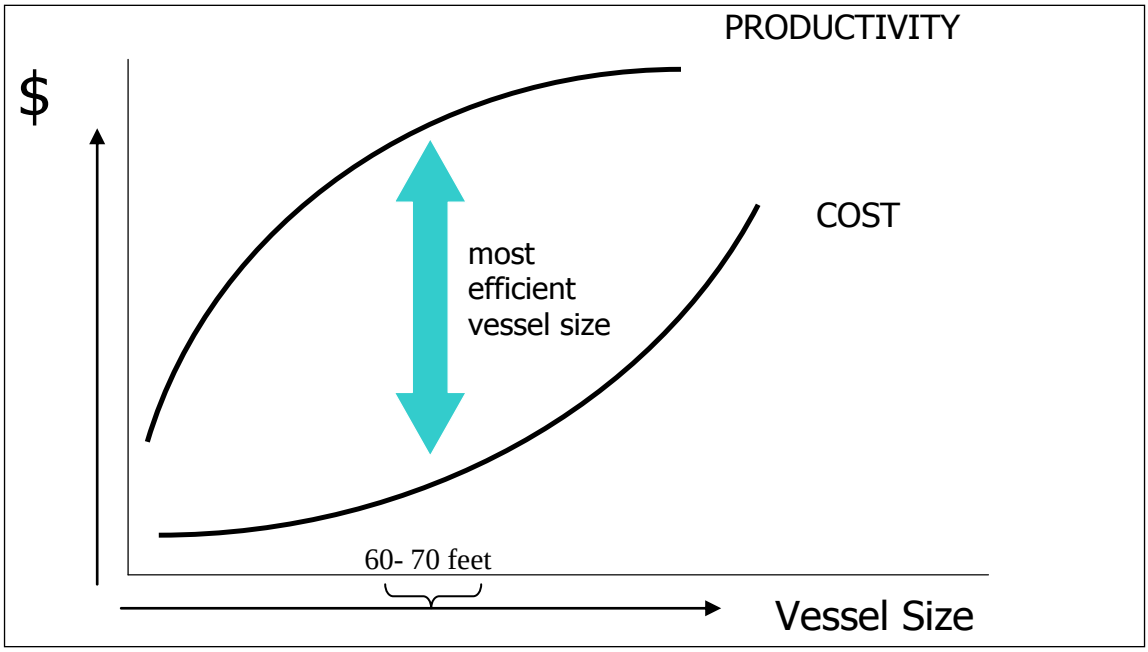


Figure 4-9. Conceptual description of vessel efficiency estimation.

The consolidation and profitability analysis assumes that harvesters of nonwhiting groundfish will tend to specialize in that fishery. This is due to the concept of economies of scope, which means there is a cost of switching from one fishery to another, and there is a loss of efficiency associated with not specializing in one fishery. For fisheries where year-round opportunities exist, this specialization assumption is reasonable. However, for fisheries where there is a limited time window of resource accessibility, vessels are likely to participate in several different fisheries. Specialization in a time-constrained fishery would mean that a vessel would sit idle for several months of the year before and after the season, and this is cost inefficient. If the opportunity exists, vessels engaged in seasonal fisheries are likely to participate in other fisheries in order to keep those vessels operating. Since the Pacific whiting fishery has a limited time window of resource accessibility, those vessels are likely to participate in other fisheries. The fisheries they are most likely to participate in are those most appropriate for that particular vessel. In the case of Pacific whiting vessels, other fisheries are likely to be other trawl fisheries or crab fisheries, because of the relative similarity of capital used to prosecute those fisheries. Many Pacific whiting vessels participate in the Bering Sea pollock fishery and are likely to continue doing so if the Pacific whiting fishery is rationalized. However, some vessels may elect to participate in the nonwhiting trawl fishery. Since the nonwhiting fishery consolidation analysis assumes that the nonwhiting fleet will be composed of nonwhiting fishery specialists, such diversification of Pacific whiting catcher vessels into the nonwhiting fishery makes the nonwhiting fleet consolidation estimates somewhat uncertain and should, therefore, be treated as order of magnitude estimates.

Consolidation in the harvesting side of the trawl industry has the potential for leaving existing participants with less capital wealth than they may have under Alternative 1 conditions. Those participants that are consolidated out of the fishery are likely to find that their fishing vessels and equipment are worth less than they may have been before rationalization as this equipment will likely be viewed as surplus and not necessary for continued prosecution of the fishery. If existing participants are the initial recipients of QSs (or catch history in a cooperative program), the decline in value of physical capital assets and the investments made in those assets may be offset by the receipt of QSs and the value of those QSs.

Changes in geographic distribution and timing of harvest

Distributional and geographic effects will almost certainly occur as a result of rationalization. Certain vessels may be more or less able to access their target species because of the geographic location of constraining overfished species. Vessels that traditionally operate in areas with relatively high bycatch rates may find themselves less able to prosecute target species activity relative to other vessels when they become individually accountable. This is because those vessels would be more likely to reach their QPs of constraining stocks in any given year and be forced to stop fishing earlier than vessels operating in an area without the same relative presence of those constraining stocks. Since those vessels may find it more difficult to access target species, they may be more likely to sell QSs to another vessel and leave the fishery, or move their operation to another port in order to access grounds where constraining stocks are less abundant. Such geographic considerations are likely to be influenced by market conditions as well. If a vessel fishes in an area with a relatively high bycatch rate of constraining overfished stocks, yet that vessel is economically efficient and delivers to a port with relatively good market conditions, then that vessel may continue to fish in that area regardless of the fact there is a relatively higher presence of constraining stocks in that area. The model that describes and estimates the result of these factors is described in more detail in Appendix C. Table 4-14 summarizes the geographic effect on fishing activities—and the vessels that fish in those geographic areas—that are likely to occur as a result of rationalization. These results are based on the regional comparative advantage analysis contained in Appendix C.

Table 4-14. Geographic effect of rationalization on catcher-vessels in the nonwhiting trawl fishery.

Area	Effect on Vessels from Rationalization
Northern Washington Coast—Shoreward of the RCA	It is highly likely that vessels fishing this area will be geographically disadvantaged by rationalization because of relatively restrictive bycatch conditions, relatively poor market conditions, and relatively inefficient vessel sizes.
Central and Northern Oregon Coast—Seaward of the RCA	Vessels fishing in this area may have to be relatively more selective about fishing practices because of bycatch concerns, but are not likely to move dramatically because of relatively beneficial market conditions.
Southern Oregon Coast—Shoreward of the RCA	Vessels fishing in this area may be forced to alter fishing behavior and location to a greater degree than vessels in other areas because of bycatch conditions.
Central California Coast—Shoreward of the RCA	Vessels fishing in this area may have to alter behavior to some degree because of bycatch conditions, but are not likely to move dramatically because of beneficial market conditions in the area.
Other Areas of the Coast	Vessels in other areas are likely to see liberalization of trawl fishing activity relative to Alternative 1 because of relatively lower bycatch rates, relatively more beneficial market conditions, or some combination thereof.

Regional differences in bycatch rates may also encourage vessels to use other legal groundfish gear to prosecute their fishing opportunities. Since different gear types have different relative rates of bycatch, some vessels operating in high bycatch areas may choose to use pot gear for example instead of trawl gear. In addition to these regional differences in bycatch rates as a motivation for using different gears, other vessels may choose to use another gear in order to capitalize on different markets, or they may choose to use trawl gear during certain times of the year and nontrawl groundfish gear during another time of year. Such gear switching may be driven by an attempt at capitalizing on economic opportunities, but it may also be driven by political motivations, social considerations, or public relation issues.

The flexibility that nonwhiting trawl harvesters have under rationalization to fish when they please is greater than Alternative 1. Although harvesters have flexibility under Alternative 1 because of the two-month limit structure of the fishery, that flexibility only exists within that two-month period. Issuing IFQs for groundfish species allows harvesters to engage in fishing operations as they please throughout the course of the year to take advantage of such things as variations in the price paid for harvested species. The following figure shows the average price per pound paid for select trawl target species. While this information may not suggest a clear seasonal pattern, it does illustrate that variations in the price per pound for groundfish occur throughout the year, and this information lends itself to suggesting that harvesters may vary fishing practices to some degree to capitalize on periods of higher prices. Allowing this flexibility in harvest timing works at enhancing opportunities for generating profits.

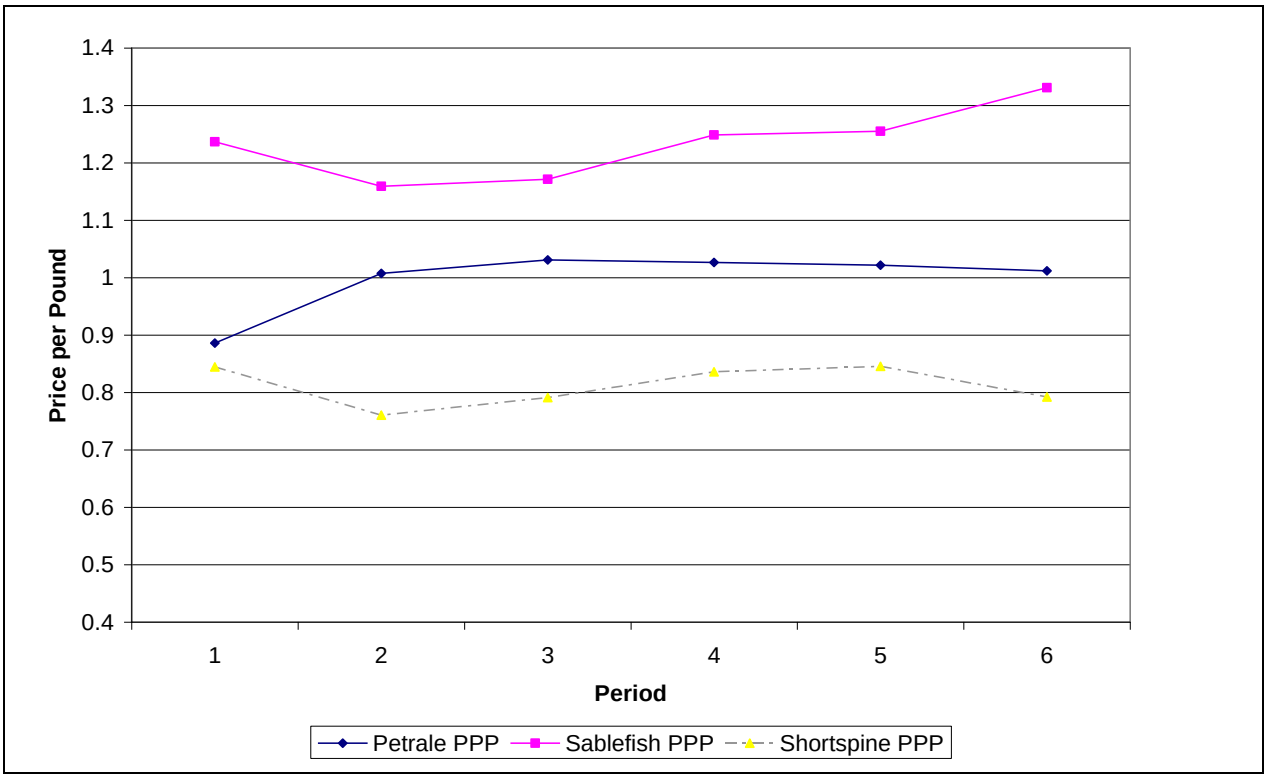


Figure 4-10. Average price per pound for select target species caught with trawl gear (2004-07).

Gear switching

In addition to the flexibility in harvest timing created by an IFQ program, the gear switching provisions allowed for an IFQ program further enhance flexibility. Such gear switching may be used to balance catch accounts (because different gears have relatively different catch rates), take advantage of differing market opportunities, or to respond to public relations issues. Although difficult to predict, some information suggests that there are harvesters located in different sections of the west coast who are more likely to engage in gear switching on a permanent basis. Harvesters located in the central and southern-central California coast have expressed a desire to switch from trawl gear to groundfish fixed-gear (longline and pots) in recent years because of public relations issues and because consumers in central and southern California appear to prefer nontrawl-caught fish. In addition, harvesters who have typically relied on areas with relatively high rates of constraining species bycatch may be more likely to

switch to a nontrawl gear to avoid those constraining stocks since many types of fixed-gear have lower bycatch rates of overfished stocks than trawl gear. This may encompass harvesters located in northern Washington and some harvesters in southern Oregon ports. Other factors may cause harvesters to temporarily use nontrawl gear to prosecute fishing activities during certain times of the year. This may be due to market conditions where there is a noticeable differential in the prices paid for groundfish species caught with one gear versus another. This is particularly the case for sablefish. The figure below shows that there is a substantial price differential between fixed-gear-caught sablefish and trawl-caught sablefish. If the trawl sector harvests 10 percent of the trawl allocation with fixed-gear, this would increase ex-vessel revenues by approximately $600,000. If 20 percent of the trawl allocation was caught with fixed-gear, ex-vessel revenues may increase by $1.2 million.

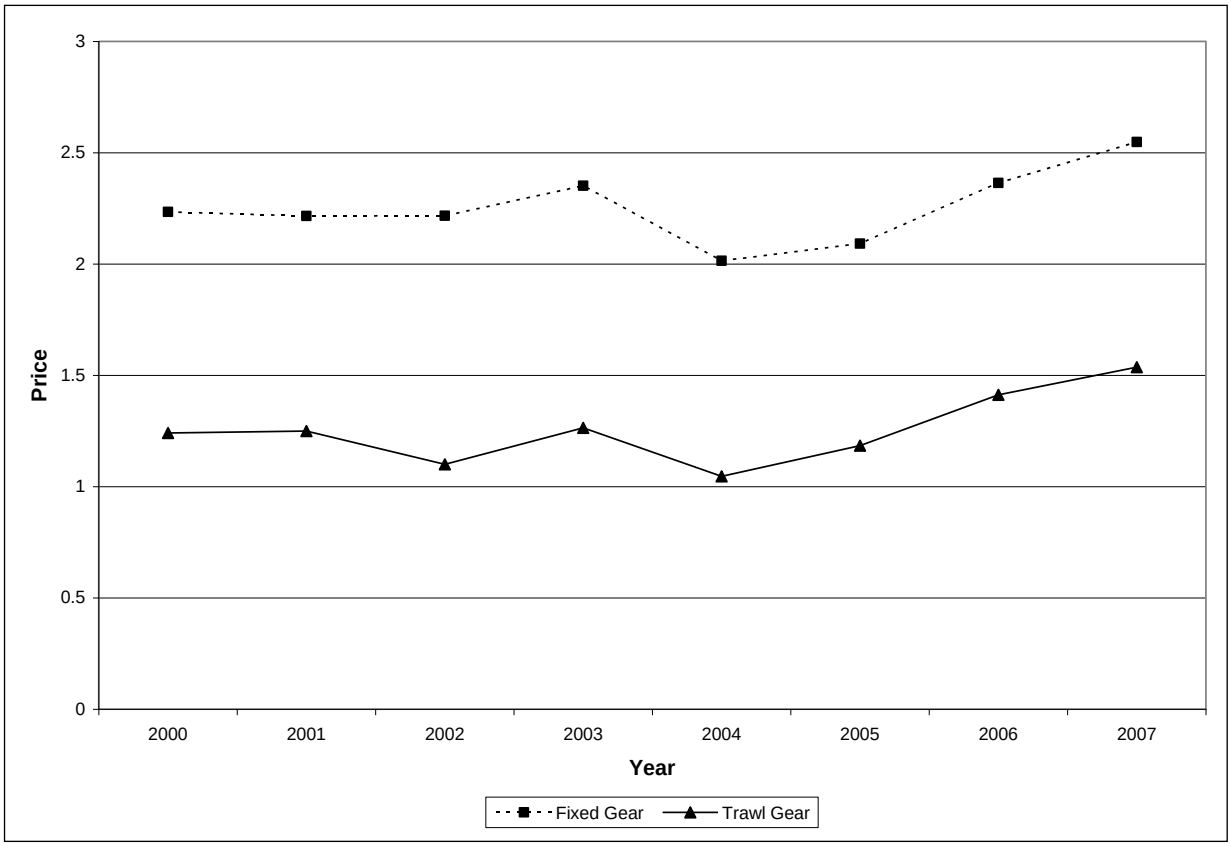


Figure 4-11. Average price per pound for sablefish by gear type (2000-07).

Another factor influencing gear switching, aside from the price differential, is the ability to harvest some types of groundfish with trawl gear that cannot be caught with nontrawl gear. Harvesters in many areas are not likely to abandon trawl gear completely because doing so would mean giving up the catch of many species of flatfish, which are not easily caught with nontrawl gears. In other words, in many areas of the coast, harvesters may use nontrawl gear to target species such as sablefish during certain times of the year and use trawl gear to prosecute petrale sole, Dover sole, and other flatfish during other times of the year. The relative catch rate—under Alternative 1 conditions—for bottom trawl and fixed-gear is shown in Table 4-15. This information shows that fixed-gear is successful at catching sablefish, shortspine thornyhead, and arrowtooth to some degree, but is not productive for catching many types of flatfish. Trawl gear, on the other hand, is capable of catching all of the species listed in the table. The reason these flatfish are not successfully caught with hook-and-line gear is because of their feeding patterns. While many longline fishermen may use herring with large hooks, for example, several of the

flatfish shown below feed on small prey, like worms, and have mouths too small to be caught with many of the hook sizes currently used. This information implies that large-scale gear switching may result in several species of flatfish being left unharvested.

Table 4-15. Catch of select groundfish by gear type, mt (2006).

Species	Nonwhiting trawl	Fixed-gear
Sablefish	2,654.3	3,119.3
Shortspine	648.7	178.1
Longspine	821.3	21.2
Dover sole	7,475.5	4.6
Petrale sole	2,690.1	4.1
English sole	1,291.4	0.0
Arrowtooth flounder	2,817.6	78.8
Other Flatfish	1,854.9	4.1

4.6.2.2 Impacts to Groundfish Trawl Harvesters in the Mothership and Shore-based Whiting Fishery

The effect of rationalization on whiting catcher vessels is more difficult to estimate and is more likely to be a result of improved product quality, slower-paced harvest activity, increased yield (which should increase ex-vessel prices), and enhanced flexibility and ability for business planning. Some consolidation may occur in these sectors, though the magnitude of consolidation is expected to be less than in the nonwhiting trawl fleet.

Consolidation

Using historic performance of catcher vessels in the shoreside and mothership sectors in the whiting fishery as a guide, the productive potential of catcher vessels in each sector can be estimated. Depending on the season length of a rationalized fishery, the number of vessels that would remain in each sector can be calculated. Assuming Alternative 1 season lengths, whiting OYs equivalent to the 2007 year, and the production potential of vessels based on historic data, information suggests that the number of catcher vessels in the shoreside sector may be approximately 20 vessels, and the number of catcher vessels in the mothership sector may be approximately 12 vessels after the fishery is rationalized (Figure 4-12). [90]

[90] The assumptions used in developing these estimates are that 1) shoreside catcher vessels catch an average of 100,000 lb of Pacific whiting per day during an 84-day season and 2) that catcher-vessels in the mothership sector catch an average of 140,000 lb per day during a 56-day season.

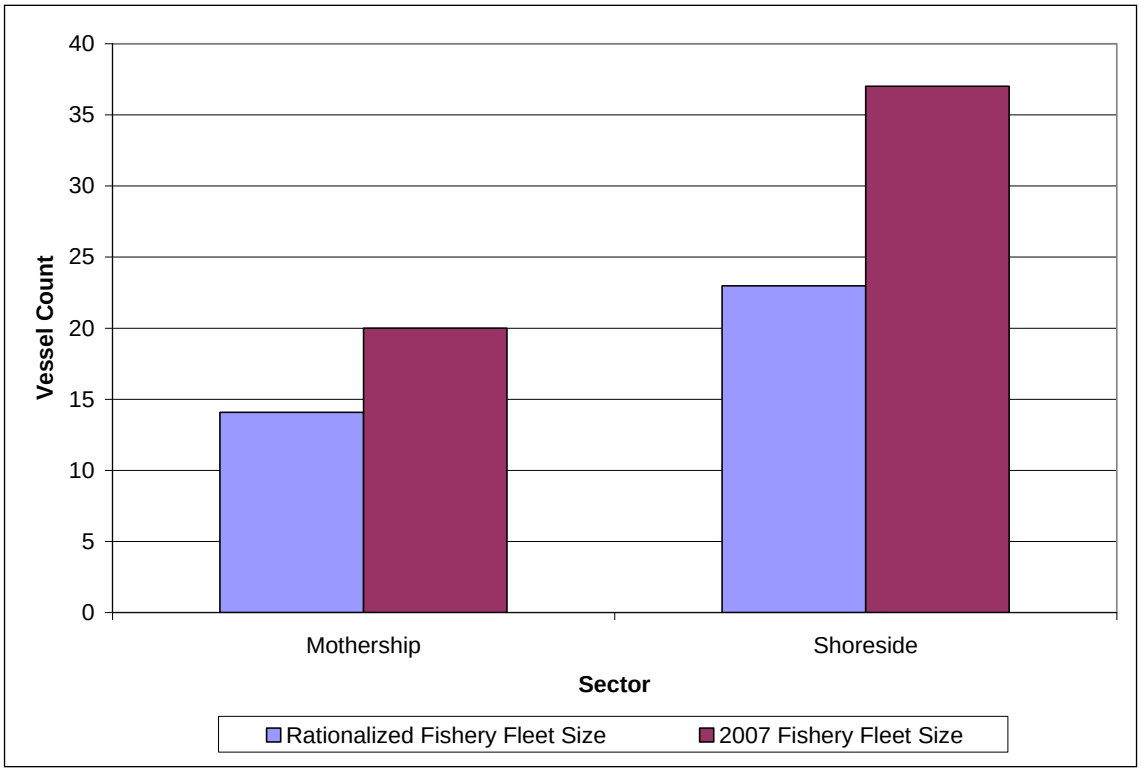


Figure 4-12. Order of magnitude estimates of catcher vessel fleet size in the whiting fishery.

Consolidation in the shoreside and mothership sectors of the whiting fishery should result in cost reductions and increased profitability. However, cost-earnings data are not readily available for estimating such cost savings, and, therefore, estimates showing improvements in profitability are not possible for this group of harvesters.

While net revenues per boat in the whiting fishery cannot be readily calculated, estimates of gross revenue can be derived using the fleet consolidation estimates and a set of assumed U.S. whiting OYs and ex-vessel prices. Using ex-vessel prices and OYs from the 2007 fishery, an estimate can be derived for gross revenue per boat in the shoreside and mothership whiting fishery. Figure 4-13 illustrates these estimates. This figure shows that catcher vessels in both the shoreside and mothership whiting fishery may be expected to generate slightly more than $400,000 on average under Alternative 1 management conditions (assuming the entire U.S. OY is harvested), while the average vessel may be expected to generate approximately $800,000 after the fishery is rationalized and fleet consolidation occurs.

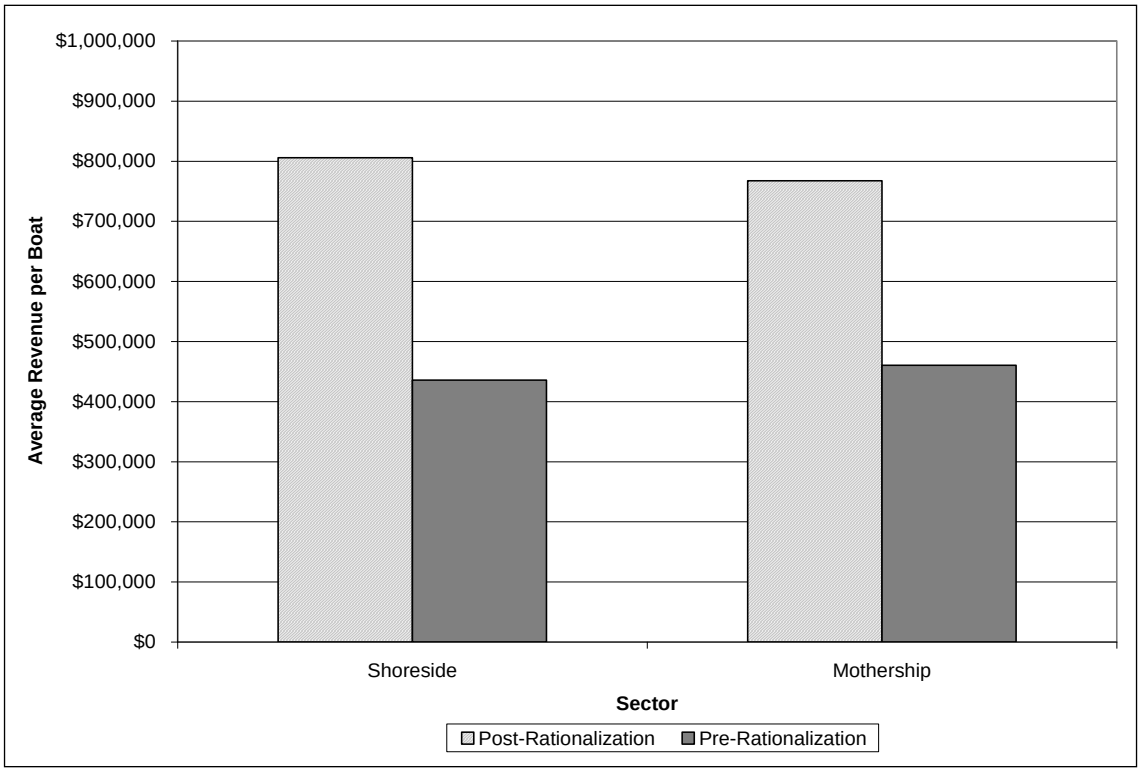


Figure 4-13. Average gross revenue per vessel in the whiting fishery (assuming 2007 OY and ex-vessel prices).

Product quality improvements

Empirical evidence has shown that substantial increases in product recovery have occurred after other rationalization programs went into effect. An increase in product recovery should increase profits in the industry, and those profits are likely to trickle down to catcher vessels in the form of higher ex-vessel prices. The Pacific Whiting Conservation Cooperative reports that product recovery increased by 40 percent after the voluntary co-op was formed (D. Waldeck, pers. comm., Executive Director Pacific Whiting Cooperative, May 2008). In the Bering Sea pollock fishery, product recovery increased from 19.5 percent to 29 percent in the best year (for a 48 percent increase) after the formation of the Pollock Conservation Cooperative (Wilen and Richardson 2003).

While substantial increases in product recovery have occurred after other programs were rationalized, it is not necessarily reasonable to assume that those same increases will occur in the at-sea portions of the Pacific whiting fishery. In the mothership portion of the whiting fishery, substantial increases in pollock product recovery came about as a result of modifications to processing capital that occurred after implementation of the American Fisheries Act. The motherships that participate in the Pacific whiting fishery also participate in the pollock fishery, and, therefore, gains in product recovery in the Pacific whiting fishery have already occurred because that same (improved) capital is being employed off the Pacific Coast in the mothership whiting fishery. However, given that portions of the Pacific whiting fishery function as an Olympic fishery with little opportunity for business planning, increases in product recovery may occur because of a slower pace of harvesting, flexibility, and ability to more selectively process harvested species. This may increase the ex-vessel price that whiting catcher vessels receive for their catch.

Seasonal and geographic changes in the fishery

To some degree, we would expect the whiting fishery to operate over a longer time period as the fleet is rationalized and prosecutes the fishery in a more strategic manner, though this is tempered to a large degree by the availability of the Pacific whiting resource, the level of participation of Pacific whiting vessels in other fisheries, such as Alaska pollock, and the timing of those fisheries. In addition, certain sectors of the fishery are time and geographically constrained. Experience with fishing patterns exhibited by catcher vessels in the shoreside sector of the whiting fishery indicates that it may not be feasible for those vessels to fish in the fall months because the type of vessels and nets employed in that sector limits access to the resource.[91] This may be the same for mothership catcher vessels, though available information and experience with the fishery makes this point less clear. Catcher vessels in the shoreside sector are geographically constrained because of the north/south distribution of whiting processing plants. In order for vessels to make deliveries to those plants, those vessels have to fish in nearby areas off central Washington, southern Washington, Oregon, and northern California. Since the Pacific whiting resource migrates north during the course of the year, this geographic limitation of the processing plants—and the need to land deliveries to those plants before the whiting spoils—restricts the time of year when shoreside catcher vessels can prosecute the fishery. If historic patterns are a guide, shoreside fishing operations may be prosecuted successfully during months prior to October. Beginning in October, it is less clear whether shoreside vessels can successfully prosecute the whiting resource.

While resource timing and delivery location may constrain the time window for prosecuting the shoreside whiting fishery, there are reasons to prosecute the whiting resource later in the year. Larger whiting are caught later in the year, one of several traits that are desirable to consumers. Published research has demonstrated that quality and price increase as whiting are harvested later in the season (Larkin and Sylvia 1999). Therefore, to some degree, we would expect both the shoreside and mothership sectors of the whiting fishery to fish longer and/or later in the year to take advantage of these improved market conditions.

4.6.2.3 Changes in the Value of Capital Assets Held by Trawl Harvesters

Rationalization has the potential to change the value of assets trawl harvesters currently own. Capital assets related to fishing include the vessels used by fishery participants, the LE permits those participants hold, and the equipment those harvesters use to prosecute fishing activity (such as nets). Much of this capital may have little or no other use than fishing or may become relatively valueless. The former is often called "stranded capital" and can generally be described as capital that experiences a substantial or total loss of value as a result of some action. This capital experiences a reduction in value because it has little or no alternative use and there is little or no demand for that capital after the implementation of some action.

The consolidation of the LE trawl fleet that is expected from rationalization is anticipated to reduce the amount of capital deemed necessary to harvest groundfish species in the trawl sector. This should result in an excess number of vessels that may have an alternative use if they participate in another sector, but the value of those vessels may be reduced because the demand for those vessels has become reduced. Those harvesters who are consolidated out of the trawl fishery may be expected to experience a decline in the value of their fishing vessels.

[91] It is generally accepted that Pacific whiting change their distribution as the year progresses. This change is reflected latitudinally and by depth. Fishermen who operate Pacific whiting catcher vessels have indicated that they have trouble successfully targeting Pacific whiting during later months of the year because their equipment does not allow them to fish at depths where the whiting are located.

The value of LE trawl permits will also change as a result of rationalization. Limited entry trawl permits act as a resource access privilege under Alternative 1 conditions, but that access privilege is the fishing quota under a rationalized fishery. While the program envisioned for the west coast requires that a vessel have a permit to prosecute opportunities in the rationalization program, the majority of the resource access privilege is tied to the fishing quota as that quota directly influences the amount of fish a vessel can harvest. Therefore, the value of permits held by trawl harvesters will decline in a rationalization program, but that decline in permit value may be offset by the receipt of QSs, depending on the volume of QSs those permit holders receive.

The rationalization of a fishery fully developed will undoubtedly result in a relative change in the value of capital assets held by participants in the fishery. As mentioned previously, the decline in value of LE permits and trawl vessels can be offset by the granting of QSs to those participants. Those QSs will have value if transferable, making those QSs a capital asset. In those alternatives where processors receive an initial allocation, harvesters will receive less of an initial allocation. Thus, the decision regarding whether and to what degree to allocate to processors will directly affect the value of capital assets harvesters receive through the initial allocation process.

4.6.2.4 Risks Imposed by Bycatch Species and Thin Markets for IFQ

While information suggests revenue could be increased substantially under rationalization, significant risk to nonwhiting trawl harvesters may be associated with an IFQ-based program. This risk comes from two sources: individual accountability and thin market conditions. Individual accountability is a source of risk because of the uncertainty that is associated with fishing and the fact that, for some species, accidentally exceeding QPs may be extremely costly to individual harvesters because of the cost of purchasing enough quota to cover that deficit, or the fact that that the vessel may be required to forego future fishing opportunity because of an enforcement action. A thin market for IFQ could occur when allocations of some groundfish species are so small that there are a very limited number of suppliers and a very limited number of transactions occurring on the market. Such conditions often lead to volatile price fluctuations (of quota in this case) and quota transactions that involve strategic behavior. The effect of thin market situations can create cases where the market cannot reach equilibrium and transfers occur based on mechanisms other than market mechanisms (such as personal relationships). In addition, thin market conditions are related to the risk posed by individual accountability. Species with few QPs available may make it problematic for vessels to actually find quota to cover catch deficits, and this poses a financial risk to harvesters.

Table 4-16 lists the species that may be the source of risk posed by thin market conditions under an IFQ-based program. This table is based on the assumption that allocations made to the trawl sector will be similar to the amount of catch that occurs under Alternative 1 management. While allocations could be made that grant more pounds to the trawl sector, these species are fully allocated, meaning any increase in trawl sector take would mean a reduction in the take of other sectors. Given the fact that many of these species are targets of the other sectors, a substantial change in the allowable take by the trawl sector seems unlikely. If these species create a great enough set of risks to harvesters, the response may be an avoidance of fishing activity in areas where these species are found.

Table 4-16. Species for which thin market conditions may exist in an IFQ program.

Thin Market Species in Nonwhiting Sector	Thin Market Species in the Whiting Sectors
Canary	Lingcod South of 42° N. latitude
Cowcod	Pacific Cod
Yelloweye	Pacific ocean perch
Longspine S 34°27' N. latitude	Chilipepper
Minor Nearshore Rockfish North	Bocaccio
Minor Nearshore Rockfish South	Splitnose
Black Rockfish (WA)	Shortspine
Black Rockfish (OR-CA)	Longspine
California Scorpionfish	Cowcod
Cabezon	Yelloweye
Kelp Greenling	Black Rockfish (WA)
	Black Rockfish (OR-CA)
	Minor Nearshore Rockfish North
	Minor Nearshore Rockfish South
	California Scorpionfish
	Cabezon
	Dover Sole
	English Sole
	Petrale Sole
	Arrowtooth
	Starry Flounder
	Other Flatfish
	Kelp Greenling
	Longnose Skate

Note: If three whiting sectors are established and the shoreside whiting and nonwhiting use common quota, the thin market species for the shoreside whiting sector would be the same as the species in the nonwhiting column.

The following table illustrates annual landings and discard for select species in the nonhake trawl fishery in 2007, 2006, and 2005. Earlier years were not provided because estimates were not readily available.

Table 4-17. Catch of select species in the nonwhiting trawl fishery by year (mt).

	Year		
	2007	**2006**	**2005**
Bocaccio	5	19	29
Canary	19	24	26
Cowcod	3	1	1
Yelloweye	0	1	1
Black rockfish	3	5	1
Cabezon	0	0	0
California scorpionfish	0	NA	NA
Kelp greenling	0	NA	NA
Minor nearshore N	0	2.7	0
Minor nearshore S	1	0	0
Shortbelly	0	0	NA

Note: "NA" means that estimates were not available

The following table illustrates annual harvests of species in the at sea fishery from 2003 through 2007 where the total catch during this period was at least 1 metric ton.

Table 4-18. Catch of select species in the at-sea trawl fishery by year (mt).

	Year				
Common Name	**2003**	**2004**	**2005**	**2006**	**2007**
Spiny Dogfish	269	615	355	61	155
Widow Rockfish	14	21	80	142	146
Yellowtail Rockfish	36	47	112	110	79
Rougheye Rockfish	2	14	36	7	29
Sablefish	17	29	15	2	3
Darkblotched Rockfish	4	7	11	11	12
Splitnose Rockfish	12	9	15	1	2
Shortspine Thornyhead	16	5	7	1	3
Arrowtooth Flounder	4	3	4	3	3
Pacific ocean perch	6	1	2	3	4
Lingcod	1	1	3	3	6
Shortbelly Rockfish	1	0	3	11	0
Redstripe Rockfish	5	2	5	0	1
Rex Sole	7	2	3	0	0
Canary Rockfish	1	5	1	1	2
Sharpchin Rockfish	2	0	0	0	1
Big Skate	0	1	1	1	1
Stripetail Rockfish	2	0	0	0	0
Longnose Skate		0	1	0	1
Shortraker Rockfish	0	1	0	0	0
Dover Sole	1	0	0	0	0
Greenstriped Rockfish	1	0	0	0	0

Cabezon specifications are specific to waters off California. This species is not found outside state waters, and California has prohibited LE trawling in state waters, which calls into question the necessity of establishing trawl IFQ for these species. Kelp greenling harvest specifications are specific to waters off Oregon and are set outside the Council process by the state of Oregon, which raises questions about how QPs would be issued. Furthermore, several species in the whiting sector column do not extend into the waters where the whiting fishery takes place; therefore, there is some question about the necessity of establishing QSs for these sectors in the whiting fishery. These species include lingcod south of 42° N. latitude, cowcod, minor nearshore rockfish south, cabezon, and bocaccio.

Whether the risk is great enough to have a noticeable impact on the effect rationalization will have on the fishery depends, in part on the amount of QPs available to each harvester and the type of catch limit (either total catch or landed catch). Table 4-16 lists species for which this risk appears relatively great under an IFQ program because of thin market conditions. Under Alternative 1 conditions, the comparatively lower level of risk is a result of catch limits that are based on landed catch (therefore harvesters can avoid penalties by discarding catch in excess of catch limits) and the size of the two-month limit. In a rationalized fishery, catch limits will be total-catch-based (harvesters cannot avoid penalties by discarding) and it is likely that the size of IFQ available for each vessel could be much smaller than the two-month limits currently available to each fishery. To illustrate this effect Figure 4-14 shows the existing two-month limit for nearshore rockfish species in the trawl fishery against the amount of IFQ available to each vessel (on average) to constrain harvest to Alternative 1 levels. For reference purposes, Alternative 1 harvest of nearshore rockfish in the nonwhiting trawl fishery is approximately 1 mt annually (compared to a northern OY of 142 mt and a southern OY of 564 mt). Figure 4-14 shows that the current two-month landing limit of nearshore rockfish is 0.14 mt (300 lbs) per two-month period. To constrain the trawl fishery to a 1 mt total catch of nearshore rockfish in an IFQ program, the average vessel would receive 0.009 mt (19 lbs) of nearshore rockfish quota for an entire year. Though the actual magnitude will differ for each of the species listed in the table above, the concept shown below would hold for almost each case: the two-month limit currently specified for those species will be substantially higher than the amount of IFQ available to each vessel to maintain the same harvest. The exception is where existing two-month limits are zero (cowcod).

The reason for the difference between the size of the cumulative catch limit and the likely size of an IFQ allocation is that cumulative catch limits are often constructed in a manner that limits few, if any, vessels, but may allow targeting of various other stocks while discouraging targeting on these nontrawl stocks. In the case of nearshore rockfish species, the existing two-month limit clearly discourages targeting, but is not so small as to result in much regulatory discard. The result, however, is that the total catch varies to some degree from year to year. In an IFQ program designed to maintain the same level of catch, that level of catch is divided among participants in the fishery in such a way that the total amount of QPs available to the participants equals the overall level of catch allowed for that sector.

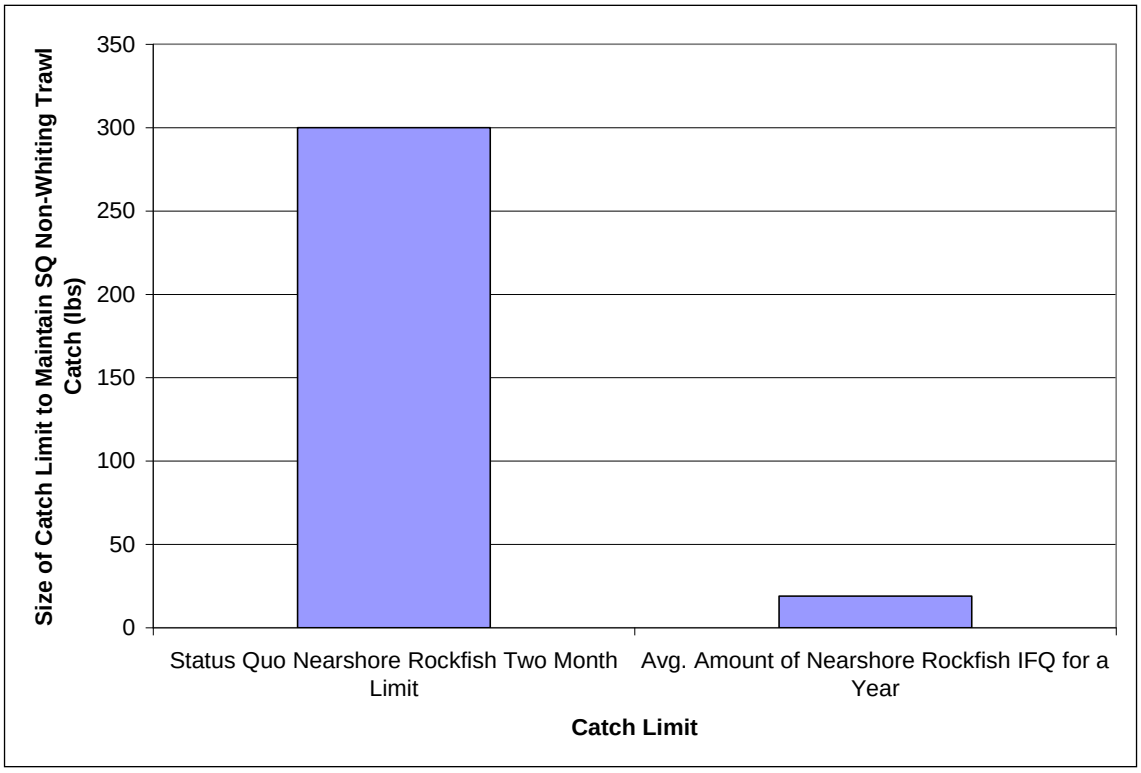


Figure 4-14. Size of catch limit necessary to maintain Alternative 1 catch of nearshore rockfish in nonwhiting trawl fishery.

In addition to the size of the cumulative limit, the actual quantity of nearshore rockfish landed with trawl gear is small. We examine black rockfish landed with trawl gear on a per-vessel basis, since this is the most frequently encountered nearshore species, and find that the occurrences of black rockfish landed with trawl gear is small, and the size of those landings is also typically small (less than 83 lbs in any given period). Most landings made with trawl gear have no black rockfish. However, of those vessels that have landed black rockfish over the 2004 to 2007 period, most have been between 1 and 83 lb over a two-month period. This is evidenced in Figure 4-15 illustrating that there were 61 occurrences over the 2004 to 2007 period with vessels that have landed between 1 and 83 lb of black rockfish during a given period.

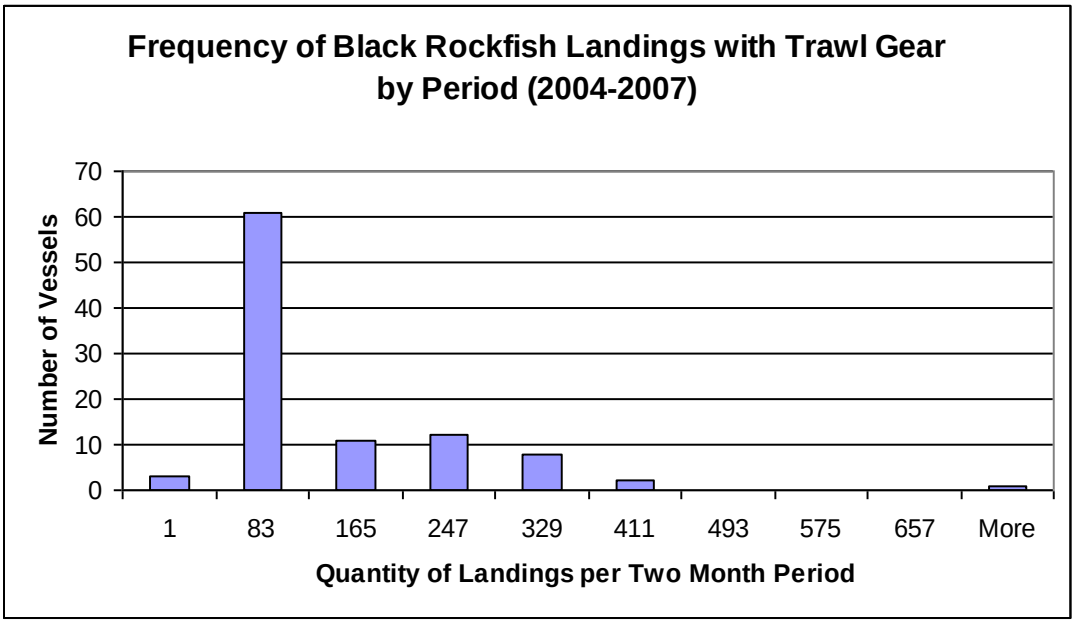


Figure 4-15. Frequency of black rockfish landings with trawl gear by period (2004-07).

The recent catch of several nearshore species in the trawl sectors is shown in Table 4-19. This information is shown against the 2008 OY for each stock to provide an indication of the scale of trawl catch relative to the OY.

Table 4-19. Catches of selected nearshore species by trawl sectors, 2005-06.

	2006		2005		
	Nonwhiting Trawl	Whiting Trawl	Nonwhiting Trawl	Whiting Trawl	2008 OY
Black rockfish	5	0	1	0	1,262
Other Nearshore rockfish N	3	0.1	1	0	142
Other Nearshore rockfish S	0	0	0	0	564
Cabezon	0	0	0	0	69
Kelp greenling	0	0	0	0	NA

The species for the nonwhiting trawl sector shown in the above table are predominately found in the nearshore areas and along the continental shelf areas within, or shoreward, of the RCA. If the average vessel receives small QPs for some, or all, of these species, they may very well forego target species opportunities in those same areas because the risk of encountering these low allocation species is too great. The socioeconomic effects of the fleet foregoing harvests of associated target species are a reduction in ex-vessel revenue and catch from what is expected, fewer vessels than expected, and fewer fishing related jobs. The biological effect depends on policies established in response to such changing catch levels; however, it is reasonable to expect that foregoing harvest of target species will increase their abundance. For most species, listed in the above table, the foregone mortality that may otherwise be induced by the trawl sector will not be large enough to have any discernable effect on population size.

Figure 4-16 is intended to demonstrate why some target species may not be accessed if the risk posed by low trawl allocation species is large. This figure shows the abundance of other flatfish, excluding rex

sole, in the trawl survey by depth.[92] This is plotted against the abundance of canary rockfish and minor nearshore rockfish by depth. This information suggests that, given enough risk posed by individual accountability of nearshore rockfish and canary rockfish in an IFQ-based program, the trawl fleet may forego the catch of other flatfish because they are found in the same areas. Catch of other target species is likely to be foregone as well if vessels avoid areas shoreward of the RCA (including petrale sole during summer months); however, the following figure is meant to illustrate the risks posed by managing some species with IFQ.

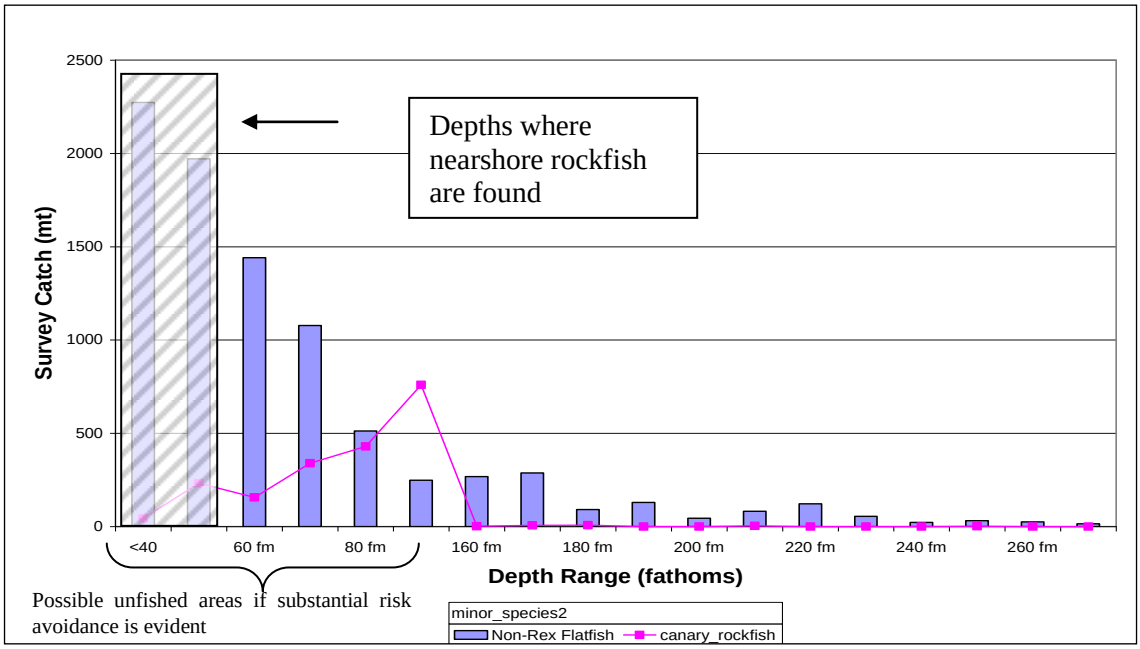


Figure 4-16. Abundance of select groundfish species by depth. (Source: NOAA Fisheries trawl survey data.)

The individual accountability of low allocation species creates a risk to harvesters where there is a relatively large potential for harvesters to encounter stocks, but a relatively small amount of quota available. This concept is weakly differentiable from thin market conditions because the number of transactions could presumably be large. The risk posed by accountability of low allocation species differs from thin market conditions in that the number of transactions of QPs is large enough to avoid the price volatility present in thin markets. The implication of low trawl allocation species is that the demand for quota of those species is likely to be high relative to supply, thus making the cost of purchasing quota of those species high. The risk posed by thin market conditions and low allocation species with relatively high probabilities of encounters may end up being the same (high costs of acquiring quota); however, the species may be different. For example, a species like darkblotched rockfish may have enough quota available, and be encountered enough, so that transactions occur in a manner that is sufficient to avoid thin market conditions. However, demand may be large relative to supply, and, therefore, the cost of this quota may be relatively high. In this case, the market is likely to work effectively because the number of transactions may be large enough to avoid thin market conditions, but the cost to individual harvesters trying to purchase quota could be substantial.

The sources of risk identified above pose risks to individual entities, but they also pose a collective risk to the entire fleet. Given the uncertainty about what will be caught when deploying fishing gear, there

[92] Rex sole was excluded because it is found across a much wider depth distribution, and, therefore, the catch of rex sole may not be affected.

may be a potential for a harvester to have a disaster tow where a single haul catches the remaining trawl sector allocation. The alternatives under consideration would require that when the trawl sector allocation is reached or exceeded, large areas of the coast may be shut down to prevent further harvests of those species. This action will almost certainly foreclose further harvest opportunities for vessels and several target species. If there is an expectation that disaster tows will occur, then the fishery may begin to take on the characteristics of an Olympic fishery where harvesters begin fishing operations in January and attempt to harvest as much of their quota as they can before one harvester preempts future opportunity through an unexpected disaster tow. Another potential outcome of these risks is that the fleet may completely avoid certain areas and forego harvest opportunities for target species in those areas. This would tend to reduce ex-vessel revenues from those expected.

One factor in the alternatives that may mitigate some of the risk is the presence of a carry-over provision. This provision would allow harvesters to debit an overage from a subsequent year and avoid the purchase of costly quota and avoid a possible enforcement action. Another way of managing risk in an IFQ-based program is for harvesters to form voluntary pools for sharing quota and spreading the risk of unexpected catch events. It can be reasonably well expected that this will happen to some degree; however, two provisions that may make it difficult to form such voluntary pools are the manner in which quota is initially allocated and whether there is the presence of a grandfather clause for constraining stocks. The management of risk by harvesters can be affected by initial allocation and by the presence of a grandfather clause. If harvesters rely on collective, voluntary pooling arrangements to collectively manage low trawl allocation species, then the initial allocation may influence the success of those pools forming. The formation of such collective arrangements relies on potential participants having relatively even power in the negotiations that occur while forming such collective agreements. Such even power does not necessarily mean that all collaborators should have equal allocations of all species, but it does mean that if one collaborator has a large amount of low allocation species, that harvester will be at a relative advantage in the negotiation. If initial allocation favors some harvesters more than others, or a grandfather clause allows some entities to hold more constraining species quota than others, the ability of those harvesters to form risk pooling arrangements may be problematic. This is because the outcome of negotiations would tend to favor fewer individuals (those with more negotiating power). Such an outcome would tend to breakdown collective agreements that are intended to treat individuals equitably and result in risk sharing.

In a co-op program, the type of risk described above is minimized through collective management that spreads the risk across the multiple participants in the co-op or fishery. However, if the risk is spread across too many participants, the ability of those participants to agree to a bycatch management plan may be jeopardized and there is a potential for a race for bycatch to develop among harvesters.[93] The risk that a race for bycatch may develop depends on the number of co-ops or sectors to which a bycatch limit applies. If a bycatch limit is applied to a relatively small pool of vessels (e.g., to individual co-ops), the possibility of a race for bycatch developing is relatively small. Conversely, if a bycatch limit is applied at a relatively gross level (to all three commercial whiting sectors combined), it is more likely that a race for bycatch would develop. However, other risks become evident if bycatch limits are established for a relatively small group of vessels. The risk of an unexpected disaster tow preempting the harvest opportunities of harvesters in a co-op is greater if the bycatch limit is established for a relatively few number of harvesters. This type of risk can be managed through the presence of inter-cooperative agreements to manage bycatch. A fishery operating with such agreements would likely rely on the individual co-op agreements to specify the management of bycatch of individual harvesters (thus

[93] The term "race for bycatch" is used in this case to describe a type of behavior that occurs when harvesters do not believe that the bycatch limit will be successfully managed. In this event, harvesters believe that they face the risk of being preempted by the attainment of a bycatch limit and, therefore, race for fish in order to harvest their allocated target species.

imposing individual accountability for bycatch) and would depend on the inter-co-op agreement to spread the risk of catch uncertainty across more participants. While this type of framework appears similar to IFQ-level management of bycatch, the presence of bycatch species quota in an IFQ program can potentially stand in the way of collective management agreements. This is because those holders of bycatch quota would tend to have a relatively greater negotiation stance. This concept is discussed in more detail under the earlier section comparing cooperative institutions with individual quota institutions.

Table 4-20. Individual and collective bycatch risk at different levels of the fishery.

Level of Bycatch Management	**Collective Risk** (risk of a race for bycatch)	**Individual Risk** (risk posed to individuals from catch uncertainty, low trawl allocation and thin market species, and individual accountability)
IFQ	Low	High
Co-op Level	Med-Low	Med-High*
Sector Level	Med-High	Med-Low
Fishery Level	High	Low

*If inter-cooperative agreements are formed for managing bycatch across co-ops, a co-op level allocation of bycatch species may have a low level of risk posed by individual accountability and catch uncertainty, while also having a low level of risk that a race for bycatch could develop. This is because a co-op level allocation of bycatch forces the cooperative to internalize bycatch management, and this would be evident in the cooperative agreement signed by harvesters in that cooperative. Such internalization of bycatch management in the co-ops would tend to foster the development of high levels of individual accountability for bycatch by members. Allowing intercooperative agreements to form would allow cooperatives to spread the risk of catch uncertainty across cooperatives (thus reducing individual risk) if those cooperatives can agree to terms.

A program that requires whiting catcher vessels to cover low OY and low trawl allocation species with quota will almost undoubtedly create a thin market for IFQ. As described above, including these species in a program creates risk because vessels that exceed their holdings of QPs for one of those species may find it difficult to purchase QPs to cover those overages. If QPs cannot be found or acquired, that vessel may incur a substantial penalty. This places a high burden on the individual, which may be appropriate if the situation warrants such a threshold. In a cooperative program, such thin market conditions are unlikely, since nontarget species will be covered by a collective bycatch limit that does not rely on market mechanisms, but rather relies on social arrangements and relationships. Pooling of nontarget species in this manner alleviates some of the individual burden in favor of risk sharing across participants in the fishery.

Species coverage and gear switching

As shown above, trawl gear may not substantially encounter many types of groundfish species, arguably making the coverage of some species in an IFQ program unnecessary (and potentially having adverse consequences if they are covered). However, gear switching opens up a new set of possibilities for trawl harvesters because nontrawl gear can be more adept at accessing some types of groundfish—particularly those groundfish that may live in rocky or high-relief habitats that trawl gear cannot access under existing footrope restrictions. Therefore, when considering which species should be covered with IFQ, it is important to consider those species substantially caught with trawl gear, along with those species that may be substantially caught with nontrawl gear.

When considering which species to cover under management of a rationalization program, one can differentiate between nearshore species and other types of groundfish—in this case, they can be differentiated because of state management regulations that restrict the harvest of these species and the fact that those regulations will likely continue to restrict the harvest of those species if the trawl fishery

is rationalized. The following bullets outline, generally, the regulations that dictate commercial nearshore groundfish regulations off the three west coast states.

- Off the Washington coast, the state of Washington has eliminated commercial fishing for groundfish in coastal state waters. This effectively eliminates the harvest of nearshore species by commercial vessels operating off the Washington coast.
- Off the Oregon coast, the state of Oregon restricts landings of nearshore species through the commercial nearshore management program. Vessels landing nearshore species are required to hold a state nearshore license. Vessels landing nearshore species along the Oregon coast would, therefore, fall under the nearshore commercial fishery regulations and would not be operating under the trawl rationalization program. This elimination of targeting opportunity heavily restricts the catch of nearshore species off the Oregon coast by vessels without a nearshore license.
- The state of California manages nearshore species similarly to Oregon, but has also implemented trawl gear closures in much of the state waters. Vessels landing appreciable amounts of nearshore species in California would, therefore, fall under the state nearshore fishery management regulations and would not be operating under the trawl rationalization program. Like Oregon, these measures heavily restrict the catch of nearshore species off the California coast.

Species affected by the state management described above include the following: cabezon, black rockfish, kelp greenling, California scorpionfish, and the various species making up the nearshore rockfish group (including deeper and shallow nearshore). It is possible that fishermen could target other species that occur in nearshore waters (such as lingcod) with nontrawl gear, incidentally encounter nearshore stocks, and incur large amounts of discard due to state landing restrictions. Therefore, if nearshore species are not covered with IFQ, it may be necessary to impose differential RCA restrictions on IFQ vessels using nontrawl gear versus those using trawl gear. The appropriateness of this measure would depend on the likelihood of vessels fishing in nearshore areas with gears that encounter nearshore species.

Other species that are not covered by state-based nearshore management regulations may or may not be frequently encountered by trawl and nontrawl vessels. Those species that are not actively encountered by commercial groundfish vessels may have a lower priority or necessity for management under the rationalization program than those species which are more frequently encountered. Eliminating some of these species from the program may reduce some administrative costs and other potentially adverse economic effects (such as those described under previous sections). In order to examine the type of species encountered and the scale to which they are encountered, past fish ticket data were analyzed. While these data do not include discards, they provide a reasonable index for mortality levels for those species that are not prohibited or have highly restrictive trip limits.

Table 4-21. Average annual shoreside landings by gear group (2003-07), mt.

Species Name	Average Annual Shoreside Landings by Gear Group (2003-07)					
	Hook and Line	Net (incl set net)	Pot	Shrimp Trawl	Trawl	Troll
Arrowtooth	5		1	0	2,605	0
Chilipepper	3	0	0	0	45	0
Dover Sole	2	0	1	2	7,298	2
English Sole	0	0		1	1,047	
Lingcod	86	0	5	0	141	10
Longspine	22	0	0	0	917	0
Other Flatfish	3	1	0	15	1,312	0
Pacific Cod	5		0	0	880	0
Pacific Whiting	0	0	0	0	96,461	0
Petrale Sole	1	0	0	2	2,334	0
Sablefish	1,973	3	799	1	2,314	2
Shortbelly	0				0	
Shortspine	141	0	0	0	591	0
Slope Rockfish	140	16	5	0	261	1
Spiny Dogfish	449	13			248	0
Splitnose	0		0	0	24	0
Yellowtail Rockfish	5		0	0	544	16

Of those species above which are caught in noticeable volumes by nontrawl gear, some may be better described as being incidental to other types of targeting activity. Longspine thornyheads fall under this category as the price for these species is low, and the size of these species is relatively small, meaning the revenue per unit of effort is minor. Based on industry representatives, fixed gear vessels do not actively target longspine thornyheads (Richter, pers. comm., 2008). Longspine south of 34 degrees 27 minutes N. latitude are found in areas not accessible to trawl gear. When combined with the fact that fixed gear vessels do not target longspine thornyheads, it may be reasonable to exclude longspine in this area from the IQ program because the catch of that species is likely to be small.

Finally, as part of the Council's decision on Intersector Allocation, the trawl sector was allocated a quantity of Pacific halibut that is noticeably lower than what has been taken under Alternative 1 conditions. In the B.C. trawl fishery, the bycatch of Pacific halibut has declined substantially as a result of imposing individual limits on Pacific halibut. This suggests that trawlers along the west coast may also be able to substantially reduce their take of Pacific halibut if individual limits are imposed on west coast trawlers. However, one major difference appears to exist between the B.C. system and what is proposed for the west coast system. Under the B.C. system, the trawl sector is allocated substantially more than what they take each year. This means that there is a substantial supply of halibut quota available to the sector, even though they take far less. In the west coast system, the trawl sector will be allocated an amount of halibut that the Council feels is an appropriate level for the trawl sector to catch. In other words, the B.C. trawl sector will allocate more than they are expected to catch, while the west coast system will allocate a target amount on a par with the Council catch level for the trawl sector. Under the B.C. system, more QPs are available than used, while under the west coast system the availability of QPs will likely be more in line with what is expected to be caught. Through simple supply-demand mechanisms, it is reasonable to expect that the price of halibut quota on the west coast market will be substantially higher than in the B.C. system because of the relative scarcity of halibut QPs. This cost of quota, combined with the fact that the trawl sector may be allocated an amount of halibut that proves to be somewhat constraining, may lead to effects on the trawl fishery that are similar

to overfished species or to other types of constraining fisheries. Those harvesters operating in areas where Pacific halibut are relatively abundant (northern Washington) may find it more difficult to avoid halibut and may reach their halibut IBQ amount sooner than harvesters in other parts of the coast. The result may be similar to trawlers operating in areas where overfished species are relatively abundant; quota may be transferred to another area of the coast, or vessels may move. Should the trawl sector be highly effective at avoiding Pacific halibut, however, the amount allocated to the sector may end up being more than what is expected to be caught in any given year. If this is the case, the west coast system may look similar to the B.C. system, and the effect of imposing individual limits on Pacific halibut may not have the same degree of regional effects as described above.

4.6.2.5 Other General Effects of Rationalization on Trawl Harvesters

While it can be reasonably well expected that individual accountability measures and an elimination of an Olympic fishery will increase ex-vessel revenues in the fishery (risk conditions aside), changes in the way the fishery is prosecuted will be a likely result. In the nonwhiting portion of the trawl fishery, vessels are likely to modify their behavior in several ways to decrease bycatch of overfished species. This may come in several forms, including gear modifications, using a different type of gear altogether (i.e., nontrawl gear), or changing the location of fishing. Changes in the location of fishing effort are likely to be driven to a large degree by the relative presence of constraining stocks and the fact that those stocks tend to be patchily distributed. As vessels become individually accountable for their catch of constraining stocks, they are likely to move from those patches where there is a relatively high abundance and bycatch rate, and, if that distance is substantial, this may have repercussions on adjacent communities that are dependent on trawl fishing activity. This effect is described in more detail under community impacts.

Consolidation of the trawl fishery will almost certainly be another outcome of rationalization. A reduction in fleet size is likely to be nonhomogenous across the fleet, meaning that there are vessels and operators with certain characteristics that may make them more or less likely to drop out of the fishery when a rationalization program goes into place. This consolidation should increase efficiency and net revenues and may also result in increased wages to those employed on fishing vessels. However, it is also likely to result in fewer fishing-related jobs and a disproportionate reduction in the number of vessels in some ports, with potentially adverse impacts to input suppliers, processors, and other fishing support businesses in those places, while having potentially beneficial impacts in other places. This effect is further described in the analysis of impacts to captain and crew (page 390), impacts to processors (Section 4.7), and impacts to communities (see Communities).

Initial allocation

The initial distribution of quota is likely to have an effect on groundfish trawl harvesters. While this is primarily a distributional issue, some research suggests that variations in overall economic performance could occur depending on the way quota is allocated (Hurwicz 1995). Overall economic performance could be affected because of the transfer costs associated with finding and trading quota, and also because of the relative amount of financial assets fishermen have to purchase quota, which may limit their ability to acquire additional quota. Economic performance may be compromised if the initial allocation to harvesters differs substantially from their current and recent fishing practices.

This initial allocation creates something like a capital asset and also influences the amount of harvest available to those individuals. Depending on the allocation formula, some permit holders and catcher vessels may receive a greater or lesser amount of allowable catch than under Alternative 1 conditions. In addition, they may receive a different mix of species allocated as quota compared to the mix of species they currently harvest. In the long run, transfers of those fishing privileges should occur in a

way that is more optimal to individual harvesters, and that transfer will act as a cost to those that purchase the shares and as a benefit to those that sell them.

Rationalization and distribution of harvest privileges may disadvantage people who currently own and/or operate vessels but are not groundfish trawl permit holders. This is because these people will not receive an initial allocation of quota. The consolidation of harvest privileges (be it IFQ or co-ops) onto fewer vessels may put those individuals without an initial distribution of harvest privileges at a relative disadvantage. They will be less able to pay quota holders to lease their unused quota compared to other quota holders wanting to lease it. This is based on the notion that vessel owners with an allocation of quota can cover their costs with their own quota and then bid higher prices to lease quota from others. Vessel operators without an initial distribution will need to cover their costs and generate revenues on quota they may lease from other individuals and this makes them less able to bid high prices to lease quota. Since holders of harvest privileges will want to get the best price, those vessel operators unable to pay for it will be shut out of the market.

The share of quota initially allocated to harvesters and processors will tend to influence ex-vessel price. Ex-vessel price is generally expected to increase relative to Alternative 1 if the entire allocation of IFQ is made to permit holders. As processor initial allocation is increased, ex-vessel price is expected to decrease. It is not clear how this compares to Alternative 1 ex-vessel prices however. In the cooperative program proposed for the whiting sector, which has linkages between harvesting and processing entities, it is unclear what will happen to ex-vessel prices. In situations where there is one buyer and one supplier, prices are typically set by nonmarket mechanisms. Personal relationships are likely to play a great role in ex-vessel price setting in such cases.

Initial Allocation of Overfished Species

Perhaps one of the most important initial allocations is the allocation of overfished species. Since overfished species will continue to limit access to target species, overfished species quota is likely to be costly and will also determine if harvesters can access their initial allocations of target species. The cost of overfished species quota will be largely determined by the degree to which they constrain access to target species. Those species that are highly constraining will likely reflect much of the value of the fishery in the price of the quota, even if the revenue generated from landing those species individually is small. For example, two of the most valuable species (in terms of landed catch value) tend to be sablefish and petrale sole. It is expected that the value of sablefish and petrale sole quota will be higher than other target species, such as Dover sole or English sole. However, the price of canary rockfish quota may well be higher than any target species simply because, in order to access many target species, one will need quota of overfished species. In some ways, those permits that do not receive an initial allocation of overfished species may be in a position that is in some ways similar to a second-generation fisherman who must buy into the fishery, simply because a large portion of the value of the fishery is contained within the price of overfished species quota. Therefore, the way overfished species are allocated has a large impact on the future success of existing fishing operations and (when viewed in more aggregate terms across multiple vessels in a port or region) on fishing communities.

An additional consideration concerns the ability of harvesters to form risk pools. If the initial allocation has an impact on the longer-term outcome of individual harvesters—and the amount of overfished species quota individual harvesters hold over the longer term—then the ability for risk pools to form and remain intact can be affected by the initial allocation. As indicated previously, if a small number of participants in a risk pool have a relatively large influence, or control, over the outcome of that pooling arrangement then the arrangement should be expected to be relatively unstable. In the case of overfished species, if one harvester holds substantially more overfished species quota than other harvesters, then that first harvester may have substantially more influence over the pooling arrangement

than others, destabilizing the arrangement and jeopardizing the continued success of that arrangement. An initial allocation that results in a relatively steep high to low distribution of overfished species QSs may have the effect of making it difficult for pooling arrangements to form, while an initial allocation that has a less severe high to low allocation may create conditions where pooling arrangements may form and may remain intact over the longer term.

Each of the options for initial allocation of overfished species results in different allocations of some species when compared to the other options for allocating these species. Some options concentrate quota into a small number of entities, while others spread out the initial allocation among all trawl permits. Summarized results for these initial allocation estimates are shown below.

As indicated in the table below, the effect of the initial allocation depends heavily on the formula chosen. For each formula that does not include an "equal sharing of buyback history" component, many permits receive zero allocations of overfished species. For some species where the scope of the allowable catch is area-specific (such as bocaccio and cowcod), this outcome may be reasonable. Those permits with history fishing north of Cape Mendocino (where the bocaccio and cowcod OY does not apply) are not held accountable for these species because management of those species does not extend to that area. For other species such as canary and widow rockfish, where the stock distribution is more widespread, an initial allocation of zero is likely to make it difficult for harvesters to engage in fishing activity unless they can purchase quota of these species through the market. Finally, some formulas result in a relatively large concentration of overfished species quota to a small number of permits. Cowcod, for instance, is heavily affected by the formula with landings-history-based formulas allocating a large portion of the quota to a single permit.

Table 4-22. Summary statistics of overfished species initial allocation to permits by initial allocation formula.

Initial Allocation Formula	Overfished Species	Initial Allocation to Permits		
		Maximum	Median	Minimum
Bycatch rate (pro rata for whiting) plus equal sharing of BB History	Bocaccio	10.88%	0.10%	0.10%
	Canary	1.91%	0.37%	0.18%
	Cowcod	8.11%	0.30%	0.30%
	Darkblotched	1.13%	0.46%	0.26%
	POP	1.81%	0.39%	0.23%
	Widow	1.58%	0.39%	0.17%
	Yelloweye	3.25%	0.40%	0.18%
Bycatch rate (pro rata for whiting) only	Bocaccio	13.22%	0.00%	0.00%
	Canary	3.17%	0.30%	0.01%
	Cowcod	17.71%	0.00%	0.00%
	Darkblotched	1.71%	0.40%	0.00%
	POP	2.80%	0.28%	0.00%
	Widow	1.86%	0.36%	0.02%
	Yelloweye	4.67%	0.33%	0.00%
Landings history plus equal sharing of BB history	Bocaccio	11.15%	0.10%	0.10%
	Canary	2.97%	0.33%	0.17%
	Cowcod	40.00%	0.30%	0.30%
	Darkblotched	3.77%	0.38%	0.26%
	POP	2.47%	0.29%	0.23%
	Widow	3.35%	0.23%	0.15%
	Yelloweye	5.42%	0.29%	0.18%
Landings history only	Bocaccio	13.55%	0.00%	0.00%
	Canary	3.28%	0.28%	0.00%
	Cowcod	90.00%	0.00%	0.00%
	Darkblotched	6.83%	0.23%	0.00%
	POP	4.13%	0.10%	0.00%
	Widow	5.03%	0.13%	0.00%
	Yelloweye	7.99%	0.17%	0.00%

Safety

Qualitative information has shown that safety onboard fishing vessels is generally improved as a result of rationalization. Typically this has been the result of an elimination of Olympic-style characteristics in fisheries; vessels no longer have to fish in hazardous weather conditions as often after the fishery is rationalized. Other reasons for changes in safety include the capability of vessel owners to adequately maintain vessels and safety equipment. This maintenance is directly associated with the amount of net revenue generated by fishery participants, and therefore, a fishery that experiences an increase in net revenue will likely experience a decrease in safety-related incidents. Since rationalization is generally expected to result in an elimination of the race for fish and an increase in net revenue across catcher vessels, it is expected that safety will be enhanced by rationalization of the west coast trawl fishery.

These expectations are supported to some degree by data on fishing-related safety incidents reported by NIOSH. Based on data on the west coast trawl fishery reported from 2000 to 2008, several incidents (both fatal and nonfatal) appear to have occurred due to weather or appear to have occurred as a result of some failure of structural integrity of the vessel. Furthermore, some incidents involved vessels with

wood hulls, or vessels that were older than 100 years. It is reasonable to expect that some of the weather-related events may have been avoided; it is also reasonable to expect that events involving structural integrity may be avoided if harvesters are generating additional income and using that income to improve maintenance. Furthermore, if harvesters are generating higher levels of income, they may be inclined to purchase vessels made of more rigorous material than wood (such as steel) and to fish on vessels that are relatively new. These factors should tend to improve safety conditions.

4.6.3 Direct and Indirect Effects of the Alternatives on Limited Entry Trawl Harvesters

In addition to the general effects described above, each of the alternatives is expected to impact catcher vessels and permit owners in different ways. The alternatives result in different impacts because of variations in the elements of those alternatives. This section analyzes the direct and indirect impacts of the alternatives on groundfish trawl harvesters.

In this section, we begin by describing the manner in which each of the elements of the alternatives is expected to impact catcher vessels and permit owners. This description of expected effects serves as an overview and introduction to the way the elements of the alternatives will impact this particular environmental component. Immediately following the overview of how the elements of the alternatives impact groundfish trawl harvesters is a description of the impacts of each alternative. Where appropriate, these impacts are compared to Alternative 1 conditions and to the other alternatives. Following the description of impacts of each alternative is a comparative summary of the effects of each of the alternatives.

4.6.3.1 Expected Effects of Elements of the Alternatives on Limited Entry Trawl Harvesters

The effect of the alternatives on LE trawl harvesters is evaluated in two ways. First, we evaluate the specific elements, or program features, that are varied across the alternatives (these are the rows in Table 4-2 describing the alternatives). Second, the entirety of each alternative is evaluated for its effects.

How do IFQs and co-ops change things relative to Alternative 1 for groundfish trawl harvesters?

Changing the primary catch control tool in the fishery to total catch IFQs and/or harvest co-ops is expected to impact groundfish trawl harvesters in a variety of ways. In general, shifting to IFQ and harvest co-ops will allow harvesters to optimize the timing of their fishing practices to maximize net revenues. In addition, IFQs and/or harvest co-ops will tend to eliminate the Olympic characteristics of the whiting fishery and to facilitate the development of strategies that increase product quality and yield. Knowledge transfer between fishermen will tend to be greater than under Alternative 1 when the catch control tool is changed because they are no longer competing to catch the largest possible share of the OY. However, knowledge transfer and communication are likely to be different in IFQ programs than in co-op programs. This is because harvesters in a co-op (be it a voluntary or mandatory cooperative) have more incentive to act collectively, which requires communication and information-sharing for collective success. This may influence the degree of success fishermen have in dealing with collective action problems such as bycatch avoidance and successfully targeting of desired species (Pacific whiting).

The individual accountability for total catch associated with IFQs and co-ops increases the financial risks that individual harvesters face when prosecuting fishing activity. This is particularly the case for vessels that may encounter species with low OYs and/or low trawl allocations. While theory suggests that fishermen will simply avoid stocks for which they do not have quota, fishing is inherently an

inexact method of extracting resources. This uncertainty means that there is a potential for harvesters to catch species that they may not intend to harvest, or may, in fact, be trying to avoid. If harvesters accidentally incur a catch deficit by exceeding their holdings of QPs, they will need to cover that deficit by purchasing additional quota. For species with low OYs (ACLs) and/or low trawl allocations, this quota may come at prices that are extremely expensive. This possibility creates a large risk to individual harvesters who are participating in an IFQ program. This risk does not necessarily exist to the same degree in a co-op system. In a co-op system, the risk of an unforeseen or unexpected catch event is spread across the co-op participants who collectively absorb that event.

IFQ may create more individual accountability than co-ops in some cases. This is partly because of the implications described above from encountering low OY species, or species with low trawl allocations. The fact that co-op members must internalize the unforeseen or unexpected actions of other co-op members tends to reduce the penalty individual harvesters must internalize from an unexpected catch event to some degree. This difference in individual accountability between the two systems is not likely to affect the outcome of the program if it is minor, but if the degree of individual accountability becomes too low, a race for fish could ensue across all harvesters in a sector because of fear of preemption over bycatch. Alternatively, if the risk associated with the harvest of some species in an IFQ program is too great, harvesters may forego the catch of some target species to avoid risk.

The imposition of IFQs and/or harvest co-ops as a catch control tool is likely to induce behavioral changes that influence the magnitude and type of species harvested in the fishery relative to Alternative 1. This is because of the perceived reward in the form of increased catch of target species associated with reductions in the catch rate of constraining overfished species.

Finally, as harvesters transition from Alternative 1 conditions to a system of IFQs or harvest cooperatives, there is likely to be an adjustment period. Research has indicated that participants have difficulty understanding and setting appropriate prices during the initial period of a new market system. This can have different effects on individuals as some pay prices that are too high or sell at prices that are too low. In subsequent periods, those who sold at inappropriate prices may try to compensate, negatively affecting the ability of the market to reach equilibrium (Anderson 2004).

How does initial allocation affect groundfish trawl harvesters?

The initial allocation of IFQ and catch history (a term used to describe harvest privileges in a cooperative system) will affect individuals differently. Under some situations, it may affect overall performance. The distribution of harvest privileges may change the fishing opportunities of several vessels when compared to Alternative 1 and some vessels may find themselves better off while others may find themselves worse off. This distributional effect may be seen as being more or less equitable by some stakeholders.

One factor that can be influenced by initial allocation is the ability of harvesters to form voluntary associations to manage risk. Some interested parties have used the term "risk pools" to describe these arrangements. If the initial allocation of groundfish—particularly constraining stocks—is done in a manner where relatively small numbers of entities receive a relatively large amount of constraining species quota, harvesters may have difficulty forming and maintaining voluntary risk pools because those with relatively large amounts of constraining species quota will have an advantage in negotiation.

How will accumulation limits affect groundfish trawl harvesters?

Accumulation limits affect how IFQ will be distributed and also affect the economic performance of individual catcher vessels and the trawl fleet as a whole. The presence of an accumulation limit would

tend to increase the number of vessels in the fishery and spread the amount of fishing activity across a wider number of entities. This, in turn, would tend to lower economic efficiency for the average vessel compared to a case where there is no accumulation limit because it would restrict consolidation. Higher degrees of consolidation would tend to restructure the fleet toward the most economically efficient vessels and increase fleet-wide economic efficiency. Other aspects of accumulation limits are discussed in more detail in Appendix A.

How will a grandfather clause or a divestiture provision affect groundfish trawl harvesters?

The inclusion of the grandfather clause would allow entities to hold quota in excess of an accumulation limit. The presence of a grandfather clause would tend to make it more likely that large producing entities would be able to maintain that relatively large degree of production, whereas the absence of a grandfather clause may eliminate, or make it more difficult, for certain entities to maintain historic levels of production and participation. A grandfather clause may also influence the negotiations that occur between harvesters and processors over ex-vessel prices. In the alternatives that include a grandfather clause, large producers that receive QSs in excess of accumulation limits would be in a stronger position during such negotiations in comparison to alternatives without this feature.

A grandfather clause also affects the ability for harvesters to form "risk pools," or voluntary arrangements to manage constraining species. Voluntary sharing arrangements rely on there being a relative balance in negotiation power. A grandfather clause would tend to allow some entities to receive substantially greater amounts of quota than other entities. This relative imbalance—particularly in the case of constraining stocks—limits the ability of harvesters to form stable and long-term risk pools since some entities will have more bargaining power than others as a result of a grandfather clause applied to constraining species. Not having a grandfather clause for constraining species would make it easier to form risk pools.

A divestiture provision acts similarly to a grandfather clause in some respects and differently in others. During the period when the entity is able to hold quota in excess of limits, the divestiture provision may act similarly. However, a divestiture provision requires that the entity transfer quota by a date certain so that he/she is within the established accumulation limits. During that transfer period, the entity is likely to transfer that overage quota in a manner that is beneficial to him or her. This may mean simply selling to the highest bidder and capturing the rent associated with fishing that quota, or transferring that quota to someone with whom that original entity may have relations. This is different than a case where no grandfather clause or no divestiture provision is allowed. Under this latter case, overage quota would be automatically redistributed to QS holders on a pro rata basis, leaving no opportunity for the entity potentially over the accumulation limit to have input on where that quota goes and leaving no opportunity for that original entity to capture any of the rent associated with that overage quota.

How do processor allocations/ties affect groundfish trawl harvesters?

An initial allocation of IFQ to processors and/or processor linkages in a co-op program will tend to influence the negotiating power harvesters have over ex-vessel prices. An initial allocation of IFQ to processors may impact the harvest quantities available to various vessels, while a processor linkage will arguably not influence the harvest quantities available to vessels. If no IFQ is allocated to processors, it is expected that harvesters will have more negotiating power over ex-vessel prices compared to Alternative 1. This is because it is expected that they can hold out longer in negotiations with processors without losing fishing opportunity. If IFQ is allocated to processors, it is expected that harvesters will not have the same degree of negotiation power because processors will be able to fish their own IFQ while negotiating with harvesters. In addition, if IFQ is allocated to processors, the amount of quota available to harvesters is likely to differ from a case where the quota is allocated to

permits. If IFQ is allocated to processors, those processors may elect to have vessels that otherwise do not hold IFQ fish to their quota.

Alternatives with a processor linkage in a co-op program are expected to affect harvesters somewhat differently than alternatives where IFQ is allocated to processors. A harvester-processor linkage creates a condition where ex-vessel price negotiations are based more on personal relationships than market conditions. Therefore, the effect on ex-vessel prices cannot be predicted. However, establishing a processor linkage does not change the distribution of harvest opportunities for vessels like an initial allocation of IFQ to processors might do. This is because catch opportunity is tied to a single vessel, and processors do not have control over the quantity of fish available to harvesters.

How will the species covered through the program affect groundfish trawl harvesters?

Both the number and kinds of species covered in an IFQ or co-op program will affect harvesters. If a larger number of species are covered by IFQs or co-op allocations, individual vessels will tend to face more constraints on their harvesting opportunities. Alternatively, if fewer species are covered in the program, harvesters are less constrained and have more flexibility in prosecuting fishing activity. In the extreme case, however, enough species without coverage may tend to erode the effects of rationalization. In addition to the number of species, the type of species can have a large impact on harvesters. If the species covered in the program have a relatively large trawl allocation and a large amount of QPs are available on the market, trawl harvesters may find it relatively easy and cost-effective to use the marketplace to transfer quota and balance catch accounts. The smaller the trawl allocation, the more problematic it will be, at some level, for harvesters because the purchase of quota may prove costly. Below that level, the markets may begin to lack thickness, or the presence of enough transactions that a clear price signal will develop. Under this situation, empirical evidence has shown that prices become highly variable and that individuals begin to engage in strategic games. This reduces the efficiency and effectiveness of the market. In addition, if one must cover a catch deficit by purchasing quota for species with extremely low trawl allocations, that quota may be unavailable, meaning the harvester would not be able to cover the deficit.

Finally, for some species, it is necessary to consider the potential magnitude of a disaster tow relative to the trawl sector allocation. If the potential magnitude of a disaster tow is large enough relative to the trawl sector allocation (and the conditions described above pertain, making it difficult to purchase quota), then it would be reasonable to expect a gradual creeping of harvest activity toward earlier months of the year and harvest activity that begins to appear like an Olympic fishery. This would take place if a disaster tow occurs that causes the trawl sector to reach or exceed its allocation, and NMFS closes all or portions of the fishery upon attainment of that allocation. This event would essentially mean that harvesters risk being preempted by other harvesters. The potential of this occurring provides an incentive for harvesters to hedge against the possibility of their fishing opportunity being preempted by someone else by fishing earlier in the year. If this behavior is evidenced in enough harvesters over time, the fishery may begin taking on the appearance of an Olympic fishery.

How does the number of trawl sectors influence harvesters?

Since either three or four trawl sectors (two for at-sea whiting and either a single shoreside sector or two shoreside sectors) are being considered for the allocation of harvest privileges, this section compares the effects of having a single shoreside sector or two separate sectors for shoreside whiting and nonwhiting. It has been hypothesized that if one sector of the fishery has more financial capability of purchasing quota than another sector, then establishing a single shoreside sector may tend to result in a flow of quota from one group of harvesters to another. If overfished species IFQ flows from one sector to another (because one sector has greater purchasing power), the sector that loses the overfished species

IFQ may see its ability to access target species reduced (because of the constraining nature of overfished stocks). Alternatively, if there are four sectors, the separation would tend to preserve the amount of species available to each sector. This argument is theoretical. Available information suggests that both shoreside sectors will see profits improve under a well designed rationalization program. Harvesters in the nonwhiting portion of the fishery should see profits improve substantially, putting them on a more level field with shoreside whiting harvesters. This means that it appears unlikely that one portion of the shoreside fishery will outbid another portion of the shoreside fishery simply because one is more profitable than the other. However, having a single shoreside sector will tend to make it easier for trades to occur across the two existing shoreside sectors (which would be merged under a single sector option), meaning that species will tend to be traded according to their most optimally economic use between those sectors.

The number of trawl sectors established will likely influence the flexibility that harvesters have in either sector. By creating three trawl sectors and bundling both shoreside sectors into a common allocation, the trading of quota can occur between both sectors in a manner that creates flexibility in harvesting activity because of the ability to acquire and sell quota as needed. The establishment of four trawl sectors imposes risks on harvesters because it reduces the amount of QPs available to each sector and creates a firm set of allocations that could cause a sector to close if one or more of those allocations were met. For example, if the incidental catch of Pacific whiting in the nonwhiting sector is higher than anticipated, nonwhiting harvesters could end up being constrained by Pacific whiting and would not be able to purchase whiting quota from shoreside whiting harvesters to alleviate some of that constraint. This division of quota between the shoreside sectors could restrict the ability of nonwhiting harvesters to prosecute fishing activity if some species become unexpectedly constraining, because it establishes boundaries and restrictions on fishing activity without a mechanism for harvesters to work around those restrictions. Alternatively, the establishment of four trawl sectors implies that a set-aside or allocation of non target species will be necessary for the whiting fishery. Such a set-aside may be a target species for the nonwhiting fishery. Setting firm allocations may mean a loss of economic opportunity in years where the whiting fishery does not need that entire set-aside, thus jeopardizing the ability of the trawl sectors to achieve their allocation.

Sablefish is one example of a species where catch in the whiting fishery has varied from year to year and for which allocations necessary to establish four sectors may result in lost potential or produce a constraining species. In years where the catch of sablefish is low in the whiting fishery, that catch will reflect a lost economic opportunity to nonwhiting harvesters if that quota cannot be transferred to them. Figure 4-17 shows sablefish catch in the whiting fishery over the past several years. This figure shows that the catch of sablefish has varied substantially. The largest source of variation is in the shoreside whiting fishery. In years where sablefish bycatch is low, the inability to transfer that catch to the nonwhiting sector (because of the establishment of four trawl sectors) represents a lost opportunity.

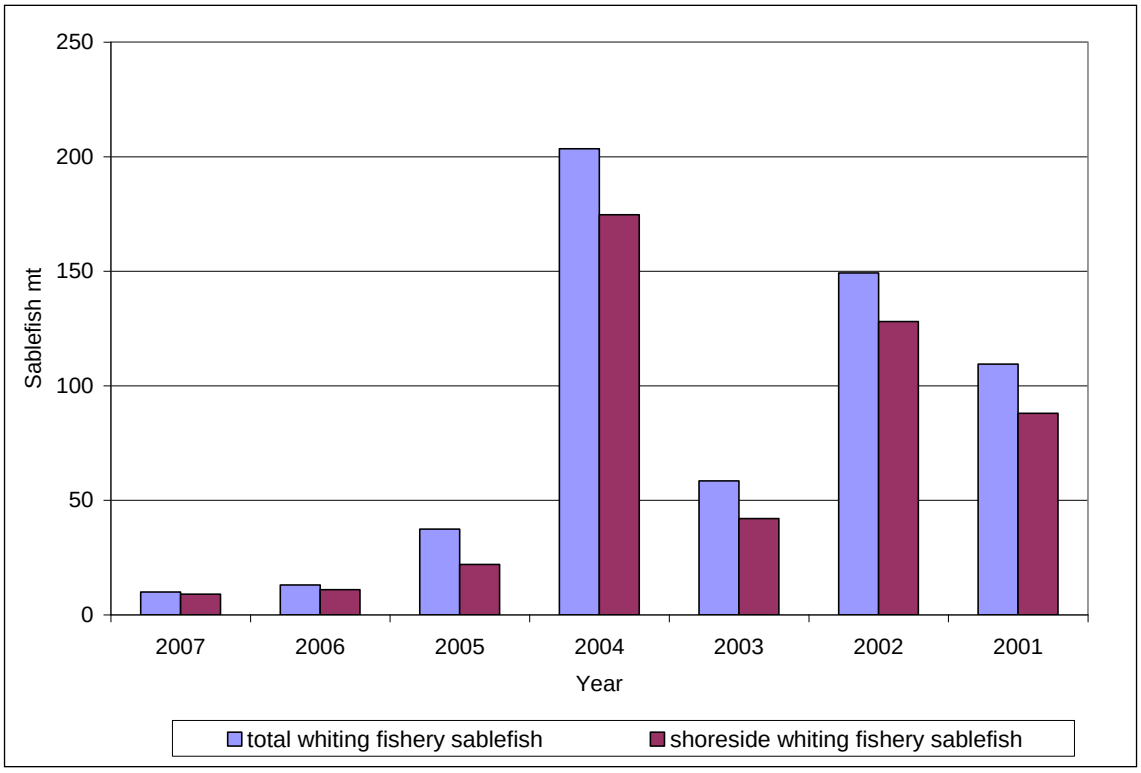


Figure 4-17. Bycatch of sablefish in the Pacific whiting fishery (2001-07).

How will an adaptive management provision affect harvesters?

An adaptive management provision will have a distributional effect on harvesters. If the Council chooses to implement an adaptive management provision that uses 10 percent of the available quota for various objectives, then some vessels may receive portions of this quota while others may not. Compared to Alternative 1 it is difficult to predict whether harvesters will gain or lose, but compared to a rationalization program without an adaptive management provision, some vessels may gain and others may lose because of the distributional effect of the provision. There is some possibility that an adaptive management provision will have an effect on ex-vessel prices since an adaptive management provision will work against a market-driven outcome, potentially leading to a downward effect on overall profitability.

When considering the use of an adaptive management provision to assist new entrants (which is one goal for the AMP), such new entrants may be simply considered as those harvesters who are not initial recipients of QSs. Published research has suggested that it is very difficult for harvesters who are not initial recipients of QSs to become independent owner operators as initial recipients of QS trade among themselves at prices that are relatively high. Those market prices for quota are bid to high levels because initial recipients of QSs have already covered their costs and generated profit from their "gifted" quota and can afford to make small margins on subsequent purchases of quota (Pinkerton and Edwards 2009). Directing AMP QPs to those harvesters who may not be initial recipients of quota at no, or a low, cost can help those harvesters bridge a profitability gap and allow them to save enough money over time that they can eventually purchase their own QSs.

How will a carry-over provision affect harvesters?

A carry-over provision will tend to influence the time horizon for managing individual IFQs. Harvesters are required to stop fishing for the remainder of the year if they are in a deficit (catch exceeds the QPs they possess); a carry-over allowance reduces the risk of going into a deficit because it allows harvesters to avoid penalties associated with a deficit condition.

How will tracking and monitoring affect harvesters?

The type of tracking and monitoring program will primarily influence cost from a harvester's perspective. This is because harvesters may be required to pay for some of the cost of carrying an observer. Monitoring may also affect the quota trading system as a whole if the quality of catch data collected is inadequate or imposes different standards on different harvesters. Catch data of insufficient quality may create conditions where it is possible for harvesters to cheat and discard catch, for example, while catch monitoring not applied in a uniform fashion across harvesters may put some at a relative advantage/disadvantage, thus affecting the ability of those harvesters to trade between one another.

4.6.3.2 Alternative 1 (No Action)

The effect of the Alternative 1 on harvesters is largely expected to mean the continuation of the status described in Chapter 3. To a large degree, harvesters are expected to be constrained in their opportunities because of measures designed to protect depleted species. While these depleted species are expected to rebuild with time, the rebuilding plans of some species state that they will not rebuild for several decades, meaning that restrictive fishing opportunities are likely to persist over the long term.

The effect of Alternative 1 on vessel profits and fleet efficiency

Under the Alternative 1, economic profits are estimated to be zero for average nonwhiting trawl vessels. Based on the results from Lian et al. (2008), the average nonwhiting trawler is able to cover costs and make wages, but nothing more. Since this is an average estimate across the fleet, some vessel owners do worse and would be better off not fishing, while other vessel owners do manage to make some profits. Under the Alternative 1, it is expected that the general state of the industry would persist, largely because the management regime is not expected to appreciably change, especially in the short term. Management under Alternative 1 prevents much fleet consolidation and provides fishing opportunities that are heavily restricted by measures designed to foster the rebuilding of depleted species. It is expected that these restrictive measures would remain in place, at least in the short term, while depleted stocks rebuild. Over the longer term, and as several rockfish stocks become rebuilt (widow and darkblotched for example), management may change, and some additional opportunities may be developed which could lead to profit generation by harvesters. For a variety of reasons, which include the fact that other depleted species may continue to dominate fishing opportunities, it is not clear how vessel profits will fare over the longer term because it is not known how management will respond as stocks become rebuilt. As stocks become rebuilt, it is possible that access to them may continue to be restricted by other depleted species, meaning that, because of the multi-species nature of the fishery, several stocks may have to be rebuilt before fishing opportunities can be liberalized.

Vessels operating in the whiting fishery are generally expected to fare better than vessels in the nonwhiting fishery. While estimates of profitability in whiting operations are not available, it is generally expected that the recently improved market conditions for whiting will be more typical in the future. Because of increased population growth, increased purchasing power from developing countries, and a depressed status of white fish resources in other parts of the world, the price received for whiting is expected to remain high relative to historic levels. When combined with the LE program

implemented as part of Amendment 15, which restricts access to sectors of the whiting fishery, the average whiting vessel is expected to be somewhat better off under Alternative 1 conditions than the average nonwhiting vessel. However, due to the Olympic structure of the fishery, large inefficiencies are expected to remain, including overcapitalization and race-for-fish behavior. These factors will lead to inefficient costs of harvesting and lower revenues than would otherwise exist under a different, more rationalized, regime. In addition, the Olympic structure of the fishery discourages fishing later in the year when it has been demonstrated that whiting are more valuable (Larkin and Sylvia 1999), and this means the amount of revenue generated by fishing activity is less than what could be the case.

Fishing vessel safety

Fishing vessel safety under Alternative 1 is expected to remain relatively unchanged. Nonwhiting trawlers are expected to have some flexibility in deciding when to fish because of the two-month limit structure of the fishery, and this is expected to result in less pressure to fish during periods of unfavorable weather. However, because of the lack of profits generated in the fishery, reinvestment into capital and maintenance that may help with safety conditions is not expected to be as great as in a case where larger profits were being generated. In the case of whiting harvesters, Alternative 1 conditions provide a large incentive to engage in race-for-fish behavior that often leads to fishing activities during periods of unfavorable weather. Because vessels in the whiting fishery tend to be better off and participate in other, profitable fisheries, (e.g., Alaska pollock), however, the condition of whiting vessels is generally expected to be better maintained than vessels in the nonwhiting sector.

4.6.3.3 Alternative 2a

The Effect of Alternative 2a on vessel profits and fleet efficiency

Alternative 2a is expected to result in larger vessel profits than other alternatives because of a decrease or elimination of regulatory discard, due to an increase in the catch of target species in the nonwhiting fishery, increased flexibility in harvest timing, and cost efficiencies created by fleet consolidation. Such changes are expected in both nonwhiting and whiting fisheries, with the nonwhiting fishery experiencing more cost efficiency gains than the whiting fishery. These expectations are tempered by risks posed to harvesters because of the low trawl allocations expected to be made for some species and the number of those species that are managed with individual quota under this alternative. In this respect, Alternative 2a results in the highest degree of risk across the largest number of harvesting entities of all alternatives.

Nonwhiting trawl fishery

Figure 4-7 shows that ex-vessel revenue in the nonwhiting fishery may increase to $32 million to $40 million compared to Alternative 1 ex-vessel revenues of $22 million to $23 million. Regulatory discards are decreased or eliminated in this alternative because the IFQ is defined as a total catch tool.[94] Vessels fishing under a total catch program will tend to retain more of their catch because catch is debited from their quota account regardless whether they retain that catch or not. If catch is discarded under a total catch program, that discard has a cost because it is a lost opportunity. This reduction in discard is expected to increase ex-vessel revenues to the fleet by $2 million to $3 million annually. Target species catch is increased in the nonwhiting fishery under this alternative because there is a reward associated with avoiding overfished stocks that comes in the form of increased harvests of

[94] Pacific halibut is covered by IBQ in this alternative. However, trawl gear is not a legal gear for Pacific halibut, and. therefore, regulations will likely still require discard of this species if caught with trawl gear.

currently under-utilized target species. The reader is referred to the description of the bycatch reduction analysis in Appendix C for more detail on these effects.

Fleet consolidation in the nonwhiting sector is expected to be substantial under Alternative 2a. Analysis indicates that the fleet may be expected to consolidate to between 40 and 60 vessels in the nonwhiting fishery. Accumulation limits under this alternative do not appear to restrict such consolidation, and, therefore, the full effect of potential cost efficiency should be realized under this alternative.[95] When combined with potential increase in ex-vessel revenues, profits under this alternative may be on the order of $12 million to $20 million (or average vessel-level profits of $300,000 $330,000 annually), compared to Alternative 1 fleetwide revenues of zero to $2 million in losses annually. The reader is referred to Appendix C for more detail on fleet consolidation.

The ex-vessel price received by nonwhiting trawl harvesters is likely to be higher in this alternative compared to all other alternatives, and higher prices will mean that the actual levels of ex-vessel revenue will be higher than the predicted levels shown above. The reason for these higher prices is that the initial allocation of IFQ is made exclusively to LE trawl permits, and this enhances harvester's negotiation power relative to Alternative 1. This enhanced negotiation power is likely to exist in the short term and possibly over the long term. While theory would suggest that quota could be purchased by processors over the long term (thus increasing processor's negotiation power and resulting in some decrease in ex-vessel price), the accumulation limits included in this alternative will limit the ability of processors to purchase substantial quantities of quota. Accumulation limits tend to work in the harvesters' favor over the long term because scale economies tend to lead to the creation of fewer processors than harvesters. The accumulation limits in this case would lead to a maximum of 3 percent being controlled by any single entity, and this is substantially less than the quantity of groundfish currently handled by several processors of trawl groundfish on the west coast. This means that the accumulation limits act as a de facto limit on the amount of quota that could be purchased by processors of trawl groundfish and insure that QSs remain—to a large degree—in the hands of harvesters, or other relatively small entities.

[95] This statement assumes the vessel length endorsement is eliminated.

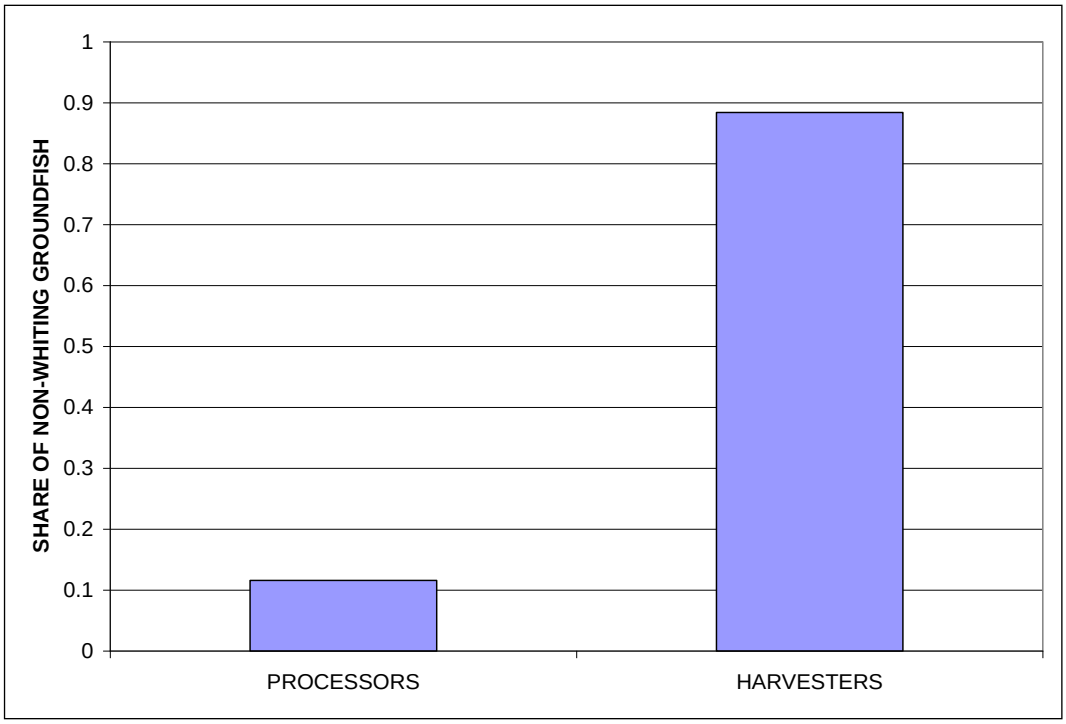


Figure 4-18. Share of nonwhiting groundfish allocated to harvesters and processors in Alternative 2a.

Pacific whiting trawl fishery

Ex-vessel revenues are not expected to change substantially in the whiting sectors relative to Alternative 1, but profits are expected to improve. Benefits from rationalization may be realized by whiting catcher vessels because of increased operational flexibility, enhanced ability for business planning, and fleet consolidation. Operational flexibility allows entities to minimize costs, maximize gross revenue potential, or take advantage of favorable market conditions, thereby increasing profits. Increases in product quality and product recovery may occur to some degree in the whiting sector, and these improvements may trickle down to harvesters in the form of higher ex-vessel prices. A quantitative prediction of changes in ex-vessel prices as a result of these effects cannot be made. However, qualitative information suggests that these effects should be minor in the mothership sector. This is because processing capital is being used in the at-sea fishery that is already more efficient as a result of the American Fisheries Act, which rationalized the Bering Sea pollock fishery. These improvements led to processing capital with higher recovery rates than prior to enactment of the AFA, and that same capital is being used off the west coast to process Pacific whiting. Therefore, changes in product recovery should be minor. Any changes in product quality and recovery that occur should come about as a result of an increase in operational flexibility, which allows harvesters to change strategies to capitalize on more favorable conditions.

Fleet consolidation in the mothership segment of the whiting sector should be minor relative to the nonwhiting sector. Since harvesting opportunities in the mothership sector are bounded by opportunities in the shoreside whiting sector (some mothership vessels also participate in the shoreside fishery) and on opportunities in the Alaska pollock fishery, the degree to which harvest timing can change is limited, and this restricts consolidation to some degree. It is expected that the mothership sector will continue to operate prior to the start of the shoreside sector. An increase in fishing effort may also occur during the fall months to take advantage of more favorable market conditions.

However, a substantial change in the harvest timing is not very likely because of the timing of the shoreside whiting fishery, the Alaska pollock fishery, and the availability of the Pacific whiting resource. Without a substantial increase in season length, it is unlikely that there will be substantial fleet consolidation because doing so would mean foregoing harvest quantities.

In the shoreside portion of the whiting fishery, it may be reasonable to assume fleet consolidation that is greater than the mothership sector, but not as great as the nonwhiting portion of the fishery. More consolidation is expected because the number of vessels in the fishery has increased over the past several years without much change in the Pacific whiting OY. Therefore, it is reasonable to expect that fewer vessels could participate in the fishery while still taking the harvestable surplus; however, how much consolidation will actually occur is limited by fishing season length and seasonal distribution of the stock. While the Pacific whiting stock migrates north throughout the course of a year, it is unlikely that shoreside whiting processors will establish themselves further north than the southern Washington coast to take advantage of this northern migration. This is because several coastal Washington ports (such as Neah Bay) have limited access to fresh water (which is necessary for processing). Infrastructure is also limited in many of these ports and may not be sufficient to support a processor large enough to handle Pacific whiting deliveries. As discussed above, the shoreside whiting sector's season may be limited by the depth-based migration of the stock, which can make the fish inaccessible to these vessels by October (and possibly earlier). Thus, both geographic and depth migration factors may limit the shore-based sector's season.

The length of harvesting activity in the mothership and shore-based whiting sectors is expected to get somewhat longer as those sectors switch to a rationalized fishery. This is due to elimination of competition for the resource because of increased flexibility in harvest timing and changes in quality attributes (such as fish size and flesh color) that improve the value of Pacific whiting later in the year. This change in the pace of harvesting will tend to increase product quality, and this should tend to increase the price that vessels receive for their catch.

The negotiation power that Pacific whiting harvesters have over ex-vessel prices is higher in this alternative relative to the other alternatives, including Alternative 1. Under Alternative 2a, holders of LE trawl permits receive the entire initial allocation of quota, and this is expected to increase the negotiation power of harvesters. Over the long term, however, processors may be able to acquire enough Pacific whiting quota to influence ex-vessel prices. The control limits specified in this alternative for Pacific whiting could allow four business entities to control the harvest of shoreside whiting and four business entities to control the harvest of mothership whiting. Since there are currently more than four processing entities, this alternative could allow processors to have control over all of the whiting IFQ over the long term, and, therefore, ex-vessel prices may only be higher in the short-term.

Under the initial allocation scheme included in this alternative, some processing entities will receive an initial allocation of quota because they own LE trawl permits (see Figure 4-19).

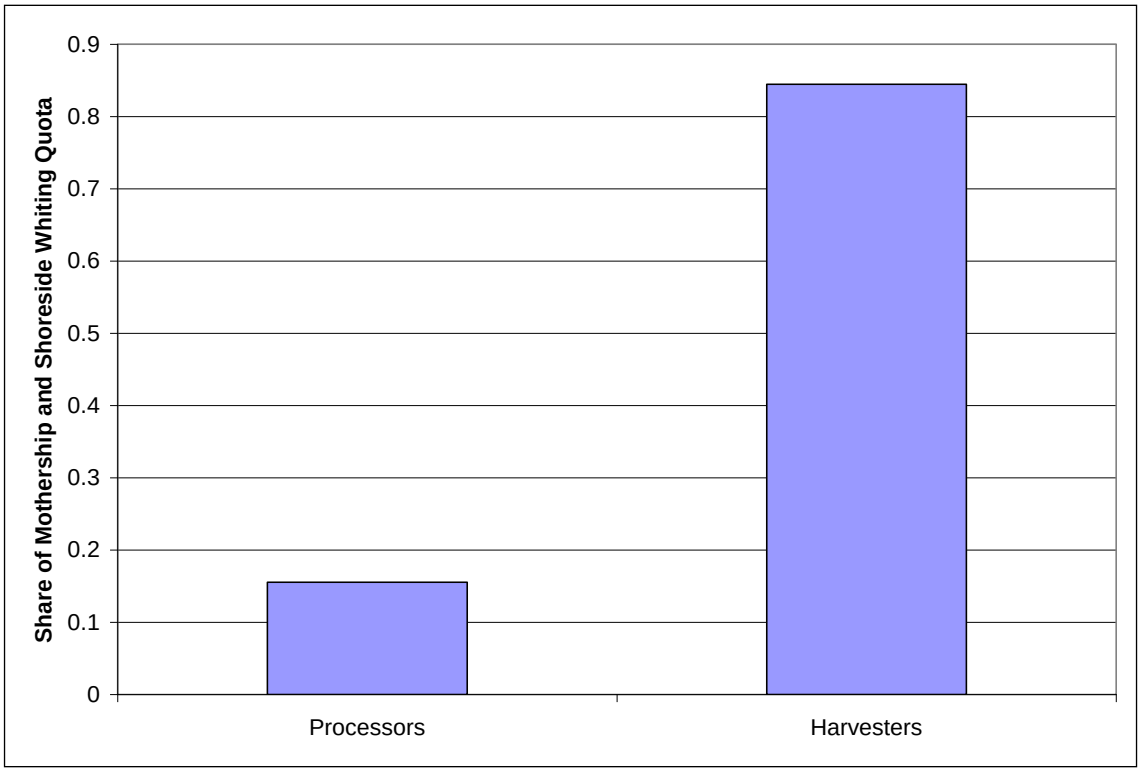


Figure 4-19. Share of mothership and shoreside Pacific whiting allocated to harvesters and processors in Alternative 2a.

Additional factors influencing the profits of nonwhiting and whiting harvesters

Another way this alternative affects profitability, which was not addressed previously, is the costs that harvesters must bear in administering the trading and transfers of QSs and QPs. This cost is a result of the number of species covered in the program and the complexity that is created by the trading and tracking of several species of groundfish. This alternative has the largest number of vessel-species combinations in the quota trading and catch tracking aspect of the programs being considered. This number of vessel-species combinations is likely to translate into a high relative cost that harvesters bear in conducting such activities.

The establishment of three trawl sectors for the purpose of trading quota may have an effect on costs as well. Establishing a larger, common pool of quota available to both the shoreside whiting and nonwhiting sectors may make it easier for vessels in each sector to find quota on the market to trade.

Table 4-23. Summary of the effect of Alternative 2a on profits and fleet efficiency.

Nonwhiting Catcher Vessels	Fleetwide profit expected to increase by $12-$22 million as a result of increased catch and fleet consolidation. Ex-vessel prices should increase profit to higher than indicated numbers as a result of negotiation power and because of gear switching. Accumulation limits do not appear to restrict consolidation.
Shoreside Whiting Catcher Vessels	Some fleet consolidation expected. Minor changes in ex-vessel revenue may be expected as a result of improved product quality. Ex-vessel prices are expected to increase in the short run as a result of increased negotiation power.
Mothership Catcher Vessels	Some fleet consolidation and associated cost savings expected. Minor changes in ex-vessel revenue may be expected as a result of increased product quality. Ex-vessel prices may increase as a result of increased negotiation power.

The distribution of profits under Alternative 2a

The distribution of profits under this alternative is influenced by the initial allocation of QSs and also by the species that are covered by IFQs in the program. The species covered in the program will tend to influence the distribution of revenues, and this may result in a negative impact on some harvesters while positively impacting others. Harvesters who operate in areas where constraining groundfish species are more commonly caught will tend to find it more difficult to access target species relative to harvesters in other areas. This is because the individual accountability of catch will restrict opportunity if a vessel reaches or exceeds the constraining species quota it holds. Vessels operating in areas where there are relatively more constraining species may run out of constraining species quota before accessing all of their target species. This constraint may make it more difficult for some vessels to access target species relative to Alternative 1. Since this alternative does not have elements that would mitigate against these regional effects, they are likely to be the most pronounced under this alternative (and Alternative 2c) compared to others.

Initial allocation under this alternative has a relatively uneven distribution relative to Alternatives 3 and 4a. This means that there is a large difference in the distribution of wealth created by the initial distribution of shares. This initial distribution may influence short-term harvest opportunities and will tend to favor relatively fewer individuals than the other alternative ways of distributing quota.

The accumulation limits specified under this alternative do not appear to restrict vessel consolidation (as illustrated in previous paragraphs under broad-level effects), but one entity may be restricted by the control limits. The grandfather clause allows that entity to exceed the control limit initially, but it cannot acquire additional quota. Several entities receive QSs that are approaching zero, some entities receive QSs that are higher than 3 percent, and the majority of entities receive QSs that are between 0.5 percent and 2 percent of the nonwhiting QS. Figure 4-20 shows that 116 entities would receive an allocation of nonwhiting groundfish under this alternative.

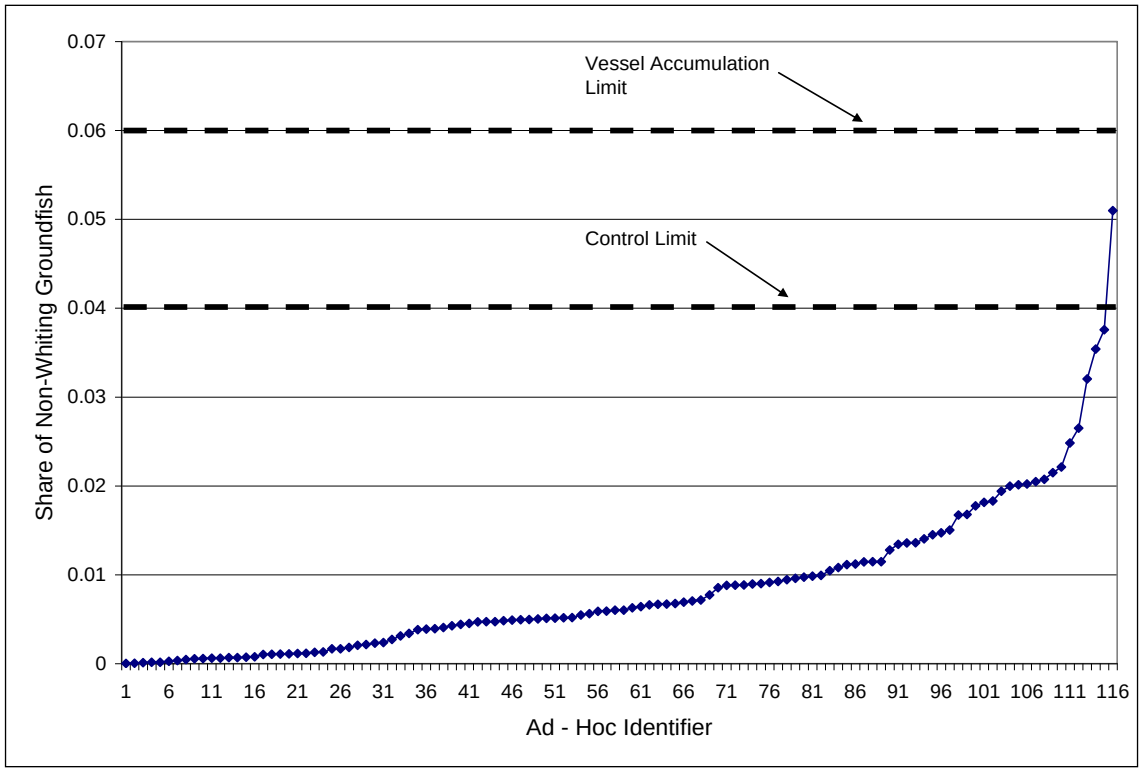


Figure 4-20. Distribution of aggregate nonwhiting QSs and accumulation limits under Alternative 2a (entities with no initial allocation are excluded).

In the whiting fishery, accumulation limits also do not appear to be restrictive. In all three sectors of the whiting fishery, business entities do not appear to be restricted by vessel limits or control limits. Nor would these limits likely restrict holdings by those entities that participate in more than one sector of the whiting fishery. The number of entities receiving an initial allocation of whiting under this alternative is listed in Table 4-24. In addition, 53 entities will receive an initial distribution of whiting from one or more sectors of the whiting fishery (including the catcher-processor sector).

Table 4-24. Total number of QS recipients for each sector.

Quota type	QS Recipients
Nonwhiting	116
Shoreside Whiting	47
Mothership	28
Total (NonCP Sectors)	120

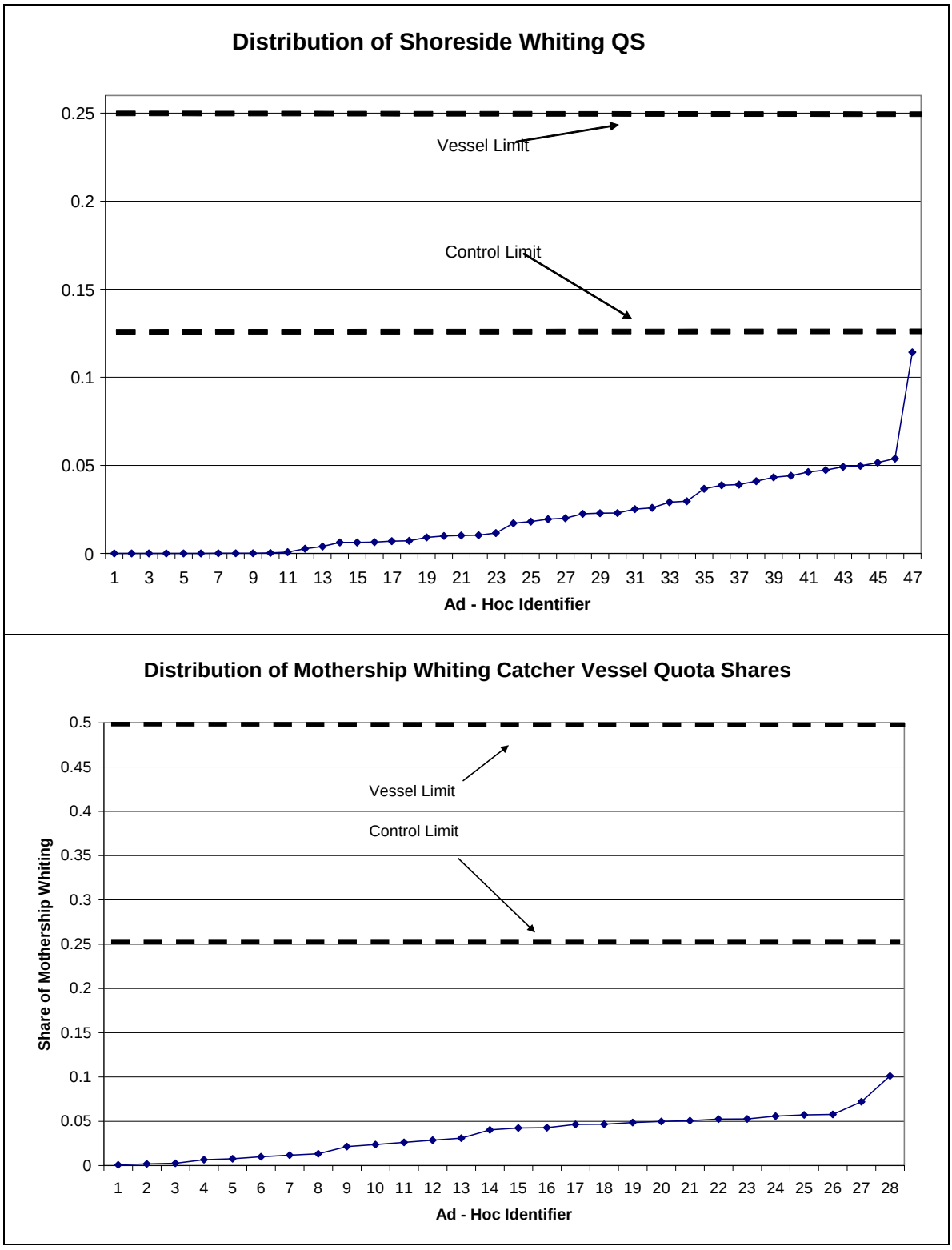
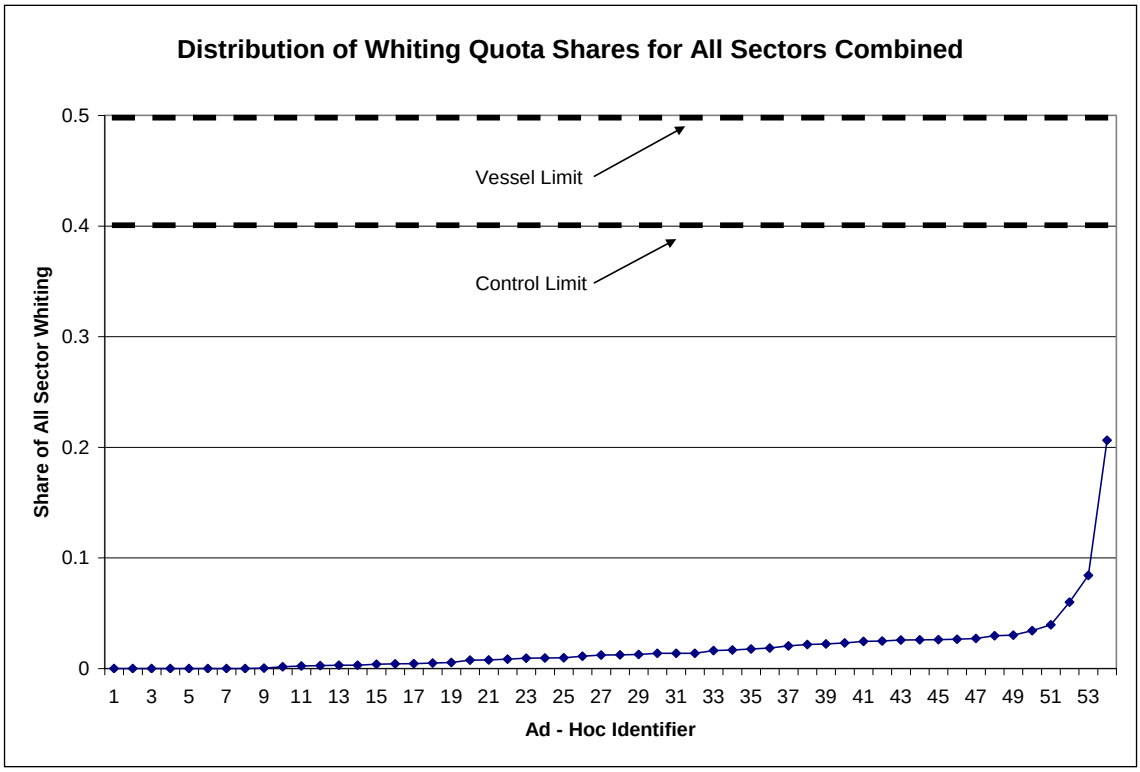


Figure 4-21. Distribution of whiting QSs and accumulation limits under Alternative 2a (entities with no initial allocation are excluded).



(Figure 4-21 cont.)

Under this allocation scheme, many of the eligible recipients will receive no initial allocation of some types of groundfish. This is likely caused by the fact that the history being used is landings history, and it may be reasonable to assume that in many of these instances, vessels actually did catch some of these groundfish, but they were discarded for one reason or another. Since the rationalization program envisioned under this alternative accounts for total catch (landings and discard), those permits that do not receive an initial allocation of some groundfish will almost certainly have to purchase QSs or QPs of these species. This serves as a distributional issue that may be an important consideration since the initial allocation may tend to favor some while disadvantaging others. The information describing this effect is covered in more detail under Appendix A.

Table 4-25. Summary of the effect of Alternative 2a on distribution of profits.

Nonwhiting Catcher Vessels	Harvesters not owned by processing companies will receive nearly 90 percent of the initial allocation of nonwhiting groundfish. Harvesters in high bycatch areas or areas with unfavorable market conditions may be at a relative disadvantage. The high/low relative distribution of nonwhiting QSs is large. Some harvesters will not receive allocations of some groundfish species.
Shoreside Whiting Catcher Vessels	Harvesters not owned by processing companies will receive approximately 85 percent of mothership and shoreside whiting quota. The high/low relative distribution of whiting QSs is small relative to the distribution of nonwhiting QSs.
Mothership Catcher Vessels	Harvesters not owned by processing companies will receive approximately 85 percent of mothership and shoreside whiting. The high/low relative distribution of whiting QSs is small relative to the distribution of nonwhiting QSs.

The risk to profits posed by Alternative 2a

Alternative 2a imposes risks to individual harvesters across the largest number of entities of all alternatives, including Alternative 1. Risks associated with this alternative create a potential for harvesters to generate less profit than expected under a rationalized fishery. In the worst case alternative, these individual risks may result in less aggregate revenue in the fishery than expected. This increase in risk relative to Alternative 1 is due to the presence of thin market conditions for several species, including overfished stocks and various nearshore groundfish species, and individual accountability for species with low trawl allocations.

Since this alternative results in a more extreme high/low relative distribution of QS (since it is based on catch history), and has a grandfather clause (particularly for constraining stocks), the ability of harvesters to form voluntary pools to manage risk may be the most difficult under this alternative compared to the other alternatives because these factors tend to favor some harvesters more than others.

Table 4-26. Summary of the effect of Alternative 2a on risk to profits.

Nonwhiting Catcher Vessels	High level of risk created by thin market conditions and by individual accountability of low OY and low trawl allocation species. The initial allocation of QSs favors some relatively more than others, making the formation of risk pools difficult.
Shoreside Whiting Catcher Vessels	High level of risk created by thin market conditions and by individual accountability of low OY and low trawl allocation species. The initial allocation of QSs favors some relatively more than others, making the formation of risk pools difficult.
Mothership Catcher Vessels	High level of risk created by thin market conditions and by individual accountability of low OY and low trawl allocation species. The initial allocation of QSs favors some relatively more than others, making the formation of risk pools difficult.

Fishing vessel safety

Fishing vessel safety is typically enhanced by the elimination of Olympic-style fisheries, increased flexibility in timing fishing operations, and improvements in revenues being generated by fishing activity. It is envisioned that the rationalization programs being considered will tend to increase operational flexibility and, in this way, improve safety conditions. As stated previously, information reported by NIOSH suggests safety-related events that may be avoided with more flexibility in harvest timing and a more profitable fleet that is able to stay current on maintenance. Under Alternative 2a, profits are generally expected to increase for both nonwhiting and whiting sector catcher vessels, and it may be reasonable to expect that this increase would lead to better maintenance of fishing vessels. The elimination of Olympic fishing activity in the mothership and shoreside sectors of the whiting fishery is also expected to enhance fishing vessel safety, because vessels will no longer feel the need to compete against one another to maximize catch, which can cause them to fish in hazardous conditions. In the nonwhiting fishery, an Olympic-style fishery does not currently exist. Safety concerns in this fishery are driven largely by a lack of profitability under Alternative 1 conditions. As illustrated previously, it is estimated that vessels participating in this fishery generate profits somewhere between zero and a loss of $2 million annually. This creates conditions where vessel maintenance may be less than adequate, and such lack of maintenance may lead to conditions that are relatively less safe than under conditions where vessels are better maintained. Therefore, it is reasonable to expect rationalization to improve safety conditions in the nonwhiting sector because of increased profitability and to improve safety in the

shoreside and mothership whiting sectors because of increased profitability, enhanced operational flexibility, and an elimination of Olympic fisheries.

Table 4-27. Summary of the effects of Alternative 2a on safety.

Nonwhiting Catcher Vessels	Vessels in this sector of the fishery are expected to generate higher profits that are expected to lead to improvements in the level and type of maintenance.
Shoreside Whiting Catcher Vessels	Vessels in this sector of the fishery are expected to generate higher profits that are expected to lead to improvements in the level and type of maintenance. The elimination of the Olympic fishery and enhanced operational flexibility should also improve safety conditions as the fleet no longer feels the need to compete and to fish in hazardous conditions.
Mothership Catcher Vessels	Vessels in this sector of the fishery are expected to generate higher profits that are expected to lead to improvements in the level and type of maintenance. The elimination of the Olympic fishery and enhanced operational flexibility should also improve safety conditions as the fleet no longer feels the need to compete and to fish in hazardous conditions.

4.6.3.4 Alternatives 2b and 2c

Alternatives 2b and 2c are intended to respond to the Council's request to consider and contrast two different methods for addressing processor concerns. Therefore, these two alternatives are examined simultaneously in this section and compared and contrasted consistently throughout this section.

The effect of Alternatives 2b and 2c on vessel profits is similar in many respects to that of Alternative 2a: harvesters are likely to access more target species in the nonwhiting sector, consolidation and associated cost savings are expected in the harvesting side, operational flexibility and ability to conduct business planning is enhanced, and risks exist to individual harvesters because of low trawl allocation species and the presence of thin markets. However, Alternatives 2a, 2b, and 2c differ in several ways in terms of the overall magnitude and/or distribution of profits. The overall magnitude of vessel profits gained under Alternatives 2b and 2c is potentially affected by an initial distribution of QSs to processors (Alternative 2c) and the fact that such a distribution to processors may influence ex-vessel prices. Alternatively, vessel profits are potentially affected by Alternative 2b because of the presence of an adaptive management provision and the fact that using such a provision to allocate QPs to processors enables processors to use additional leverage when negotiating terms (such as prices) with harvesters. In other words, Alternative 2b assumes that an adaptive management provision is used to mitigate against adverse impacts that occur to processors.[96] In addition to leverage over prices gained by processors who receive adaptive management quota, an AMP is likely to work in contrast to the effect of the market. This is simply because the adaptive management quota would be allocated in a manner that is not market-based, but rather is based on a decision or framework outlined by the Council. Since markets tend to work toward efficient and profitable outcomes, a program that counters a market effect may restrict some of the gains in profitability and efficiency expected from rationalization.

The distribution of vessel profits is also affected by the conditions prevailing under Alternatives 2b and 2c. A distribution of QSs to processors will tend to have a geographic effect as those processors

[96] The existing suite of alternatives allows the adaptive management provision to be used for more than just adversely impacted processors. If an adaptive management program is adopted as currently specified, the adaptive management program could be used for many different objectives such as incentives for bycatch reduction, the use of habitat-friendly gear, for adversely impacted communities, to help second generation fishermen/new entrants, or for adversely impacted processors.

direct landings associated with their QSs to particular ports where their plants are located. An adaptive management provision will tend to have geographic consequences, as well, if adversely impacted processors are located in distinct areas, and adaptive management shares are directed to processors in those distinct areas. It is likely that the geographic effects of both options will differ. Alternative 2c may tend to result in a flow of QSs toward stronger ports with more vibrant and robust processing facilities and infrastructure, whereas Alternative 2b may result in a flow of quota toward less advantaged processors in less advantageous locations. Harvesters are impacted through these measures indirectly to the extent that they harvest the quota owned by the processor, or held by the processor via the AMP.

Given that the only differences between Alternatives 2b and 2c are the consideration of processor allocations of QSs and an adaptive management provision to mitigate against adverse impacts to processors, this section concentrates on the effect of those two elements on harvesters.

The Effect of Alternatives 2b and 2c on vessel profits and fleet efficiency

Whether there is an initial distribution of QSs to processors, or an adaptive management provision used to address adversely impacted processors, is unlikely to impact the tendency for the fleet to approach a cost minimization strategy. The main impact explored here is whether the harvester retains the profits of reducing costs, or whether processors are able to pull those potential profits from the harvesting sector by negotiating ex-vessel prices to the processors favor.

In general, making an initial allocation to processors will tend to have a downward effect on ex-vessel prices compared to a case where no initial distribution of QSs is made to processors because processors can use quota as leverage when negotiating with harvesters. It is unclear whether an allocation to processors will decrease prices relative to Alternative 1, though it likely depends on the amount of quota allocated to processors. An initial allocation of quota to processors will also have a geographic effect on harvesters. This is because QSs allocated to processors will tend to be landed in ports where those processors are located. Vessels in ports with processors may have access to more QSs than if an initial allocation was made to permits. Inversely, harvesters in ports without processors may end up with less access to quota than if an initial allocation was made to permits. In other words, vessels fishing in ports where processors are located may be impacted differently than vessels in ports without processors because of their access to processor-held fishing quota.

Since Alternatives 2b and 2c do not create a link between harvesters and processors (harvesters with quota are free to deliver to any processor, and processors with QSs can lease to any LE-trawl-permitted vessel), it is possible that harvesters and processors will self-divide themselves into those with quota and those without quota. Since price negotiation tends to favor those holding quota, harvesters holding quota may elect to sell to processors without quota. They would do this because of their relative negotiation power and the fact that selling to processors without quota will enable them to negotiate higher ex-vessel prices. Conversely, processors with quota may elect to lease their quota to harvesters without quota because they can bid ex-vessel prices downward against those harvesters. If harvesters and processors with QSs attempt to work together, both sides would likely come to a compromise on ex-vessel prices. But if both sides know that they can get a better price by dealing with an entity without QSs, then a relationship between harvesters with QSs and processors with QS may become unstable.

Like an initial allocation to processors, an adaptive management provision may have an impact on ex-vessel prices. Depending on how the adaptive management provision is set up, an AMP may tend to limit the number of potential processors to which harvesters can deliver catch. This could occur if adaptive management is allocated to processors, and processors entice harvesters with that quota, conditional on the fact that those harvesters deliver to those processors. If harvesters are not harvesting

adaptive management groundfish, there may be no limitations on the number of potential buyers. In cases where harvesters have elected to prosecute adaptive management quota held by processors, the harvester and processor may engage in behavior that represents a bilateral monopoly with each entity being dependent on the other. The harvester cannot fish and deliver catch without the processor being willing to do accept it, and the processor cannot process fish without the harvester being willing to do provide catch. This is a case where both the harvester and processor are in an equally strong negotiation position and the result is one where profits are shared between the two entities. This outcome is likely to be different compared to a case where no adaptive management or initial allocation of QS is given to processors. If there is no adaptive management and no initial allocation of QSs to processors (as in Alternative 2a), harvesters are likely to be in a relatively strong negotiation condition. This is because the holder of the QSs tends to have the strongest negotiation position and can use that position in his or her favor—in this case, higher ex-vessel prices.

Nonwhiting trawl fishery

Under Alternatives 2b and 2c, it is unlikely that processors will acquire much additional quota in the nonwhiting sector because of the control limits. The 3 percent control limits specified for the nonwhiting sector make it difficult for the processing sector as a whole to acquire additional quota, unless, over time, that sector becomes composed of multiple small producers. This means that, over time, ex-vessel prices in the shoreside and mothership whiting sectors may fall to some degree since processors have the ability to acquire additional quota, but it is not likely that ex-vessel prices will fall much over time in the nonwhiting sector because processors have limited ability to purchase quota.

An initial allocation of 25 percent of nonwhiting quota to processors (Alternative 2c) is much larger than a 10 percent set aside of nonwhiting quota outlined in Alternative 2b. Depending on the species, 25 percent of the nonwhiting quota may equate to the majority, if not all, of the current market demand for those species meaning that an initial allocation of 25 percent to processors is akin to a 100 percent allocation of some species to processors unless the market expands for those species. It is not unreasonable to expect that processors receiving an initial allocation of quota will elect to prosecute their own quota first before looking to independent harvesters to fill their remaining need. In cases where 25 percent of the quota fills market demand, processors may not need additional fish from harvesters, meaning nonwhiting harvesters specializing in these species may be made substantially worse off if processors receive 25 percent of the initial allocation compared to Alternatives 1, 2a, and 2c. Those harvesters specializing in species where 25 percent does not represent the majority of the sector allocation may still be made better off by this alternative compared to status quo. To illustrate this effect,

Table 4-28 was constructed. This table shows the allowable catch level of several representative species, the amount represented by 25 percent of the trawl allocation, and the amount currently landed in the fishery. What is apparent from this information is that, unless markets for several groundfish stocks expand, a 25 percent allocation to processors may equal the majority, or all, of the current market demand for those species. This will have negative consequences to nonwhiting harvesters as it is likely that processors will prosecute their own quota first as doing so would tend to be more advantageous for reasons discussed previously in this section.

Table 4-28. Tonnage of select species allocated to processors with 25 percent initial allocation against 2007 mortality.

	Nonwhiting Trawl Allocation Applied to 2010 OY (mt)	2007 Bottom Trawl Catch (mt)	25% of Trawl Allocation (mt)
Dover sole	15,260	9,824	3,815
English sole	8,979	839	2,245
Other Flatfish	4,275	1,443	1,069
Arrowtooth Flounder	9,430	2,769	2,358
Shortspine Thornyheads North	1,482	980	371
Longspine Thornyheads North	2,039	890	510
Sablefish North	2,971	2,607	743
Pacific cod	1,088	55	272
Petrale sole	2,172	2,286	543

The size of the adaptive management provision at 10 percent will mean less quota reserved for processors than the 25 percent allocated to processors in Alternative 2c. Still, 10 percent of the trawl allocation for several underutilized species represents a relatively substantial portion of the catch under status quo conditions (Table 4-29). However, reserving this 10 percent for adversely impacted processors is not likely to have the same negative implications to harvesters as a 25 percent processor allocation for a variety of reasons. One reason is simply that 10 percent is less than 25 percent, but also that if the adaptive management quota is used for adversely impacted processors, those processors may have different characteristics and different market inroads than processors deemed to be not adversely impacted by rationalization. Assuming that relatively large processors are not deemed to be adversely impacted (which is logical given that larger processors tend to also be permit owners, which means they will receive an initial allocation of quota, and are distributed across a relatively wide geographic area), then these relatively large processors will still be in need of fish from independent harvesters to fulfill their market demand for groundfish species. This differs from adversely impacted processors who may use their adaptive management quota to fill their market demands. Therefore, both the size of the adaptive management quota amount at 10 percent and the way in which the quota is directed will tend to affect the impact harvesters experience from a 10 percent adaptive management provision for adversely impacted processors. It is likely that the effect on harvesters from a 10 percent AMP for processors will result in a lower impact to nonwhiting harvesters than what may be expected to occur under Alternative 2b with a 25 percent allocation to processors.

Table 4-29. Tonnage of select species allocated to processors with 10 percent adaptive management quota against 2007 mortality.

	Nonwhiting Trawl Allocation Applied to 2010 OY (mt)	2007 Bottom Trawl Catch (mt)	10% of Trawl Allocation
Dover sole	15,260	9,824	1,526
English sole	8,979	839	898
Other Flatfish	4,275	1,443	428
Arrowtooth Flounder	9,430	2,769	943
Shortspine Thornyheads	1,482	980	148
Longspine Thornyheads	2,039	890	204
Sablefish North	2,971	2,607	297
Pacific cod	1,088	55	109
Petrale sole	2,172	2,286	217

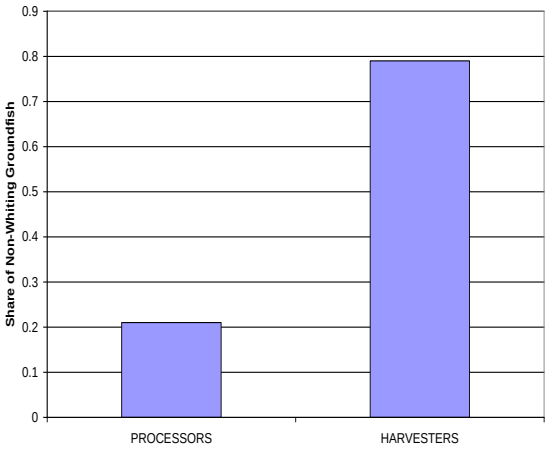


Figure 4-22. Share of nonwhiting groundfish allocated to harvesters and processors under Alternative 2b.

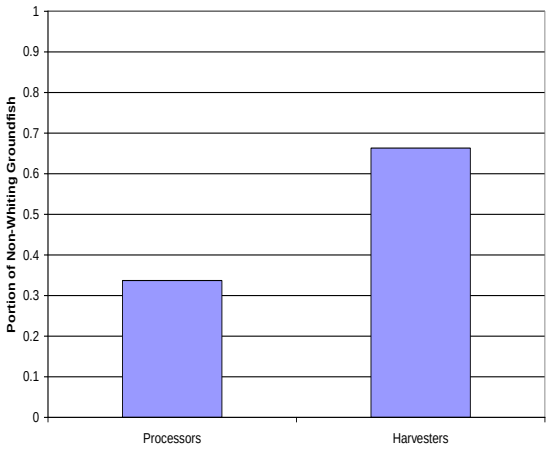


Figure 4-23. Share of nonwhiting groundfish whiting allocated to harvesters and processors under Alternative 2c.

Shoreside whiting trawl fishery

Over the long run, processors may continue purchasing QSs in the whiting sectors, because of the relatively large size of the control limit. For comparison purposes, this is less likely in the nonwhiting sector where the control limits are smaller. Smaller control limits tend to favor harvesters as the average harvester deals with less volume than the average processor. Therefore, smaller control limits make it less likely that a processor could acquire enough QSs to meet the full needs of the processing operation, making it necessary for processors to enter into agreements with harvesters. Inversely, relatively large control limits make it possible for processors to vertically integrate to a larger degree, reducing the need for processors to enter into agreements with independent harvesters.

Many of the effects described above under the section describing impacts to nonwhiting harvesters also hold true for shoreside whiting harvesters. However, the comparison between 50 percent initial allocation for whiting versus 10 percent adaptive management is much more straightforward for the whiting fishery. To a large degree the Pacific whiting resource is fully utilized (or in most years nearly so) and is readily marketable, unlike some species of flatfish, so assessing the effect of a 50 percent allocation compared to a 10 percent allocation is much more straightforward. Therefore, it is also relatively straightforward to say that 50 percent to processors will have a greater negative impact on harvesters than a 10 percent adaptive management provision for a couple of reasons. One reason is that 50 percent initial allocation is simply larger than 10 percent, but also because the adaptive management quota is likely to be directed in a conscious manner toward adversely impacted processors.

The principal difference for shoreside whiting harvesters between Alternatives 2b and 2c may be best described in terms of short term versus long term impacts. Allocating QSs to processors (as described in Alternative 2c) grants processors some leverage in negotiations and other matters at the start of the program, and those processors can transfer QSs in such a way as to be most advantageous to them. This may result in relatively smaller ex-vessel prices paid to harvesters in the short run. Under Alternative 2b, processors receive adaptive management QPs, yet it is still a distinct possibility that whiting processors will acquire additional QSs via transfer over time. The amount of quota processors acquire over time may be relatively large because the accumulation limits allow for a single entity to control 12 percent of the QSs. The incentive for processors to purchase QSs over time is based on the notion that vertical integration is generally more efficient, and, therefore, processors may acquire QSs over

time to attain that efficiency. Over the longer term—as processors acquire QSs—the outcome of Alternative 2c on harvester revenues may be very similar to that of Alternative 2b. However, in the short term, Alternative 2b may result in slightly higher ex-vessel prices on average than Alternative 2c.

Mothership whiting trawl fishery

Harvesters in the mothership whiting trawl fishery are expected to be impacted in a similar fashion to shoreside whiting harvesters. However, as the mothership fishery is characterized by much greater degrees of vertical integration under status quo than either the nonwhiting or shoreside whiting fisheries, the magnitude of change is likely to be relatively watered-down. Higher degrees of vertical integration mean that independent harvesters are likely to have more trouble negotiating relationships with motherships in their favor. However, the effect of allocating 50 percent of the mothership whiting to motherships is likely to have a greater downward effect on prices than using a 10 percent adaptive management provision. In addition, like the impact on shoreside whiting harvesters, the difference between Alternatives 2b and 2c for harvester revenues may be largely limited to impacts in the short run. Over time, motherships and harvesters may continue vertically integrating as the control limits appear to allow for continued vertical integration (control limits in the mothership sector are 25 percent under Alternatives 2a, 2b, and 2c).

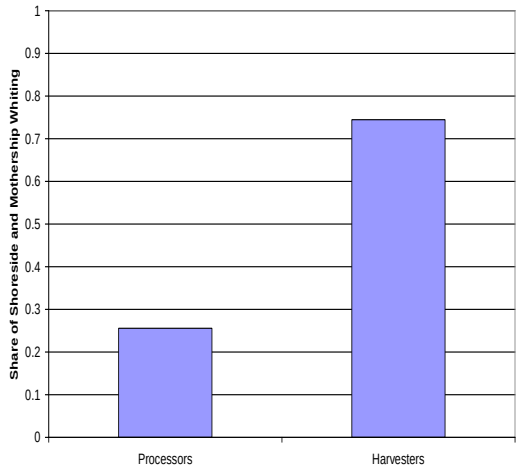


Figure 4-24. Share of shoreside and mothership whiting groundfish allocated to harvesters and processors under Alternative 2b.

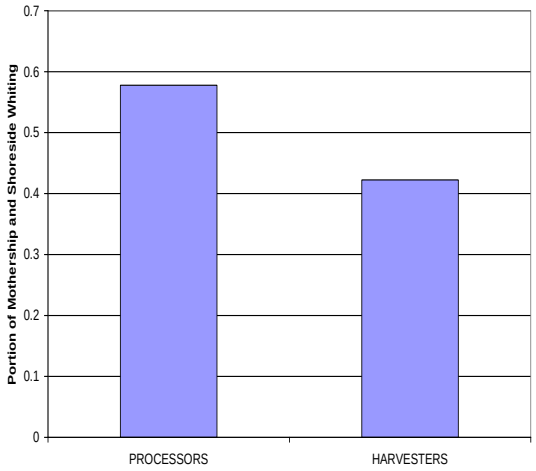


Figure 4-25. Share of shoreside and mothership whiting groundfish allocated to harvesters and processors under Alternative 2c.

In summary, both Alternatives 2b and 2c are likely to result in lower ex-vessel prices on average than Alternative 2a. In either case, it is likely that processors can use adaptive management quota or their initial allocation of QSs to negotiate prices to their favor. Over the longer term, Alternatives 2a, 2b, and 2c may all begin to have a similar effect on harvester revenues if it is strategic for processors to vertically integrate by acquiring QSs. This is possible under Alternatives 2a, 2b, and 2c because the accumulation limits are relatively large, allowing processors to acquire quota in volumes sufficient to cover large portions of their fish input needs. As processors acquire QSs, harvester leverage over prices will tend to decline.

Table 4-30. Effect on harvesters from an adaptive management provision to mitigate against harm to adversely impacted processors or initial allocation of QSs to processors.

Effect of Adaptive Management on Harvester Revenues	Effect of Processor Initial Allocation on Harvester Revenues

• Downward effect on prices compared to the Alternative with no initial allocation to processors.
  ○ Profits still expected to improve relative to Alternative 1, but expected to be similar to prices received in Alternatives 2a and 2b over the long term.
• Will likely have a geographic effect that directs harvest to areas where processors are adversely impacted. This geographic effect is expected to be different than the geographic effect found in Alternative 2c.
	• Downward effect occurs on ex-vessel prices compared to a case with no initial allocation to processors.
	• Ex-vessel price effect is likely to be felt by all harvesters.
	  ○ Profits are still expected to be greater than Alternative 1, but are expected to be similar to prices received in Alternatives 2a and 2c over the long term.
	• Geographic effect directs harvest to areas where processors are located.

The distribution of profits under Alternatives 2b and 2c

An initial allocation to processors and an adaptive management provision will have differing distributional effects. Both an initial allocation to processors and an adaptive management provision will have geographic implications. If adversely impacted processors are located in distinct areas of the coast, a distribution of shares in a manner that benefits those processors would tend to have corollary geographic impacts that favor some harvesters. Those harvesters located in ports where there are adversely impacted processors may stand to have access to more quota than would otherwise be the case if no adaptive management quota was available. An initial allocation to processors would also have geographic implications because processors are located in distinct areas of the coast.

The distribution of QSs across entities under Alternative 2c is different than under Alternative 2a because of the allocation to processors. There are 121 entities who are expected to receive QSs of nonwhiting groundfish under Alternative 2c, and 3 of these entities exceed the control limit (but still receive the full amount due to the grandfather clause) (Figure 4-26). Under this option, the majority of receiving entities receive less than 1 percent of the nonwhiting allocation of groundfish, while a handful of entities receive over 2 percent.

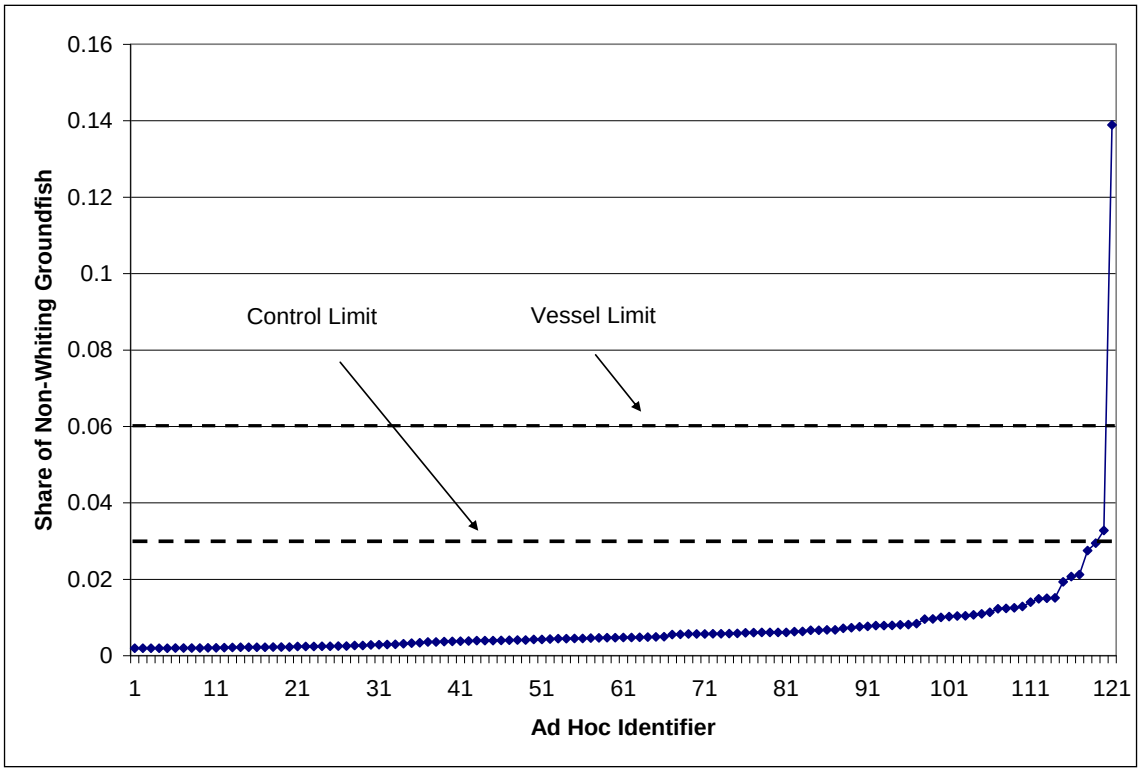


Figure 4-26. Distribution of aggregate nonwhiting QS and accumulation limits under Alternative 2c.

In the whiting sectors, there is also a different distributional effect, though the difference between Alternatives 2a and 2b is relatively lower for the whiting sectors than the nonwhiting sectors. Interestingly, by including shoreside processors in the initial allocation, the initial distribution of shoreside whiting becomes relatively more equal than in Alternative 2a. As shown in Figure 4-27, the largest recipient of shoreside whiting QSs receives less than 10 percent of the shoreside whiting quota, while, under Alternative 2a, the largest recipient receives almost 12 percent. The total number of entities that are estimated to receive shoreside whiting QSs under this alternative is 67.

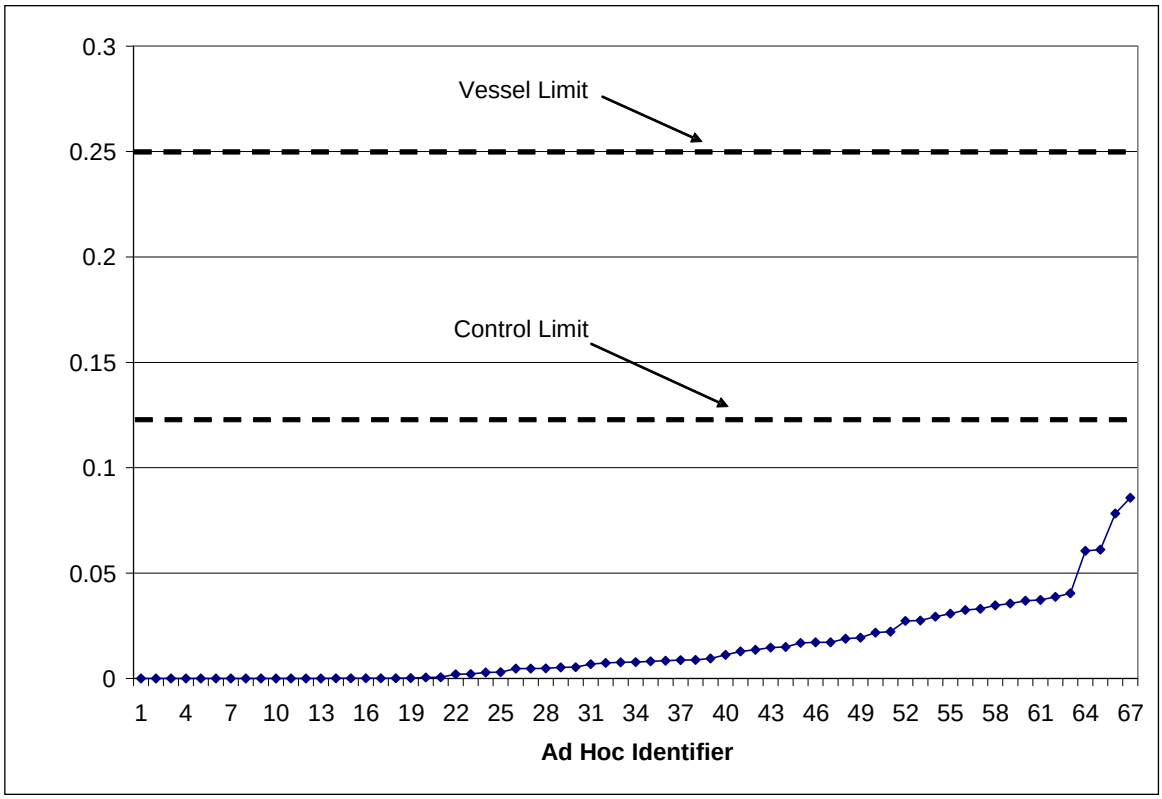


Figure 4-27. Distribution of shoreside whiting QSs and accumulation limits under Alternative 2c.

In the mothership sector, an initial allocation to processors shifts the distribution of whiting somewhat, but less than in the nonwhiting sector, as shown in Figure 4-28. Contrary to the shoreside sector, by making an initial allocation to processors, the largest entity receives approximately 13 percent of the mothership whiting quota compared to Alternative 2a, where the largest entity receives approximately 10 percent. The total number of entities receiving mothership whiting QSs is 30 under this alternative.

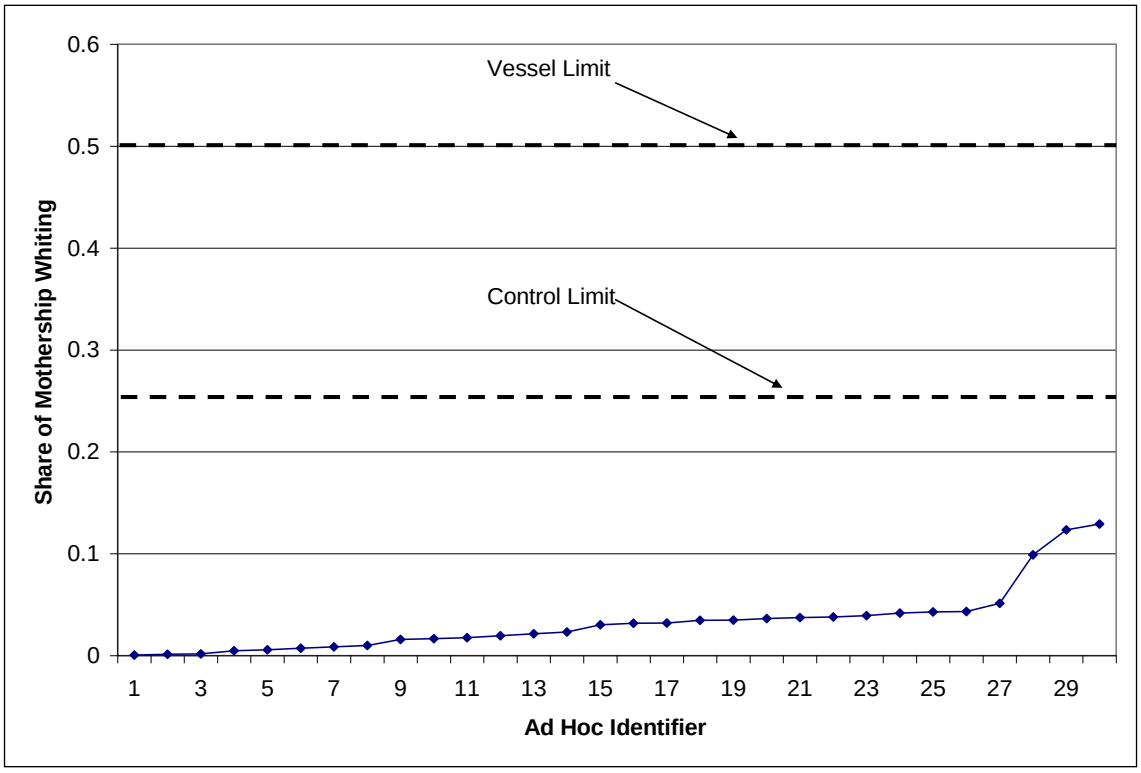


Figure 4-28. Distribution of mothership whiting QSs and accumulation limits under Alternative 2c.

The number of QS recipients under Alternative 2b is the same as the number of recipients under Alternative 2a. Alternative 2c has a much larger number of QS recipients (Table 4-31). In particular, the number of entities receiving nonwhiting QSs under this alternative is 297 compared to 116 in Alternatives 2a and 3a. The number of entities receiving shoreside whiting QSs is 67, and the number of entities receiving mothership QSs is 30. The total number of entities receiving QSs under this alternative is 305.

Table 4-31. Number of QS recipients under Alternative 2b versus 2c.

Sector	Number of QS Recipients under Alternative 2b	Number of QS Recipients under Alternative 2c
Nonwhiting	116	297
Shoreside Whiting	47	67
Mothership	28	30
Unique Number of QS Recipients (NonCP Sectors)	120	305

Fishing vessel safety

Alternatives 2b and 2c are expected to result in similar effects as the other action alternatives. These effects include increased flexibility in harvest timing and the potential to generate higher revenues through cost efficiencies. The possibility that Alternative 2c will make some nonwhiting trawl harvesters worse off due to the initial allocation to processors is likely to translate into those vessels moving to another set of species where they can be made better off, or simply dropping out of the

fishery. Other vessels are likely to be made better off by this alternative. On the whole, harvesters should find safety conditions improve for reasons outline previously.

Table 4-32. Summary of the effect of Alternatives 2b and 2c on safety.

Nonwhiting Catcher Vessels	Vessels in this sector of the fishery are expected to generate higher profits, which are expected to lead to improvements in the level and type of maintenance.
Shoreside Whiting Catcher Vessels	Vessels in this sector of the fishery are expected to generate higher profits, which are expected to lead to improvements in the level and type of maintenance. The elimination of the Olympic fishery and enhanced operational flexibility should also improve safety conditions because the fleet no longer feels the need to compete and to fish in hazardous conditions.
Mothership Catcher Vessels	Vessels in this sector of the fishery are expected to generate higher profits, which are expected to lead to improvements in the level and type of maintenance. The elimination of the Olympic fishery and enhanced operational flexibility should also improve safety conditions because the fleet no longer feels the need to compete and to fish in hazardous conditions.

4.6.3.5 Alternative 3

The effect of Alternative 3 on nonwhiting harvesters differs somewhat from Alternatives 2a, 2b, and 2c. For Pacific whiting harvesters, the effect of Alternative 3 differs to a much greater degree. Harvesters in the nonwhiting trawl sector face risks because of low allocation and thin market species. Harvesters also face risks because of the lack of a carry-over provision and the establishment of four trawl sectors and the resulting sector-specific allocations. Finer sector-specific allocations can reduce flexibility and impose greater restrictions on harvest activity compared to a case where quota can be traded between sectors. One element of this alternative that increases the potential that nonwhiting harvesters will effectively deal with risk is the manner in which IFQ is allocated—particularly for overfished stocks. The distribution of overfished species quota based on a bycatch rate creates a more balanced distribution of negotiating power between harvesters compared to a case where allocations are based purely on catch history; this increases the likelihood of risk pools forming among harvesters and staying together over the long term. The impact of an area management provision is somewhat unclear, though it may reduce gross revenues and overall harvest volume. This could occur if area management isolates available harvest from the location of the fishery, or if large scale gear switching occurs in a certain area (such as off the central California coast, as has been hypothesized). Such gear switching may mean several species of flatfish are not fully harvested due to the inaccessibility of those species to fixed gear and because area management would restrict that quota from moving to another area where trawl gear may be more prevalent. Other elements differ in Alternative 3, but do not appear to result in changes to profitability or risk.

Individual harvesters face risks in the nonwhiting trawl fishery because of low trawl allocation species and the presence of thin markets. These same risks are not apparent in the Pacific whiting sectors, although there are other risks for these harvesters. The fact that there is a common bycatch limit for all three whiting sectors imposes risk to all harvesters in the whiting fishery and creates a potential that a de facto race for fish could develop among the Pacific whiting sectors as those harvesters compete for catch before a bycatch limit is reached that can shut down all three sectors. Such an outcome would tend to eliminate the gains in profit and safety conditions typically expected of rationalization. The presence of this common bycatch pool is likely to result in a fishery that resembles Alternative 1 conditions, even though harvesters receive allocations of Pacific whiting and form cooperatives.

The effect of Alternative 3 on vessel profits and fleet efficiency

Vessel profits are highly influenced by the risk factors (discussed in more detail in the next sub-section) present in this alternative. In the nonwhiting trawl fishery, fleet consolidation and the associated cost efficiency are expected to occur to the same degree as that described under the broad-level effects section (Section 4.6.2). This improvement in cost efficiency is likely to be substantial, and the outcome is likely to be an improvement in the profitability of nonwhiting harvesters even in the face of risks posed by thin markets and low allocation species. The aforementioned potential for a race for fish, due to fishery-wide bycatch limits for Pacific whiting harvesters, is likely to erode the majority—or all—of the gains typically expected from rationalization of the whiting fishery.

Nonwhiting trawl fishery

The individual accountability associated with Alternatives 2b and 2c (and for all alternatives for that matter) is expected to result in modifications to behavior and gear, which should decrease bycatch of constraining overfished stocks. This reduction in bycatch should lead to higher catch levels of currently underutilized target species, which provides a further source of profit (in the form of gross revenues) in addition to that which occurs because of fleet consolidation. This effect was described in more detail under broad-level effects (Section 4.6.2), and also in Appendix C.

Ex-vessel prices received by harvesters in the nonwhiting trawl fishery in this alternative are expected to be lower than Alternative 2a, but similar or equal to those received under Alternative 2c. This is because 25 percent of nonwhiting groundfish is allocated to processors. Such an initial allocation is expected to reduce prices paid to harvesters compared to Alternatives 2a, 2b, and 4a where no initial allocation is made to nonwhiting groundfish processors; however, it is unclear how this initial allocation compares to prices paid under Alternative 1 conditions. In the long run, the balance of ex-vessel prices is expected to remain relatively unchanged. That is, ex-vessel prices are expected neither to change in favor of harvesters, nor for processors compared to prices in the period immediately following the allocation of QSs. This is because of the accumulation limits specified under this alternative, which are small enough so as to act as a de facto limit to the amount of quota that processors are able to acquire. The 1.5 percent control limit over all nonwhiting groundfish QSs, without a grandfather clause provision, means that the amount of quota allocated to processors will have to be divided among 17 processing companies at a minimum. Several processors who qualify for an initial allocation have their initial allocations truncated by the lack of a grandfather clause, arguably reducing the leverage some processors have compared to Alternative 1 conditions.

For some species, an initial allocation of nonwhiting quota of 25 percent to processors may equate to most, if not all, of the current market demand for some groundfish species, meaning that an initial allocation of 25 percent to processors could be akin to a 100 percent allocation of some species to processors, unless the market expands for those species. It is not unreasonable to expect that processors receiving an initial allocation of quota will elect to prosecute their own quota first before looking to independent harvesters to fill their remaining need. In cases where 25 percent of the quota fills market demand, processors may not need additional fish from harvesters, meaning nonwhiting harvesters may be made substantially worse off if processors receive 25 percent of the initial allocation compared to alternatives where there is no initial allocation made to processors of nonwhiting groundfish. To illustrate this effect, Table 4-33 was constructed. This table shows the allowable catch level of several representative species, the amount represented by 25 percent of the trawl allocation, and the amount currently caught in the fishery. What is apparent from this information is that, unless markets for several groundfish stocks expand, a 25 percent allocation to processors may equal the majority, or all, of the current market demand for those species. For species for which 25 percent is close to recent harvests, such as arrowtooth, English sole, other flatfish and Pacific cod, the current harvest levels are

already at levels generally comparable to or above those of the mid-1990s, indicating the possibility that expanding markets might be more challenging than for species that are well below historic harvest levels. This will have negative consequences for nonwhiting harvesters, as it is likely that processors will prosecute their own quota first, since doing so would tend to be more advantageous for reasons discussed previously in this section. Even without an initial allocation, processors will be able to acquire QSs. but will be limited by the control limits.

Table 4-33. Tonnage of select species allocated to processors with 25 percent initial allocation against 2007 mortality.

	Nonwhiting Trawl Allocation Applied to 2010 OY (mt)	2007 Bottom Trawl Catch (mt)	25% of Trawl Allocation (mt)
Dover sole	15,260	9,824	3,815
English sole	8,979	839	2,245
Other Flatfish	4,275	1,443	1,069
Arrowtooth Flounder	9,430	2,769	2,358
Shortspine Thornyheads North	1,482	980	371
Longspine Thornyheads North	2,039	890	510
Sablefish North	2,971	2,607	743
Pacific cod	1,088	55	272
Petrale sole	2,172	2,286	543

The fact that historically large producers have their initial allocation truncated by the lack of a grandfather clause means that the prices received by harvesters could be different than those prices that would be received under Alternative 2c where some large producers receive relatively large amounts of quota. Regardless of the ex-vessel prices received, cost savings expected in the nonwhiting fishery because of consolidation are expected to be substantial because the vessel limits do not appear to restrict the amount of fleet consolidation predicted and described in Section 4.6.2.1. For these reasons, harvesters in this sector should see profits improve over Alternative 1 conditions.

The presence of an area management provision that divides species north and south of 40°10' N. latitude may influence overall gross revenue and harvest volume. As discussed previously, central California harvesters may switch to nontrawl gear. As noted, if this occurs on a large scale, fewer flatfish could be harvested, resulting in a reduction in harvest volume and gross revenue compared to what would be expected to occur if they continued to use trawl gear.

The presence of an adaptive management provision under Alternative 3 may tend to depress profits compared to a case without an adaptive management provision. This is because such a provision would presumably be used in a manner that is contrary to an outcome driven by market conditions. Imposing measures that run contrary to a market outcome should, in turn, have a downward effect on profits since profits are a motivating factor behind market outcomes. However, since this provision uses 10 percent of the available quota, the effect is likely to be minor.

Shoreside whiting trawl fishery

In general, a system of harvest cooperatives should allow harvesters in the Pacific whiting sectors to generate higher levels of profit than Alternative 1. The reasons for expected profit improvements

include flexibility in harvest timing, opportunities for more optimal business planning, and fleet consolidation. Collective institutions, like harvest cooperatives, also tend to foster greater communication among harvesters (as explained in Section 4.3.3), and, given the correct set of incentives, such communication may lead to more successful bycatch reduction and a greater potential that harvesters will fully attain their allowable catch of target species.[97] The ability for harvesters in a cooperative structure to share catch among themselves provides a framework for harvesters to consolidate, like in an IFQ program, with some harvesters potentially choosing to opt out of harvest activity and allow another harvester to catch his/her quota, or catch history, assignment. Catch history assignments (like an IFQ) in the shoreside and mothership sector provide a form of assurance that individual harvesters have access to a given amount of resource, making short and long-term business planning decisions easier to make in comparison to Alternative 1.

The relationship between shoreside whiting harvesters and processors that is formed in this alternative is different from that relationship established by issuing both shoreside whiting harvesters and processors IFQs. The ex-vessel prices that develop through a harvester-processor linkage could very well be different from the ex-vessel prices that arise when both harvesters and processors receive IFQs under Alternatives 2a and 2c. Harvesters and processors who own IFQs are not limited in who they can buy from and sell to; however, if harvesters and processors are tied to one another with harvester-processor linkages harvesters are limited in terms of to whom they can deliver fish (though the linkage can be broken with some effort). This linkage means that negotiation and relationships that exist between the harvester and processor are likely to have a large influence over ex-vessel prices in the short term. In many respects, the relationships that develop in this arrangement may begin to resemble a vertically integrated firm with both the harvester and processor in a relatively strong negotiation position. The outcome is likely to be one where prices are negotiated to a place where profits are shared between the harvester and processor.

Over the long term, harvesters and processors can break that arrangement if the harvester fishes in the noncooperative portion of the fishery, though this fishery is a competitive, race-for-fish fishery, which makes it unattractive and arguably less profitable. This means that over the longer term, harvesters can break linkages and establish a linkage to another processor with a more favorable ex-vessel price. However, breaking that linkage may come at a cost, meaning that harvesters may elect to maintain the existing linkage and agree to suboptimal ex-vessel prices if the perceived cost of breaking the linkage and participating in the noncooperative fishery is too great. That aside, it is unlikely that harvesters would agree to ex-vessel prices that compromise their ability to generate profits, since they have the opportunity to break linkages, and this plays to their favor to some degree.

In the shoreside whiting fishery, the linkage of harvesters to (potentially) multiple processors can create problems in negotiations with processors over deliveries and delivery timing. For example, if one harvester begins fishing at the start of the year and delivers that catch to processor A, but then is preempted by bycatch constraints before making deliveries to processor B, then an argument can be made that the harvester did not meet his/her obligation to deliver to processor B, and in fact delivered 100 percent of his/her catch to processor A, which may appear to violate the processor linkage provisions. Such complexities may lead to difficulties negotiating with processors over harvest timing and may create strategic arrangements and negotiations that tend to complicate harvest activities. These types of arrangements may not exist if a harvester is only connected to a single processor.

The accumulation limits specified for this alternative do not include a limit on vessels. Therefore, the limits specified for this alternative are not expected to restrict cost savings possible through fleet

[97] However, as will be discussed in later sections, the fishery-wide bycatch limits specified in this alternative make successful bycatch management on the part of industry uncertain, and perhaps even unlikely.

consolidation. However, the control limits specified do restrict ownership of shoreside whiting catch history to 15 percent. This amount appears large enough to accommodate a relatively large degree of consolidation of catch history ownership into a handful of entities. This may result, over time, in processors acquiring multiple permits with catch history if vertically integrating is to their favor. As such processors vertically integrate, this may tend to reduce the ability of harvesters to negotiate prices to their favor even with a processor harvester linkage provision simply because the processor will have a reduced need to secure deliveries from independent harvesters if that processor can acquire necessary fish through the catch history and permits held by that processor.

The presence of an adaptive management provision would tend to reduce overall profit, for reasons discussed previously. The concept of an adaptive management provision implies that it be used in a manner contrary to a market-driven outcome. Since market-driven outcomes are motivated by profit, such provisions would tend to reduce profit in the fishery. However, since the adaptive management provision is 10 percent, this effect is likely to be minor.

While the above factors speak generally to the fact that profits should be generated (and are likely to improve) for harvesters under a cooperative structure, the common bycatch limit that exists in this alternative may very well eliminate the gains expected from the implementation of harvest cooperatives. This effect is discussed in more detail in the following section.

Mothership whiting trawl fishery

The effect on mothership catcher vessels is similar to the effect on shoreside whiting vessels. Because of this similarity, we provide a relatively condensed analysis on the effects on mothership catcher vessels under this alternative and concentrate mostly on the places where the effect on mothership catcher vessels differs from shoreside catcher vessels.

The cooperative structure created under this alternative grants mothership catcher vessels a defensible resource access privilege if they elect to join a cooperative. As a result, mothership catcher vessels can develop business plans, engage in economically optimal harvest timing and other behaviors, and perform fleet consolidation to capitalize on economic opportunities through cost reductions created by fleet consolidation. The linkage created to a mothership creates a condition that begins to resemble a vertically integrated firm, and both the harvester and mothership are in a similar negotiation position in this case. The result is likely to be one where profits are shared between the mothership and catcher vessel.

The collective institution, or harvest cooperative structure, created through this system will tend to foster greater degrees of communication than a comparable IFQ system, but only if the participants in the fishery have a set of characteristics such that they can operate collectively (Section 4.3.3 has more information on this point). Such enhanced communication will tend to result in more collective action to manage bycatch, and the result may tend to be more successful avoidance of overfished stocks on a fleet-wide basis, increasing the possibility that the Pacific whiting allocation will be attained before the fishery is shut down via attainment of a bycatch limit. However, as outlined in a subsequent section describing risks to profitability, the three-sector-wide bycatch limit that exists in the alternative creates incentives that may lead to a race for fish via a race for bycatch across the three different whiting sectors. This circumstance creates the possibility that the economic gains expected as a result of a cooperative structure will be eroded, or lost.

The accumulation limits in this alternative establish a 20 percent limit on the amount of catch history with which a mothership can be linked and a 10 percent mothership catcher vessel limit that restricts the amount of catch history any one entity can own. Neither of these limits restrict the amount of fleet

consolidation, meaning that there appear to be no barriers to potential cost savings as a result of fleet consolidation. With the 10 percent CV limit, there appear to be opportunities for the relatively small entities to consolidate, but some limited opportunities for the largest entities to consolidate. The 20 percent mothership limit means that at least five motherships will have to be present in the fishery in any given year if the allocation is to be attained. This is a relatively large number of motherships compared to the number in the fishery over the past 10 to 15 years. Guaranteeing a minimum number of motherships will provide options for catcher vessels should relationships between a catcher vessel and a mothership become unfavorable. As the number of motherships declines, the ability for harvesters to find favorable relationships with motherships may tend to decline simply because there are fewer options available to those catcher vessels, and both the mothership entities and the harvesting entities are aware of that fact. In the most extreme case. a mothership may be able to use the lack of other mothership opportunities against the harvester when negotiating over long term relationships.

Table 4-34. Summary of the effect of Alternative 3 on profits.

Nonwhiting Catcher Vessels	Fleetwide profit is expected to increase as a result of increased target species catch and fleet consolidation. Ex-vessel prices are expected to be lower than Alternative 2a because of the initial allocation made to processors, however, gear switching and flexible harvest timing provide opportunities to capitalize on favorable market conditions. Area management may result in lower ex-vessel revenue than would otherwise occur if large-scale gear switching occurs in certain areas of the coast because flatfish catch may be foregone. An adaptive management provision will tend to have a minor, downward effect on profit because it works counter to a market system. The risk associated with managing some species with IFQs makes profit expectations uncertain. Accumulation limits do not appear to restrict consolidation.
Shoreside Whiting Catcher Vessels	Cooperative structure should theoretically improve profitability in the fishery, but the risks posed by the level of bycatch management specified in this alternative jeopardize profits to a great degree.
Mothership Catcher Vessels	Cooperative structure should theoretically improve profitability in the fishery, but the risks posed by the level of bycatch management specified in this alternative jeopardize profits to a great degree.

The distribution of vessel profits under Alternative 3

The distribution of harvest opportunities under a cooperative structure with harvester-processor linkages is similar to an IFQ distribution that allocates 100 percent of the initial allocation to permits. This is because, under a cooperative system with processor linkages, the harvester still controls the opportunity to harvest the available quantity. That quantity is not made available to processors (unless they, too, hold permits), as would be the case if IFQs was allocated to processors.

In addition to the distribution of profits seen as a result of the initial allocation, harvesters fishing around areas with a relatively high presence of overfished stocks are likely to be disadvantaged and be less able to access their target species, like in Alternative 2a. Other factors play into the distribution of profits—namely the presence of area management. The division of species at 40°10’ N. latitude maintains a separation of catch north and south of that boundary. While harvesters are free to travel across the boundary to access the northern and southern quotas (so long as they hold QPs for northern and southern species), such area management will likely tend to direct profits to harvesters located in different geographic areas to a greater extent than if there was no area management because harvesters are more likely to fish in an area near their location.

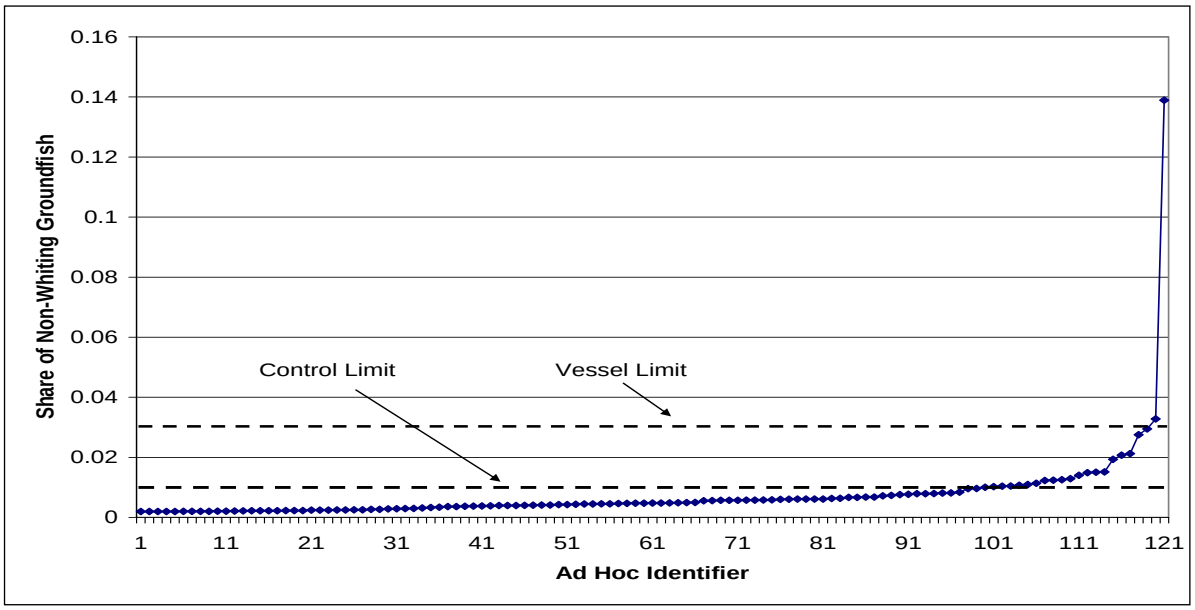


Figure 4-29. Distribution of aggregate nonwhiting QS and accumulation limits under Alternative 3.

In the shoreside whiting fishery, 37 entities are estimated to receive catch history designations under this alternative. All of the entities receive less than the accumulation limit, but the largest entity receives more than twice as much as the second largest entity. A handful of entities stand to receive catch history designations that are close to zero percent of the shoreside whiting quota.

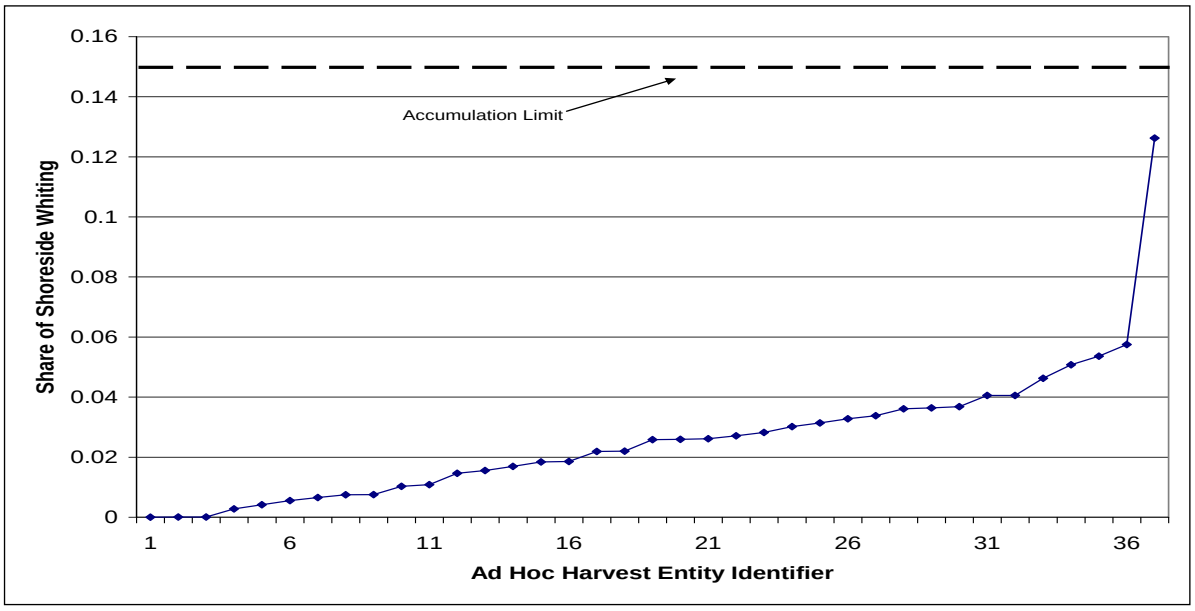


Figure 4-30. Distribution of shoreside whiting catch history and accumulation limit in Alternative 3.

In the shoreside whiting fishery, several harvesters are connected to more than one processing company. Thirty-six shoreside whiting harvesters are connected, at least in part, to the three largest processing companies. Those companies are linked to more than 80 percent of the shoreside whiting catch history.

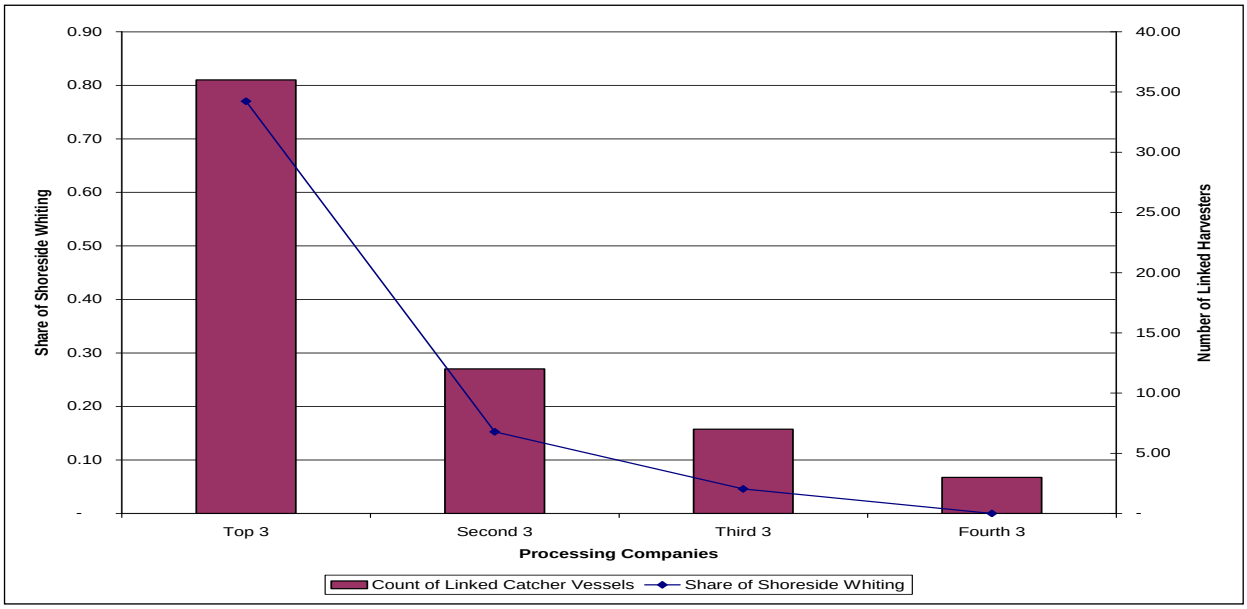


Figure 4-31. Harvester-processor linkages in the shoreside whiting sector under Alternative 3.

In the mothership sector, 29 entities stand to receive catch history designations of mothership whiting. The largest entity receives just over 10 percent of the catch history designation, while the second largest entity receives close to 7 percent. Many entities receive between 3 percent and approximately 6 percent of the designation. The smallest entity receives approximately 0.5 percent.

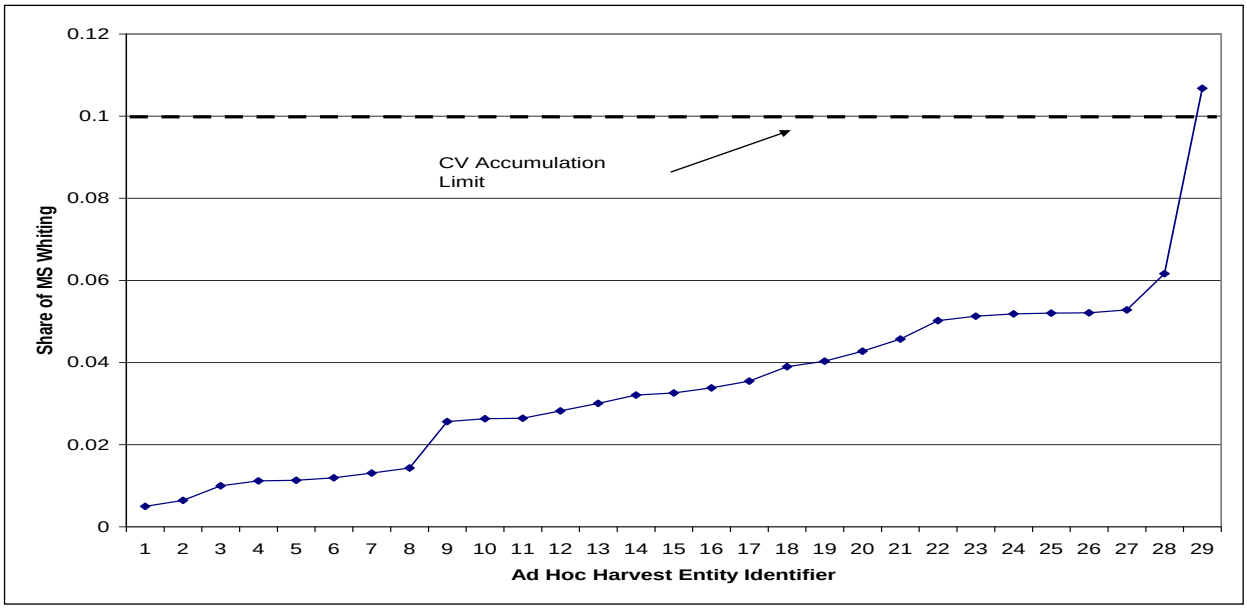


Figure 4-32. Distribution of catcher vessel mothership catch history under Alternative 3.

Mothership catcher vessels are connected to six different mothership companies through the MS linkage provision. One mothership company is connected to eight catcher vessels, while the smallest company is connected to two catcher vessels. These connections assume the most recent delivery year prior to 2007 is the basis for establishing the mothership linkage.

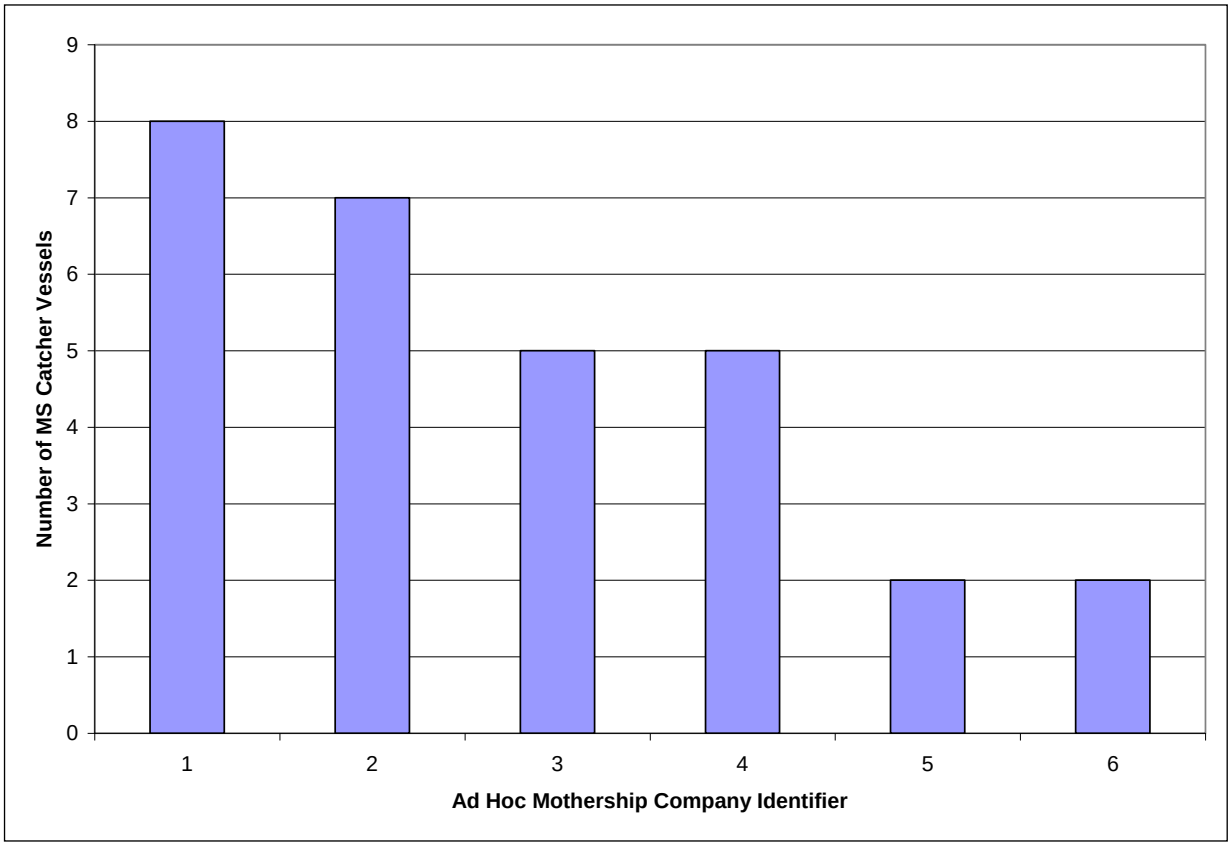


Figure 4-33. Catcher vessel mothership linkages under Alternative 3.

The risk to profits posed by Alternative 3

Nonwhiting trawl fishery

Under this alternative, the risk to harvester profits in the nonwhiting sector from species with low trawl allocations and the presence of thin market conditions is largely the same as under Alternatives 2a, 2b, and 2c. Alternative 3 differs from Alternatives 2a, 2b, and 2c in the initial allocation rules specified for this alternative, the lack of a carry-over provision, and the establishment of four trawl sectors.

In order to manage risk, it is likely that harvesters in the nonwhiting sector will form voluntary risk-sharing arrangements, or pools, where harvesters are expected to transfer quota among themselves to cover unexpected catch events—particularly for low OY or thin market species for which quota may be expensive or difficult to find. In comparison to all other alternatives, the initial allocation rules specified under this alternative, and the lack of a grandfather clause, are arguably the most conducive to the development of such risk sharing arrangements. This is because the initial allocation of overfished stocks is more responsive to need than in Alternatives 2a, 2b, and 2c. This is true for overfished stocks because the initial allocation is made on a basis that is relative to the allocation of target species and the fishing locations and practices of individual vessels (referred to as a bycatch rate allocation approach).

While the amount of overfished species allocated to individual permit holders varies widely depending on the species, the reason for such wide variation is—in short—due to data indicating which permits need more or less overfished species to prosecute target strategies. This approach places harvesters on a relatively even playing field in terms of the amount of overfished species quota each permit holder needs and makes permit holders more likely to enter into sharing agreements as individual permit holders are not likely to be in a strong position, which can upset such voluntary sharing arrangements. The lack of a grandfather clause limits the amount of overfished stocks any one entity can hold. As discussed in previous sections, this facilitates the formation of voluntary risk pools that are stable over the long term.

The lack of a carry-over provision in this alternative increases risk to individual harvesters. Since harvesters cannot carry over a deficit from one year to the next, harvesters would have to purchase QPs to cover an unexpected catch event that puts them into a deficit condition or face an enforcement action. Both of these outcomes could prove quite costly, and this potential cost increases the risk of fishing in areas where low allocation species and thin market species are found. This increases the likelihood that harvesters will forego harvest opportunities for some target species associated with overfished and nearshore rockfish species to avoid such risks.

Finally, the establishment of four trawl sectors rather than three increases risk because the shoreside nonwhiting and shoreside whiting harvesters cannot transfer needed quota to one another. The result is that the nonwhiting sector may be constrained or may shut down prematurely even if quota is available in another sector. In the nonwhiting sector, species such as Pacific whiting (which is commonly caught as bycatch) may inadvertently constrain or shut down nonwhiting harvest opportunities even if substantial amounts of Pacific whiting quota are available in the shoreside whiting sector. This increases the risk that available harvest volumes will not be attained in the nonwhiting sector.

Shoreside and mothership whiting trawl fishery

Under this alternative, Pacific whiting is allocated to shoreside and mothership harvesters, but no other species are so allocated. Bycatch species are covered through a common bycatch limit that stretches across harvesters in all three Pacific whiting sectors. This means that there is no individual accountability for bycatch species (except through peer pressure), and transfers of bycatch species quota cannot occur. A quota market for those species cannot develop under this alternative, and the risk to individual harvesters posed by markets for low allocation and thin market species is low because they will not face the possibility of purchasing costly quota due to unexpected catch events. However, there is a collective risk, which can impact many, or all, harvesters in the Pacific whiting sectors.

The fact that all three sectors of the whiting fishery are likely to close if one or more bycatch limits is reached creates the conditions necessary for a de facto race for fish via a race for bycatch species, as described previously. Under such conditions, more capital is likely to be employed than necessary (increasing costs in the fishery), and the greater business planning typically associated with rationalization is likely to be compromised. Under such conditions, gross revenues in the fishery are put at risk, and the cost efficiencies expected because of fleet consolidation are not likely to be realized. When combined with the lack of business planning possible under such race for fish conditions, the end result of this alternative on Pacific whiting harvesters is likely to be highly similar to Alternative 1 conditions with higher harvesting costs than necessary, harvest timing that is less than optimal, and the possibility that several harvesters could see their catch opportunities preempted by other harvesters because of the common bycatch limit.

Whether harvesters engaged in Pacific whiting harvest opportunities are able to agree on a strategy to successfully manage bycatch to the benefit of all the harvesters involved in the fishery will determine

the success of this common bycatch limit. If existing conditions serve as a guide, the number of harvesters engaged in the whiting fisheries is sufficiently large to limit the ability that these harvesters will agree to successful bycatch management conditions.

The establishment of four trawl sectors does not necessarily impose risks to individual shoreside Pacific whiting harvesters under this alternative like occur in the nonwhiting sector. Nontarget catch in the shoreside whiting fishery is bundled with the at-sea whiting fisheries through a bycatch limit that is common to all three whiting sectors. If the shoreside whiting fishery was separated from the nonwhiting fishery through the establishment of four sectors and was accountable for its own sector-specific catch, then the establishment of four sectors would impose risks like those in the nonwhiting sector, because of the hard allocations and the resulting limited flexibility.

Table 4-35. Summary of the effect of Alternative 3 on risk to profits.

Nonwhiting Catcher Vessels	High level of risk is created by thin market conditions and by individual accountability of low OY and low trawl allocation species. The initial allocation of overfished species QSs based on a bycatch rate, combined with the lack of a grandfather clause—particularly for overfished species—creates the most favorable conditions for forming risk pools among all alternatives. The presence of four trawl sectors may jeopardize the ability of harvesters to achieve the full trawl sector allocation of some target species.
Shoreside Whiting Catcher Vessels	The risk associated with setting a fishery-wide bycatch limit is likely to erode, or eliminate, the gains expected of rationalization if bycatch limits are constraining. This may lead to a fishery that resembles Alternative 1, Olympic fishery conditions, even though cooperatives form among harvesters.
Mothership Catcher Vessels	The risk associated with setting a fishery-wide bycatch limit is likely to erode or eliminate the gains expected of rationalization if bycatch limits are constraining. This may lead to a fishery that resembles Alternative 1, Olympic fishery, conditions, even though cooperatives form among harvesters.

Fishing vessel safety

Safety conditions in the nonwhiting sector are expected to be very similar to those in Alternative 2c. In the nonwhiting sector, safety improvements should occur because of the increase in profitability expected with this alternative. Such improvements in profitability are expected to improve maintenance on vessels, and this improved maintenance should lead to less hazardous conditions. In addition, enhanced harvest flexibility created by rationalization decreases the potential that harvesters will feel the need to fish during unfavorable weather conditions.

Because of the bycatch management conditions in the whiting fishery under this alternative, harvesters in the mothership and shoreside whiting sectors are not likely to see an improvement in safety conditions over Alternative 1. The incentives given to harvesters under this alternative encourage Olympic-like behavior that adversely impacts potential profit and provides incentives for harvesters to fish during unfavorable weather conditions. However, in the event that harvesters are able to form successful bycatch management pools, revenues should be expected to increase and fishing patterns should be expected to be more rational; therefore, safety conditions should improve.

Table 4-36. Summary of the effect of Alternative 3 on safety.

Nonwhiting Catcher Vessels	Vessels in this sector of the fishery are expected to generate higher profits, which are expected to lead to improvements in the level and type of maintenance.
Shoreside Whiting Catcher Vessels	No change from Alternative 1.
Mothership Catcher Vessels	No change from Alternative 1.

4.6.3.6 Alternative 4a

The effect of Alternative 4a on harvesters can be described as falling between the effects seen in Alternatives 2a through 2c and Alternative 3. The way in which Alternative 4a differs from the other alternatives is predominately the result of the initial allocation formula, the presence of a grandfather clause, the lack of an initial allocation to processors, the combination of both shoreside sectors into one, bycatch management at the co-op level in the at-sea fisheries, and the presence of an adaptive management provision. The presence of an area management provision may have an effect on ex-vessel revenue if large-scale gear switching occurs off specific areas of the coast. Other elements of this alternative differ, but do not appear to have a noticeable effect on the outcome.

Shoreside whiting and nonwhiting harvesters are expected to see profits improve under this alternative, but encounter risks associated with low allocation and thin market species as in other IFQ alternatives. The presence of a carry-over provision reduces this risk somewhat, as does the bundling of both shoreside sectors into one sector. This merging of the two shoreside sectors provides the opportunity that harvesters focusing on nonwhiting species can trade quota with harvesters focusing on shoreside whiting when necessary to achieve such outcomes as the covering of catch deficits. Combining the two sectors into one expands the pool of quota available, reducing risk.

Harvesters in the mothership sector see profits improve under this alternative. Risks to individual harvesters are higher than under Alternative 1 because individual cooperatives are held accountable for bycatch, but risks to the collective fleet (risk of a race for bycatch) are minimal. The individual risk posed by this alternative can be overcome by allowing inter-cooperative agreements to manage bycatch and their subsequent development. Such agreements allow cooperatives to share bycatch, thereby spreading the risk of unexpected catch events.

The effect of Alternative 4a on vessel profits and fleet efficiency

Nonwhiting trawl harvesters

The profits that nonwhiting harvesters make under this alternative are expected to be largely similar to those seen in Alternative 2a. This profit comes from fleet consolidation, higher catch of under-utilized target species, and from increased negotiation power over ex-vessel prices with processors compared to Alternative 1. Higher ex-vessel prices are the result of the initial allocation being made to LE trawl permit holders. Over the long run, the negotiation power is expected to remain in the harvester's favor because of the accumulation limits. These accumulation limits result in a de facto limit on the amount of quota that the processing sector can acquire over the longer term. Since scale economies tend to result in a fewer number of processors than there are harvesters, small accumulation limits make it difficult for the processing sector to acquire much quota in the aggregate. While these accumulation limits appear to restrict the amount of quota that the processing sector may acquire over the longer term, they do not appear to restrict fleet consolidation, and, therefore, they do not appear to restrict the cost

savings associated with the expected degree of fleet consolidation. The minimum number of vessels remaining in the fishery under this alternative is 23.

Gear switching provides another source of potential revenue because it allows vessels to capitalize on market conditions that may be more favorable for nontrawl caught groundfish. However, gear switching in combination with an area management provision included under this alternative may mean that catch and ex-vessel revenues are lower than expected. If large-scale gear switching occurs off one particular area of the coast, the catch of flatfish stocks may be foregone because fixed-gear is relatively less effective at catching those species. Since the area management provision does not allow the harvest of that quota in another area, trawl vessels may find it difficult to access those stocks because of long transit distances to fishing grounds where area-specific IFQ could be used. For example, trawl vessels in the north may, at times, travel south to harvest available flatfish, but the large travel cost involved may act as a financial deterrent, meaning that much of the harvest of flatfish in the southern area is foregone.

The adaptive management provision would have the same effect as described for Alternatives 2b and 3: it tends to put downward pressure on profits. As noted previously, since adaptive management only uses 10 percent of the quota, the effect should be minor.

The accumulation limits for nonwhiting quota are not substantially different from the other alternatives. Fleet consolidation and associated cost savings do not appear to be encumbered by the vessel limits. Furthermore, the control limits appear to make it difficult for a large amount of quota to leave the harvesting sector, meaning that an erosion of ex-vessel price negotiation power is not expected to occur over time in this alternative. As under all the other alternatives, while increased levels of profit are expected, there is some uncertainty associated with the level of profit because of the presence of low allocation and thin market species, and the response that harvesters will have to such conditions.

Shoreside whiting trawl harvesters

Pooling of a common IFQ for shoreside whiting and nonwhiting trawl harvesters and the initial allocation formula will make the effects of this alternative different from Alternatives 2 and 3. As discussed under the section describing the expected effects of alternative elements, establishing four trawl sectors may make it difficult to attain the full trawl allocation, while establishing three trawl sectors will allow quota trading and enhanced opportunities between both shoreside sectors. Shoreside whiting harvesters should see profits improve over Alternative 1 conditions because of fleet consolidation, enhanced operational flexibility, and enhanced opportunities for business planning. Because 50 percent of the shoreside whiting allocation is made to processors, ex-vessel prices for shoreside whiting harvesters should be lower than under Alternatives 2a and 2b where there is no initial allocation to processors. Furthermore, many harvesters will see their harvest opportunities reduced with a 50 percent processor initial allocation, unless they are able to enter into agreements with processors to harvest some of the quota allocated to those processors.

As noted previously, some processors hold LE trawl permits, and those processors will receive quota allocated both to permits and to processors, resulting in an allocation to the processing sector that exceeds 50 percent. The following figure shows the estimated share of shoreside whiting that would be allocated to processors and harvesters under Alternative 4a.

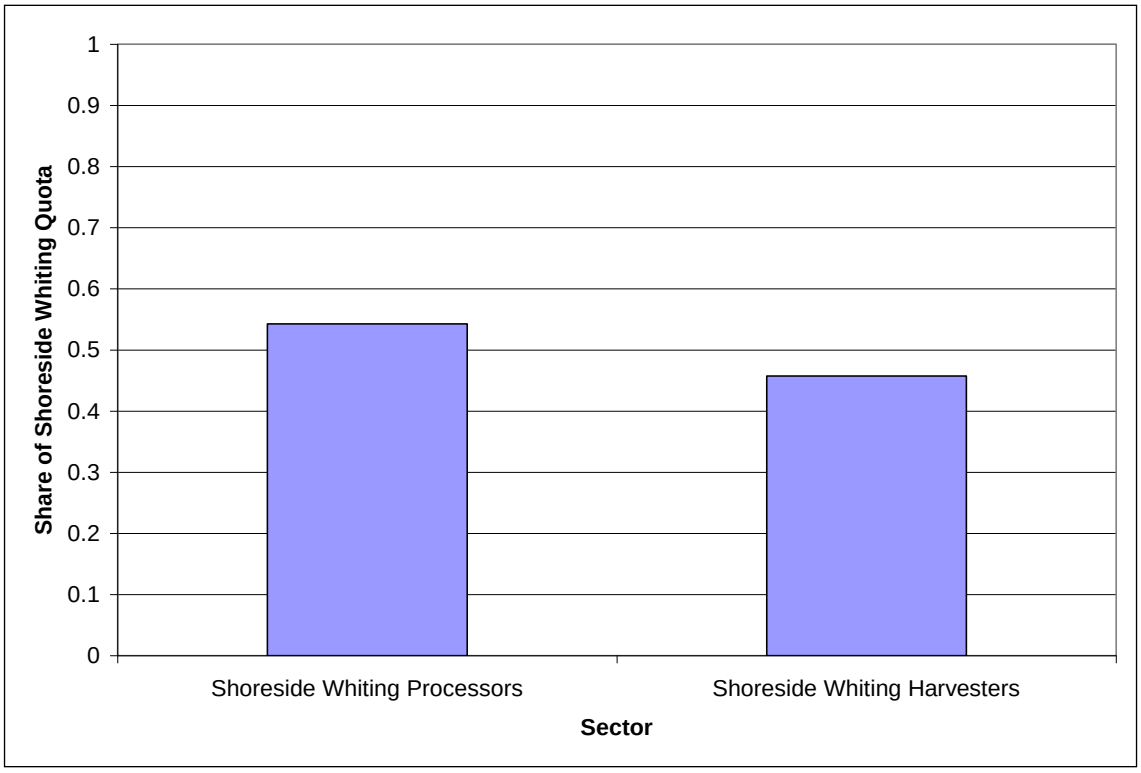


Figure 4-34. Allocation of shoreside whiting quota to harvesters and processors under Alternative 4a.

The same risks when IFQ is applied, of thin market and low allocation species, described earlier in Section 4.6.2.4, may cause shoreside whiting harvesters to fish further out along the continental shelf and slope and incur higher costs than under Alternative 1. These higher costs will put downward pressure on profits.

The accumulation limits in this alternative do not appear to restrict vessel consolidation, meaning that cost efficiencies that may be gained through consolidation are likely to occur in this alternative. However, the control limits allow entities to consolidate the ownership of shoreside whiting quota to a relatively large degree. The control limits are set at 25 percent for shoreside whiting under this alternative, the highest shoreside whiting control limit of any alternative. If processors find efficiencies through vertical integration, processor ownership of QSs may continue to grow with time as processors acquire additional shoreside whiting quota, resulting in a decreasing price paid to independent harvesters. If such vertical integration occurs, this alternative is likely to result in the lowest ex-vessel prices received by shoreside whiting harvesters of any of the alternatives.

Mothership trawl harvesters

Harvesters in the mothership sector see profits improve under this alternative because of fleet consolidation and because of enhanced flexibility in harvest timing and business planning. The certainty of these greater profits is highest under this alternative compared to all other alternatives, because the combined individual and collective risks associated with this alternative result in the lowest overall risk compared to all other alternatives, including Alternative 1. This concept is discussed in more detail in Section 4.6.2.4 (page 301), describing risk.

This alternative includes the harvesters-processor linkage, but, unlike Alternative 3, only 50 percent of the catcher vessel catch history is obligated to the linked processor. This partial linkage allows harvesters to shop around and use the market for half of their catch history, thus providing harvesters with a mechanism to attain higher ex-vessel prices than under Alternative 3. Establishing only a partial linkage injects strong market mechanisms into the relationships between motherships and catcher vessels. This will tend to change the way negotiations occur over the linked catch history, since harvesters can leverage those negotiations with the unlinked catch history. Therefore, it is reasonable to expect that the ex-vessel prices for linked processor deliveries would be higher than under Alternative 3 where a full linkage exists. Ex-vessel revenue would also be higher than under Alternative 2c where 50 percent of the IFQ is given to processors. Under Alternative 2c, processors have the ability to find a harvester willing to prosecute their quota at prices that the processor finds favorable. Under this alternative, where only a portion of the catch history is connected to motherships, those processors/motherships do not have control over catch history and, therefore, have a more limited ability to negotiate prices. This would tend to work in the harvesters' favor.

Table 4-37. Summary of the effect of Alternative 4a on profits.

Nonwhiting Catcher Vessels	Fleetwide profit is expected to increase as a result of increased target species catch and fleet consolidation, though actual estimates are uncertain because of the risks posed by thin market and low allocation species. Ex-vessel prices are expected to be higher than Alternative 1 because of the initial allocation made to permits and the resulting negotiation power harvesters will have over ex-vessel prices. Gear switching and flexible harvest timing also provide opportunities to capitalize on favorable market conditions. Area management may result in lower ex-vessel revenue for the fleet as a whole than would otherwise occur if large-scale gear switching occurs in certain areas of the coast, because flatfish catch may be foregone from those areas. An adaptive management provision will tend to have a minor, downward effect on profit because it works counter to a market system. Accumulation limits do not appear to restrict fleet consolidation and will tend to result in QS remaining with harvesters.
Shoreside Whiting Catcher Vessels	Fleetwide restructuring is expected to occur through fleet consolidation and improvements in harvest timing flexibility. Ex-vessel prices are expected to be the lowest under this alternative compared to all other alternatives because of the amount of quota allocated to processors and the relatively large control limits which allow processors to acquire more QSs over time. The risks posed by thin market and low allocation species may force harvesters to incur greater costs as they travel further in order to avoid areas where these species are found.
Mothership Catcher Vessels	Fleetwide profit is expected to increase as a result of fleet consolidation and improvements in harvest timing flexibility and because of the ability to use unlinked catch history to negotiate favorable prices. There is some limited uncertainty regarding potential profits because of risk associated with bycatch management at the cooperative level, and because of the presence of a noncooperative fishery. That risk is relatively small.

The distribution of profits under Alternative 4a

As in the other alternatives, the effect of individual accountability will tend to encourage those harvesters who have historically fished in areas where constraining stocks are more abundant to move to another area, or to sell their quota. This may distribute trawl activity toward those harvesters who fish in areas where such stocks are less abundant and away from harvesters who fish in areas where they are

more abundant. This concept was discussed in more detail in Section 4.6.2 (page 289) under broad level effects.

In the nonwhiting trawl sector, the distribution of harvest privileges is similar to that of Alternative 2c; however, in contrast to Alternatives 2b and 3, because the adaptive management provision is used for more than just adversely impacted processors in this alternative, the geographic distribution of these shares is expected to be different. In cases where adaptive management is used to encourage the use of bycatch-friendly gear, the distribution of adaptive management quota may go toward harvesters who would use bycatch-friendly gear regardless of the presence of adaptive management. For example, those harvesters who are located off central California and northern Washington may elect to switch to fixed-gear because of public relations issues, market conditions, and bycatch reasons. Allocating adaptive management to these harvesters would allow them to harvest more groundfish than otherwise would be the case, but may not induce additional vessels to switch to fixed-gear. In areas where the aforementioned incentives for vessels to switch to fixed-gear are not present, the use of adaptive management quota may create another incentive for gear switching. This redistribution of shares would tend to provide access to higher amounts of groundfish to those harvesters who are recipients, and may in turn provide a redistribution of profits toward those harvesters.

In the shoreside whiting fishery, the use of adaptive management quota to encourage bycatch-friendly gear is not likely to induce gear switching from trawl gear to another type of gear because Pacific whiting harvesters rely on high volume. It may, however, encourage the modification of midwater trawls so that they successfully reduce the bycatch of overfished stocks or salmon. Distributing adaptive management quota to those harvesters who alter their midwater trawls may provide benefit to those harvesters, but it is likely to reduce overall, fleetwide profit because the use of adaptive management encourages an outcome that is contrary to the one purely driven by the market. If a modified midwater trawl gear has a lower catch rate of whiting, but also reduces salmon bycatch, harvesters may only use that gear as long as they are recipients of adaptive management quota. If that adaptive management quota is redirected to another use, those harvesters may revert to the unmodified, higher bycatch gear. Therefore, the effect that an adaptive management provision has on profits in this case is only as permanent as the location/distribution of that adaptive management quota.

The initial allocation of QSs (applicable to the shoreside sectors only) with equal sharing of trawl buyback catch history will allot shoreside whiting to harvesters in the nonwhiting trawl fishery who have not historically participated in the whiting fishery and allocate nonwhiting groundfish to shoreside whiting harvesters who have not historically participated in the nonwhiting fishery. Figure 4-35 and Figure 4-36 show that there would be 121 nonwhiting quota recipients (compared to 116 when no buyback history is shared). The number of shoreside whiting quota recipients is 139, though approximately 90 of these recipients receive close to zero QSs while the largest five recipients receive 47 percent of the QSs. The distribution of quota/catch history in the mothership sector under this alternative is the same as in Alternative 3 (except for the accumulation limit) and is, therefore, not repeated here.

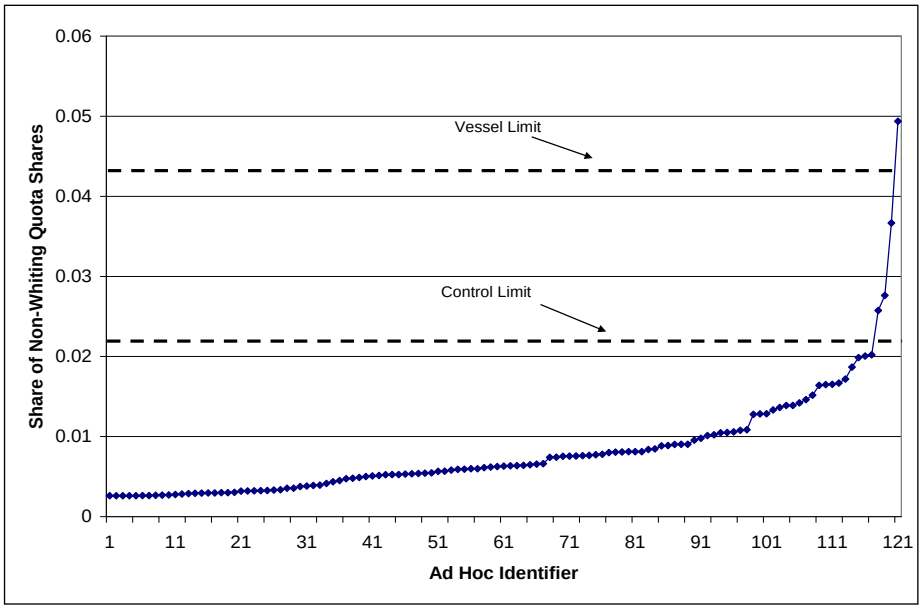


Figure 4-35. Distribution of aggregate nonwhiting QSs and accumulation limits under Alternative 4a.

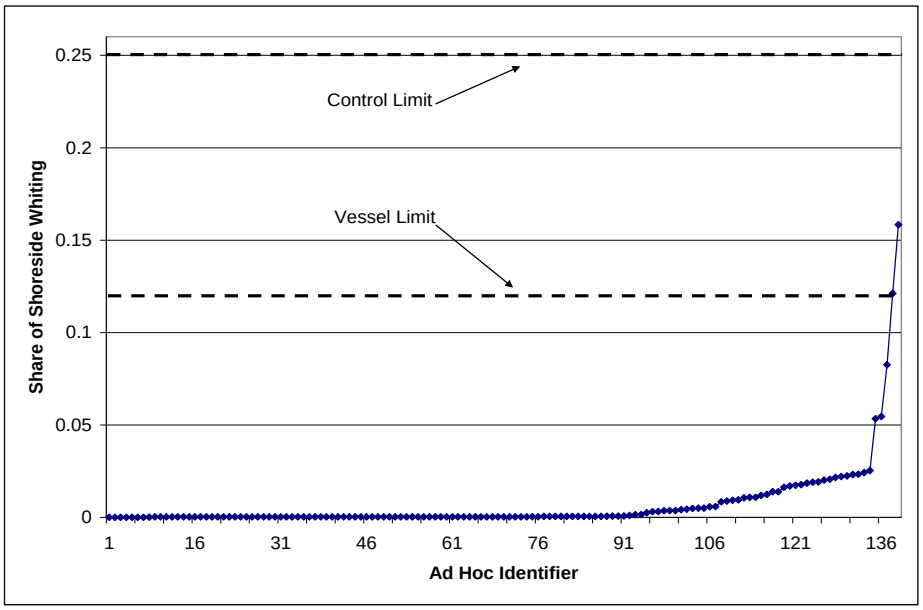


Figure 4-36. Distribution of shoreside whiting quota under Alternative 4a.

The distribution of catch history to mothership catcher vessels under Alternative 4a is the same as under Alternative 3, but with higher accumulation limits (see Figure 4-37). In addition, only half of the catch history is linked to a mothership. Under this alternative no catcher vessels would be constrained by the accumulation limit.

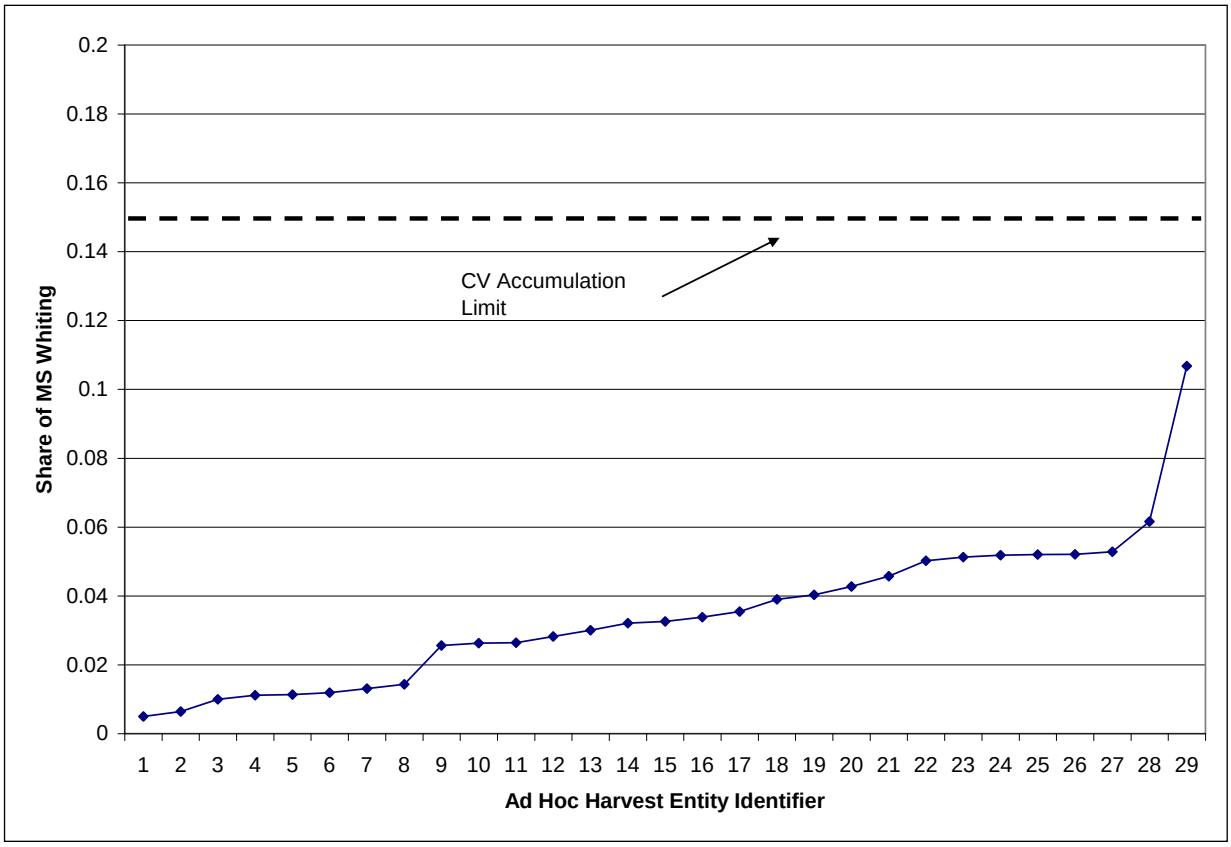


Figure 4-37. Distribution of mothership catcher vessel catch history under Alternative 4a.

The risk to profits posed by Alternative 4a

Nonwhiting trawl harvesters

As under Alternatives 2a through 3, because of the presence of thin market and low allocation species, harvesters may avoid fishing in nearshore and continental shelf areas, thus foregoing the harvest of target species in these areas. This disincentive may be counterbalanced by the ability for nonwhiting trawl harvesters to form and maintain risk pools, which is much greater in this alternative compared to Alternatives 2a, 2b, and 2c, but is lower than Alternative 3. The allocation of overfished stocks based on a bycatch rate results in a more equitable distribution of QSs for these species. The equal sharing of buyback catch history has the same effect for non overfished species. Overall, these two provisions tend to put individual harvesters in a more equal negotiation stance, thus fostering the ability of harvesters to form mutually beneficial risk pooling arrangements. However, in contrast to Alternative 3, the inclusion of a grandfather clause (particularly for constraining stocks) counterbalances more equitable distribution of QSs; that is why this alternative is judged to be less conducive than Alternative 3 for the formation of risk pools.

Like Alternatives 2a through 2c, three trawl sectors makes it more likely that harvesters will be able to attain the full trawl sector allocation than under Alternative 3, where there are four trawl sectors. The catch of sablefish in the shoreside whiting sector, in particular, varies fairly substantially from year to year. Since this alternative has three trawl sectors (one shoreside sector), it is likely that this alternative has a higher probability of attaining the trawl sector allocation than Alternative 3.

Shoreside whiting trawl harvesters

The presence of low allocation and thin market species creates risk to individual harvesters in the shoreside whiting fishery. This risk would have similar effects on the geographic distribution of fishing as described for other sectors that are managed with IFQs. These effects include possible avoidance of areas where constraining species are found, and longer travel distances to reach low bycatch areas. These risks are the same under this as under Alternatives 2a through 2c. Like Alternatives 2a through 2c, three trawl sectors create a single IFQ pool for shoreside whiting and nonwhiting harvesters and give harvesters the flexibility to transfer quota as needed through the market. This allows harvesters to be relatively adaptable to changes in catch conditions from year to year.

Mothership trawl harvesters

In contrast to Alternative 3, collective risk (the risk of a race-for-fish because of bycatch) to harvesters in the mothership sector is minimal under this alternative because the allocation of bycatch species to co-ops insulates harvesters in separate co-ops from one another. The presence of the noncooperative fishery poses some risk to harvesters in the cooperatives because the noncooperative fishery is structured in a manner that creates the incentives necessary for an Olympic fishery to develop. Harvesters fishing under such conditions are less likely to fish in a manner that effectively reduces bycatch, thus increasing the potential of a disaster tow occurring. This risk posed to the cooperatives can be overcome through the establishment of provisions like a noncooperative fishery bycatch buffer or through more stringent area management conditions. For example, a bycatch buffer placed on the noncooperative portion of the fishery would insulate the cooperatives if a disaster tow occurs in the noncooperative fishery that causes that portion of the fishery to exceed its bycatch amount.

Individual risk to mothership harvesters (the risk to individuals posed by unexpected catch amounts of bycatch species) is lower in this alternative than in Alternatives 2a through 2c (IFQs) because of the lack of individual quota for thin market and low allocation species and the associated costs and/or penalties associated with deficit conditions associated with an IFQ program. However, there are some risks to individual harvesters-and harvesters associated with one another in a cooperative—through the bycatch limits that are set at the cooperative level. Bycatch limits established at this level reduce the spreading of individual risk that occurs if bycatch limits apply to the whole whiting sector as under Alternative 3 and, as a result, impose more burden—and risk—to the individual harvesters in a cooperative. This risk is imposed on other harvesters in that cooperative. If one harvester has a disaster tow of a bycatch species, the entire cooperative may be shut down, and other harvesters in that cooperative may have their fishing opportunity preempted by that event. Such an event can be avoided through the presence of inter-cooperative agreements to manage and share bycatch. This type of an agreement would tend to develop among cooperatives that find it mutually beneficial to do so. This agreement would spread the risk of unexpected catch events across more participants, thus reducing the likelihood that harvesters will have their opportunities preempted by the unexpected catch of another harvester because the larger collective bycatch limit established through the inter-cooperative agreement may be able to absorb such events. In addition, bycatch limits set at the cooperative level will most likely lead to the development of cooperative agreements that impose a high degree of individual accountability of bycatch on harvesters within that cooperative. This will likely occur because cooperatives will have to internalize the management of bycatch, and the likelihood of one cooperative forming an inter-cooperative agreement with another cooperative may likely depend on the strength and success of the bycatch management plan contained in the individual cooperative agreements.

Table 4-38. Summary of the risk to profits posed by Alternative 4a.

Nonwhiting Catcher Vessels	High level of risk to profits is posed by the presence of thin market and low allocation species. The allocation of overfished stocks on a bycatch rate creates conditions that are conducive to the forming of risk pools. But this alternative is less conducive to the forming of such pools than Alternative 3 because of the presence of a grandfather clause (particularly for overfished stocks) allowing entities to hold in excess of accumulation limits. The existence of three trawl sectors minimizes risk associated with unexpected catch events because of a larger pool of available quota.
Shoreside Whiting Catcher Vessels	High level of risk to profits is posed by the presence of thin market and low allocation species. The bycatch rate allocation approach is conducive to the formation of risk pools. The existence of three trawl sectors minimizes risk because of a larger pool of available quota.
Mothership Catcher Vessels	There is relatively low risk to individuals and relatively low collective risk (risk of a race for bycatch). Individual risk can be further minimized by allowing intercooperative agreements to develop to manage bycatch across co-ops. Collective risk can be minimized by establishing provisions on the noncooperative fishery such as bycatch buffers and area management.

Fishing vessel safety

Fishing vessel safety is expected to improve for all harvesters under this alternative, except possibly those harvesters who elect to participate in the noncooperative portion of the mothership fishery. While Alternative 3 has a noncooperative portion of the fishery, these alternatives differ because of the manner in which bycatch is managed. Under this alternative, higher profits would tend to lead to better maintenance, which would enhance harvester safety. Safety is also improved because of the flexibility in harvest timing that occurs as a result of rationalization and the fact that a successful rationalization program will eliminate the perceived need to fish during hazardous conditions. Those harvesters who participate in the noncooperative fishery may not see safety improvements because of the Olympic conditions that exist in this portion of the fishery. Such conditions provide incentives to fish during times of unfavorable weather, eroding potential safety gains. However, assuming that the time spent in the noncooperative portion of the fishery is temporary, harvesters in the mothership sector should see safety improve, except perhaps during times when they are participating in the noncooperative fishery.

Safety conditions in the nonwhiting sector are expected to be the same as under Alternatives 2a and 2b.

Table 4-39. Summary of the effect of Alternative 4a on safety.

Nonwhiting Catcher Vessels	Vessels in this sector of the fishery are expected to generate higher profits, which are expected to lead to improvements in the level and type of maintenance.
Shoreside Whiting Catcher Vessels	Vessels in this sector of the fishery are expected to generate higher profits, which are expected to lead to improvements in the level and type of maintenance. Rationalization expected to eliminate Olympic conditions, thus allowing harvesters flexibility and eliminating the incentive to fish in hazardous conditions.
Mothership Catcher Vessels	With the exception of those harvesters who spend time in the noncooperative portion of the fishery, harvesters should see safety conditions improve because of improved vessel maintenance and elimination of the incentive to fish in hazardous conditions.

4.6.3.7 Alternative 4b (Council Preferred)

Alternative 4b is intended to reflect the Council's preferred alternative for rationalization of the LE trawl fishery. The Council's preferred alternative includes several measures not part of Alternatives 2a through 4a, but includes other measures that are similar, if not the same, as many other measures included in Alternatives 2a through 4a.

Several distinct differences exist between Alternative 4b and the other alternatives. These differences include a divestiture period for which QS holders may transfer QSs to comply with accumulation limits, a mothership-catcher vessel declaration requirement that has some similarities but some noteworthy differences from a linkage, a distinct set of groundfish species and Pacific halibut being covered with the rationalization program rather than all groundfish, a 10 percent AMP set aside of nonwhiting species that goes into effect in year three of the trawl rationalization program, a carry-over that declines if a groundfish OY declines, an initial allocation of 20 percent of shoreside whiting to shoreside processors, and a catcher vessel usage limit for the mothership cooperative program that acts similarly to a vessel accumulation limit in an IFQ fishery. Also, the Council's preferred alternative for trawl rationalization intersects with the Council's preferred alternative for Intersector Allocation. Alternative 4b uses the Council's preferred alternative for Intersector Allocation in the analysis, and these sector level allocations result in some noteworthy effects on the fishery.

Many effects of Alternative 4b are similar to the other alternatives. Nonwhiting trawlers are expected to receive an ex-vessel price from processors that is similar to that received in Alternative 4a because of the amount of QSs allocated to processors and because the nonwhiting control limits are similar to other alternatives, restricting the ability for processors to acquire QSs over time and reduce ex-vessel prices over time. Consolidation in the fishery is expected to occur in a manner that is the same as in other alternatives because vessel limits do not appear to be specified at a level that would restrict the amount of consolidation estimated to occur in a free-market condition. However, the control limits will restrict the influence that any given entity can have over the fishery, and these control limits may impact some entities (those entities will have to divest of their quota within four years of the start of the trawl rationalization program). The risk faced by harvesters is less in Alternative 4b than in Alternatives 2a, 2b, 2c, 3, and 4a because some rarely encountered species are not managed with IFQs or catch history as may be the case with harvest cooperatives. However, risk is greater than in Alternative 1 because vessels are held individually accountable for total catch of most groundfish in the ABC/OY table, including constraining/rebuilding species, which can be caught in unexpectedly large volumes. Since harvesters in Alternative 1 are only held accountable for landed catch (and can, thus, discard unexpectedly high volumes of catch), imposing accountability for landings and discard imposes risk due to the uncertain nature of fishing and the fact that larger volumes of catch can occur than what is expected. If that unexpected catch puts a vessel into a deficit condition, the cost of acquiring quota to cover that deficit can prove quite costly, especially in the case of depleted, constraining, species. However, imposing such individual accountability creates opportunities that are arguably greater than under Alternative 1 conditions. Such individual accountability encourages vessels to modify gear and behavior to access target species to a greater degree than allowed under the existing command and control conditions. This potential was discussed under the section describing broad level effects on trawl harvesters.

The fact that both shoreside sectors are combined into a single sector under Alternative 4b alleviates some of the potential that a species may become unexpectedly constraining to one of the shoreside sectors. If one shoreside sector encounters unexpectedly high amounts of a certain species, that sector can compensate by purchasing quota of that species from the other shoreside sector. This provides a form of alleviation of risk compared to a case where hard allocations are set up between sectors. If hard allocations are specified across sectors, and one sector experiences higher than expected catch of one or

more species during a year, there are fewer mechanisms available for dealing with that unexpected catch rate, and the result (in the worst case alternative) may mean premature closure of that particular fishery.

Since Alternative 4b allocates overfished stocks on a bycatch rate, the formation of risk pools is more likely to occur and remain intact over the longer term. It is expected that overfished stocks will continue to play a major role in the access to target species, meaning that those who hold overfished species quota could control much access to the entire fishery. Since overfished species are allocated in a manner that responds to what individual permits will need based on their target species quota and where they prefer to fish, it is less likely that a single entity will play a dominate role, making the formation of mutual agreements necessary for the formation of risk pools more likely. This concept was described previously in the discussion contrasting cooperative-based systems and individual-based systems. While a voluntary risk pool designed to work as an insurance mechanism is not formally a harvest cooperative, it does have many similarities.

Harvesters in the shoreside whiting portion of the fishery are expected to generate higher profits under Alternative 4b when compared to Alternative 1 and Alternative 4a. Ex-vessel prices received for shoreside whiting should be somewhat higher than Alternatives 2c, 3, and 4a because 20 percent of the shoreside whiting is allocated to processors, whereas Alternatives 2c, 3, and 4a allocate more than 20 percent to shoreside processors. Furthermore, ex-vessel prices paid to shoreside harvesters may remain higher over time under Alternative 4b than Alternatives 4a, 3, and, to some extent, Alternatives 2a, 2b, and 2c because the control limits are smaller. Smaller control limits will tend to restrict the ability of processors to acquire QSs over time. If such acquisition occurred, it would tend to result in lower ex-vessel prices over time. Ex-vessel prices received for nonwhiting should be somewhat higher than for Alternatives 2c, 3, and 4a because processors do not receive an initial allocation of nonwhiting species. This effect should remain largely intact over the long term as the accumulation limits are specified at a level that would tend to make it difficult for processors to vertically integrate to an appreciable degree.

Harvesters in the mothership portion of the fishery are expected to have greater revenues under this alternative compared to Alternatives 2c, 3, 4a and Alternative 1 (status quo). It is not clear how they fare relative to Alternatives 2a and 2b. If there is a notable difference, though, harvesters will likely be somewhat worse off under Alternative 4b compared to Alternatives 2a and 2b since a catcher vessel in a cooperative must deliver to a single mothership during the course of a year. The fact that Alternative 4b does not require a mothership linkage, but does require an annual mothership declaration, means that harvesters would likely to find it easier to switch motherships, similar to what happens under Alternative 1 conditions and Alternatives 2a and 2b. Furthermore, the fact that mothership catcher vessels will not have to participate in a noncooperative fishery to switch motherships means that participation in the noncooperative portion of the fishery should be minimized. This, in turn, reduces the risk of a disaster tow occurring as a result of race for fish conditions that may be present in a noncooperative fishery and also provides more certainty to individual harvesters that they will have access to their catch history instead of competing with other vessels in the noncooperative fishery, which could be the case if they switched motherships under a linkage provision.

The effect of Alternative 4b on vessel profits and fleet efficiency

Nonwhiting trawl harvesters

Vessel profits under Alternative 4b are expected to improve relative to Alternative 1 for a variety of reasons. As in the other alternatives, the amount of catch in the fishery is generally expected to increase because of a reduction in the bycatch rate of overfished species which, in turn, allows vessels to leverage higher catch amounts of under-utilized target species. This increased catch should lead to greater ex-vessel revenues attributed to harvesting activity relative to Alternative 1. In addition to

greater catch quantities, the vessel accumulation limit specified for this alternative does not appear to restrict fleet consolidation; therefore, the amount of cost savings possible as a result of consolidation does not appear to be encumbered by the vessel limits. Lower harvesting costs combined with greater ex-vessel revenues are expected to result in an improvement in the economic status of nonwhiting harvesters, assuming ex-vessel prices remain somewhat constant, or increase. Other reasons for expected increases in revenues come from the gear switching provisions made part of the action alternatives (Alternatives 2a through 4b). Such gear switching allows harvesters to capitalize on higher prices paid for nontrawl harvested species (such as sablefish) and also allows harvesters to change relative catch ratios and therefore balance catch accounts. As illustrated previously, each gear type has a different relative rate of capture. Allowing harvesters the opportunity to use different gears provides them the opportunity to change capture rates to their advantage, and this may mean avoiding overfished stocks and harvesting some groundfish species more selectively.

Unlike Alternatives 2a through 4a, the amount of risk associated with fishing activities on continental shelf areas may not induce harvesters to forego the harvest of some target species. As shown previously in Section 4.6.2.4, the layers of risk associated with overfished species, minor nearshore rockfish, cabezon, and other species with small trawl sector allocations may, at some level, induce harvesters to avoid fishing activities in certain areas to circumvent the possibility that a chance encounter with one of these species could occur. A chance encounter with these species could put that harvester in a deficit condition, which may prove quite costly to get out of since limited quota poundage will be available on the market. Since Alternative 4b does not require that nonwhiting harvesters cover several types of rarely encountered species with IFQ (which is the source of one kind of risk), it is less likely that harvesters will avoid continental shelf areas where nearshore species and many types of target species are found. This makes it more likely that the expected amount of revenue associated with nonwhiting fishing activity will be realized because harvesters are not as likely to forego shelf target species.

Ex-vessel prices under Alternative 4b are expected to be similar to Alternatives 2a and 2b. It is unclear how ex-vessel prices will compare to Alternative 1, though it is possible that they will increase somewhat compared to Alternative 1 (under several assumptions). This is because 90 percent of the nonwhiting IFQ is allocated to permits, and 10 percent is reserved for an AMP (starting in year three) with no initial allocation to processors (except to the extent that processors are also owners of trawl permits). This may tend to increase the negotiation power of harvesters as they have a longer time in which to hold out against processors when negotiating over prices compared to Alternative 1 conditions where harvesters must do so within a two-month window. Furthermore, the control limits specified for this alternative will make it difficult for processors to acquire QSs and vertically integrate to an appreciable degree, thus leading to a retention of ex-vessel price negotiation power in the harvesting sector over the long term. The following figure illustrates the share of nonwhiting quota allocated to processing entities and harvesting entities under Alternative 4b. Several processing entities hold LE permits, thus making the allocation of QSs to processing entities larger than zero. This figure does not include an adaptive management quota.

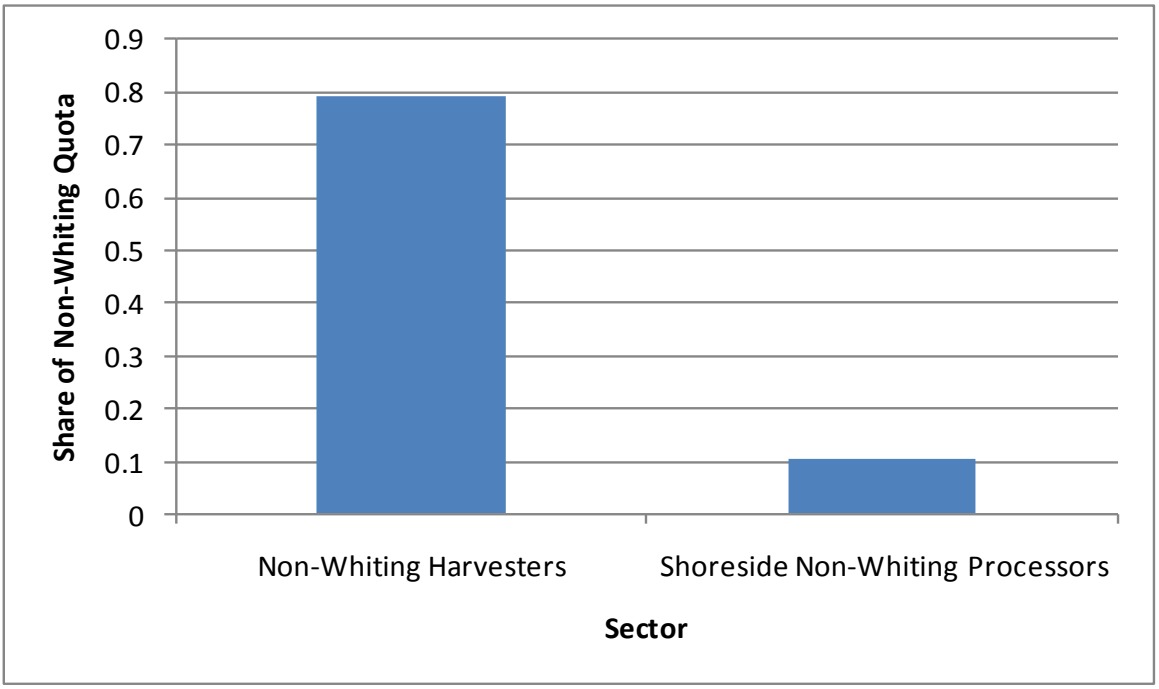


Figure 4-38. Share of nonwhiting groundfish allocated to harvesters and processors in Alternative 4b.

Adaptive management has the potential to reduce overall revenues in the fishery, while redistributing revenues in a fashion that some may consider more equitable. Because the adaptive management provision may work in a manner that is counter to a market-driven outcome (it is likely that an adaptive management quota will be distributed based on a Council action or framework rather than a market signal), the outcome may be one that generates less revenue (assuming a more market-driven outcome is one that tends to maximize economic gains). Based on this notion, the inclusion of an adaptive management provision under Alternative 4b may result in lower revenues at the fishery level compared to a case where adaptive management does not exist. However, since the adaptive management provision is up to 10 percent of the available quota, the effect of the adaptive management provision on total harvester revenues is likely to be small.

Adaptive management has the potential to distribute profits toward some harvesters who may be more marginal producers, or to distribute profits toward those harvesters who may not be initial recipients of QSs (second-generation fishermen or new entrants). For those harvesters who may lease quota (and may be considering the purchase of QSs in the future), the AMP may help those harvesters generate enough profit that they can purchase QSs over time. Alternatively, the lack of an AMP would require quota-leasing harvesters or second-generation harvesters to pay the going rate to lease quota, and research has indicated that this cost can be quite high, creating conditions that make it difficult to save enough money to purchase QSs and become independent owner-operators (Pinkerton and Edwards 2009). Therefore, the AMP acts as a tool to help distribute profits to harvesters who are not initial recipients of QSs and to help those harvesters to become QS owners. This concept was discussed in the section describing the effect of the AMP on harvesters above.

Shoreside whiting trawl harvesters

Shoreside whiting harvesters are affected similarly, in many respects, under Alternative 4b as they are under Alternative 4a. The fact that both shoreside sectors are bundled into one means that shoreside

whiting harvesters can use market mechanisms to trade quota with nonwhiting harvesters. This combination of sectors means that there are fewer hard barriers between sectors, which may mean fewer restrictions on harvesting activity. Under a four sector option, hard allocations would be made between sectors. In some instances those hard allocations may mean that certain species end up being constraining to one or both sectors. With both sectors combined into one, there is a larger pool of quota from which to draw. In the event that midwater whiting trawlers encounter more of a certain type of species than expected, they can purchase quota from nonwhiting trawlers. This ability to trade enhances the possibility that catch will be realized by whiting trawlers compared to a case where hard allocations are drawn between the two trawl sectors, as such hard allocations may at times become constraining. This effect is also true for nonwhiting harvesters. This is explained in more detail under the subsequent section on risk to profits.

Ex-vessel prices under Alternative 4b are expected to be higher for shoreside whiting trawlers than under Alternatives 3 and 5, principally because of the amount of quota allocated to processors. Since processors receive 20 percent of the allocation under Alternative 4b, but they would receive 25 and 50 percent under Alternatives 3 and 5, respectively, harvesters have more negotiation power under Alternative 4b, leading to higher ex-vessel prices than Alternatives 3 and 5, but likely lower ex-vessel prices compared to a case where no allocation is made to processors. Furthermore, the control limits established under this alternative for shoreside whiting are lower than for any other alternative, meaning that the ability for processors to acquire shoreside whiting QSs and vertically integrate over time is limited. This, in turn, limits the ability of processors to bid down ex-vessel prices against other harvesters over time. The vessel limit specified for this alternative does not appear to restrict fleet consolidation, and, therefore, the amount of cost savings possible as a result of consolidation does not appear to be encumbered by the vessel limits.

The amount of revenue expected to be generated by shoreside whiting harvesters under Alternative 4b has a greater potential of being realized from year to year compared to Alternatives 2a through 4a, and possibly even compared to Alternative 1. This is due to a variety of factors that are also discussed under the section describing risk. The fact that shoreside whiting harvesters are not responsible for the catch of rarely encountered species, such as nearshore species, means a reduction in the possibility that a chance encounter with one or more nearshore species will constrain the shoreside whiting fishery. Not issuing IFQ for some rarely encountered species is also likely to lead to less of a risk aversion response on the part of harvesters. An aversion to risk may mean that harvesters travel longer distances (such as out to the deep shelf and continental slope areas) to avoid chance encounters with nearshore species. That risk aversion response would come at a cost because of the travel distance involved and would tend to reduce net revenues in the fishery as a result. Since shoreside whiting harvesters are not issued quota for such rarely encountered species, it is more likely that shoreside whiting harvesters would fish closer to shore and that costs would be lower than if they traveled further to prosecute whiting activity.

When considering the comparison between Alternative 4b and Alternative 1, it is possible that the expected catch level (the shoreside whiting allocation) may be harvested more frequently under Alternative 4b than under Alternative 1. Under Alternative 1, harvesters are constrained by bycatch limits and occasionally reach one of those limits prior to harvesting the shoreside whiting allocation (meaning the fishery is shut down prematurely). Since Alternative 4b eliminates race-for-fish conditions, harvesters in the shoreside sector may elect to change their fishing timing if incidental catch rates of nontarget species are too high and wait for a time when those incidental catch rates are lower. It is more difficult to take those types of actions under Alternative 1 because of the race-for-fish conditions present in the fishery and the fact that if one harvester elects not to fish, another harvester may catch the fish that would otherwise be caught by that first harvester. This makes it relatively more difficult for harvesters to undergo activities that may reduce the catch of incidental species under Alternative 1 (though collective actions have taken place under existing conditions).

The following figure illustrates the amount of quota allocated to harvesters and processors under this alternative. Several shoreside whiting processors are also owners of trawl permits with whiting catch history, thus making the initial allocation of whiting to shoreside processors greater than 20 percent.

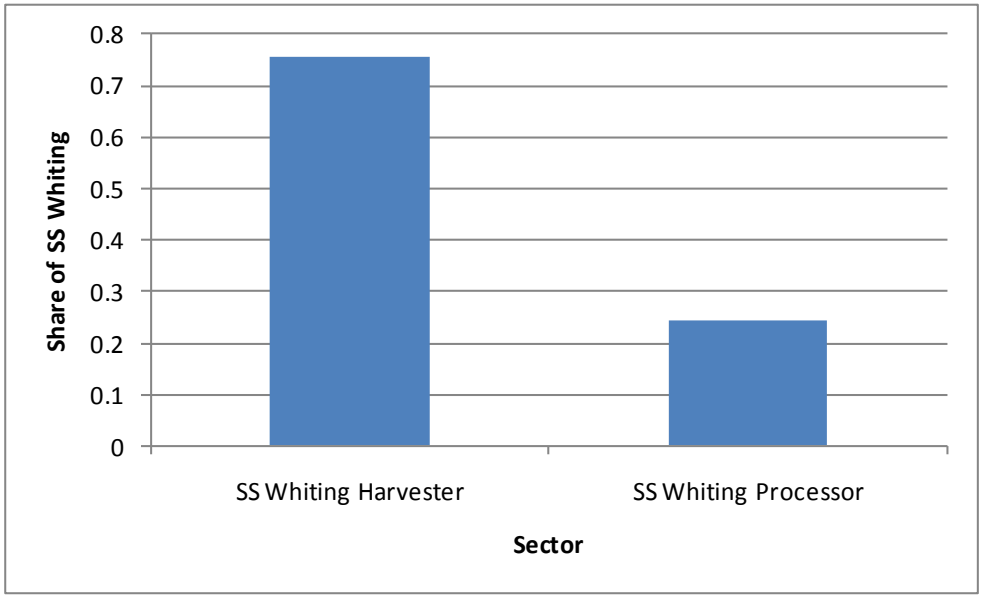


Figure 4-39. Share of shoreside whiting allocated to harvesters and processors in Alternative 4b.

Mothership trawl harvesters

Harvesters in the mothership trawl sector are expected to fare better under Alternative 4b than under Alternatives 1, 2c, 3, and 4a. Rationalization, in general, is expected to improve the revenues generated by harvest activity in the mothership sector for a variety of reasons, including the fact that harvesters no longer compete for a common quota. In addition, since bycatch is managed at a more refined level (the cooperative level), participants in the whiting sector will no longer compete for a common bycatch pool, which also has a race-for-fish effect. Since Alternative 4b manages bycatch at the cooperative level, the race for bycatch" is not as likely to exist under Alternative 4b compared to a case where bycatch is managed at a broader level. However, other risks are imposed on harvesters from managing at the cooperative level. If a member of a cooperative incurs a relatively large catch event, it is more likely that the other members of the cooperative may have their fishing opportunities shut down prematurely because they may be less able to collectively absorb that unexpectedly large catch event. Should the mothership sector become several cooperatives, this type of an effect can be alleviated if those multiple cooperatives form an inter-cooperative agreement to spread the risk of those unexpected catch events of nontarget species.

The added benefit of Alternative 4b is that harvesters do not have to fish in the noncooperative portion of the fishery to switch motherships. This means that participation in the noncooperative portion of the fishery is expected to be less frequent than a case where participation in the noncooperative portion of the fishery is necessary to break a mothership linkage. For those harvesters who wish to switch motherships, not having to participate in the noncooperative fishery makes it more likely that those harvesters can continue to fish in a manner in which they do not fear their catch opportunities will be preempted by someone else, and as a result, can fish in a way that is more economically beneficial.

Mothership harvesters declare a single mothership to which they will deliver in the coming season under Alternative 4b. Under this structure, the catcher vessel can enter into dialogs and negotiations with various motherships prior to the season starting. If that catcher vessel wishes to participate in a cooperative, it must declare a single mothership to which it will deliver in the coming season by a date certain. If that catcher vessel wishes to fish for a different mothership in the next year, it simply declares that it will fish for that other mothership in that next year. This is different than the linkage provision in Alternatives 3 and 4a that would require those catcher vessels to fish in the noncooperative fishery for a season in order to break that linkage. This added ease of switching motherships enhances the negotiation power that harvesters have over issues such as prices and/or profit sharing with motherships compared to a case with linkages that are difficult to break. However, since that catcher vessel must deliver to a single mothership during the course of a year, it is possible that the catcher vessel may not be in as advantageous a position in price negotiations compared to a case where a catcher vessel can freely deliver to any mothership during the course of the year. On the other hand, catcher vessels appear to be in a relatively advantageous position over price negotiations prior to the fishery starting, and the end result of negotiations taking place prior to the season may be very similar, if not identical, to a case where a catcher vessel is switching motherships mid-course during a season to take advantage of the highest price. The reason for this declaration requirement is to provide for some degree of certainty for business planning on the part of the mothership, and this effect is described under the section on the effect of rationalization on motherships.

Perhaps the largest benefit to harvesters in the mothership sector from the declaration requirement (rather than a linkage) arises when harvesters in a cooperative are considering a move to another mothership. An alternative where harvesters can switch motherships without going into the noncooperative portion of the fishery makes the switching of motherships easier for the catcher vessel, and arguably less punitive, since they do not have to participate in a competitive, race-for-fish fishery. This ease of switching motherships will also tend to give harvesters enhanced negotiation power over ex-vessel prices since they will find it easier to move to a mothership offering higher prices and will not have to participate in the noncooperative fishery to do so (the participation in which could come at a cost).

Table 4-40. Summary of the effect of Alternative 4b on profits.

Nonwhiting Catcher Vessels	Fleetwide profit is expected to increase as a result of increased target species catch and fleet consolidation. Some uncertainty is associated with these estimates due to the ability of the fleet to avoid overfished stocks and deal with the risk and uncertainty associated with unexpected catch events of overfished species. Uncertainty in these estimates is also present due to variations in groundfish allowable catch levels in the future. It is possible that ex-vessel prices will be higher than Alternative 1. Gear switching and flexible harvest timing also provide opportunities to capitalize on favorable market conditions. An adaptive management provision will tend to have a minor, downward effect on profit because it works counter to a market system, but may enable harvesters who are not initial recipients of QSs to generate higher levels of profit and make it relatively easier to become independent owner operators. Accumulation limits do not appear to restrict fleet consolidation.
Shoreside Whiting Catcher Vessels	Fleetwide profit is expected to increase as a result of fleet consolidation and improvements in harvest timing flexibility. Ex-vessel prices are expected to be lower than in Alternative 2a but higher than Alternative 3 and 5 because of the amount of quota allocated to processors.
Mothership Catcher Vessels	Fleetwide profit expected to increase as a result of fleet consolidation and improvements in harvest timing flexibility. There is some limited uncertainty regarding potential profits because of the type of risk associated with bycatch management at the cooperative level, and because of the presence of a noncooperative fishery. However, the ability to switch motherships without going into the noncooperative fishery reduces some of this risk.

The distribution of profits under Alternative 4b

The distribution of profits under Alternative 4b is highly similar to that of Alternative 4a. As in the other alternatives, the effect of individual accountability will tend to disadvantage those harvesters who have historically fished in areas where constraining stocks are more abundant. This may distribute the benefits of trawl rationalization toward those harvesters who fish in areas where such stocks are less abundant and away from harvesters who fish in areas where they are more abundant. This concept was discussed in more detail in Section 4.6.2 (page 289) under broad level effects.

One of the principal differences between Alternative 4b and the other alternatives is the allowance of a divestiture period for entities that receive an initial allocation in excess of the accumulation limits. This divestiture period is in years three and four of the trawl rationalization program. Entities over the control limit would be required to transfer their QSs to another entity in order to comply with the control limits by the start of year five. Allowing for a divestiture period, rather than automatically redistributing QSs that may otherwise be above a control limit, enables the entity above the control limit to have some measure of say in where those overage QSs go. It is not unreasonable to assume that those entities would transfer those shares in a manner that is beneficial to them. This may mean simply selling those overage shares to the highest bidder, and in this way capturing the rent associated with fishing that quota in the future, or it may mean transferring those QSs to another entity with whom that first entity is familiar or may have business relations. An example may be a case where a harvester who is over the control limit transfers the overage QSs to the processor to whom he delivers with the expectation that that processor may, at times, transfer the quota poundage associated with those shares to the vessel operated by that original harvester. Another example could be one where a harvester over the control limit transfers QSs to an association that acts on behalf of a community of which the overage harvester is a member. That harvester may see the activities of the association as beneficial and, in this way, benefit from the activities of that association. In any event, the distribution of those QSs through a divestiture provision should be expected to result in a distribution of fishing activities, and/or profits, in a manner that is more beneficial to the original recipient of overage QSs compared to a case where no grandfather clause and no divestiture clause exists.

Alternative 4b includes an ADP, like some other alternatives, but that program does not go into effect until year three of the trawl rationalization program. The fact that the AMP does not go into effect until year three means that some of the effects that the AMP may be designed to counter will occur in years one and two. This could mean that consolidation of the fleet will occur as if there is no AMP in the first two years and that ports and regions that may be at a relative disadvantage as a result of rationalization may feel relatively greater effects in the first two years. Vessels operating out of disadvantaged, or vulnerable, ports and regions that might be recipients of AMP QPs would, therefore, operate without those pounds during the first two years.

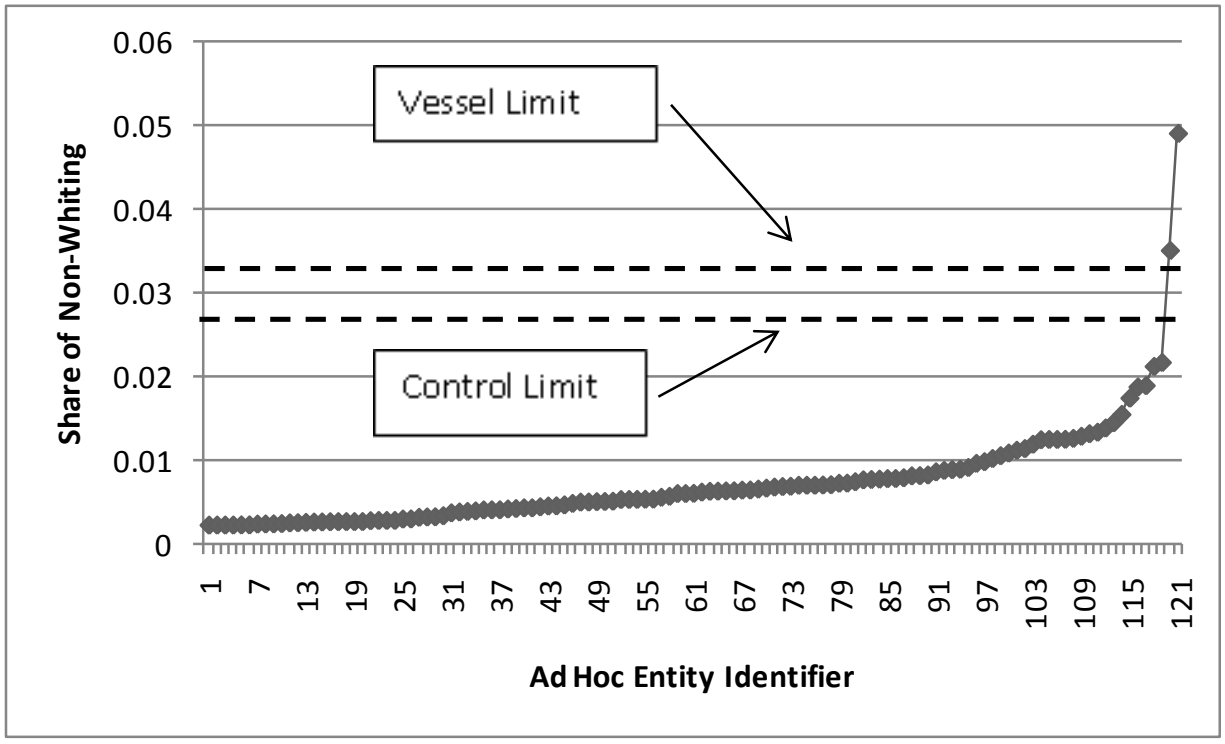


Figure 4-40. Distribution of Nonwhiting IFQ under Alternative 4b.

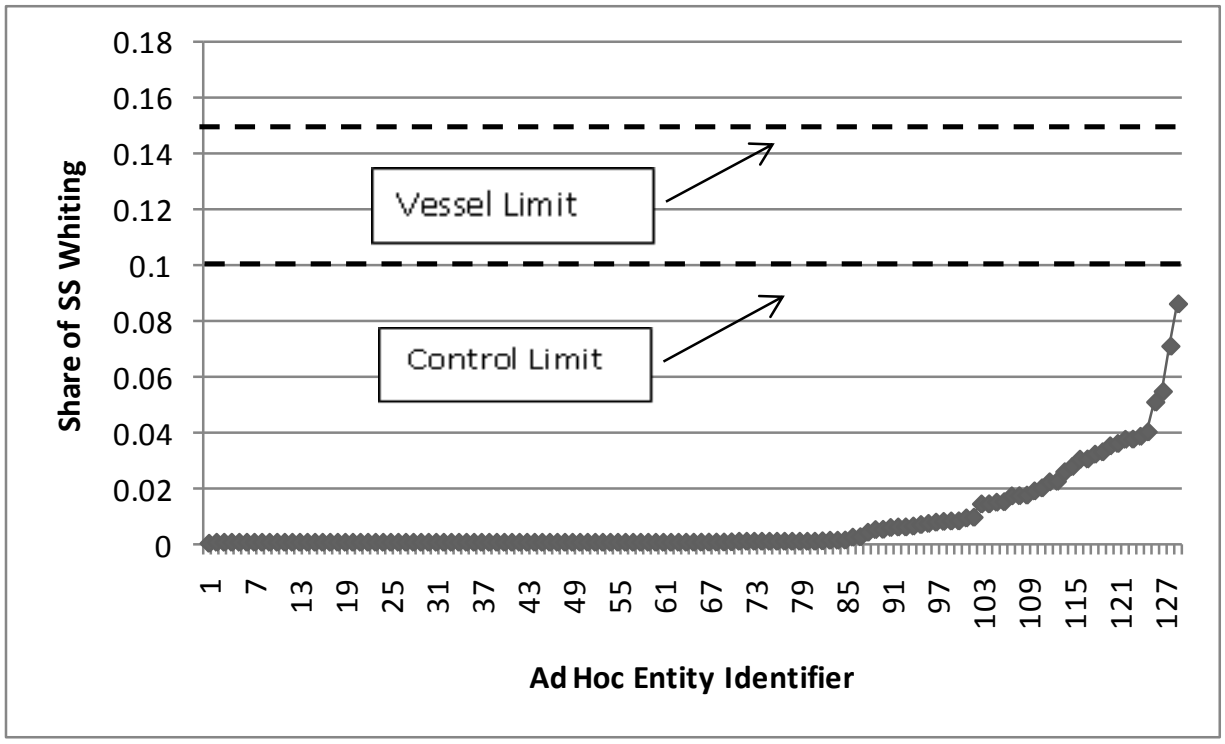


Figure 4-41. Distribution of Shoreside Whiting IFQ under Alternative 4b.

The distribution of catch history to mothership catcher vessels under Alternative 4b differs from alternatives 3 and 4a because the endorsement years include 1994 to 2003, whereas Alternatives 3 and 4a use 1997 to 2003. The year selection results in one additional permit being eligible to receive catch

history, and this additional permit, combined with the greater number of years included in the catch history calculation, alters the amount of catch history distributed to MS(CV) permits, though only slightly. When compared to entity activity over the 2004-to-2006 period, there are some noteworthy differences in what an entity will be allocated compared to the share of landings made during that same period. Though not shown, in general several entities that receive an initial allocation of MS(CV) catch history did not participate in the 2004-to-2006 period. Also, several entities caught substantially different (both larger and smaller) shares of the mothership sector allocation over the 2004-to-2006 period than would be allocated. The accumulation limits for mothership catcher vessels allow for some consolidation among entities in the mothership sector. The fact that the control limits are higher than would be initially allocated allows for some consolidation over catch history to occur among the entities with the largest production and initial allocation. This may mean growth that comes in the form of vertical integration (mothership companies purchasing catch history) or horizontal integration (catcher vessels purchasing the catch history of other catcher vessels). In addition, while the control limit is higher than all of the initial allocation estimates, it is similar to levels harvested by individual entities in recent years (some entities have increased catch levels since the qualifying years).

The usage limit specified as part of this alternative is a feature that does not exist in other alternatives. A usage limit in a cooperative program is similar to a vessel limit in an IFQ program. The difference is that a usage limit restricts the amount of catch one vessel can harvest, while a vessel limit restricts the amount of QPs that can be registered to a vessel in an IFQ program. The difference between the two is out of necessity. Agencies do not track inseason catch history transfers in a cooperative program—such inseason, annual transfers are wholly internalized by the cooperative institution. Therefore, there is no mechanism for agencies to impose a vessel limit. Agencies can, however, track catch at the vessel level in a cooperative program; therefore, it is possible to restrict the amount of catch that any one vessel catch harvest. This is referred to as a "usage limit." The usage limit specified as part of this alternative is set at 30 percent, and this percentage appears to allow vessels to harvest more than has been taken under recent conditions. This means that fleet consolidation is able to occur under the size of the usage limit specified for this alternative.

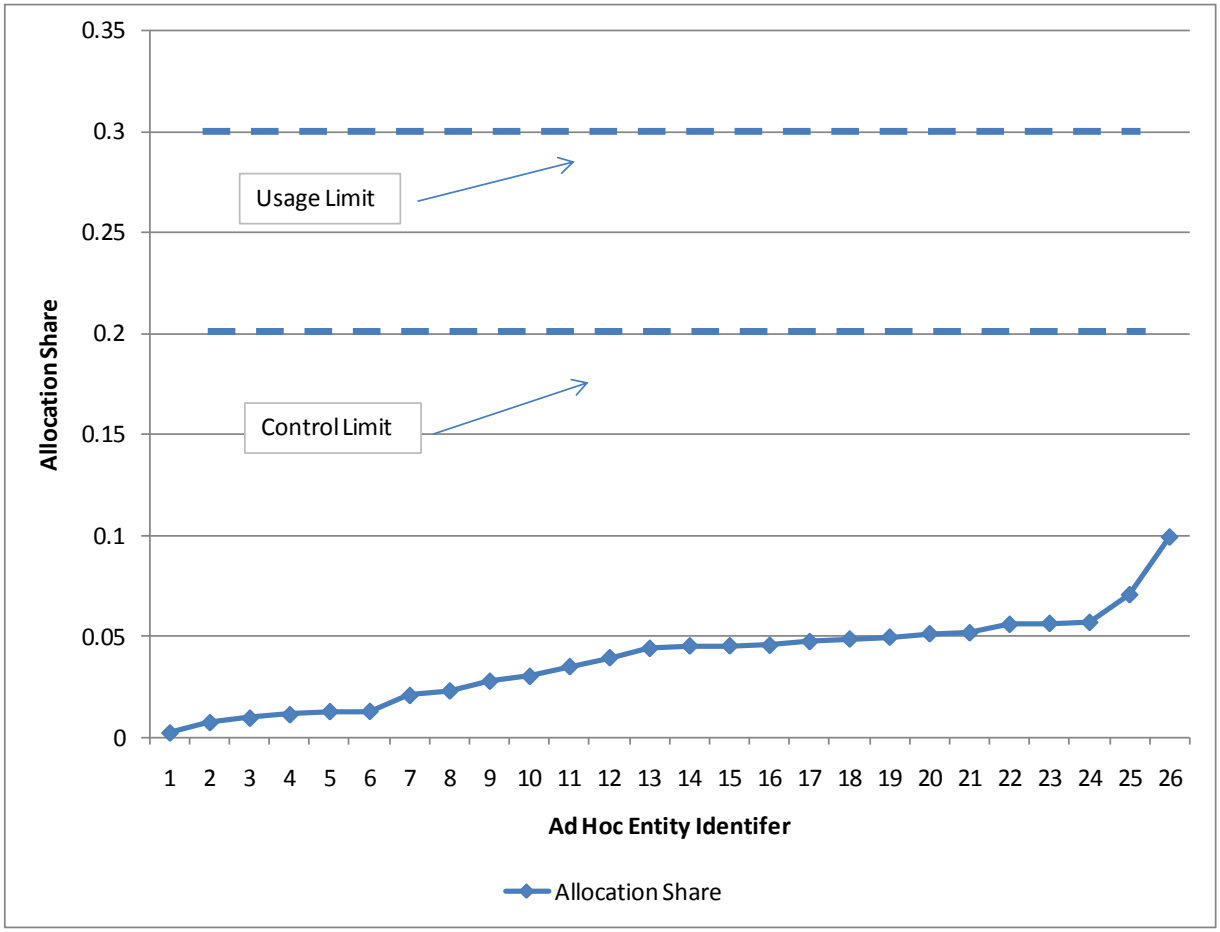


Figure 4-42. Distribution of mothership catcher vessel catch history under Alternative 4b.

The risk to profits posed by Alternative 4b

Nonwhiting trawl fishery

The risk to harvester profits in the nonwhiting sector under this alternative from species with low trawl allocations and the presence of thin market conditions is lower than for other alternatives, except for Alternative 1. The fact that rarely encountered species are not managed with IFQs reduces the chances that an unexpected catch of such species could put a harvester into a deficit condition. Alternative 4b also differs from other alternatives because of the initial allocation rules specified for this alternative, in the lack of a grandfather clause and establishment of three trawl sectors.

To manage risk, it is likely that harvesters in the nonwhiting sector will form voluntary risk-sharing arrangements, or pools, where harvesters are expected to transfer quota among themselves to cover unexpected catch events—particularly for low OY or thin market species for which quota may be expensive. This tool can be described as a type of insurance mechanism to protect against unexpected catch events. In comparison to other alternatives, the initial allocation rules specified under this alternative, and the lack of a grandfather clause, are arguably the most conducive to the development of such risk sharing arrangements. This is because the initial allocation of overfished species is done in a manner that allocates based on relative need and should, therefore, place harvesters in a relatively similar position when negotiating terms that might govern a risk pool. As discussed in previous

sections, an initial allocation that does not allow an entity to operate in a relatively strong position facilitates the formation of voluntary risk pools that are stable over the long term.

Shoreside whiting trawl harvesters

The presence of low allocation and thin market species creates risk to individual harvesters in the shoreside whiting fishery. This risk would have similar effects on the geographic distribution of fishing as described for other sectors that are managed with IFQs. These effects include possible avoidance of areas where constraining species are found and longer travel distances to reach low bycatch areas. These risks are similar as under other alternatives, but the fact that IFQ is not required to cover the catch of some rarely encountered species reduces this risk somewhat. The fact that overfished species are allocated to harvesters pro rata to their holding of whiting creates conditions that tend to foster the development of risk pools. A pro rata distribution means that harvesters receive a proportion of overfished species that is equivalent to their proportion of whiting, thus placing individual entities on a similar status, in terms of holdings of overfished species QSs. This tends to help foster and maintain risk pools as described in previous sections. Like Alternatives 2a through 2c, having three trawl sectors creates a single IFQ pool for shoreside whiting and nonwhiting harvesters and gives harvesters the flexibility to transfer quota as needed through the market. This allows harvesters to be relatively adaptable to changes in catch conditions from year to year.

Mothership trawl harvesters

In contrast to Alternative 3, collective risk (the risk of a race for fish because of bycatch) to harvesters in the mothership sector is minimal under this alternative because the allocation of bycatch species to co-ops insulates harvesters in separate co-ops from one another. The presence of the noncooperative fishery poses some risk to harvesters in the cooperatives because the noncooperative fishery is structured in a way that creates the incentives necessary for a race for fish to develop. However, because harvesters do not have to participate in the noncooperative fishery to switch motherships, the risk posed by this noncooperative fishery is minimized since participation in that fishery is expected to be lower than in an alternative where harvesters may more frequently participate in the noncooperative fishery. Theoretically, harvesters fishing under race-for-fish conditions are less likely to fish in a manner that effectively reduces bycatch, thus increasing the potential of a disaster tow occurring. However, the characteristics created by the noncooperative fishery resemble Alternative 1 conditions. Bycatch avoidance efforts routinely occur under Alternative 1 conditions, and, given that the noncooperative fishery will likely be a small portion of the entire sector, the risk of bycatch events under Alternative 4b is lower than under Alternative 1 where the entire sector can be described as a noncooperative fishery. Furthermore, the risk posed by the noncooperative fishery under Alternative 4b is lower than in Alternatives 3 and 4a because participation in the noncooperative fishery is expected to be lower than in those other alternatives. This is because harvesters are not required to fish in the noncooperative fishery to break a linkage with a mothership. Rather, harvesters can simply declare their intention to fish for a different mothership in a subsequent year without penalty if conditions become unfavorable. This will tend to reduce participation in the noncooperative fishery.

Individual risk to mothership harvesters (the risk to individuals posed by unexpected catch amounts of bycatch species) is lower in this alternative than in Alternatives 2a through 2c (IFQs) because of the lack of individual quota for bycatch species and the associated costs and/or penalties associated with deficit conditions associated with an IFQ program. However, there are some risks to individual harvesters-and harvesters associated with one another in a cooperative—through the bycatch limits that are set at the cooperative level. Bycatch limits established at this level reduce the spreading of individual risk that occurs if bycatch limits apply to the whole whiting sector and as a result impose more burden—and risk—to the individual harvesters in a cooperative. This risk is imposed on other

harvesters in that cooperative. If one harvester has a disaster tow of a bycatch species, the entire cooperative may be shut down, and other harvesters in that cooperative may have their fishing opportunity preempted by that event. Such an event can be avoided through the presence of inter-cooperative agreements to manage and share bycatch. This type of an agreement would tend to develop among cooperatives that find it mutually beneficial to do so. This agreement would spread the risk of unexpected catch events across more participants, thus reducing the likelihood that harvesters will have their opportunities preempted by the unexpected catch of another harvester because the larger collective bycatch limit established through the inter-cooperative agreement may be able to absorb such events. In addition, bycatch limits set at the cooperative level will most likely lead to the development of cooperative agreements that impose a high degree of individual accountability of bycatch on harvesters within that cooperative. This will likely occur because cooperatives will have to internalize the management of bycatch. The likelihood of one cooperative forming an inter-cooperative agreement with another cooperative may likely depend on the strength and success of the bycatch management plan contained in the individual cooperative agreements.

Table 4-41. Summary of the risk to profits posed by Alternative 4b.

Nonwhiting Catcher Vessels	Moderate risk to profits is posed by the presence of constraining species, but there is less risk than Alternatives 2a through 4a because rarely encountered species are not covered. The allocation of overfished stocks on a bycatch rate creates conditions that are conducive to the forming of risk pools. The existence of three trawl sectors minimizes risk associated with unexpected catch events because of a larger pool of available quota.
Shoreside Whiting Catcher Vessels	Moderate risk to profits is posed by the presence of constraining species, but less risk than Alternatives 2a through 4a because rarely encountered species are not covered. The pro rata allocation of overfished species is conducive to the formation of risk pools. The existence of three trawl sectors minimizes risk because of a larger pool of available quota.
Mothership Catcher Vessels	There is relatively low risk to individuals and relatively low collective risk (risk of a race for bycatch). Individual risk can be further minimized by allowing inter-cooperative agreements to develop to manage bycatch across co-ops.

Fishing vessel safety

Fishing vessel safety is expected to improve for all harvesters under this alternative. While Alternative 4b has a noncooperative portion of the fishery, this alternative differs because of the manner in which bycatch is managed, and because it is not necessary for harvesters to participate in the noncooperative fishery to switch motherships, thus reducing participation in the noncooperative fishery under this alternative. Under this alternative, higher profits would tend to lead to better maintenance, which would enhance harvester safety. Safety is also improved because of the flexibility in harvest timing that occurs as a result of rationalization and the fact that a successful rationalization program will eliminate the perceived need to fish during hazardous conditions. Those harvesters who participate in the noncooperative portion of the mothership fishery may not see as many safety improvements because of the Olympic conditions that exist in this portion of the fishery. Such conditions provide incentives to fish during times of unfavorable weather, eroding potential safety gains. However, assuming that the time spent in the noncooperative portion of the fishery is temporary and less frequent than in the other cooperative alternatives, harvesters in the mothership sector should see safety improve in general.

Table 4-42. Summary of the effect of Alternative 4b on safety.

Nonwhiting Catcher Vessels	Vessels in this sector of the fishery are expected to generate higher profits, which are expected to lead to improvements in the level and type of maintenance.
Shoreside Whiting Catcher Vessels	Vessels in this sector of the fishery are expected to generate higher profits, which are expected to lead to improvements in the level and type of maintenance. Rationalization expected to eliminate Olympic conditions, thus allowing harvesters flexibility and eliminating the incentive to fish in hazardous conditions.
Mothership Catcher Vessels	With the exception of those harvesters who spend time in the noncooperative portion of the fishery, harvesters should see safety conditions improve because of improved vessel maintenance and elimination of the incentive to fish in hazardous conditions.

4.6.3.8 Comparative Summary of the Effects of the Alternatives

Alternative 1	• Continuation of depressed status and overcapitalization of fleet. • Minimal individual and collective risks.
Alternative 2a	• Fleet consolidation accompanied with increased gross revenue per boat and decrease in harvesting cost. • Highest ex-vessel prices of any Alternative. • Higher individual risk, lower collective risk compared to Alternatives 1, 3, and 4a.
Alternative 2b	• Fleet consolidation accompanied with increased gross revenue per boat and decrease in harvesting cost. • Similar ex-vessel prices as Alternative 2a, perhaps somewhat lower. • Higher individual risk, lower collective risk compared to Alternatives 1, 3, and 4a.
Alternative 2c	• Fleet consolidation accompanied with increased gross revenue per boat and decrease in harvesting cost. • Lower ex-vessel prices than Alternatives 2a, 2b, and 4a in nonwhiting sector. • Higher individual risk, lower collective risk compared to Alternatives 1, 3, and 4a.
Alternative 3	• Fleet consolidation accompanied with increased gross revenue per boat and decrease in harvesting cost. • Similar ex-vessel prices in nonwhiting sector as Alternative 2c (relatively low). • Ex-vessel price negotiations in SS and MS whiting unclear. May lead to profit-sharing arrangements. • Individual risk high, collective risk low in nonwhiting (equal to Alternatives 2a through 2c). • Individual risk in SS and MS whiting lower than Alternatives 2a through 2c. Collective risk relatively high and similar to Alternative 1.
Alternative 4a	• Fleet consolidation accompanied with increased gross revenue per boat and decrease in harvesting cost. • Similar ex-vessel prices in nonwhiting sector as Alternative 2a (relatively high). • Lowest shoreside whiting ex-vessel prices of all alternatives over the long run. • Ex-vessel price negotiations in MS whiting unclear but may be higher than Alternative 3. May lead to profit-sharing arrangements. • Individual risk in SS whiting and nonwhiting high, but collective risk low. • Individual risk in MS whiting moderate. Lower than Alternatives 2a through 2c, but higher than others. Collective risk somewhat moderate.
Alternative 4b	• Fleet consolidation accompanied with increased gross revenue per boat and decrease in harvesting cost. • Similar ex-vessel prices in nonwhiting sector as Alternative 2a and 3.a. • Similar ex-vessel prices in SS whiting sector as Alternative 3. • Ex-vessel price negotiations in MS whiting similar to a case with no linkages and no mothership processor allocation of QS • Individual risk in SS whiting and nonwhiting somewhat less than other Alternatives but still higher than Alternative 1. Collective risk low. • Individual risk in MS whiting moderate, same as in Alternative 4a. Collective risk somewhat moderate.

4.6.4 Cumulative Effects on Limited Entry Trawl Harvesters

The effect of the alternatives on LE trawl harvesters is combined with past actions, current and future trends, and RFFAs to derive the cumulative effect. In some respects, the effect of rationalization on trawl harvesters can be viewed as a replacement to present conditions rather than an action that is additive to present conditions. Rationalization is intended to change the system in which the trawl fishery operates and allow outcomes to be based more on market forces and individual accountability than on command and control mechanisms. In other words, rationalization removes a structure that is responsible for much of the past and present trends, condition, and status of trawl harvesters and replaces it with another. Taken in the context of the additive model for assessing cumulative effects (described earlier in Chapter 4), imposing rationalization on the trawl sector is in some ways subtractive, while in other ways may be additive. In this additive model of cumulative effects, we identify factors that may be seen as beneficial or adverse to trawl harvesters and use this assessment to determine the overall, cumulative effect of the alternatives.

4.6.4.1 Overview of Past Actions and Trends Affecting Limited Entry Trawl Harvesters

Limited entry trawl harvesters have been subject to a wide array of past actions and trends that continue to play a role in their status. Many of these actions and their effects on trawl harvesters were discussed in Chapter 3; however, in order to aid in the analysis and understanding of cumulative effects, these actions and trends are summarized here.

Since the 1980s, trawl harvesters have been subject to increasingly stringent catch restrictions. These catch restrictions came about for several reasons including the need to rebuild depressed stocks and the SFA. In the early 2000s, MPAs were implemented (called trawl RCAs), which closed off wide areas of the ocean to bottom trawl vessels to protect depleted groundfish. On one hand, these closed areas allowed greater fishing opportunity in areas remaining open than would otherwise have been the case; on the other hand, vessels were forced into areas that were often not as productive. Trawl harvesters were required to carry and pay for VMS to verify compliance with the RCAs.

Revenues in the nonwhiting portion of the fishery have declined through time, leading to the depressed status of many trawl harvesters remaining in the fishery. In the late 1990s and early 2000s, nonwhiting trawl harvesters found it difficult to generate enough revenue to pay crew and many vessel owners crewed for other vessel owners and vice versa. In late 2003, a trawl vessel buyback occurred, and average revenues per vessel improved. However, recent cost earnings information from 2004 indicates that the average nonwhiting trawl vessel generates enough revenue to cover wages and expenses, but nothing more.

Over this same period, Pacific whiting emerged as a target species in the domestic fishery. This species historically had been targeted by foreign and joint venture operations, but was not targeted by domestic producers until product quality innovations were developed on the west coast that allowed domestic producers successfully to produce surimi from Pacific whiting. The Pacific whiting industry took a downturn in the early 2000s as the Pacific whiting stock was declared overfished and because of the scare over Mad Cow disease (Pacific whiting surimi producers used beef plasma in the production of surimi). These events led to a downturn in revenues attributed to harvest and a downturn in revenues as a result of depressed prices. Shortly thereafter, Pacific whiting was declared rebuilt. In addition, surimi producers substituted egg ingredients for beef plasma to produce surimi (avoiding issues associated with Mad Cow disease) and also began selling more head-and-gut and fillet products from Pacific whiting. These efforts increased the value of Pacific whiting. In recent years, the market for Pacific whiting (and many other whitefish species) improved, resulting in higher ex-vessel prices and causing increased

participation in the fishery. This led to the Council's action to implement Amendment 15, which limited access to specific sectors of the whiting fishery.

4.6.4.2 Trends and Actions Influencing Vessel Profits and Fleet Efficiency

The effect of rationalization (and the reasons for those effects) on vessel profits and fleet efficiency was described previously. Factors exogenous to rationalization are listed here. Several trends and actions not associated with rationalization are expected to continue, or be implemented in the future, and they are expected to have an effect on vessel profits and fleet efficiency. These include the following:

- Implementation of Amendment 21 (intersector allocation)
- Vessel monitoring systems
- Relatively high cost of inputs (such as fuel)
- Increased competition for ocean space (state MPAs, wave energy, offshore resource exploration and development)
- Increased global demand for protein
- Rebuilding of depleted groundfish stocks
- Consumer awareness and scrutiny of the fishing industry
- Ongoing harvest specifications process and OY setting
- Provisions in Amendment 20 (trawl rationalization) supplant Amendment 15
- Implementation of Amendment 10 (maximized retention for shoreside Pacific whiting)
- Climate change and the effect on species abundance and location
- The possibility that a stock is unexpectedly declared as "rebuilt" or "overfished"
- The development and implementation of CFAs

These considerations are combined with the effect of rationalization to derive the overall, or cumulative effect, of rationalization on vessel profits and fleet efficiency using the additive model for assessing cumulative effects described earlier in Chapter 4.

Rationalization of the west coast trawl fishery implies that Amendment 21 (intersector allocation) is implemented. Intersector allocations are a necessary component to rationalization because issuing QPs relies on there being a known quantity of fish to distribute across QS holders. Because Amendment 21 determines the amount of fish available to trawl harvesters, it has a direct effect on the amount of revenue that can be generated in the fishery. If allocations are relatively small, it is possible that overall revenue in the fishery could be lower than under Alternative 1. However, because rationalization allows fleet consolidation to occur, harvest capacity may still be more in line with available harvest, even if available harvest is lower than under Alternative 1 (status quo), and this is likely to result in increased levels of fleet efficiency. If the trawl sector allocation under Amendment 21 allows for harvest that is greater than under Alternative 1 conditions, then it is likely that catch, gross revenue, and fleet efficiency will be greater under a rationalized fishery than under the Alternative 1.

Rationalization of the LE trawl fishery is likely to require that LE trawl harvesters bear some additional costs in addition to those already being borne to meet various requirements. Because of the need to monitor compliance with closed areas (such as trawl RCAs and EFH closures) trawl vessels are required to carry and pay for VMS under the Alternative 1 regime, and it is expected that this will continue into the future independent of the decision to rationalize the fishery. Implementing a rationalization program is likely to mean that LE trawl harvesters will have to carry and pay for additional observation systems, which may come in the form of a human observer who monitors catch, or a camera that verifies whether discard has occurred on the vessel. These requirements will add to the cost of participating in the LE trawl fishery, and recent estimates have indicated the daily cost of carrying an observer may be

approximately $350 per day (this is a direct effect of the proposed action).[98] When combined with the cost of carrying VMS and other trends expected to exist in the future, the cost of participating in the trawl fishery is expected to be higher than in past years.

Trends expected to affect the cost of trawling (that are independent of rationalization) in the future include the expectation that resource inputs will remain high relative to prices seen throughout the 1980s, 1990s, and early 2000s. These include the expectation that steel, fuel, and many other inputs necessary to operate and maintain a trawl vessel will remain high in the future because of increased global demand for such inputs. Exogenous factors (such as higher fuel prices) may have an effect on the degree of fleet consolidation and the type of species harvested. Relatively high fuel costs should induce harvesters to spend more time prosecuting more valuable fish and/or species with a relatively high CPUE. The rationale for this effect is that harvesters must continue to generate positive revenues per hour of fishing. If the cost for an hour of fishing increases, harvesters may find it necessary to increase the revenues generated per hour of fishing. If fuel prices remain high, or increase, it is reasonable to expect harvesters to forego some harvests of less valuable species (such as arrowtooth flounder), or of species with relatively low CPUE (such as thornyheads) because the cost of harvesting those species may end up being greater than the revenue associated with harvesting them. As harvest of these lower revenue species is foregone, the amount of capital necessary to prosecute fishing activities will decline, leading to more fleet consolidation than would be expected with lower fuel costs.

Other factors expected to continue into the future, which influence the cost of fishing, include increased competition for space in ocean areas (because of wave energy projects, marine reserves, and offshore nonrenewable resource exploration and development). These types of projects will tend to decrease the amount of area to which trawl harvesters may have access, potentially affecting where harvesters can operate and making it more costly to fish. When combined with rationalization, the ability of harvesters to respond under rationalized fishery conditions will be easier than if Alternative 1 (status quo) management remains in place. The possible elimination of fishing grounds for another use will mean that harvesters must move to another area to fish. Under a rationalized condition, harvesters will be able to move or transfer harvest privileges to another harvester and in this way adapt to those conditions fairly readily while maintaining fishing activity. While harvesters have the opportunity to move and adapt under Alternative 1, much of the opportunity depends on regulations enacted by managers. Such a command and control approach can constrain the ability of harvesters to adapt in ways that may be more creative and favorable to their operations.

Rationalization has the effect of mitigating some of the expected increases in cost that may be exogenous factors as well as factors that are part of Council actions. Since rationalization allows vessels to time deliveries and fishing activity to take advantage of market conditions, rationalization has the effect of mitigating some of the cost burden by allowing opportunities to optimize revenues. Furthermore, because of the ability of the fleet to consolidate, many costs associated with fishing activities may be directly reduced by rationalization, especially fixed costs, thus mitigating cost increases expected elsewhere. When combined with higher gross revenues per vessel and other outside factors, the expectation is that net revenues should be higher for the average vessel under a rationalized fishery than under Alternative 1.

While various input costs (such as fuel) are generally expected to remain higher in the future compared to the average over the past several years, it is also expected that the value of fish products will escalate or remain relatively high on a global basis, and the supply of whitefish from sources such as the North

[98] As noted elsewhere, a cost estimate provided by the WCGOP just prior to release of the DEIS identified the daily observer cost as $500. Lian, et al. (2008) used the $350 figure in their study. Section 4.16 on page 574 includes additional discussion of cost estimates.

Atlantic will remain depressed. This increased demand is expected to result in higher prices for raw fish products, and this should offset the cost associated with relatively high fuel prices. However, the ability for harvesters to benefit from this expected increase is tied to harvester/processor negotiation power and the ability of harvesters to negotiate profits from processors. This concept is closely related to the decision over the amount of QSs that should be allocated to harvesters versus the amount of QSs allocated to processors. Those alternatives that allocate relatively more to permits (principally harvesters, recognizing that processors own some LE permits and may acquire more) will tend to allow harvesters to benefit from this demand compared to those alternatives where processors are allocated relatively more.

The implementation of individual accountability will tend to result in lower bycatch of rebuilding species, as described in earlier sections of Chapter 4. This bycatch reduction is expected to lead to higher catch of underutilized target species, which is expected to result in higher catch and gross revenue in the fishery. When combined with the expectation that depleted stocks will rebuild, it may be reasonable to expect that there are at least two factors leading to the potential for increased catch quantities in the future. Higher populations of rebuilding species may lead to greater catch of both rebuilding species and target species; however, this depends on the bycatch rate of rebuilding species as they rebuild relative to the OY of those species. If the bycatch rate increases at the same rate as the OY, then the rebuilding period is not likely to result in any increased fishing opportunity on target species constrained by rebuilding stocks. In fact, if the bycatch rate increases more quickly than the OY (which can happen for a variety of reasons, including the fact that stock assessments lag the conditions found in the present day by at least two years), rebuilding may actually lead to a larger constraint on fishing than experienced under present day conditions. This term is often called the "rebuilding paradox." However, it is reasonable to assume that after rebuilding stocks are declared rebuilt, greater fishing opportunity will exist. It may require that multiple stocks become rebuilt before fishing opportunity can be liberalized to any great degree (because several stocks may simultaneously constrain fishing opportunity), but rebuilding is eventually expected to result in greater opportunities for harvesters.

One trend that is likely to continue in the future is increasing scrutiny of the fishing industry by the public, particularly scrutiny of bottom trawl gears. Such increased scrutiny may not necessarily lead to formal regulation changes, but it may affect the marketability of bottom trawl-caught groundfish and groundfish caught with nontrawl gear. One possible outcome of increased scrutiny is a relatively higher price for nontrawl caught groundfish than trawl-caught groundfish. When combined with the effect of rationalization, the net result is likely to mean increasing numbers of trawl vessels switching over to a nontrawl gear. On one hand, the price received for nontrawl caught groundfish may be relatively higher, but on the other hand the amount of fish landed in the fishery may decline as nontrawl gears are generally not as effective at catching some types of groundfish as trawl gear. Therefore, the overall effect on revenues is somewhat unclear.

Amendment 10 is expected to be implemented in the near future, establishing a maximized retention program for the shoreside portion of the whiting fishery. This program allows vessels to store their catch without having to sort and discard such things as prohibited species. One benefit of this amendment is expected to be the counting of all catch made by shoreside whiting vessels. This counting mechanism is expected to facilitate the needs of a total catch rationalization program and/or the continuation of bycatch limit management in the whiting fishery. On one hand, the implementation of Amendment 10 is expected to mean a cost that whiting vessels must bear to comply with the necessary at-sea monitoring requirements (which may come in the form of a camera). On the other hand, this type of a system is expected to help facilitate implementation of a rationalized fishery and/or the continuation of bycatch limit management; both of which are a performance-based management tool and can be expected to lead to greater revenues in the fishery than a command and control management tool.

Amendment 10 is expected to have a net positive impact on shoreside whiting vessels compared to a case where the provisions of Amendment 10 are not implemented.

Amendment 15 established a sector-specific LE program in three sectors of the nontribal whiting fishery. The Council took action to implement Amendment 15 because of increasing participation in certain sectors of the whiting fishery, or the possibility of new entry that appeared to be developing in other sectors of the whiting fishery. As part of this action, the Council stated its intent that the provisions of Amendment 15 would sunset upon implementation of a rationalization program. This means that the effect of Amendment 15 is expected to continue into the future, but be replaced upon rationalization of the fishery. The effect of Amendment 15 is expected to be positive to trawl harvesters in the whiting fishery as it restricts new entry and, therefore, protects profits being generated in the fishery and limits further overcapitalization.

Several additional factors that are largely exogenous to the effect of rationalization, but which may influence profits and fleet efficiency, include the possibility of a stock becoming declared as overfished, the unexpected removal of a stock from overfished status, and the effect of climate change and variability on species abundance and location. While these factors are largely factors related to uncertainty, they are best examined in the cumulative effects section because they are not directly related to rationalization, but may affect the profits and fleet efficiency in a rationalized fishery.

If a stock becomes overfished, and a lower OY is implemented, harvesters are likely to see lower revenues due to a loss in harvest of that species, or because that species constrains access to other stocks, or both.[99] The inverse is true if a stock is taken off the overfished list. Whatever the mix of overfished species in the short to medium term, the characteristics of the trawl rationalization program, including individual accountability providing an incentive to lower bycatch rates and more comprehensive catch monitoring, will tend to improve fishery performance from an economic and conservation perspective, compared to Alternative 1 (status quo). In the long term, these characteristics are expected to support eventual rebuilding of currently overfished species and reduce the risk that other species will become overfished.

The effect of climate change and variability on fish abundance and location also influences profit and fleet efficiency. If conditions are such that groundfish migratory patterns differ substantially from one year to the next, the ability of harvesters to make informed decisions about fishing location and the species caught at those locations will become compromised. This can have the effect of increasing the amount of effort (and cost) harvesters must exert in performing fishing activities and result in lower revenues. However it is not known if these types of climactic events on fish resources will actually occur, so the effect of climate change and variability on trawl harvesters is not known.

The final factor considered here that is expected to affect revenues and fleet efficiency is the development and implementation of CFAs. While it is difficult to predict the effect CFAs will have since they have not yet been formally defined, some assumptions can be made regarding what they will be allowed to do and how they may operate.[100] The first assumption is that a CFA will be allowed to

[99] At their November 2009 meeting, just before the DEIS was released, the Council adopted new proxy biomass and harvest rate reference points recommended by their SSC for petrale sole and other west coast flatfish species as follows: 1) a biomass target (i.e., B_{MSY}) of 25 percent of virgin biomass (i.e., $B_{25\%}$); 2) a minimum stock size threshold (the overfished designation threshold) of half that amount or $B_{12.5\%}$ percent; and 3) a harvest rate predicted to achieve MSY (i.e., F_{MSY}) of $F_{30\%}$. Given this decision and the adopted current biomass estimate of petrale sole of 11.6 percent of unfished biomass, it is likely that the Secretary (per the MSA) will designate the petrale sole stock as overfished, which will require development of a rebuilding plan. Adoption of a rebuilding plan will occur as part of the 2011-2012 biennial specifications process during 2010.

[100] The Council has identified establishing a framework for CFAs as a trailing amendment action to be

hold quota in excess of accumulation limits. It is also assumed that the goals and objectives of the CFA will take into account the needs of the community, and these goals and objectives may be somewhat different from the goals and objectives of a QS holder or harvester. Since commercial harvesters engage in fishing activity as a source of income, it is not unreasonable to expect that one of the primary goals of a harvester is to maximize profitability from harvesting operations. A CFA may not have that same goal, or it may not rank that goal as highly as a harvester may. A CFA may be more interested in ensuring that the broader community benefits from fishing related activity. If this is the case, the CFA may create a structure that tends to affect the revenues generated by harvesters. However, the way in which harvester revenue is affected may benefit some harvesters. Those harvesters who are positively affected may be harvesters who did not receive an initial allocation of QSs and work through the CFA to find quota at less than market rates. Some harvesters may also benefit by working through the CFA organization and having the CFA organization interact with NMFS and the Council. Using the CFA organization may decrease the amount of time individual harvesters spend interacting with agencies, and this may result in some positive effects. In any case, the possibility of these latter activities occurring is conditional on the way in which CFAs organize and the way the Council outlines the manner in which CFAs can form.

implemented after the current target implementation date for the trawl rationalization program of January 1, 2011.

Table 4-43. Trends and factors affecting revenues and fleet efficiency.

Trends and factors affecting revenues and fleet efficiency		Score
Due to Rationalization	• Fleet consolidation	
	▪ Increased gross revenue per vessel	+
	▪ Reduction in fixed costs	+
	▪ Increased operational efficiency	+
	• Reduction in bycatch rate as a result of rationalization and subsequent increase in catch of underutilized species	+
	• Additional cost of 100 percent observer and/or camera monitoring	−
	• Intersector allocations of groundfish	Conditional
Exogenous to Rationalization	• Increased global demand for food products	+
	• Rebuilding of depleted groundfish species	+
	• Relatively high cost of inputs (fuel)	−
	• Possibility that a stock unexpectedly becomes overfished	−
	• Possibility that a stock unexpectedly becomes rebuilt	+
	• Ongoing harvest specifications process	Unknown
	• Amendment 10	+
	▪ Cost of at-sea monitoring	−
	▪ Performance based management	+
	• Amendment 15	+
	• Climate change	Unknown
	• Increased public scrutiny of fishing industry	Conditional
	• Continued requirement to carry VMS	−
	• Continuation of relatively high fuel costs	−
	• Competition for ocean space	−
	• Community Fishing Associations	Conditional

Note: scores are intended to reflect directional change. A positive score means that the effect is viewed as being beneficial, while a negative score indicates an adverse effect.

4.6.4.3 Trends and Actions Influencing Individual and Collective Risk

Several trends and actions are expected to continue, or be implemented in the future, which affect the amount of risk harvesters face. These include the following:

- The presence of trawl RCAs
- The rebuilding of depleted groundfish stocks
- Climate change and the effect on species abundance and location
- The possibility that a stock is unexpectedly declared as rebuilt or overfished
- The development and implementation of CFAs

As described in Section 4.6.2, rationalization has the effect of imposing risk on harvesters. Some risks can be described as a collective risk. in which a group of harvesters can be affected by the actions of another, while others can be described as individual risk, in which the aspect of individual accountability, combined with catch uncertainty, creates the potential for individual harvesters to have

an overage, which can be costly if the quota for that species is expensive or if the harvester faces an enforcement action. The level of individual and collective risk largely depends on several factors, including the degree of catch uncertainty relative to the OY of each species, the type of species covered with IFQ, and the level of bycatch management in a cooperative program.

When combined with other actions and trends, the risk faced by harvesters is not expected to be much different than the incremental effect associated with rationalization of the fishery. Several management tools used under the Alternative 1 (status quo) are expected to remain in place in a rationalized fishery, which have the effect of mitigating some risk, including the presence of trawl RCAs. These areas effectively close sites where depleted rockfish are found and may minimize the effect of a disaster tow that may occur in the nonwhiting portion of the fishery. However, the fact that depleted species are expected to rebuild and become more abundant may actually increase the risk that harvesters will encounter these species and, in this way, increases the amount of risk harvesters in the fishery face when prosecuting fishing activity if increased abundance increases the potential for disaster tows.

When combined with elements of the alternatives, those alternatives that allocate groundfish stocks on a more even basis, have lower accumulation limits, and do not have a grandfather clause are likely to mean the formation and sustaining of risk pools among harvesters is more likely. This will influence the ability of harvesters to deal with risk conditions on an individual and collective basis, as previously described.

Several additional factors that are largely exogenous to the effect of rationalization, but that may influence risk, include the possibility of a stock becoming declared as overfished, the removal of a stock from overfished status, and the effect of climate change on species abundance and location. These factors were discussed in the preceding section on vessel profits and fleet efficiency. While these factors largely relate to uncertainty, they are best examined in the cumulative effects section because they are not directly related to rationalization, but may affect the degree of risk harvesters face in a rationalized fishery. If a stock becomes overfished, and a lower OY (ACL) is implemented, additional risk can be imposed on harvesters if catch uncertainty is high relative to that OY. However, the level of risk faced by harvesters depends on the level of uncertainty relative to the OY level that may be specified by the Council, which cannot be predicted here. The inverse is true if a stock is taken off the overfished list. The effect of climate change on fish abundance and location also influences the degree of risk harvesters face. If conditions are such that groundfish migratory patterns differ substantially from one year to the next because of changes in climate and oceanographic conditions, the ability of harvesters to make informed decisions about fishing location and the species caught at those locations could become compromised. This could increase the uncertainty associated with harvesting and influence the degree of risk associated with fishing activity. However, it is not known whether climactic events will affect groundfish resources in this manner; therefore, the effect of climate change is largely unknown.

The final factor considered is the effect of CFAs on individual and collective risk. While it is somewhat difficult to identify the specific manner in which CFAs may impact risk (primarily because CFAs have not been specifically defined at this time), we assume that CFAs are allowed to hold quota in excess of limits and that they work in a collective fashion, similar to a harvest cooperative. Under this assumption, a CFA organization acts to pool the quota of overfished species and may foster high levels of collaboration, cooperation, and communication, similar to what was discussed in earlier sections describing collective management systems. This type of activity can be expected to result in some benefits that may help in weak stock management conditions and in a way that helps to alleviate risk of disaster tows—the cost of which may otherwise be borne entirely by an individual. Since the CFAs are allowed to hold quota in excess of accumulation limits, such benefits to risk (both individual and

collective) may spread throughout more harvesters in the fishery compared to a case where CFAs do not exist.

Table 4-44. Factors affecting the degree of individual and collective risk faced by harvesters.

Factors affecting the degree of individual and collective risk faced by harvesters		Individual Risk	Collective Risk
Due to Rationalization	• Coverage of Infrequently encountered species with IQ	−	Conditional
	• Individual accountability for total catch in an IFQ program	−	+
	• Collective accountability for bycatch in a cooperative program	+	−
Exogenous to Rationalization	• Trawl rockfish conservation areas	+	+
	• Rebuilding of depleted groundfish stocks	Unknown	Unknown
	• Climate change	Unknown	Unknown
	• Possibility that a stock unexpectedly becomes rebuilt	+	+
	• Possibility that a stock unexpectedly becomes overfished	−	−
	• Community Fishing Associations	+	+

Note: Scores are intended to reflect directional change. A positive score means that the effect is viewed as being beneficial, while a negative score indicates an adverse effect.

4.6.4.4 Trends and Actions Influencing Vessel Safety

Safety conditions are largely related to profitability of vessels, the subsequent ability to pay for and conduct maintenance and the ability of harvesters to avoid fishing in hazardous weather conditions. As a result, many aspects affecting safety are the same as those factors affecting vessel profits and fleet efficiency. Rather than repeating the factors that are expected to result in changes in vessel profits and fleet efficiency, the reader is referred to the subsequent section describing the effect on profits and fleet efficiency. Factors improving profits and fleet efficiency should be beneficial toward safety conditions, while those that may adversely affect profits and fleet efficiency should be adverse toward safety conditions.

Factors that may lead to fewer occurrences of vessels fishing in hazardous weather conditions are limited to those directly related to the effects of rationalization. Therefore, the cumulative effects are the same as the incremental effect of rationalization.

4.6.5 Summary of the Effects on Trawl Harvesters by Alternative

In this section, we itemize cumulative effects by alternative. As stated previously, each action alternative (Alternatives 2a through 4b) is a replacement for the existing fishery management framework and does not necessarily add to the effects of past and current conditions. Rather, the action alternatives replace the system responsible for the effects of past and current conditions. This perspective is important in understanding the cumulative effect of the alternatives.

4.6.5.1 Alternative 1 (No Action)

The cumulative effect of Alternative 1 on harvesters can be described as the continuation of existing conditions in the fishery. Under these existing conditions, many trawl harvesters have seen a deterioration of their economic status. This has been caused by regulations crafted in response to declining stocks and the imposition of things such as VMS, which have required trawl harvesters to pay additional costs. When taken in the context of events, trends, and actions that are expected to occur in

the future, many trawl harvesters will have difficulty sustaining their operations and a gradual decline in the status of the fishery is expected to continue. This may take several forms, including vessels dropping out of the fishery, vessels falling into various states of disrepair, and vessel owners and operators who face general financial difficulty because of the relatively small amounts of revenue being generated by fishing activity. The exception may be the Pacific whiting fishery, assuming the status of the Pacific whiting fishery improves in the future, and prices for whiting remain relatively high. In other words, maintaining Alternative 1 is likely to mean that the status of nonwhiting trawl harvesters along the west coast continue to decline, while the Pacific whiting trawl harvesters maintain their existing status.

4.6.5.2 Alternative 2a

Alternative 2a replaces much of the management structure responsible for the past and current conditions affecting trawl harvesters. Taken in the context of past and current conditions, Alternative 2a improves the economic status of trawl harvesters. As indicated in previous sections, nonwhiting trawl harvesters do not make economic profits under existing conditions (on average). This is due to a handful of different factors including a decline in populations of many groundfish stocks and a management system that makes it difficult for harvesters to respond to such declines while remaining profitable. Alternative 2a replaces the existing management structure with one that allows for more flexibility in harvesting activities (such as harvest timing and fleet consolidation) and, therefore, allows the harvesting sector to adapt to changing allowable catch levels while remaining profitable.

Alternative 2a differs from other alternatives when viewed at an individual harvester level. The conditions created by this alternative impose a substantial amount of individual accountability on trawl harvesters for a wide array of species—many of which are rarely encountered in the trawl fishery. This level of accountability results in a risk to individual harvesters because fishing is in some ways an inexact method of extracting resources, and there is a possibility that harvesters will encounter some of these rarely encountered species, even when trying to avoid them. In such an event, individual harvesters may face substantial costs to acquire quota sufficient to cover that catch event, or may face substantial costs as a result of an enforcement action for being in a catch deficit. So, while trawl harvesters on the whole may see their status improve under Alternative 2a, some individuals may be substantially worse off should they incidentally encounter certain species for which the quota supply is limited.

4.6.5.3 Alternatives 2b and 2c

Alternatives 2b and 2c are very similar to Alternative 2a. As with Alternative 2a, Alternatives 2b and 2c replace much of the management structure responsible for the past and current conditions affecting trawl harvesters. Taken in the context of past and current conditions, Alternative 2b improves the economic status of trawl harvesters. As indicated in previous sections, nonwhiting trawl harvesters do not make economic profits under existing conditions (on average). This is due to a handful of different factors, including a decline in populations of many groundfish stocks and a management system that makes it difficult for harvesters to respond to such declines while remaining profitable. Alternative 2a replaces the existing management structure with one that allows for more flexibility in harvesting activities (such as harvest timing and fleet consolidation) and, therefore, allows the harvesting sector to adapt to changing allowable catch levels while remaining profitable.

Alternatives 2b and 2c respond to the Council's request to consider two different tools for responding to processor concerns. One tool is to use AMQ to help processors adversely impacted by rationalization, while another tool is to make an initial allocation of QSs to processors. The effect these differences

have on harvesters can be described in several different parts. First, the amount of AMQ used to address processor concerns is smaller than the amount of quota contemplated for initial allocation to processors (10 percent for AMP versus 25 to 50 percent for processor initial allocation). As the alternative to these elements is an allocation to permits, the 10 percent quota for AMP has a lesser effect on the amount of quota initially allocated to permits than an initial allocation to processors, meaning harvesters will stand to receive more quota if an AMP is used than if there is a 25 or 50 percent initial allocation made to processors. Second, the way in which the quota is used to address processor concerns will differ, and by extension, the effect on harvesters will differ. Using AMP to respond to adversely impacted processors implies that some processors will be recipients, while others will not. This differs from an initial allocation made to processors where all processors with history stand to be recipients of that initial allocation. The difference here is regional. Those harvesters in areas where processors are recipients of either AMP quota or an initial allocation to processors could stand to be impacted differently if those harvesters can enter into agreements with processors to prosecute that AMP quota (Alternative 2b) or the processor held QSs (Alternative 2c). Over the longer term, these two options may begin to look very similar to Alternative 2a because the control limits allow entities to acquire relatively large amounts of QSs. If processors purchase quota up to the control limit, over time, each Alternative 2 may begin to look the same, and this is likely to come in the form of similar regional impacts and similar impacts on ex-vessel prices.

When viewed in the context of other past, present, and future conditions/actions the impact of Alternatives 2b and 2c is the same as Alternative 2a, except with regard to harvester and processor relations in the short term. Over the long run, Alternative 2b and 2c will look similar to 2a. Furthermore, like Alternative 2a, Alternatives 2b and 2c provide harvesters with tools that will allow the fishery to restructure according to prevailing conditions. As stocks rebuild and the allowable harvest of groundfish species changes with each biennial harvest specifications process, the fishery can reorganize to capitalize on the opportunities provided by those different allowable harvest levels.

In addition to capitalizing on profit opportunities, Alternatives 2b and 2c may impact some harvesters at the individual level to a large degree, as in Alternative 2a. The risks posed by holding individual harvesters accountable for rarely encountered species means that, should a harvester incidentally encounter one of the infrequently encountered stocks, the cost burden to that individual could be substantial and may come in the form of high costs to purchase quota to cover that event, or costs in the form of an enforcement action if that individual is not able to find or purchase quota.

4.6.5.4 Alternative 3

Alternative 3 replaces much of the management system responsible for the current status of trawl harvesters. As stated in earlier portions of the analysis, many trawl harvesters have seen catches decline over the past several years in response to declining groundfish populations and the need to rebuild depleted stocks. However, in more recent years, the Pacific whiting fishery has grown in importance, and prices for that species have recently increased following a low in the early 2000s.

Alternative 3 implements a rationalization program that will allow harvesters in all portions of the trawl fishery to be more flexible with harvest timing and capital use, and this, in turn, will allow trawl harvesters to be more economically efficient than in current conditions. However, this flexibility in the whiting fisheries is dampened and possibly eliminated through the implementation of a set of common (whiting sector) bycatch limits. This common limit creates incentives that may lead to a race for fish via a race for bycatch species. This means that, even if a rationalization program is put in place for the whiting fishery, the outcome may be one resembling status quo conditions. Taken in the context of past, present, and future actions/conditions, this alternative may be similar to Alternative 1 (No Action).

In the nonwhiting portion of the fishery, the outcome is expected to be different. Mechanisms in the nonwhiting fishery appear to create a system without race-for-fish incentives, and, as a result, profits are generally expected to improve. Taken in the context of past, present, and future actions/conditions, Alternative 3 replaces the system responsible for the past and current conditions with a system that allows the nonwhiting sector to restructure into a more profitable fishery. The flexibility afforded to harvesters in this system allows for greater adaptability to changes occurring in the future through such events as changing OYs (ACLs) and the removal of species from the overfished list. However, at an individual level, the risks posed to nonwhiting harvesters are much greater than under current conditions. This is partially the result of imposing individual accountability (which also creates added flexibility and adaptability) but is also the result of holding individual nonwhiting harvesters responsible for infrequently encountered species and the fact that covering catch events of these species with quota could prove quite costly. Taken in the context of past, present, and future actions/conditions, this risk may create conditions where some harvesters are unable to participate in the fishery under this alternative, while they are able to participate under current conditions.

4.6.5.5 Alternative 4a

Alternative 4a is similar to other action alternatives in that it replaces much of the management system responsible for the current status of trawl harvesters. As stated in earlier portions of the analysis, many trawl harvesters have seen catches decline over the past several years in response to declining groundfish populations and the need to rebuild depleted stocks. However, in more recent years, the Pacific whiting fishery has grown in importance, and prices for that species have recently increased following a low in the early 2000s.

Alternative 4a allocates much of the shoreside quota to processors. When nonwhiting volumes under status quo conditions are compared to the amount allocated to processors under this alternative, the amount for some species is substantial. In some cases, the amount allocated to processors exceeds status quo catch levels for underutilized species. In cases where harvesters rely on such species, this outcome will tend to be adverse. In cases where harvesters do not rely on such species, the outcome may not be adverse, or may not be adverse to the same degree. Taken in the context of past, present, and future conditions/actions Alternative 4a has a mixed effect. The change imposed on the fishery is relatively substantial, allowing the fleet to restructure and improve efficiency, but some nonwhiting harvesters can be expected to be made worse off under this alternative, while others may be made better off.

In the case of whiting harvesters, the incremental effect of Alternative 4a is substantial, where the mothership and shoreside whiting fleets are able to restructure and capitalize on potential cost efficiencies and other revenue opportunities. The incentives created through this alternative do not result in an incentive to race for fish via a race for bycatch as in other alternatives. For these reasons, the harvesters in the shoreside and mothership whiting fisheries are expected to operate in a system that allows for added flexibility and adaptability under this alternative. Taken in the context of past, present, and future conditions/actions, this alternative is expected to result in an improvement in the status and efficiency of whiting harvesters compared to status quo conditions.

4.6.5.6 Alternative 4b (Council Preferred)

Similar to the other action alternatives, Alternative 4b replaces the existing management structure responsible for much of the past and current condition of the fishery with another management structure. Harvesters who focus on nonwhiting species see improvements in flexibility and conditions that allow for potential cost efficiencies and other sources of revenue to be realized. The amount of nonwhiting

quota allocated to processors under this alternative is zero, creating a noticeably different effect on nonwhiting harvesters compared to Alternative 4a. In comparison to Alternative 4a, harvesters focusing on some underutilized species are not made worse off by this alternative. Harvesters focusing on shoreside and mothership whiting fisheries also see enhanced flexibility and opportunities to realize potential cost efficiencies and other sources of revenue. Unlike some of the other action alternatives, the way in which bycatch, or nontarget species, are managed under this alternative does not create incentives for a race for fish among whiting harvesters via a race for bycatch.

Risks faced by harvesters in this alternative are reduced compared to some of the action alternatives due to a more refined set of species being covered with IFQ, or catch history as is the case with cooperatives. Removing some infrequently encountered species from the list of species that would be covered with these catch control tools reduces the risk that harvesters face from inadvertent catch events of these species that may be costly to cover with quota.

Taking into account past, present, and future actions/conditions, this alternative allows harvesters in all three non catcher-processor sectors to improve their economic status and to be more flexible and adaptable to conditions that may change in the fishery into the future.

4.7 Captain and Crew

In this section, we describe the impacts of rationalization on captain and crew employed on LE trawl groundfish vessels. This group consists of individuals who do not own groundfish trawl catcher vessels and who do not own LE trawl permits. In many cases, a vessel captain is also the owner of that vessel and the owner of a permit. These individuals are discussed in Section 4.6 above, describing impacts to harvesters. Under the alternatives being considered, captain and crew who do not receive an initial allocation of quota or catch history can purchase quota or catch history. While new entrants or second-generation fishermen may comprise individuals who are not necessarily captain and crew, new entrants and second-generation fishermen are covered under this section because a review of available literature indicates that most new entrants into fisheries began their careers as crewmembers.

We begin the section by providing a description of methods used to assess effects on captain and crew and the metrics used to illustrate those effects. Following the description of methodology, we discuss the effects of rationalization on captain and crew. Unlike the sections describing impacts to harvesters and processors, this section compares the general effects of trawl rationalization to Alternative 1; it does not include the effect of each alternative on captain and crew (page 392). This is because variations in the alternatives do not appear to noticeably change the impact to captain and crew. Specific elements may have an effect, in which case they are identified and assessed, but overall variations in the alternatives do not appear to noticeably change the outcome.

Finally, we assess cumulative effects. This cumulative effects section briefly summarizes the past and present actions with ongoing effects on captain and crew,, and the RFFAs that are expected to have effects. The effect of these past, present, and RFFAs are combined with the effect of the alternatives to arrive at the cumulative effect.

4.7.1 Methods for Assessing Impacts

In this section, we describe the methodology for assessing the impacts of rationalization on captain and crew. This section summarizes the potential impacts, the reasons why those impacts occur (the mechanisms), and the way in which those impacts are analyzed and modeled (the metrics). Table 4-45 provides an overview of the approach used to estimate the impacts of rationalization on captain and

crew. The analytical approach includes 1) potential impacts, 2) mechanisms that relate the proposed action to the potential impacts, 3) measurement criteria or indicators used in assessing each type of impact, and 4) models and data sets used in the analysis. This table shows that the expected impacts to captain and crew are changes in captain and crewmember compensation system, changes in the number of captain and crew jobs, changes in the hours worked, changes in the average income received by captain and crew members, and changes in safety conditions for captain and crew. The mechanisms that are driving changes to the number of captain and crew jobs include fleet consolidation and vessel crew size. Changes in the compensation system are driven by changes in the relationships between captain and crew and vessel/permit/quota owners. Changes in the number of hours worked are driven by fleet consolidation and the corresponding change in fishing effort exerted by each vessel. Changes in average income per captain and crewmember are driven by changes in revenue per boat and in the compensation system. Changes in the skill set required of captain and crew are largely driven by opportunities for gear switching. Changes in safety are driven by fleet size, vessel operational flexibility, and financial ability to invest in equipment and conduct vessel maintenance. Each of these mechanisms, which are drivers for the potential impacts, are measured through listed criteria (third column) that are estimated through the methods described in the final column.

Table 4-45. Overview of impacts, mechanisms, and metrics used to compare the effect of the Alternative 1 and the alternatives on trawl catcher vessels.

Potential Impacts	Reasons or Mechanisms for Impacts	Metrics or Indicators for Informing Impact Mechanisms	Data, Models, and Methods used for Assessing Impacts
Changes in number of captain and crew jobs	Fleet consolidation and number of captain and crew per vessel	Number of vessels and crew per vessel	Fleet consolidation analysis, literature review, discussions with key informants
Changes in shares paid to captain and crew	Changes in the relationships between captain and crew and vessel/permit owners	Captain and crew share	Literature review
Changes in number of hours worked	Fleet consolidation and changes in effort per vessel	Number of vessels and catch/effort per vessel	Fleet consolidation analysis, change in target species catch analysis, and literature review
Changes in average income per captain and crew member	Changes in revenue per boat. Changes in captain and crew shares	Average catch per boat and shares paid to captain and crew	Fleet consolidation analysis and literature review
Changes in the skill-set required	Gear switching	Potential for gear switching to occur	Qualitative assessment and literature review
Ability to become new owners of quota	Changes in the cost of purchasing entry to the fishery	Cost of purchasing quota	Fleet consolidation model, literature review, and qualitative assessment
Changes to safety	Fleet size; vessel operational flexibility; and financial ability to invest in vessel maintenance and safety equipment	Occurrence of safety-related incidents	Qualitative assessment based on literature and expertise of analysts

4.7.2 Direct and Indirect Effects of the Alternatives on Captain and Crew

Rationalization is expected to impact captain and crew in a variety of ways. Captain and crewmembers are primarily affected indirectly through fleet consolidation, changes in the relationships between captain and crew and vessel/permit/quota owners, and changes in the status and profitability of trawl vessels.

Studies of existing IFQ programs have documented changing relationships between crew and captains and vessel/permit owners due to rationalization. For example, in some fisheries the shift to IFQs altered the compensation system from a share of profits system to a wage system. (Macinko 1997) discusses impacts on crew who were affected by rationalization when they were not allocated quota. In this study, which was conducted during the first year after implementation of the Alaska halibut/sablefish IFQ program, he noted that some crew benefit, and others do not. Those who benefit worked for entities who benefited from the system as a whole, while those who did not benefit worked for vessels that left the fishery due to rationalization. However, (Macinko 1997) notes that although some crew had lower crew shares, they still earned more under the IFQ program.

Another example is from the B.C. trawl fishery. In this fishery, the overall share paid to crew is estimated to have declined by 5 percent (from 40 to 35 percent) per vessel, while the overall wages paid to crewmembers is estimated to have increased by 137 percent, primarily because of increases in revenue per vessel (GSGislason & Associates Ltd.. 2008).

Wilen and Casey (1997) discuss other potential impacts on crewmembers. Consolidation of activities and elimination of vessels and crew will occur as the fishery restructures. Second, on remaining vessels, inputs, such as the need for crew labor, will be reconfigured, reflecting changes in fishing processes. Wilen and Casey write that (particularly in comparison to a derby fishery), demand for crew labor will likely fall at first. However, they note that as the fishery restructures, there may be new needs for labor not present before rationalization. They note that in virtually all IFQ fisheries, raw product quality became more important than it was prior to rationalization, leading to new skill requirements for handling and partial processing. Switching to new gear types (such as longlining instead of trawling) may also impact the need for crew labor.

4.7.2.1 Captain and Crew in the Nonwhiting Trawl Fishery

Fleet consolidation, in general, means that fewer captain and crewmember jobs will be necessary. Based on the fleet consolidation analysis, there may be 40 to 60 nonwhiting trawl vessels after the fleet is rationalized compared to current Alternative 1 with 100 to 120 vessels. According to industry representatives, the number of crewmembers currently on west coast nonwhiting trawl vessels is approximately two crew with one captain. Historically, the larger vessels had up to three or four crew (P. Leipzig, pers. comm., Executive Director, Fishermen's Marketing Association. May 2008). The following table outlines an order of magnitude estimate of number of crew under a rationalized fishery compared to Alternative 1 based on this information.

Table 4-46. Order of magnitude estimates of the number of captain and crew jobs in the nonwhiting trawl fishery.

	Number of Vessels	Approximate Number of Captain and Crew
Alternative 1 (No Action)	100 - 120	300-360
Rationalized Nonwhiting Fleet (low fleet size)	~40	~120
Rationalized Nonwhiting Fleet (high fleet size)	~60	~180

Based on the analysis in Appendix C, which illustrates how target species catch could be expected to increase as a result of bycatch avoidance, overall revenues in the fleet may increase by approximately 40 to 65 percent, and average catch per boat is expected to nearly triple as a result of fleet consolidation. This information suggests that any decrease in shares paid to crewmembers may be substantially outweighed by increases in revenue and catch per vessel as a result of rationalization. Increases in crew wages will likely be complimented by an increase in working hours. This increase in working hours is likely to mean that hired captain and crewmember jobs may become fulltime occupations.

Based on information from industry representatives, the type of crew compensation system varies somewhat across vessels. Many vessels compensate crew after calculating an adjusted gross revenue value that takes into account the cost of fees (to the OTC and FMA), the cost of fuel, and cost of groceries. The share paid to crew can vary from 8 percent of adjusted gross to 12 percent of adjusted gross, with exceptional crew fetching up to 15 percent of adjusted gross. Hired captains are also paid according to the adjusted gross revenue scale, but fetch higher shares. Captains may receive 17 to 25 percent (P. Leipzig, pers. comm. Executive Director, Fishermen's Marketing Association, May 2008). The following table illustrates information received from industry representatives that can be used to generate order of magnitude estimates regarding crew wages under Alternative 1 conditions and under rationalized fishery conditions. This information shows that the cost of fuel under current conditions may range from 30 to 40 percent of gross, the cost of FMA fees is 1.3 percent of gross, and the cost of OTC fees is 0.5 percent of gross, meaning adjusted gross revenues may be 68.2 to 58.2 percent of actual gross (before subtracting groceries, for which no information was readily available). Crew shares range from 8 to 15 percent of adjusted gross, and hired captain shares may range from 17 to 25 percent of gross.

Table 4-47. Select itemized costs incurred by trawl vessel owners.

	Low	High
Fuel	30%	40%
FMA	1.30%	1.30%
OTC	0.50%	0.50%
100% minus subtotal	68.2%	58.2%
Crew	8%	15%
Captain	17%	25%

Source: P. Leipzig, pers. comm., Executive Director, Fishermen's Marketing Association, 2008.

By assuming two crewmembers and one captain, the information shown above indicates the total share of unadjusted gross revenue received by captain and crew may range from approximately 20 percent to almost 40 percent. Captain and crew may receive 20 percent of unadjusted gross if the vessel incurs high fuel costs, but pays relatively low shares. Captain and crew may receive nearly 40 percent of gross if the vessel incurs low fuel costs, but pays relatively high shares.

Under rationalized fishery conditions, the shares paid to captain and crew may decline. Assuming total crew compensation declines by 5 percent under rationalized fishery conditions, we can illustrate changes in the overall compensation to captain and crew. This reduction is based on estimates from British Columbia, which illustrate a 5 percent aggregate reduction in crew wages. Table 4-48 shows the average revenue per boat based on the fleet consolidation model described in Appendix C. This analysis shows the effect of a rationalized fishery with no change in landings and a rationalized fishery with an optimistic change in the bycatch rate leading to increases in the catch of currently underutilized

target species (described in more detail in Appendix C). Results indicate that crew wages should more than double, even though the actual share may decline.

Table 4-48. Estimated compensation to hired captain and crew in the nonwhiting trawl fishery.

State	Avg Gross Rev/Boat	Total Captain and Crew Share (sum of all captain and crew per vessel)	Total Captain and Crew Wages (sum of all captain and crew per vessel)
Alternative 1	$196,500	20% to 40%	$39,300 to $78,600
Rationalized Fishery (no reduction in bycatch rate)	$575,000	15% to 35%	$86,250 to $201,250
Rationalized Fishery (high reduction in bycatch rate)	$670,000	15% to 35%	$100,500 to $234,500

4.7.2.2 Captain and Crew in the Shoreside and Mothership Whiting Fishery

Crew size in the whiting fishery is likely to follow a similar pattern. Although fleet consolidation in the whiting fishery is not expected to occur to the same degree, some consolidation is expected. Based on the analysis of whiting fishery fleet consolidation in Section 4.6 above, describing impacts to harvesters, the number of shoreside whiting vessels may decrease from approximately 37 vessels to approximately 23 vessels, while the number of mothership catcher vessels may decline from 20 to approximately 14 vessels. This means that the number of captain and crew jobs may decline from approximately 111 to 69 in the shoreside whiting fishery and from 60 to 42 in the mothership sector (see Table 4-49). The following table shows the approximate number of crew under the Alternative 1 fishery size and compares that to the number of crew in a rationalized fishery. These figures assume the Pacific whiting OY is similar to 2006 and 2007 levels.

Table 4-49. Order of magnitude estimates of the number of captain and crew jobs in the shoreside and mothership whiting trawl fishery.

Sector	Approximate Number of Captain and Crew under Alternative 1	Approximate Number of Captain and Crew under a Rationalized Fishery
Shoreside Whiting	111	69
Mothership Whiting	60	42

The amount of ex-vessel revenue attributed to the average vessel in both the mothership and shoreside sectors is expected to increase due to fleet consolidation. Using 2007 ex-vessel price as an indicator, the average shoreside whiting vessel may generate slightly more than $430,000 per year. After fleet consolidation takes place, the average vessel may generate approximately $700,000. These figures assume whiting OYs (ACLs) that are similar to those set in 2007. These will undoubtedly vary, making the revenue per vessel estimates vary in concert. In the mothership sector, a similar pattern may hold. Under Alternative 1 conditions the average vessel may generate over $460,000, while under a rationalized fishery with fleet consolidation, the average vessel may generate over $650,000. Such changes for revenue generated by each vessel should change the compensation paid to hired captain and crewmembers. Assuming the adjusted gross revenue and crew share structure described in the nonwhiting fishery is similar to the whiting fishery, then crew wages in the shoreside sector may increase by over 60 percent even though the actual share declines (see Table 4-50). Crew wages in the mothership sector may increase by over 40 percent.

Table 4-50. Estimated compensation to hired captain and crew in the shoreside and mothership whiting trawl fishery.

Sector	Alternative 1 Captain and Crew Wages	Rationalized Fishery Captain and Crew Wages
Shoreside Whiting	$69,000-$161,000	$97,500-$227,500
Mothership Whiting	$64,500-$150,000	$105,000-$245,000

4.7.2.3 Ability to Become New Owners of Quota

Hired captain and crewmembers are likely to be the main source of new fishery entrants. New entry in this case is defined as those who were not initial recipients of quota, but subsequently obtain quota.[101] These individuals may purchase quota, but continue to be hired captain and crewmembers and fish their quota on the same vessel, or they may elect to purchase quota and a vessel and fish their quota independently.

Entering the fishery may very well prove to be more costly under a rationalized program than under Alternative 1. In addition, entering into a fishery rationalized through a cooperative system may prove to be more difficult than entering into a fishery rationalized through a IFQ system. Entering a cooperative-based fishery may be more difficult because catch history in a cooperative system is not divisible, meaning the cost of entry is likely to be large. Since IFQ is finely divisible, one can buy a small amount of quota, representing a smaller outlay than buying a large quantity of catch history. In addition, one can increase shareholdings by purchasing small quantities of QS over time.

The cost of purchasing quota is largely determined by the revenue above cost that is attributed to harvesting. Based on the fleet consolidation and cost efficiency model, the amount of revenue generated above costs may average $0.43 per pound for DTS species, and $0.26 per pound for non-DTS species. These estimates reflect the cost of leasing QPs for a single year. Purchasing QS represents a longer-term investment, but the cost is a function of the annual lease price. The price of QS is theoretically equal to the discounted value of the annual lease price. While quota owners' discount rates in this case are not known, the per-pound value of QS can be calculated with an assumed discount rate. If we assume a 20 percent discount rate (which is a value that falls within the range suggested by available literature) and estimate the current value of a perpetual series, then the value of DTS QS on a per pound equivalent may be $2.15, while the value of non DTS QS on a per pound equivalent may be $1.30. Put in other terms, the cost of purchasing DTS QS that is equal to 100,000 lb may be $215,000, while the cost of purchasing non DTS QS that is equal to 100,000 lb may be $130,000. However, these values are sensitive to the personal discount rate exhibited by quota owners, which is not known (see Appendix E for additional discussion of personal discount rates and their effects on the distribution of QS). Whatever the discount rate may be, this information shows that entering into the fishery by purchasing QS may prove costly. If a loan is taken out to pay for purchased QS, then it will take several years to pay off that loan.

In addition to the description above regarding discount rates, published research has demonstrated that other factors influence the cost of acquiring QSs. Those entities w are initial recipients of QSs are in a position of bidding relatively high prices for those QSs or QPs because they have covered costs and generated revenue on their gifted QsS and can afford to make relatively small margins on additional purchases or leases (see Pinkerton and Edwards 2009). This tends to drive up the cost of QSs and QPs, making it difficult for a potential new entrant to buy into the fishery. This is because that new entrant

[101] QS could be purchased, received as compensation for services or as a gift, or inheritance. For the purposes of the discussion here it is assumed the purchases will be the most likely way quota will be obtained.

would need to cover costs and generate revenue from those QSs and QPs that have been bid up to relatively high levels by the initial recipients of QSs who can afford to make small margins on those purchases. The AMP can alleviate the hurdle that new entrants must overcome to become owners of QSs. If adaptive management QPs are granted to new entrants for a sufficient period at a cost that is low, those new entrants can generate revenues off those AMP QPs and use those revenues to purchase QSs. In other words, the AMP QPs can be used to bridge the gap between those entities who are initial recipients of QSs, and those entities who are not initial recipients of QSs, but want to become holders of QSs.

4.7.2.4 Captain and Crew Safety

Captain and crew safety is likely to change because of rationalization. Captain and crew conditions are a function of vessel safety, as described in Section 4.6 above. As described in that section, rationalization is expected to improve vessel maintenance because of increased profitability. Such improvements in maintenance should be expected to improve conditions for captain and crew by reducing the probability of such things as equipment failure. In addition, implementing a rationalization program in the whiting fishery is expected to reduce the Olympic conditions in this fishery and should lead to less time spent fishing during hazardous weather conditions.

4.7.2.5 Effects on Captain and Crew by Alternative

The information presented in the above sections applies generally to describe the ways in which captain and crew will be impacted by rationalization of the west coast trawl fishery. However, some slight differences exist in the manner in which captain and crew are impacted depending on the alternative chosen. Some criteria used to estimate impacts do not appear to vary by alternative. These include the number of captain and crew jobs, changes in hours worked, changes in skill-set required, and changes in safety. This is because these criteria affect crew indirectly through direct impacts on trawl harvesters. Captain and crew jobs are tied to the number of vessels in the fishery, and, based on the analysis of trawl harvesters, each alternative should result in the same number of vessels. Changes in hours worked is an indirect effect resulting from the number of hours a trawl vessel spends fishing. This also does not appear to vary by alternative because there are no elements restricting catch or hours at sea. Likewise, changes in skill-set required and changes in safety do not appear to be impacted by alternative, as no element influences variations in these criteria. Those criteria that do appear to vary by alternative include the wages made by crewmembers (and the risk of crewmembers making expected wages) and the ability to become new owners of quota. These are outlined in the following subsections. The analysis above presents information documenting Alternative 1, so the effect of Alternative 1 is not repeated here.

4.7.2.5.1 Alternative 2a

Alternative 2a results in relatively high wages paid to crewmembers compared to the other action alternatives. This is an indirect result of higher prices paid to trawl harvesters under this alternative because of the amount of quota allocated to permit holders. Some of these relatively high wages are put at risk because of the species covered with IFQ in the program, also an indirect effect from risks imposed on harvesters. If a harvesting vessel incurs high costs or has to stop fishing, that would indirectly affect opportunities for captain and crew. Captain and crew face a relatively difficult time in becoming new owners of quota due to the lack of an AMP that could be used to allocate temporary QPs to captain and crew who want to become new owners of quota. Such a temporary allocation would enable captain and crew to make money from the AMP quota and save funds for purchasing QSs.

Purchasing those shares outright could prove quite difficult, as outlined in Pinkerton and Edwards, 2009.

4.7.2.5.2 Alternative 2b

Alternative 2b results in similar impacts as Alternative 2a. The place where Alternative 2b differs is in the presence of an adaptive management provision to help adversely impacted processors. If such a provision results in slightly lower ex-vessel prices paid to harvesters, then the wages captain and crewmembers receive from fishing will, in turn, be slightly lower compared to Alternative 2a.

4.7.2.5.3 Alternative 2c

Alternative 2c is similar to Alternatives 2a and 2b. However, because there is an initial allocation of QSs made to processors (25 percent for nonwhiting and 50 percent for shoreside and mothership whiting), the ex-vessel price paid to harvesters is likely to be smaller than under Alternatives 2a and 2b. This, in turn, should reduce captain and crew wages compared to Alternatives 2a and 2b.

4.7.2.5.4 Alternative 3

Alternative 3 results in lower wages to captain and crew in the nonwhiting fishery compared to other action alternatives due to lower ex-vessel prices paid to harvesters. In the shoreside and mothership whiting fishery, the outcome is not as clear due to difficulties in comparing the effect of a processor linkage with an initial allocation of IFQ to processors. The same risks to captain and crew that exist in Alternatives 2a, 2b, and 2c due to risks imposed on harvesters from rarely encountered species exist in Alternative 3 for captain and crew in the nonwhiting fishery. These risks do not exist in the shoreside and mothership portions of the whiting fishery because certain species are removed from the program. The presence of an ADP can help captain and crew in all sectors of the fishery become new entrants/second generation QS holders.

4.7.2.5.5 Alternative 4a

Alternative 4a results in relatively low wages for captain and crew in the shoreside whiting fishery due to low prices for shoreside whiting harvesters. This stems from the amount of QSs allocated to shoreside whiting processors under this alternative. Captain and crew in the nonwhiting portion of the fishery see relatively high wages in the fishery, as do captain and crew in the mothership sector. These wages are put at risk somewhat in the shoreside sectors because of the requirement that vessels be accountable for a large number of species, some of which are rarely encountered, yet may be costly to cover with quota and may result in some lost fishing opportunity. This risk does not exist to the same degree for captain and crew in the mothership sector.

4.7.2.5.6 Alternative 4b

Alternative 4b results in relatively high wages in the nonwhiting sector due to the relatively high ex-vessel prices expected for this alternative. Wages for shoreside whiting captain and crew are expected to be relatively moderate, with wages being higher than alternatives with a 25 percent or 50 percent allocation to processors, but with wages being lower than alternatives with no allocation to processors, or a 10 percent reserve for adaptive management for processors. Wages in the mothership sector are also somewhat moderate compared to the other alternatives as the declaration provision is likely to result in more favorable price negotiation conditions for harvesters than an alternative with a full processor linkage. The risk to those wages is lower in this alternative than in nearly all other

alternatives except for status quo, because several infrequently encountered species are removed from the program.

4.7.3 Cumulative Effects on Captain and Crew

Captain and crew are affected in several ways including fleet consolidation, vessel profits, and safety conditions on board vessels. These factors influence the number of captain and crew jobs, the wages made at those jobs, and the safety conditions associated with captain and crew employment. As such, the cumulative effect of rationalization on captain and crew includes the effects of rationalization itself, past and present trends, and RFFAs that influence fleet consolidation, vessel profits, and safety conditions. In addition to rationalization, the factors expected to influence these effects include the following:

- Increased demand for protein
- Change in production costs associated with trawl activities
- Ongoing harvest specifications
- Increasing public scrutiny of fishing, especially the bottom trawl gear type
- Climate change and variability
- Overfished species rebuilding
- Competing use of ocean areas

As described above, rationalization is expected to result in fleet consolidation in the nonwhiting, shoreside whiting, and mothership sectors of fishery. This, in turn, is expected to result in fewer jobs for captain and crew, but for those jobs that remain, wages are expected to be higher. Furthermore, as a result of increased revenues, safety on-board vessels is expected to improve because of greater funds available to perform onboard maintenance of vessels. Safety is also expected to be affected by rationalization because the incentive to race for fish is expected to be eliminated, reducing the frequency of vessels fishing in hazardous conditions.

Ongoing trends and future actions are also expected to influence revenues (and by extension, captain and crew wages) and vessel safety conditions. A relatively high demand for protein on a global basis should generally lead to higher prices for fish products and a higher ex-vessel price received at the dock. However, increasing demand for resources on a global scale in general is also likely to lead to a higher cost of inputs at the vessel level, thus increasing the cost of engaging in fishing activity and putting downward pressure on captain and crew wages. The net effect of increasing protein demand and prices for production inputs is not immediately clear. However, rationalization will have the effect of allowing fleet capital to respond to market conditions. Therefore, it is reasonable to expect that captain and crew wages will be no worse than under Alternative 1 conditions if the fishery is rationalized and will most likely be improve under rationalized conditions since the fleet will be able to consolidate to appropriate market conditions.

Harvest specifications for groundfish are set on a two-year cycle. At times, substantial revisions can be made to the OYs (ACLs) of groundfish species, requiring that management and fishing opportunities respond. Such changes can mean noticeable changes in the opportunities harvesters have in prosecuting fish resources, and captain and crew are affected by extension. While actual changes in the OYs (ACLs) of groundfish in the future cannot be clearly predicted, it is certain that OYs (ACLs) will be adjusted through time, requiring that management measures and fishing opportunities be adjusted. This will mean that wages earned by captain and crew will vary over time as OYs (ACLs) and associated management measures change.

Increased scrutiny of fishing activities, particularly bottom trawl fishing activities, may not lead to increased regulation or restriction of bottom trawling. It may, however, lead to differences in the marketability of trawl versus nontrawl caught groundfish. Nontrawl-caught groundfish may receive higher relative ex-vessel prices in the future compared to trawl-caught groundfish and this may induce increasing numbers of vessels to fish with fixed gear instead of trawl gear. The result may be a reduction in the tons harvested in the fishery since fixed gear is generally not as productive at catching many types of flatfish as trawl gear, but the price received for landed species may increase. It is not immediately clear what the net effect will be on vessel revenues (and by extension, captain and crew wages) but it will most certainly mean that increasing numbers of captain and crew members in the fishery will find it necessary to acquire new skills in order to prosecute fishing activities with fixed-gear as opposed to trawl gear.

Competing uses of ocean areas for such things as wave energy projects and offshore resource exploration and development will tend to place restrictions on locations where harvesters can prosecute fishing activities. Captain and crew may be affected by these restrictions. Harvesting operations may find it more difficult to prosecute fishing operations if productive fishing grounds are dedicated to other uses. If this occurs, captain and crew may see wages reduced as a result.

Overfished species rebuilding is expected to result in a positive influence on vessel profits in the long term as it is expected to result in an increased harvest. In the short term, the effect of overfished species rebuilding is not clear as it may result in increased harvests in some cases, decreased harvests in other cases, and no change from Alternative 1 (No Action) conditions in other cases. Captain and crew are affected, by extension, as harvesters are affected.

Finally, climate change and variability, as well as the possibility of a stock unexpectedly becoming overfished or rebuilt, may affect captain and crew. Climate change and variability may, for example, have an effect on species abundance and location. This can have an effect on the ability of harvesters to locate and prosecute fish resources successfully. Captain and crew wages are influenced (by extension) as the successful targeting of groundfish resources can directly influence vessel gross revenues and costs. It is not clear exactly how climate change and variability will influence groundfish stock abundance and location. Therefore, the effect of climate change and variability on captain and crew is not clear. The possibility of a stock unexpectedly becoming listed as overfished is likely to mean restrictions on the opportunities available to harvesters, which would impact captain and crew through a second order effect. Inversely, the possibility of a stock unexpectedly becoming listed as rebuilt is likely to mean a liberalization of fishing activity and a positive effect on captain and crew.

Table 4-51. Cumulative factors affecting captain and crew.

Factors Affecting Captain and Crew		Impact
Due to Rationalization	• Fleet consolidation	
	▪ Captain and crew wages	+
	▪ No. of captain and crew jobs	–
	▪ Safety conditions	+
Exogenous to Rationalization	• Increased demand for protein	+
	• Change in production costs associated with trawl activities	–
	• Ongoing harvest specifications	Unkn
	• Increasing public scrutiny of fishing, especially the bottom trawl gear type	Unkn
	• Competing use of ocean areas	–
	• Overfished species rebuilding	+
	• Climate change and variability	Unkn
	• Stock unexpectedly declared as overfished	–
	• Stock unexpectedly declared as rebuilt	+

4.7.4 Summary of the Effects on Captain and Crew by Alternative

The cumulative effects on captain and crew vary little by action alternative, except with respect to variations in wages, ability to become second-generation owners of quota, and risk to annual wages due to risks to harvesters. Alternatives allocating QSs to processors tend to result in lower wages to captain and crew than alternatives that do not allocate shares to processors. The effect of a processor linkage is difficult to compare to the effect of an initial allocation to processors; however, greater proportional linkages are likely to result in lower wages. A declaration procedure is likely to favor captain and crew wages more than a linkage.

Across all of the action alternatives, the number of captain and crew jobs is expected to decline from the no action alternative (Alternative 1). However, total wages paid to crew are expected to increase across the action alternatives compared to Alternative 1, because the amount of volume (and ex-vessel revenue) being handled by each vessel is expected to increase. Furthermore, because each vessel is expected to generate higher levels of revenue, maintenance is expected to improve, leading to safer conditions onboard vessels. Safety is also enhanced to the degree that race-for-fish conditions are eliminated. These conditions appear to go away for each of the alternatives, except for Alternatives 1 and 3, where whiting harvesters may race for fish via a race for bycatch.

Captain and crew wages are indirectly put at risk to the extent that harvester wages are put at risk. Each of the alternatives increases harvester risk due to the implementation of individual accountability for groundfish species. Each alternative imposes accountability for overfished species, creating risk since covering catch of these species with QPs could prove costly. However, Alternative 4b reduces this risk somewhat by removing some infrequently encountered species in the nonwhiting fishery from the program and removing other infrequently encountered species from the at-sea programs. This means that Alternative 4b increases risk relative to no action (Alternative 1), but less than the other alternatives.

Taken in the context of past, present, and future actions/conditions, captain and crew remaining in the fishery see their status improve and participate in a fishery that is more flexible and, thereby, more adaptable to changing conditions. Wages made by captain and crew are expected to be higher than current conditions and generally more stable, except in individual cases where a harvester inadvertently encounters some risk imposing species and fishing opportunities are ceased. Captain and crew would be indirectly impacted by such an event.

4.8 Nontrawl Commercial Harvesters

In this section we describe the effects of trawl rationalization on nontrawl commercial harvesters. This group comprises harvesters who target groundfish and nongroundfish species with nongroundfish trawl, or nontrawl gear. In one case, (the California halibut fishery) such harvesters may use gear that is described as groundfish trawl gear, but in other cases these harvesters do not use gear described as groundfish trawl gear. Examples include harvesters in the nearshore rockfish fixed-gear fishery, the Dungeness crab fishery, and the pink shrimp trawl fishery. In many cases, trawl harvesters also participate in these other fisheries, but the focus of this section is on the impacts to those harvesters who do not also participate in the LE trawl fishery.

We begin this section by briefly outlining the expected effects of rationalization on nontrawl harvesters. This initial section describes the potential effects of trawl rationalization on this group of harvesters and the reasons why those effects are expected to occur. We follow this initial section with a description of the broad level effects expected to occur on nontrawl harvesters similar to the equivalent discussion found in Sections 4.6 (harvesters), 4.9 (shore-based processors), and 4.10 (mothership processors).

4.8.1 Methods for Assessing Impacts

In this section, we describe the methodology for assessing the impacts of rationalization on nontrawl harvesters. This section summarizes the potential impacts, the reasons why those impacts occur (the mechanisms), and the way in which those impacts are analyzed and modeled (the metrics). Table 4-52 provides an overview of the approach used to estimate the impacts of the alternatives on nontrawl harvesters. The analytical approach includes 1) potential impacts, 2) mechanisms that relate the proposed action to the potential impacts, 3) measurement criteria (indicators used in assessing each type of impact), and 4) models and data sets used in the analysis.

Nontrawl vessels, their owners, and crew are predominately indirectly affected by the rationalization of the trawl sector. Possible indirect effects may result from economic impacts of spillovers resulting from the rationalization of the trawl fishery. If the trawl fleet consolidates, vessels and crewmembers no longer employed in trawl fisheries will potentially be able to switch into nontrawl fisheries, increasing participation in those other fisheries and adversely impacting those nontrawl harvesters. In addition, the increased harvest timing flexibility afforded by rationalization may mean that trawl vessels participate in nontrawl fisheries to a greater degree than they do now. The increased effort in nontrawl fisheries would likely have a negative impact on the economic performance of the fishermen already engaged in those fisheries. Harvest for existing fishermen could decline due to crowding and intensified fishing pressure on stocks. Moreover, an increase in fishery participants would result in greater market competition. These changes in economic performance could, in turn, affect the participation levels and fishing patterns of nontrawl vessels. Finally, a type of spillover could occur that is based on changes in catch in the trawl fishery of nontarget species. If changes in the bycatch of Pacific halibut occur in the trawl fishery, this could increase or decrease the amount of directed Pacific halibut fishermen' fishing opportunity. Since Pacific halibut is managed to a fixed allowable catch level, an increase in trawl-induced mortality would decrease the amount available to other sectors.

Another potential indirect effect can occur if nontrawl harvesters rely on the presence of a trawl sector in particular communities. Trawl vessels are often the source of much economic activity as a result of the large volume of landings. Such activity tends to draw support businesses and processing activity to areas where trawl vessels are found. If trawlers leave a port (see the geographic comparative advantage analysis in Appendix C), their departure may mean the departure of support businesses and processing activity. Nontrawl harvesters reliant on the presence of these entities may suffer as a result.

Table 4-52. Overview of impacts, mechanisms, and metrics used to compare the effect of the Alternative 1 and the alternatives on nontrawl harvesters.

Potential Impacts	Reasons or Mechanisms for Impacts	Metrics or Indicators for Informing Impact Mechanisms	Data, Models, and Methods used for Assessing Impacts
Changes in profits and participation of nontrawl commercial harvesters	Potential impacts on ex-vessel prices from increased fixed-gear catch as a result of gear switching	Price changes of select groundfish as a result of increased quantities of fixed-gear harvest	Available literature, together with expert opinion and other pertinent information
	Potential spillovers from trawl harvester participation in other fisheries, potential spillover from increased catch of nontarget species, and competition over grounds and fishery resources	Changes in trawl vessel effort and catch in nontrawl fisheries and impacts to opportunities for nontrawl harvesters	
	Access to processors and markets	Reliance of nontrawl harvesters on the presence and activity generated by trawl harvesters	

4.8.2 Direct and Indirect Effects of the Alternatives on Non-trawl Harvesters

The type and degree of indirect effects to nontrawl harvests may very well be fishery-specific, but to some extent, the factors driving these potential effects are the same. Potential impacts could result from potential spillover effects from a rationalized groundfish trawl fishery:

- Fleet consolidation
- Engagement in nontrawl sectors for a longer time than under Alternative 1 because of more flexibility
- Changes in trawl fishery bycatch that alters the available catch of certain species in nontrawl sectors
- Potential impacts to ex-vessel prices received for fixed-gear-caught groundfish if trawl vessels switch to fixed-gear to harvest IFQ fish.

Gear switching, which is part of the rationalization alternatives, is an additional mechanism that may cause a spillover effect. Gear switching could allow vessels that currently use trawl gear to access species occurring in rocky habitat that is inaccessible with trawl gear (unless footrope restrictions were relaxed). Depending on the allocation made to trawl and nontrawl sectors, this gear switching may allow trawl vessels to increase the take of species like nearshore rockfish. The likelihood of gear switching occurring will not be known until specific management measures and allocations are identified. However, state regulations minimize the capability of gear switching trawl vessels to

prosecute nearshore fishery opportunities. Vessels harvesting nearshore species off the states of Oregon and California are required to have a state-issued nearshore commercial fisheries permit. Washington prohibits commercial fishing in coastal state waters.

In addition to spillover effects, if nontrawl sectors rely on the presence of trawl harvesters to maintain the presence of processors and support businesses, the departure of trawl vessels from a port may have geographic consequences to nontrawl harvesters. Using the regional comparative advantage analysis as a guide, if nontrawl harvesters do indeed rely on the presence of a trawl sector to maintain support business and infrastructure, then nontrawl harvesters in the ports of Crescent City, Neah Bay, Fort Bragg, and Half Moon Bay may face difficulties accessing markets and finding necessary support businesses.

4.8.2.1 Spillover of Vessel Participation

Trawl vessels participate in several different fisheries under Alternative 1. The two most common fisheries, outside the trawl fishery, are the Dungeness crab fishery and the pink shrimp fishery. In a rationalized fishery, those holding QSs have more control over their future fishing opportunity than under Alternative 1 conditions. This relaxes the need for trawl harvesters to diversify into other fisheries (as they do under Alternative 1 conditions) because they have more certainty about the future of trawling. In addition, participation in multiple fisheries tends to make it harder to specialize, and the lack of specialization may create cost inefficiencies. This means that rationalization may actually result in fewer trawl harvesters participating in Dungeness crab and pink shrimp fisheries than under Alternative 1. However, fleet consolidation may tend to work in the opposite direction, because fleet consolidation will make additional, relatively large vessels available. Vessels that are removed from the trawl fishery may increase their participation in fisheries like Dungeness crab and pink shrimp. Although effort controls (LE and pot limits) are in place in these fisheries, there are many latent permits, making it possible for participation levels to increase over Alternative 1. Trawl vessels exiting the groundfish trawl fishery could replace vessels currently used in the Dungeness crab and pink shrimp fisheries. Replacement of existing vessels may change the harvesting power of some nontrawl harvesters.

4.8.2.2 Bycatch of Nontarget Species as a Form of Spillover

Bycatch of nontarget species in the trawl fishery affecting opportunities for other sectors that target those species is another type of spillover. Pacific halibut is one example of a species that is encountered, but not targeted, by trawlers. It is, however, targeted by commercial fixed-gear harvesters and by recreational harvesters. Pacific halibut bycatch in the trawl fishery may change as the fishery becomes rationalized. Some have hypothesized that Pacific halibut bycatch could increase as trawlers find more efficient ways to avoid overfished stocks and access more target species such as arrowtooth flounder and petrale sole. Both of these species have been shown to co-occur with Pacific halibut. Therefore, it is reasonable to expect that Pacific halibut bycatch may increase in concert. Others have countered that rationalization typically results in a wholesale reduction in bycatch because fishermen no longer feel the need to compete and can spend the time fishing more cleanly. This occurs because catching nontarget species and discarding them is time consuming and, therefore, costly. Under a rationalization program, harvesters have a greater ability to avoid such species in the first place because they are not racing and competing among one another for catch.

Since the nonwhiting trawl fishery does not currently operate as a derby with harvesters racing for catch, it may be likely that rationalization will significantly reduce nontarget bycatch not covered by IFQs. If nontarget species bycatch is covered with IFQ, there are reasons to expect bycatch of these

species to decline. The B.C. trawl fishery is one empirical example of Pacific halibut bycatch in a rationalized trawl fishery. At the outset of this trawl IFQ program, Pacific halibut was not managed at the individual vessel level, but was managed at a sector level. The result was that management targets set for Pacific halibut in the trawl fishery were not met. In an attempt to reach those goals, managers imposed individual vessel limits on Pacific halibut catch. Since that time, the trawl fishery has caught less than the management target for the trawl sector as a whole[102]. This implies that covering Pacific halibut with IFQs will tend to decrease bycatch from current levels. It is unclear whether not covering Pacific halibut with IFQs will change bycatch from existing levels without allocating less halibut to the trawl sector than is currently taken.

The Council's preferred alternatives for both Trawl Rationalization Alternative 4b and Intersector Allocation are expected to reduce the incidental catch of Pacific halibut in the trawl fishery. The Council's decision on Intersector Allocation consciously allocated less Pacific halibut to the trawl fishery than had been taken in the past. This regulated reduction in Pacific halibut bycatch should have a generally positive impact on nontrawl harvesters as greater amounts of Pacific halibut will be available to those sectors than would otherwise be the case.

4.8.2.3 Resource, Fishing Grounds, and Market Competition

Other nontrawl harvesters may see indirect effects because of resource and fishing grounds competition. Specifically, nontrawl groundfish harvesters may be affected because of the gear switching provisions in the rationalization alternatives and the fact that the utilization of nontrawl gear to catch groundfish creates different opportunities in terms of markets and areas. Trawl gear is subject to regulations that restrict the maximum size of the footrope. This footrope restriction limits the ability of trawl vessels to access areas of relatively high relief substrate where many types of rockfish are found. If trawl IFQ holders are able to use nontrawl gear, this may enable those harvesters to access species such as nearshore rockfish, black rockfish, and cabezon, potentially competing with harvesters of those species (though state regulations will minimize this effect on nearshore species to a great degree). However, the ability for trawl IFQ holders to engage in these activities depends on the management measures in place that allow or discourage the targeting of those species and the allocation made to the trawl sector. If allocations made to the trawl sector reflect Alternative 1 harvest amounts of these species, resource and grounds competition with harvesters targeting nearshore species (such as nearshore rockfish) are not likely to occur. If allocations to the trawl sector are increased over Alternative 1 amounts, and regulations allow targeting by trawl IFQ holders, competition over fishing grounds and resources may, in fact, occur.

Nontrawl harvesters who target species such as sablefish and thornyheads are more likely to see grounds competition than those nontrawl harvesters who target black rockfish and nearshore groundfish species. In addition, market competition is possible in cases where a change in the quantities of fish caught with fixed-gear and trawl gear can affect ex-vessel price. Sablefish is one species likely to motivate gear switching by IFQ holders. As illustrated previously, the price paid for fixed-gear-caught sablefish is noticeably higher than the price for trawl-caught sablefish. Because of this price differential, trawl vessels are likely to use nontrawl gear to some degree to harvest sablefish.

An increase in the amount of sablefish harvested with fixed-gear may drive prices down for fixed-gear-caught sablefish from their current levels, thus negatively affecting existing fixed-gear sablefish harvesters. Whether this is likely to be the case depends on several factors, including the amount of sablefish sold in the global market and whether sablefish caught on the west coast competes in the same, global market or is directed to a separate market. If the amount of sablefish caught on the west coast is

[102] Mose, Brian. 2008. British Columbia Trawl Fisherman. Personal Communication.

small relative to the amount caught globally, and west coast sablefish competes in the same market as sablefish caught in Alaska and British Columbia, for example, then there is not likely to be a price effect due to gear switching.

To help determine whether a price effect is likely, we compare west coast sablefish landings with landings made in Alaska and British Columbia during 2006 (Table 4-53). In 2006, landings from the west coast made up 25 percent of landings from the three areas. The amount potentially subject to gear switching (the trawl allocation portion) represents 11 percent. It is unlikely that this entire amount would be caught with fixed-gear, simply because some must be held in order to serve as incidental catch while targeting other, associated target species like Dover sole.

Table 4-53. Alaska, British Columbia, and W-O-C sablefish landings.

	Alaska 2006 Landings	British Columbia 2006 Landings	W-O-C 2006 Landings	2006 West Coast Trawl Allocation (a portion of W-O-C)	Total 2006
Actual mt	15,199.5	4,535	6,472	2,971	26,206
Percent of total	58%	17%	25%	11%	100%

Source: NOAA Fisheries. 2008. Office of Science and Technology. Catch Statistics
NOAA Fisheries, NWFSC. 2008. 2006 Groundfish Catch Estimates
Canadian Department of Fisheries and Oceans. 2008. Pacific Region. Regional Data Services Unit. Summary Commercial Statistics

Unfortunately, data are not readily available to determine whether west coast sablefish is sold in a different market than sablefish caught in other regions. However, it is known that Japan is the largest consumer of U.S. exported sablefish. Japan purchased 90 percent of U.S. exported sablefish in 2002, and 73 percent of U.S. exported sablefish in 2005 (McDowell Group 2006). The Japanese market has been shown to be somewhat elastic, where changes in supply have noticeable changes in price. Huppert and Best (2004) show that the import price decreased as per capita imports of sablefish increased. Specifically, as per capita imports double, the import price in Japan declined by 30 to 40 percent.

Given the large amount of sablefish purchased by Japan, it appears unlikely that fixed-gear-caught sablefish on the west coast is sold in a different market altogether than fixed-gear-caught sablefish from other regions. Though there may be some local markets that purchase west coast sablefish specifically, it seems unlikely that all, or even most, west coast sablefish is purchased by these local markets. It may be reasonable to expect, however, that there are different markets for fixed-gear- and trawl-caught sablefish, simply because of the relative quality of fish caught by both methods. If that is, indeed, the case, and Japan is the buyer of most fixed-gear sablefish, the change in supply of fixed-gear-caught sablefish as a result of gear switching may have a slight effect on the import price paid in the Japan market. Such a change may, in turn, have a slight downward influence on the ex-vessel price received by harvesters. However, given the amount of sablefish potentially subject to gear switching, such a price effect is likely to be small. For example, using the information found in Huppert and Best (2004), if 10 to 20 percent of the trawl allocation is caught with fixed-gear, this will have less than a 1 percent downward price effect on the Japanese import price of sablefish.

Nontrawl harvesters who currently target sablefish may see grounds competition if trawl vessels switch to fixed-gear. For example, trawl vessels that switch to fixed-gear may join fixed-gear harvesters of sablefish in their same fishing grounds, thus leading to competition for space. In addition, as trawl harvesters switch to a new gear there may be a learning curve, which leads to more adverse interactions with other fixed-gear harvesters (because of the potential for tangled and poorly set gear) in the years immediately following rationalization. If gear switching leads to an increase in the amount of fixed-gear used, this may also increase conflicts with trawl vessels as trawl vessels search for grounds. Such

conflicts are likely to result in a loss of fixed-gear if trawlers inadvertently tow through sets of pot or longline gear.

Trawl and fixed-gear RCAs may interact with the gear switching provisions. If the seaward boundary of the RCA remains in deeper water for vessels harvesting trawl IFQ fish (either with fixed-gear or with trawl gear) this may reduce the impact on other nontrawl harvesters of sablefish since there would be less competition for those grounds shoreward of the trawl RCA seaward boundary. However, those trawl vessels using fixed-gear may conflict with those continuing to use trawl gear. Therefore, if differential RCAs remain gear-specific, trawl IFQ holders that use fixed-gear may avoid some interactions with trawl gear, but may interact with other fixed-gear harvesters.

4.8.2.4 Effects on Nontrawl Harvesters by Alternative

To a large degree, the effects on nontrawl harvesters do not vary much by action alternative. The criteria by which nontrawl harvesters can be impacted include, in short, market competition, grounds competition, spillover as a result of increased participation in nontrawl activities from trawl harvesters, and possible changes trawl harvesters may cause in the mortality of some species that are important species for nontrawl harvesters. Of these criteria, the only one that varies by alternative is the impact of bycatch in the trawl fishery. This varies depending on whether Pacific halibut is covered with IBQ in the trawl fishery. Alternatives 2a, 2b, 2c, and 4b include a halibut bycatch quota provision, while Alternatives 3 and 4a do not. Therefore, the analysis of alternatives addresses Alternatives 2a, 2b, 2c, and 4b simultaneously, and 3 and 4a simultaneously.

4.8.2.5 Alternatives 2a, 2b, 2c, and 4b

Alternatives 2a, 2b, 2c, and 4b include a provision for managing Pacific halibut bycatch in the trawl fishery. This provision caps the amount of bycatch that will occur in the trawl fishery and in this way protects the directed halibut fisheries. While bycatch has tended to decrease in other fisheries when they move toward a rationalization program, such declines have typically come from fisheries that have moved from a race for fish fishery to a rationalization fishery. Under existing conditions (Alternative 1, no action), the nonwhiting fishery (where most of the halibut bycatch occurs) is not described as a race for fish fishery. Therefore, harvesters in the nonwhiting fishery already have the opportunities to fish selectively should it be beneficial for them to do so. Under a rationalization program, it is expected that harvesters will have incentives to avoid overfished species, thereby increasing the catch of target species. Many target species, such as arrowtooth flounder and petrale sole, are correlated with Pacific halibut. Unless harvesters have an incentive also to avoid Pacific halibut, then the bycatch of Pacific halibut may actually increase in the Pacific groundfish program unless there are provisions limiting the catch of Pacific halibut in the trawl fishery. As Alternatives 2a, 2b, 2c, and 4b impose a limit on halibut bycatch, the directed halibut fishery should not be impacted by changes in the way the trawl fishery operates.

Other types of effects on nontrawl harvesters who are expected from these alternatives include spillover of vessel participation, grounds competition, and market competition. Some nontrawl harvesters may be impacted if substantial numbers of trawl vessels leave a port, and the infrastructure and support business that these nontrawl harvesters rely on follows. Vessel spillover is likely to occur in the pink shrimp trawl fishery and the Dungeness crab fishery under the action alternatives for a couple of different reasons. One reason is due to fleet consolidation and the fact that vessels leaving the trawl fishery may elect to participate in the pink shrimp and/or Dungeness crab fishery. Given the number of latent permits that appear to exist in these fisheries, the amount of spillover from this mechanism is not likely to be encumbered by the fact that these fisheries are LE. The other reason spillover is likely to occur is

simply due to opportunities over harvest timing. Trawl harvesters may elect to stay within the pink shrimp and Dungeness crab fishery for longer periods.

4.8.2.6 Alternatives 3 and 4a

For reasons outlined in the preceding paragraph, it may be reasonable to expect Pacific halibut bycatch to increase in the groundfish trawl fishery as that fishery moves to rationalized conditions unless there is an incentive for harvesters not to do so. Alternatives 3 and 4a do not appear to include such an incentive because there is no provision for a Pacific halibut bycatch quota. Therefore, the bycatch of halibut may actually increase under these alternatives, decreasing the amount of Pacific halibut left for the directed halibut fisheries and negatively affecting those nontrawl harvesters.

Other types of effects on nontrawl harvesters who are expected from these alternatives include spillover of vessel participation, grounds competition, and market competition. Some nontrawl harvesters may be impacted if substantial numbers of trawl vessels leave a port and the infrastructure and support business that these nontrawl harvesters rely on follows. Vessel spillover is likely to occur in the pink shrimp trawl fishery and the Dungeness crab fishery for a couple of different reasons. One reason is due to fleet consolidation and the fact that vessels leaving the trawl fishery may elect to participate in the pink shrimp and/or Dungeness crab fishery. Given the number of latent permits that appear to exist in these fisheries, the amount of spillover from this mechanism is not likely to be encumbered by the fact that these fisheries are LE. The other reason spillover is likely to occur is simply due to opportunities over harvest timing. Trawl harvesters may elect to stay within the pink shrimp and Dungeness crab fishery for longer periods.

4.8.3 Cumulative Effects on Nontrawl Harvesters

Nontrawl harvesters are affected by a variety of factors directly related to rationalization, including fleet consolidation; longer engagement of trawl vessels in nontrawl sectors; changes in trawl fishery bycatch that alter the available catch of certain species in nontrawl sectors, potential impacts to ex-vessel prices received for fixed-gear-caught groundfish if trawl vessels switch to fixed-gear to harvest IFQ fish, and competition over markets for species such as pink shrimp. Other factors affecting nontrawl harvesters (that are exogenous to the effect of rationalization) include the following:

- Amendment 21 (intersector allocations)
- Ongoing harvest specifications process (including nongroundfish species)
- Competing use of ocean areas (wave energy, MPAs, offshore resource development)
- Increasing consumer awareness of the fishing industry
- Relatively high demand for protein
- Relatively high production costs
- Overfished species rebuilding
- RCA and EFH area restrictions
- MSC sustainability certification in the pink shrimp and Dungeness crab fisheries

The effect of intersector allocations on nontrawl participants will depend on the amount of fish allocated to each sector. Opportunities in the nontrawl sablefish fishery are not expected to be affected to any appreciable degree by the intersector allocation process because the Council is not considering an adjustment to the sablefish allocation. Intersector allocations on other stocks may have an effect on nontrawl harvesters. If the allocation made to nontrawl sectors results in more catch available to those sectors, then the impact may be positive. The inverse is true if the intersector allocation process results in lower catch available to each sector.

At times, substantial revisions can be made to the allowable catch of fish species, including nongroundfish, requiring that management and fishing opportunities respond. Such changes can mean noticeable changes in the opportunities harvesters have in prosecuting fish resources, and this will influence the opportunities available to nontrawl harvesters. While actual changes in the available catch of various species in the future cannot be clearly predicted, it is certain that allowable catch levels will be adjusted through time, requiring that management measures and fishing opportunities be adjusted. This will mean that wages earned by captain and crew will vary over time as OYs (ACLs) and associated management measures change.

Projects such as wave energy development, MPAs, and offshore resource exploration and development have the effect of restricting areas available to harvesters. Wave energy projects may impact areas closer to shore and, therefore, affect nearshore harvesters and Dungeness crab harvesters, while offshore resource exploration may occur further out along the continental shelf, slope, and beyond, possibly affecting harvesters working in those areas. In other words, competing ocean uses may exist for all nontrawl harvesters, leading to restrictions on access to fishing grounds in those areas. Such restrictions may increase the cost of fishing or reduce the success harvesters have in prosecuting fishing activity. In either case, the effect of competing uses is likely to be adverse on nontrawl harvesters.

Increasing consumer awareness of the fishing industry (particularly of the bottom trawl gear type) may have mixed effects on nontrawl harvesters who could ultimately depend on the gear type used. The certification of fisheries as sustainable by the MSC is likely to lead to positive effects on fisheries attaining that certification, and harvesters in those fisheries may see higher ex-vessel prices as a result. Other factors may play a role including the increasing public scrutiny of bottom trawling. Such scrutiny may result in a wider price differential between fixed-gear-caught groundfish and trawl-caught groundfish regardless of any official certification. In this case, those nontrawl harvesters who possibly stand to see higher prices may end up better off, while those harvesters who use bottom trawl gear (such as California halibut and sea cucumber trawlers) may be worse off.

On a worldwide basis, the price of commodities has been high relative to recent years. This has the potential effect of increasing the value of harvested fish species, but it also results in higher production costs (fuel). Therefore, increased prices for such products simultaneously put upward and downward pressure on profits generated by nontrawl harvesters.

Over the long run, rebuilding is expected to result in positive effects on nontrawl harvesters by providing for additional opportunities on those rebuilt stocks, as well as alleviating the constraint that depleted stocks may place on other species. Over the shorter term, rebuilding may result in mixed effects. The rebuilding paradox may mean that rebuilding—at times—results in adverse effects on nontrawl harvesters in the shorter term. In other cases, rebuilding may result in positive effects on nontrawl harvesters.

RCA and EFH restrictions are expected to act similarly to other uses that restrict access to fishing grounds. In general, restrictions that limit access to fishing grounds should be expected to increase the cost of harvesting a given unit of fish. This should have the effect of reducing revenues to nontrawl harvesters if additional area management restrictions are put in place.

Table 4-54. Cumulative factors affecting nontrawl harvesters.

Factors Affecting Nontrawl Harvesters		Impact
Due to Rationalization	• Trawl fleet consolidation	− or no effect
	• Trawl fleet harvest timing flexibility (effort spillover)	−
	• Trawl fishery bycatch (catch spillover)	Conditional
	• Trawl sector gear switching	−
Exogenous to Rationalization	• Amendment 21	Conditional
	• Ongoing harvest specifications process (including nongroundfish species)	Unknown
	• Competing use of ocean areas (wave energy, MPAs, offshore resource development)	–
	• Increasing consumer awareness of the fishing industry	Conditional
	• Relatively high demand for protein	+
	• Relatively high production costs	–
	• Overfished species rebuilding	+ (long term)
	• RCA and EFH area restrictions	−

4.8.3.1 Summary of the Effects on Nontrawl Harvesters by Alternative

The effects of trawl rationalization on nontrawl harvesters all have similar impacts. The place where impacts differ on nontrawl harvesters is in bycatch as a form of spillover. Bycatch of Pacific halibut in the trawl fishery is expected to be higher in alternatives 1, 3 and 4a, than the other alternatives, reducing the amount of halibut available to the directed halibut fishery. Other effects are common across the action alternatives. Fleet consolidation in the trawl fishery under the action alternatives is expected to result in a spillover into nontrawl fisheries such as Dungeness crab and pink shrimp, compared to the no action alternative (Alternative 1). Furthermore, enhanced harvester flexibility in the trawl sector under the action alternatives is expected to provide opportunities for trawl harvesters engaged in multiple fisheries to increase participation in nontrawl fisheries, causing another form of spillover, compared to the no action alternative (Alternative 1). In addition, gear switching in the trawl rationalization alternatives is expected to result in grounds competition with nontrawl groundfish harvesters compared to the no action alternative (Alternative 1).

When combined with past, present, and future actions/conditions, nontrawl harvesters are expected to face increasingly stringent competition over space due to such issues as wave energy development. Combined with spillover and competition over grounds with trawl harvesters electing to engage in gear switching, nontrawl harvesters should be adversely impacted compared to the no action alternative. In addition, pink shrimp harvesters are expected to be adversely impacted by increased participation of trawl harvesters in the pink shrimp fishery. Since the pink shrimp fishery is not managed with a TAC, increased participation in the shrimp fishery should increase catch, reducing the price received for shrimp, and decreasing the revenues generated by shrimp harvesters. This trend may reverse the price increases in pink shrimp recently seen because of MSC certification. Dungeness crab harvesters may not see the same change in price because of increased participation. Markets for Dungeness crab have recently absorbed historically high harvest volumes, speaking to the ability of the market to absorb increases in catch that may occur because of increased participation in the Dungeness crab fishery.

4.9 Shoreside Processors of Trawl Groundfish

Trawl rationalization may result in a wide range of impacts to processors, varying in extent and degree depending upon alternative. As a result of rationalization, it is likely that impacts to processing businesses will be distributed according to the geographic shift of fishing effort and subsequent consolidation of fishing and processing enterprises. Impacts may also occur based on the extent to which processing companies gain and control QS. The types of impacts to processors resulting from the trawl rationalization program, and associated mechanisms, are outlined in more detail below.

In this section, we describe the impacts of rationalization on shoreside or land-based processors of trawl-caught groundfish. This group is composed of businesses that receive whiting and nonwhiting groundfish directly from harvesters and conduct processing activities on the fish to make product forms that are usable at the wholesale and/or retail market level. In several cases, entities holding LE trawl permits may be processors of LE trawl-caught groundfish. Impacts on these entities are also considered in this section.

Section 4.9.1 below describes methods used to assess effects on processors and the metrics used to illustrate those effects. The variables and metrics used, some of which are also used in earlier sections, can be compared and contrasted among the alternatives. Section 4.9.2 describes the broad-level effects of rationalization on groundfish processors and contains a discussion of important general issues associated with rationalizing the fishery.

Following the description of broad-level effects, we assess the impacts on processors of the alternatives. This section begins by identifying the impacts that are expected to occur from each of the elements of the alternatives independently. We then provide an assessment of the impact of each alternative on groundfish processors. This assessment is programmatic and examines the ways in which processors of trawl-caught groundfish are affected by the combined suite of options within each alternative. At the end of this section, we provide a side-by-side comparison of the effects of each alternative on groundfish trawl processors.

Finally, we assess cumulative effects of rationalization on processors. This cumulative effects section briefly summarizes the past and present actions with ongoing effects on shoreside processors of trawl-caught groundfish, and the RFFAs that are anticipated to have effects. The combined effect of these past, present, and RFFAs are merged with the effect of the alternatives to arrive at the cumulative effect.

4.9.1 Methods for Assessing Impacts

This section contains a brief overview of the methodology we used for assessing the impact of rationalization on processors, including the ways in which each of the expected impacts is measured and assessed. A summary is included of the potential impacts described above, the reasons why those impacts occur (the mechanisms), and the way in which those impacts are measured (the metrics). Table 4-55 provides an overview of the approach used to estimate the impacts of the alternatives on processors of trawl groundfish, in a format similar to previous analytical categories: 1) potential impacts, 2) mechanisms that relate the proposed action to the potential impacts, 3) measurement criteria or indicators used in assessing each type of impact, and 4) models and data sets used in the analysis. The potential impacts to processors are changes in economic performance, or profitability, of individual processors, and changes in economic efficiency of the processing sector as a whole. Changes are initiated by at least 11 identifiable mechanisms; these are described in some detail in Appendix C, along with the methods used for examining the impacts.

Table 4-55. Overview of impacts, mechanisms, and metrics used to compare the effect of the no action alternative and the alternatives on processors of trawl-caught groundfish.

Potential Impacts	Mechanisms Driving Impacts	Metrics or Indicators for Informing Impact Mechanisms	Data and Models used for Assessing Impacts
Changes in processor net revenue	Changes in the bargaining power between harvesters and processors	Ex-vessel and wholesale prices	Qualitative economic assessment of negotiation outcomes
	Regional shifts in landings patterns	Location and quantity of landings	Regional comparative advantage model
	Initial distribution of IQs	• Processor ownership of harvest privileges • Location of harvest privileges	The effect of initial distribution of IQs
	Changes in the quantity and mix of landings	Quantity and type of groundfish landings	Change in bycatch, landings and revenue
	Changes in the timing of harvests	Seasonality of groundfish landings	• Seasonality of harvest information from CP sector • Geographic shifts in fishing patterns
	Barriers to entry into the processing sector	New entrants to processing sector	Qualitative assessment based on expertise of analysts
	Market restructuring	Number of processing companies and the amount of vertical and horizontal integration	Qualitative assessment based on literature review and expertise of analysts
	Change in the quality of landings	Quality of trawl groundfish landings	Qualitative assessment based on expertise of analysts
	Change in processor costs	Changes in the cost of labor and other costs	Qualitative assessment base on expertise of analysts
	Product recovery and yield	Product recovery	Literature review on product yields and changes that occur as a result of rationalization
	Long term business planning	Ownership of QS	Qualitative assessment based on whether processors own QS
	Product output mix	Seafood products produced by trawl groundfish	Qualitative assessment based on expertise of analysts
Change in value of capital assets	Value and quantity of quota distributed to processors	Receipt of transferable quota	Initial allocation data and qualitative assessment
	Change in the value of processing capital	Processor consolidation and the potential for stranded capital	Estimates of processor consolidation and qualitative assessment

The mechanisms that are driving changes in processor net revenue include changes in relative bargaining power between processors and harvesters over ex-vessel prices; regional shifts in landing patterns; initial allocation of QS; changes in the quantity, quality, and timing of harvests; barriers to entry into processing and sector restructuring; and changes in processor costs, product yield, and output mix. Each of these mechanisms, which are drivers for the potential impacts, is measured by the criteria listed in the third column. The metrics are estimated using the methods described in the final column. The model-based methods are described in Appendix C and earlier sections of Chapter 4.

4.9.1.1 Potential Impacts, Mechanisms, and Metrics

Bargaining Power: There is a negotiating relationship between processors and harvesters with respect to ex-vessel prices. The alternatives would result in, at one extreme, 100 percent of shares going to permit owners. In this alternative, processors believe they will be at a relative disadvantage in setting ex-vessel prices, and that the capacity of the processing sector may no longer match the rationalized fishery, in which seasons may be elongated. At the other extreme, issuing the maximum amount of fishing QSs prescribed in the alternatives to processors would, it is argued, guarantee that certain processors would have access to product, beyond the QSs they may also receive as permit owners. This increased access to product could reduce a processor's need to compete in the marketplace for an independent harvester's fish. It is argued that these alternatives (Alternatives 2c and 4a) may lower the ex-vessel price received by harvesters.

The relative shift in bargaining power for processors is assessed qualitatively. A review of the game theory and negotiation literature is made with particular emphasis on applications to fisheries or similar common property situations. The experience of other fisheries is also examined for any conditions that may be applicable to this action.

Regional Shifts in Landings: Trawl rationalization is anticipated to result in geographic changes in harvest patterns in the nonwhiting trawl fishery, and consequently, increases or decreases in the number of landings at west coast ports. These changes are likely to impact processor operations. To examine this impact, the geographic shift and regional comparative advantage analysis are used to show regions likely to experience change. The output of this analysis was applied to a representation of the web of physical processing plants, ownership, and their regional buying stations.

Initial Distribution of IQ: The manner in which QS is initially distributed will have a profound effect on the processing sector, especially if processors receive designated QSs. The analysis of the initial distribution originates from two models: 1) a quantitative analysis of initial shares based on historic landings, and 2) a delineation of processor ownership combined with historic purchases of landed trawl-caught groundfish. Using the distribution rules for each of the alternatives, the two models' output can reveal the patterns of initial IQ distribution.

Changes in Quantity and Mix of Catch: Trawl rationalization will not only change the regional distribution of catch, but also the quantity and species mix of the catch. It is expected that the elimination of derby-style race for whiting, along with a net increase in nonwhiting harvests, will allow vessel operators to have a greater ability to respond to market forces in terms of targeting species. Furthermore, harvest operations managed with individual accountability are expected to avoid bycatch to a greater extent, leveraging more underutilized target species. These changes in quantity and mix of catch will have a direct effect on processor operations and profitability. Greater quantities of harvested species are expected to provide opportunities for processors to generate higher amounts of revenue. It is also argued that, particularly if processors own QSs, processors may play a greater role in arranging harvester contracts for targeting species.

The bycatch model (page 237), illustrating the potential to reduce the catch rate of overfished species, was used to predict changes in quantity of target species harvest. The model outputs allow for a forecast of the aggregate changes in deliveries made to processors.

Harvest Timing: The rationalization program will tend to slow the pace of derby style fisheries in both the shore-based and mothership sectors of the whiting fishery. It is expected that these sectors will lengthen because fishery participants no longer feel the need to compete. However, certain factors, in particular the timing of the Bering Sea pollock fishery and the availability of whiting to shore-based

harvesters, may limit lengthening seasons. Harvest timing will affect processors by changing or lengthening harvest and processing periods, changing the need and demand for labor, and changing the need and demand for processing capital. A longer season will tend to reduce peak harvest volume, thereby potentially lessening the demand for processing capital. A reduction in peak-period harvest volume may also reduce the need for overtime labor during peak periods, potentially altering the cost of labor.

Market Restructuring: The processing sector is organized with a few very large operations and their subsidiaries, along with a number of small and mid-sized firms. In a rationalized trawl fishery, some changes in the industrial organization of processors are anticipated, based on experiences found in other rationalized fisheries, including possible consolidation, joint ventures, and other arrangements among processors (vertical integration) and between processors and harvesters (horizontal integration). In addition, there can be influences leading to changes in diversification, expansion in the use of custom harvesting and processing, and related market restructuring.

Quality of Landings: In addition to changes in harvest timing and elimination of the derby-style fishery is an improvement in the quality of landed fish. Harvesters can be more selective in harvests, and to manage the harvested fish once on board, in such a way as to improve quality. The quality could also be affected if the volume of individual landings is reduced. This could lead to generally higher prices received by harvesters, and the effect on processors could be positive or negative, depending upon processors' ability to influence wholesale or retail prices due to the higher quality fish. Processors could also be positively affected if the better quality fish leads to new market opportunities. The analysis addressed these concepts qualitatively.

Processor Costs: In a rationalized fishery, the cost of processing could be affected in a variety of ways. Labor costs per unit of processed fish could be reduced if there is more uniform operation during the season or year, with fewer hires and layoffs and less overtime required. There may be an ability to better utilize capital resources and capacity to avoid idle periods, offset by times of overuse. Other costs could be affected depending on the ability to open new markets or change operations. Additionally, processors may bear the costs of shoreside catch monitors that will observe offloadings, depending on negotiations with vessels about the distribution of compliance costs. These effects are discussed qualitatively.

Product Recovery Yield: The positive effect on product recovery yields is related to harvest timing and quality of landings. Reducing the derby-style fishery can lead to more careful management of the fish that are harvested and less waste. The experiences from other rationalized fisheries are explored and discussed qualitatively.

Product Output Mix: A rationalized fishery will reduce the need for shortened seasonal harvests and allow harvesters (and processors who contract with them) to better respond to market conditions, tastes and preferences, and changing demands by consumers. In particular, the effect of rationalization may lead to new and additional products in the market, and allow specialized niche markets to develop, with associated increases in the ability to compete and profitability. The effects are evaluated qualitatively with reference to experiences in other fisheries and the existing market structure of the west coast fishery.

4.9.2 Broad-Level Effects of Rationalization on Shoreside Processors

Broad level effects to processors from rationalization could include changes in bargaining power over ex-vessel prices, the quantity and quality of fish to be handled, the location of landed catch, and the

timing of deliveries, among other things. The structure of the west coast groundfish processing sector differs from that seen in other fisheries, such as the pollock fishery in the Bering Sea or the North Pacific halibut fishery, and as a result, the effects on processors from trawl rationalization may be different than that seen elsewhere after rationalization goes into effect.

4.9.2.1 Ex-vessel Price Negotiation

Available information suggests that the processing sector, as buyers of raw fish, consists of few "large" firms, a few "moderate" sized firms, and a considerable number of small firms. In the nonwhiting sector, three firms have processed nearly 80 percent of landings in recent years. The shoreside whiting sector involves fewer firms in total, but the three largest have processed over 85 percent of recent landings.[103] Economic literature suggests that an industry with this type of structure may operate in a manner where the largest firms appear to behave competitively, and the smaller firms respond to the ex-vessel prices set by the larger ones. However, in the west coast seafood industry the final processed products enter markets where they compete with similar products originating elsewhere in the U.S. and other countries and are, therefore, more competitive in the final processed product market. In other words, market structure suggests that west coast processors are generally unable to influence market prices for final products.

Harvesters and processors are in a dependent relationship, each specializing in certain elements in the supply chain that brings fish to the ultimate consumer. For this reason, rationalization is likely to affect processors directly by altering this relationship. Rationalization will also have second-order effects on processors because of direct impacts to harvesters and the response of harvesters to such effects. The distribution of QSs will have a direct effect on processors by potentially altering the bargaining power between processors and harvesters over ex-vessel prices. Currently, the market structure indicates that nonwhiting processors may have more influence over harvesting operations than the permit owners. Pacific whiting processors appear to have less influence over harvesting operations.

Assignment of QSs to harvesters may alter existing relationships. Under status quo, harvest opportunity is ephemeral. It is either lost to other harvesters if all harvesters are fishing against a single quota (the situation in the whiting sector) or the opportunity must be exercised within a given two-month cumulative landing limit period (the situation in the nonwhiting sector). IFQs and cooperatives each institute a quasi-permanent harvest privilege assigned to the individual (or cooperating group). Even though the harvest opportunity (QPs) must be exercised within the year, the underlying QSs renew the specified opportunity in the next year. QS holders even have the ability to sell their QPs and realize some gain from the harvest opportunity they do not exercise. This gives harvesters much greater latitude to hold out for better prices, because they have a guaranteed harvest opportunity over a longer time. QS ownership by processors would tend to offset the gains for harvesters. For example, a processor could use QSs to induce a harvester that is short of QPs for a particular species to make deliveries under specified conditions and prices. At this time, it is unclear what balance of processor/harvester quota ownership would achieve status quo conditions.

Harvester QSs are likely to have a second order effect on processors in several ways. Fleet consolidation would reduce the number of harvesters, thus lessening the processors' market influence by more closely aligning the number of harvesters with the number of processors. Assignment of QSs to processors would have a countervailing effect because, as suggested above, processors could use the QSs they control as leverage in forging agreements with harvesters.

[103] The "recent landings" period as used in this section is 2004 through 2006 for both whiting and nonwhiting.

Ex-vessel prices directly influence profitability. Asset values are one factor that could potentially change under a rationalized fishery because of changes in ex-vessel prices. This can occur because the value of an asset is a function of the profits associated with that asset. If ex-vessel prices change in a fishery in favor of harvesters or in favor of processors, the value of assets associated with harvesting or with processing should be expected to change in concert. Therefore, while considering the effect on ex-vessel prices, it is important to consider the implications that a change in ex-vessel prices may have on profitability and the value of current assets in the fishery.

A number of second order effects on processors result from changes in the groundfish trawl sector that would occur no matter how a trawl rationalization program is structured as part of the proposed action. These include changes in the distribution of landings across west coast ports and over the year, the quantity and mix of catch delivered to processors, and the quality of landed catch. These broad-level effects are discussed in Section 4.6.2 (page 289) from the harvester perspective; from the processors' perspective, some effects may be beneficial and others adverse.

4.9.2.2 Regional Shifts in Landings

As discussed in Section 4.14.5, the distribution of landings across west coast ports may change as a result of fleet consolidation, industry agglomeration, and the comparative advantage of ports (a function of bycatch rates in the waters constituting the operational area for the port, differences in infrastructure, and other factors). Processors have invested in physical plants (processing facilities and related infrastructure) based on the historical distribution of landings. To the degree that harvesters wish to change their port of landing, and depending on the relative bargaining power discussed above, there could be a mismatch between the distribution of existing physical plants and the volume of catch landed in different ports. If processors retain a relatively large degree of bargaining power (by holding QSs), they could influence the location of landings by enticing or directing harvests to existing plants even if the harvesters prefer to fish in other areas. Otherwise, processors may have to enlarge operations at facilities experiencing an increase in landings and reduce operations, or shut down plants in ports where landings permanently decline. Alternatively, they could truck fish from the port of landing to their facilities. In either case, a shift in the location of landings may mean a shift in the location of where those landings are processed. We use the term "at risk" to describe processing volumes that may move to another location under a rationalized fishery. For example, landings of nonwhiting trawl groundfish that historically came into Neah Bay have often been processed in Astoria, Oregon. According to the regional comparative advantage analysis, those landings historically made at Neah Bay are at a disadvantage for a variety of reasons, and it may be reasonable to assume that catch would be landed elsewhere. The quantity of product processed in Astoria that originated in Neah Bay may be put at risk as catch historically delivered to Neah Bay is delivered elsewhere. These landings may continue to be processed in Astoria, but not necessarily; therefore, that relationship is at risk.

The implication of this network information can be combined with the geographic comparative advantage analysis described in Appendix C. This comparative advantage analysis indicates several potential shifts in regional distribution of landings:

- Neah Bay appears to be at a clear relative disadvantage, suggesting landings may shift toward another location.
- The ports with the greatest advantage appear to be in the north, suggesting a shift in effort and catch at a much broader, aggregate level from central California, toward northern California and Oregon.

This geographic shift information implies that processors associated with disadvantaged communities may see trawl groundfish volume decline. Those processors receiving landings from central California may see a reduction in trawl-caught groundfish if the market is able to redirect activity toward more efficient and advantaged ports. However, gear switching may work at retaining landings in those ports because of different relative rates of bycatch, less infrastructure necessary to support (presumably smaller) fixed-gear vessels, and proximity to markets that appear more favorable to nontrawl caught-fish species.

At a smaller, less regional scale, individual ports may see a reduction or increase in landings. Very few processors rely on a single port, so processors may be able to make up a reduction in landings made at one port with an increase in landings made at another. However, landings directed to a processor because of a relationship between a disadvantaged port and a processor may be considered to be at risk because it is not clear where landings will redirect. For example, under a purely market driven outcome it may be expected that landings into Neah Bay would decline or move to another port altogether, meaning that for those processing centers historically receiving their fish from Neah Bay, those landings would be placed at risk. As indicated in the above information, these at-risk landings have historically been processed in Astoria. However, this does not necessarily mean that Astoria will see a subsequent reduction in volume. It could very well be that landings historically made into Neah Bay are redirected to Astoria or Westport (which are then processed in Astoria). However, those landings may also be re-directed to Bellingham. Because it is not known where those landings will be redirected, the relationship and associated volume that flows between Neah Bay and Astoria is termed at risk.

The fact that more ports in the north appear to be at a relative advantage than those in the south (particularly those south of Fort Bragg) means that a gradual shift of trawl activity may occur toward the north, potentially putting at risk those landings and relationships in the San Francisco area and areas further south. Factors that may influence this potential shift include making an initial allocation to processors and implementing an area management provision. In addition, allowing trawlers to use fixed-gear may influence this geographic shift. Harvesters in central California, for example, may shift to fixed-gear and continue harvesting sablefish and thornyheads while trawlers to the north increase their take of flatfish by harvesting the flatfish catch foregone by vessels that have engaged in gear switching. Making an initial allocation to processors could allow processing facilities to direct landings associated with their quota to areas that are beneficial to them. An area management provision would also influence this geographic shift by retaining a given proportion of quota in the south, restricting the ability of trawl activity to migrate north.

Because of shifts in the geographic distribution of landing activity, some processing facilities may no longer be necessary, while others may have to expand. The cost to processors who may be adversely affected by these shifts depends on a number of factors. Processors may be able to relocate equipment, but that would have to be balanced against the cost of purchasing new equipment. The tradability of immovable assets (buildings, wharves, etc., and the land upon which they reside) depends on the economic climate in the port region and whether the processor owns or leases these assets. If facilities can be easily put to other uses, and there is sufficient demand, they could be sold; leased facilities could be turned back at relatively little cost. However, there may be human capital assets in a port, such as specialized labor and longstanding relationships with local suppliers that could be lost in the event of relocation. Finally, the actual depreciated value of the facilities would be a factor. A business would face the replacement cost of a fully depreciated asset anyway, so the cost of buying new assets because of relocation may not represent an added cost.[104]

[104] This assumes that businesses' accounting of depreciation accords with the actual, physical depreciation of the asset. For example, a business could assume a period for depreciation but continue to use the asset after the end date because the asset is still usable. Purchase of new assets would then represent a cost the business

4.9.2.3 Changes in the Quantity and Mix of Landings

As discussed under the section describing impacts to LE trawl harvesters, the quantity of harvested species in the nonwhiting sector is expected to increase because of rationalization. This is because of the individual accountability harvesters will face under rationalized fishery conditions and the perceived reward—in the form of increased harvests of currently underutilized species—that will come about as a result of successful bycatch avoidance. The implications of higher harvest volumes could be positive for processors of nonwhiting groundfish if higher harvest volumes decrease the cost of production.

To address the production cost issue, we examine available information from a variety of sources, including the 2001 groundfish harvest specifications EA, reports prepared for the West Coast Seafood Processors Association and presented via public testimony at various Council meetings, and discussions with stakeholders in the shoreside processing industry. Information from the 2001 Groundfish Harvest Specifications EA (PFMC 2000) provides a clear indication of cost per unit of production and available capacity. While this information is not recent, making it likely that costs have changed and industry consolidation may have reduced capacity, it is the best available information. Obtaining operational data from private firms can be difficult because they are often unwilling to divulge information that has business value. In spite of these caveats, this information is still useful for illustrating patterns. In this EA, costs per pound of processing are indicated for 1997 and 2000 (Table 4-56). In addition, the total number of filleting stations is indicated for 1997 and 2000.

Table 4-56. Landings, processing capacity, and costs in 1997 and 2000 (Source: PFMC 2000).

Year	Landings	Utilized Processing Capacity	Processing Cost per Pound
1997	56,209	83%	$1.55
2000	37,557	51%	$1.89

Table 4-56 provides evidence of the effect on processors during a time before recent restrictions on groundfish harvesting and during the start of the period of recent groundfish harvest restrictions. Since harvest volumes are expected to increase in the nonwhiting sector as a result of rationalization, the comparison of processing costs and capacity between 1997 and 2000 is relevant for inferring changes that may occur between status quo conditions and a rationalized fishery. From this information, several patterns become apparent:

- The cost per pound of finished groundfish product increased by 22 percent from 1997 to 2000.
- Eighty-three percent of processing capacity was utilized in 1997, while 51 percent of processing capacity was utilized in 2000.
- Information from PacFIN indicates the landings of nonwhiting groundfish declined from 56,209 to 37,557 mt from 1997 to 2000 (2000 landings were 67 percent of 1997 landings).

From this information, it is clear that excess capacity existed in the shoreside processing industry in both 1997 and 2000, but with substantially greater excess capacity in 2000. It is also clear that the cost per unit of processed product increased substantially in 2000. These changes appear to have occurred because of a decrease in landed volume of nonwhiting groundfish. Several changes have occurred in the industry since 2000, including consolidation in the processing sector. This means that the amount of excess capacity in the industry in 2000 may have diminished, and that, because of this consolidation, the cost per pound of processed product may be now what otherwise would have been the case without the

otherwise would not have had to bear.

recent consolidation. Nevertheless, it is generally accepted that there is excess capacity in the shoreside processing industry.

Analysis of potential increases in harvest volume suggests that landings in the trawl fishery may nearly double (depending on one's level of optimism regarding bycatch reduction). Depending on the degree of increase in landings, existing yet idle capital may simply be reactivated, or new capital may be constructed. In any event, available information indicates that the cost per pound of finished product should decline in the shoreside nonwhiting processing industry because of higher landings.

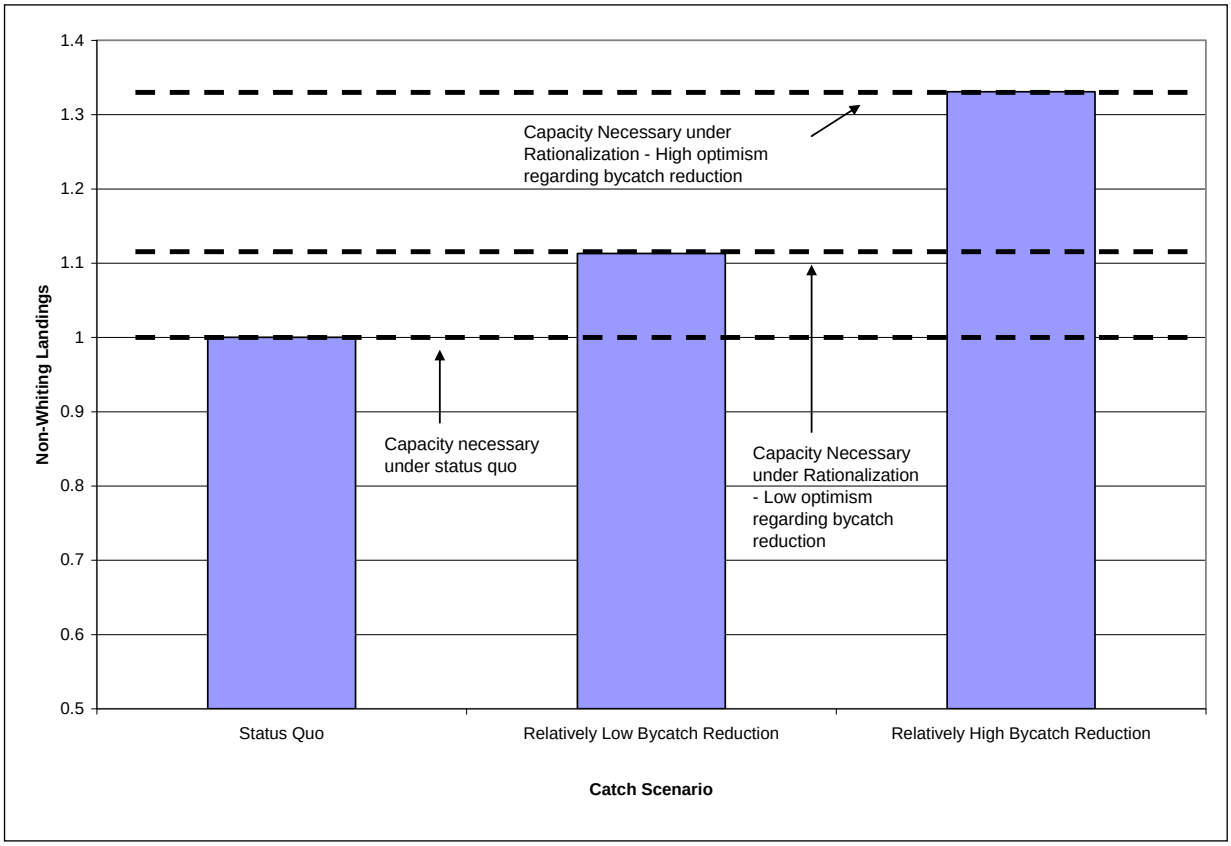


Figure 4-43. Estimated volume of landed catch of nonwhiting trawl-caught species (status quo = 1).

The degree to which shoreside processors could market this additional volume is uncertain. Since whitefish is a global commodity, processors of west coast groundfish compete in a global market with many substitute products. This is likely to mean increased efforts at marketing and selling the additional catch and these increased efforts may mean that the benefit to shoreside processors from increased harvest volumes may be realized over a longer time horizon as marketing efforts and new markets are developed.

In addition to overall volume, the mix in the type of species landed is expected to change. Many species are currently discarded for regulatory reasons and this need for regulatory discard is expected to be substantially reduced under rationalized fishery conditions. Many of the species currently discarded are rockfish, which are relatively valuable. Increases in the amount of these species landed at shoreside processing facilities are likely to be a source of benefit as processors are able to generate revenue on these higher valued species.

Stranded Capital Potential in the Nonwhiting Processing Industry

The possibility of higher harvest volumes speaks directly to the concept commonly referred to as "stranded capital." While it is difficult to identify a consistent and agreed-upon definition of the term "stranded capital," we assume it refers to the potential for capital to become worth substantially less than what may have been the case before rationalization because that capital has little or no other use, and rationalization may have eliminated the need for some, or all, of that capital. In fisheries that have transitioned from a derby style system to a rationalization system, the need to handle peak harvest volumes is reduced or eliminated and as a result, less capital is needed for both the harvesting and processing aspects of the fishery. If this capital is relatively specialized, that capital that is consolidated out of the fishery may be considered "stranded." The fact that harvest volumes in the nonwhiting fishery are expected to increase, and because peak harvest volumes generally do not exist in the nonwhiting trawl fishery, stranding of capital in the processing aspect of the nonwhiting trawl fishery is not expected to occur as a result of rationalization.

4.9.2.4 Changes in the Timing of Landings

An important effect of rationalization on the harvester side is to eliminate Olympic- or derby-style fisheries. This is because harvesters have control over an allocation of fish that is defensible from the actions of others. In the groundfish trawl fishery, the current two-month cumulative landing limits have largely eliminated this form of Olympic-style competition in the nonwhiting sector. The whiting sector remains a single, common quota-based fishery. With exception of the catcher-processor sector, which operates as a cooperative, the whiting fishery can be described as a derby with respect to both target species (the traditional race-for-fish concept), and important bycatch species (often termed "race-for-bycatch").

Rationalization assigns catch privileges to individual harvesters or cooperatives that coordinate their behavior, eliminating the need to compete. This traditionally has led to an increase in the length of the season and a reduction in the volume being harvested during peak time periods. In the whiting fishery, complete flexibility in the timing of landings is mitigated by regulatory measures to limit the bycatch of salmon and vessels' participation in other fisheries, such as the Alaska pollock fishery, or other west coast fisheries. Chinook salmon bycatch is controlled to a large degree by the June 15 start date in the shoreside sector; participation in the Alaska pollock fishery will likely induce at least some participants to leave the west coast during the summer months. However, a reduction in peak harvest volumes could lead to a decrease in the amount of capital necessary to process whiting. Such a decrease in necessary capital should be expected to lead to consolidation of processing activity, and this may translate to the downsizing or closure of some existing whiting processing facilities. Although difficult to estimate, the degree to which necessary processing capital may be reduced can be informed by ability for the whiting season to lengthen.

In recent years, the shoreside whiting fishery end dates have varied between early and mid-August with a start date for the primary season of June 15. Though the period depends on several factors, including the specified Pacific whiting OY and the number of vessels engaged in whiting activity, this information means that the season has lasted 1.5 to 2 months in recent years. Anecdotal information and empirical evidence from the 2007 whiting fishery suggests that whiting become increasingly difficult to prosecute in a shoreside fishery around October 1. This October date of availability can essentially serve as a sideboard on the degree to which the season can lengthen. Using this October date as the possible extent of the primary whiting season means that the season could lengthen by an additional 1 to 1.5 months, or by 33 to 50 percent if peak volumes decline and are used to extend the season. This effectively serves as an upper bound estimate on the degree to which the need for shoreside whiting processing capital could decline. It is likely that the demand for shoreside whiting capital will not

decline this far because many harvesters in the shoreside whiting fishery still participate in other sectors (the mothership sector) and other fisheries (the Bering Sea pollock fishery), which are time constrained. This means that many harvesters may still have to prosecute their fishing activity during the same time as status quo. Therefore, the season is likely to be characterized by a period of peak production that is the same as the existing period of peak production. However, the magnitude of that peak may decline somewhat, and the season may extend into the early fall. The decline in peak production is likely to be less than 33 to 50 percent due to the time constraints described above.

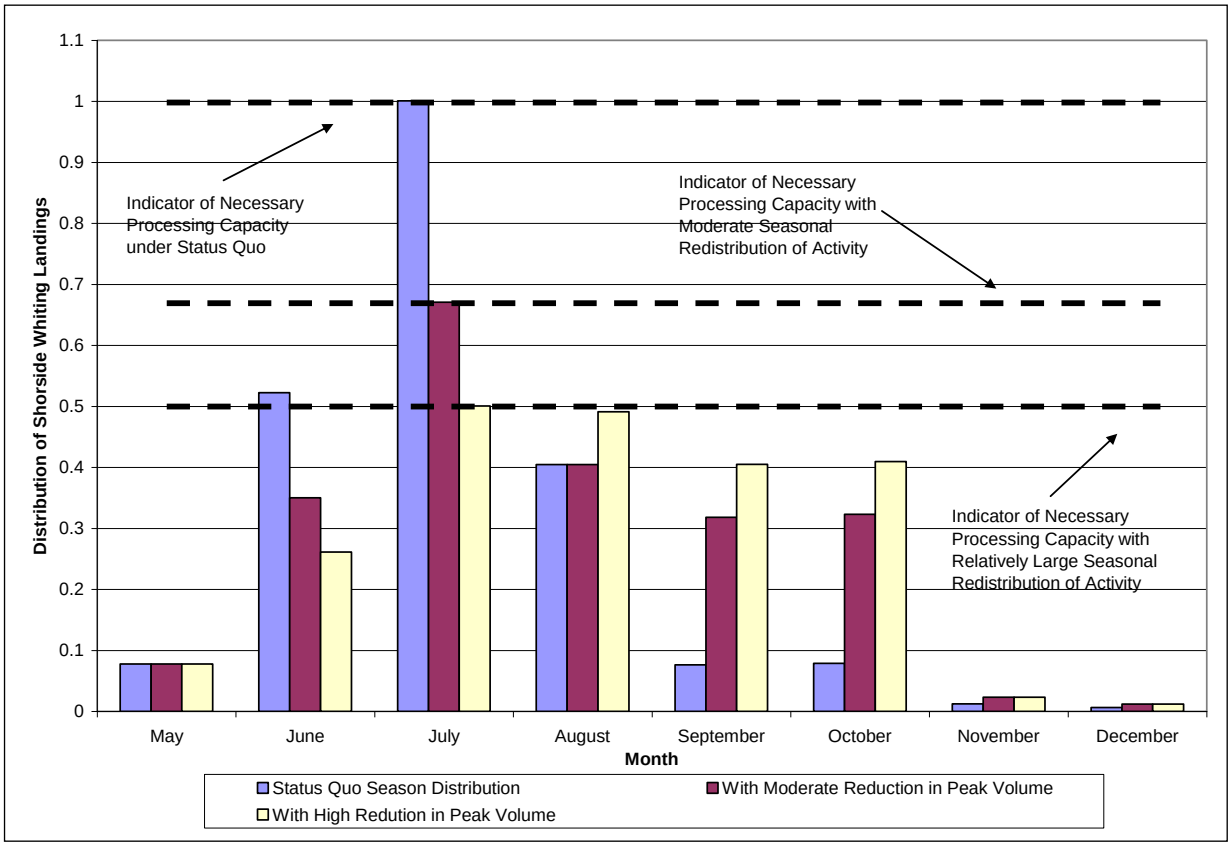


Figure 4-44. Estimated seasonality of shoreside whiting landings.

In the nonwhiting sector it is generally accepted that Olympic fishery conditions do not exist. Nevertheless, an IFQ system could have some benefit in terms of greater control over the timing of landings in comparison to the current cumulative limit system. From the processors' perspective, these changes in harvest timing are likely to be beneficial. Again, depending on relative bargaining power, they would be able to optimize plant operations by better matching deliveries to the plants' characteristics (for example, how much fish can be processed in a given time period and the use of labor) and match product flow with market conditions.

Stranded Capital Potential in the Shoreside Whiting Processing Industry

The timing of landings in the shoreside whiting fishery speak to the potential of stranded capital in the shoreside portion of the Pacific whiting fishery. While harvest volumes may not necessarily change substantially, the seasonal redistribution of that harvest will tend to reduce the need to accommodate peak processing demand and therefore reduce the need for processing capital. If this capital is relatively specialized, that capital may become stranded as it may have little to no other alternative use.

4.9.2.5 Market Restructuring of the Processing Sector

Rationalization could change the overall makeup of the processing sector through restructuring and making it more difficult for new firms to enter the sector. Currently, the west coast processing sector is organized around a large operator and its subsidiaries, several mid-sized firms, and a larger number of smaller firms. If the trawl fishery is rationalized, new opportunities may present themselves, leading to restructuring of the processing sector. From the experience of other rationalized fisheries, there has been a move towards further consolidation of processing firms to counter the increased bargaining power of harvesters. Either through consolidation by direct purchase or joint ventures, integration could increase. This includes both horizontal integration—business arrangements among processors—and vertical integration—arrangements between processors and harvesters. An initial allocation of QSs to processors could stimulate horizontal and/or vertical integration. First, QS are likely to encourage consolidation as more efficient firms are willing to buy up QSs owned by less efficient firms. This could occur among processing firms or processing firms could buy up harvesters' QSs (and their physical assets, such as vessels), increasing vertical integration. Depending on the availability of capital the converse could occur; more efficient harvesters could buy up processors' QSs (and/or their physical assets) to vertically integrate. In general, such consolidation or integration would be encouraged by any resulting returns to scale: increased size and integration across a range of operations would serve to reduce overall costs. Joint ventures serve much the same purpose while retaining existing ownership arrangements.

4.9.2.6 Product Recovery

Regular supply is likely to increase "product recovery yield," or the ratio of the final weight of processed fish to the weight delivered to the plant.[105] Better use of plant equipment, fine-tuning, and modification of equipment, as well as better use of labor would lead to an increase in product recovery. Laborers working under more paced conditions would have the opportunity to cut fish more carefully; likewise, equipment could be more easily adjusted to maximize yield. As previously discussed, this is likely to be a bigger factor in the whiting fishery if its derby characteristics are eliminated. Since this is a high-volume fishery with a generally highly processed end product, small changes in product recovery yield can lead to a substantial increase in profits. Initial allocation of QSs to processors, functioning as a means of guaranteeing supply, could provide an incentive to make necessary capital investments to increase product recovery yield.

In the nonwhiting fishery, some factors may lead to an increase in product recovery, while others may lead to a decrease. Since IFQs tend to increase certainty about the future and enhance business planning, new investments may be made in processing equipment, which would lead to greater product recovery. However, less desirable fish may be landed in the nonwhiting fishery as market discards and high grading are decreased. Since a discarded fish represents a cost to harvesters in a rationalized fishery (discards serves as foregone revenue because any such amounts must be covered by QPs), there may be reasons for harvesters to land smaller and less desirable fish under a rationalized fishery than under status quo, where small and unmarketable fish are more likely to be discarded. In general, smaller fish result in lower yields because a larger proportion of the fish comprises unmarketable parts (e.g., head and guts).

[105] This is also discussed with respect to effects on harvesters, in Section 4.6.2.2.

4.9.2.7 Changes in the Value of Capital Assets Held by Shoreside Processors

The value of capital assets held by shoreside processors may be affected by rationalization similar to the ways in which trawl harvesters are affected. While shoreside processors may not hold permits (though some processors do own LE trawl permits), shoreside processors have the potential to be affected by consolidation in the processing portion of the fishery. Consolidation in the processing aspect of the fishery can occur for several reasons, the most common of which is a redistribution of harvest timing in a fishery moving from a derby fishery to a rationalized fishery. This redistribution of harvest timing reduces the need for peak processing volumes and subsequently reduces the amount of capital required to process the same amount of harvest. Through market mechanisms, the amount of capital that exists in a fishery that experiences a reduction in peak harvest volumes should consolidate. Though the form of that consolidation may not be entirely known, a decrease in the amount of processing capital necessary to process a given amount of catch will almost certainly reduce the value of capital, especially if that capital is relatively specialized and cannot be easily used toward another purpose.

The initial allocation of QSs can offset the change in asset value that may be driven by a switch in a fishery that moves from a derby fishery with peak harvest volumes, toward a rationalized fishery that is more paced and with harvest volumes that are relatively spread out. Those alternatives that allocate QSs to processors will undoubtedly grant processors a capital asset. Those alternatives that allocate relatively greater amounts of QSs to processors will grant those processors a relatively greater amount of capital assets, while those that allocated little or no shares to processors will allocate little or no capital assets to processors.

4.9.2.8 Other Broad-Level Effects on Shoreside Processors

The overall mix of landed species could change, both because of an increase in the quantity of target species and added flexibility to employ different harvest strategies. As already discussed, harvesters will have more control over the timing of their catch and it is expected that landings will be more evenly distributed throughout the year. These changes could benefit processors in at least two ways. First, harvesters should be able to increase the quality of landed fish, because a more measured pace of fishing will allow more attention to factors affecting quality (such as the amount of fish caught in a given haul and the storage of fish onboard the vessel). This may be more of a factor in the whiting sector because, as discussed above, currently it is more of a derby-style fishery. If harvesters are able to better control the quantity and mix of species in their landings, this could benefit processors by assuring a more stable supply, which would make it easier to maintain existing markets and develop new ones. With more stability in catches, harvesters and processors may be able to coordinate to develop new products and markets. Changes in harvest strategies, assuming they translate into reliable supply, could allow processors to more effectively market new product forms. Higher quality landings could benefit processors because they can deliver a higher quality—and perhaps higher priced—product to markets. Any premium realized again depends on relative bargaining power; however, if harvesters have relatively more bargaining power then they may be able to command a price premium for higher quality landings, reducing processors' profits from higher retail prices.

Several factors, while related to the changes in the harvesting sector that would induce a more regular supply of fish to processors, bear more directly on the operational characteristics of processors. These include operating costs, product recovery yield, ability to respond to market demand, and the ability to realize higher final product prices. As previously mentioned, these effects are more likely to be felt in the whiting fishery, because currently it is subject to greater variability in the timing of landings in comparison to the nonwhiting sector managed under cumulative landing limits. However, a more modest effect could be felt in the nonwhiting sector because harvesters would be released from what are essentially two-month individual vessel quotas.

In a rationalized fishery, the cost of processing could be affected in a variety of ways. Labor costs per unit of processed fish could be reduced if, as discussed above, deliveries are steadier or made on a predictable basis. This would reduce the need to lay off workers when deliveries dip and pay overtime when delivery volume exceeds normal plant operating capacity. Similarly, the physical plant could be more efficiently used if inputs are supplied more regularly. For example, variable inputs like power and water might be obtained at lower cost if demand is more even. While operating costs could be lowered, changes in the relationship between harvesters and processors affecting bargaining power could change raw fish (input) costs. If harvesters are in a better position to negotiate prices then the overall cost to processors could increase. Relations with harvesters will also affect the distribution of some of the compliance costs, such as payment for a catch monitor to observe the offloadings. While regulations may require that the processor pay these costs directly to an observer contractor, depending on relative bargaining power, the processor may pass the expenses through to the vessel or bear the cost itself.

To the degree that IFQs or cooperatives allow harvesters to time landings and coordinate with processors, rationalization could allow processors to better respond to changing market conditions along with the ability to develop new markets. Market conditions are subject to the changing tastes and preferences of consumers. A guaranteed supply of fish, and thus more steady supply to retailers, would allow processors to gauge these consumer preferences and develop products to meet them. Processors could also bring a greater variety of products to market, including new ones. This could include development of specialized products for niche markets, based on the ability to reliably supply certain species or product forms.

Markets respond favorably to uniformity and predictability, and stronger guarantees of steady product deliveries could increase market penetration and the building of stronger relationships with retailers. West coast fish providers (harvesters and processors) could in turn increase their share of the international whitefish market, for example by providing higher quality fillets to niche markets. Again, increasing the ability to guarantee supply to retailers and meet consumer demand for specialized products should increase profits for processors and potentially for harvesters, depending on their relationship with processors.

4.9.3 Direct and Indirect Effects of the Alternatives on Shoreside Processors

This section provides an analysis of the direct and indirect effects of the alternatives on shoreside processors. It begins with an overview description of the manner in which each of the key elements of the alternatives is expected to impact processors. The details of the alternatives are evaluated in the remaining subsections, with a comparison to status quo and other alternatives, as appropriate.

4.9.3.1 Expected Effects of Elements of the Alternatives on Shoreside Processors

A summary comparison of the key elements of the alternatives is provided below. Each of the alternatives will impact groundfish processors in different ways. Before considering the impact of the alternatives, we first examine how the elements of the alternatives are expected to impact processors in a general sense. Following this discussion, we examine the impact of each alternative on groundfish processors.

How does the implementation of an IFQ / co-op system impact processors relative to status quo?

IFQs and co-ops have a direct effect on the harvesting associated with a fishery. Processors may be affected indirectly from changes in harvesting activities. If processors are allocated QSs, however, they

may have a direct influence over harvesting activity. Issuing catch privileges that are defensible and in a manner that makes harvesting entities individually accountable will lead to changes in the timing of harvesting operations, in the flexibility of harvesting operations, in the volume and mix of landed species, and potentially in the location of delivery and processing activity. Many of these effects were described previously. Changes in timing and harvest volume associated with the fishery may have some positive impacts to some processors and potentially adverse impacts to other processors. Those processors who are the recipients of additional volumes of nonwhiting groundfish may be positively impacted because of additional throughput (which creates potential for revenue) and lower per unit costs of processing. In addition, if the whiting fishery season length increases, production costs in the whiting fishery may decline, because of less necessary capital to process the same amount of volume. Those firms able to capitalize on those lower costs may benefit. Furthermore, an increase in the season length of the Pacific whiting fishery and a subsequent reduction in peak harvest volumes allow for fine-tuning of production, which tends to increase yield and product quality. However, because of a reduction in peak harvest volume, fewer processing companies and/or facilities may be necessary to handle harvest volumes of Pacific whiting, meaning some companies may find themselves without enough product to continue justifying processing operations of Pacific whiting. This could also occur in the nonwhiting fishery because of regional shifts in fishing patterns where those processors in areas seeing a reduction in nonwhiting activity may find themselves without enough volume to justify operations, while those seeing an increase may benefit.

The decision to implement IFQs or cooperatives may have different effects on processors. Much of the effect of IFQs or cooperatives on processors depends on whether processors are allocated quota (in an IFQ program) or whether they are tied to catch history (in a cooperative program). If processors are not allocated quota in an IFQ program, or are not tied to a permit in a cooperative program, then the effect on processors may be the same. The effect of allocating processors QSs or establishing processor ties is described in a later sub-section.

IFQs and co-ops have the potential to increase certainty about future opportunities. With greater certainty to harvesters and, potentially, processors, better planning and efficient utilization of processing facilities can be achieved. Certainty about future opportunities can be achieved if processors hold QSs, or if they have established relationships with harvesters who hold QSs.

How does initial allocation of QS to harvesters make things different for processors?

The initial allocation of QSs will have a secondary effect on processors, as described above, with parts of the coast seeing a decline in processing activities and others an increase. Allocating QSs to harvesters will also have an effect on ex-vessel prices paid to harvesters for fish. This is because harvesters with QSs may be able to leverage higher ex-vessel prices from processors if the entire allocation is made to harvesters.

How do processor initial allocations or ties affect processors?

If processors receive initial allocation of QSs, then processors' bargaining power over ex-vessel prices will increase compared to a case where they do not receive QSs. Processors with initial allocation can vertically integrate and also engage in fish harvesting opportunities to some degree independent of other harvesters. This increases the ability of processors to hold out against harvesters while negotiating over ex-vessel prices.

Processors with QSs will gain increased flexibility for matching catch periods to market demand, and elongating the season for optimal processing efficiency. This creates opportunities for lower per unit

costs; in combination with expanded market opportunities, this could lead to an increased ability to compete with groundfish providers in the global market.

The regional distribution of fishing activity, a result of harvester shares, may also be influenced by processors that receive initial allocation. Since processors have fixed and generally immobile processing plants, they may use their QSs to contract for harvesters' nearest existing facilities and maintain harvest volume in their facilities.

If processors are tied to harvesters in a cooperative system, the net effect on ex-vessel prices is unclear. Prices paid in this case may depend on personal relationships between the processing entity and the harvesting entity. Some Bering Sea cooperatives appear to have developed profit-sharing arrangements between harvesters and processors. A cooperative with processor linkages tends to create a structure where harvesters take into account the needs of processors and vice versa. This relationship begins to look like a vertically integrated firm, and profit sharing between harvesters and processors may become more likely. However, this may only occur if both the harvester and processor are able and willing to coordinate activities with one another.

Finally, a processor linkage provision in a cooperative system does not decrease the quota available to individual harvesters. Therefore, establishing linkages in a cooperative system does not give processors direct control over any harvesting activity.

How will accumulation limits affect processors?

Accumulation limits restrict the amount of quota any single entity may hold (the control limit) and the amount of quota that can be placed on a vessel (the vessel limit). A per-vessel limit will limit fleet consolidation, which tends to restrict the economic performance of harvesters. However, this tends to spread out the amount of harvesting activity across a wider number of locations. If this results in a more widespread geographic distribution of vessels then this would tend to reduce the likelihood for closure of geographically disadvantaged processing facilities.

Control limits affect the ability of the processing sector as a whole to increase the amount of QSs held by the processing sector. High control limits will tend to allow the processing sector to acquire more QSs over time, while small control limits tend to favor harvesters and restrict the amount of quota the processing sector can acquire over time. This is due to the concept of scale economies. In general, the structure of harvesting and processing will lead to more harvesters than processors participating in a fishery. Accumulation limits, therefore, tend to leave QSs in the harvesting sector more than in the processing sector simply because there may not be enough individual processing entities to acquire all the quota if accumulation limits exist, though this will depend on the size of the accumulation limit and the number of processing entities. This will have a long-term effect on ex-vessel prices.

A restriction on control will tend to limit the degree of influence that the largest processors will have on the program, and, therefore, affect the distribution of economic performance. Large processors potentially affected by a control limit may have their participation in the fishery restricted by that limit, thus causing redistribution in their control over delivery and, therefore, processing activity.

How will a grandfather clause affect processors?

A grandfather clause tends to have a distributional effect on processors if processors stand to receive an initial allocation of QSs. Those processors that have historically been large producers would gain QSs in excess of the accumulation limits if a grandfather clause is adopted.

If large processing entities receive QSs in excess of the accumulation limits, this may affect ex-vessel prices, because it creates the potential for a few dominant companies to hold large amounts of QS. In contrast, if there is no grandfather clause, those same large processing entities with excess QSs may be allowed to divest QSs that are over the limit by a specified date. When that divestiture must take place—whether immediately after IFQ implementation, or after a specified waiting period—will likely affect the value received by processors for the excess QS asset. A delayed divestiture period will provide those processors with time and opportunity to transfer that quota in a manner that benefits them, and this may come in the form of relatively high sale price for excess QSs, or transfer to an operator that tends to deliver harvested species to their processing operation.

How does the number and type of species covered affect processors?

The number of species covered will affect harvesters directly, and processors indirectly. As the number of species covered in the program increases, harvester flexibility—at some level—begins to decrease, and this may have an effect on the outcome of the program. Species with low OY levels may impose risk to harvesters because of uncertainty about what a vessel will catch while fishing and the cost of going into deficit (Section 4.6.2.4). If some of the species covered generate a high level of risk to harvesting operations, harvesters may avoid targeting those species associated with high-risk species. This would decrease the amount of some species available to processors. This may be true for shelf flatfish species that include English sole, petrale sole during summer months, and sanddabs, among other species.

How do the number of trawl sectors influence processors?

The number of trawl sectors primarily influences the ability of the shoreside sectors to trade quota among one another. Establishing four trawl sectors may, at times, make it difficult for either one of the sectors to operate, if a target species in one sector becomes a constraining species in another. As described in Section 4.6, describing impacts to harvesters (page 284), establishing a four-sector split on sablefish, for example, may constrain the shoreside whiting sector during years when sablefish bycatch is higher than expected. This could occur because shoreside whiting harvesters may not have a mechanism for acquiring additional sablefish quota to cover unexpectedly high bycatch. In the extreme case, this constraint may lead to premature closure of the fishery and foregoing harvest of whiting. This would have an adverse impact on shoreside processors, because less whiting would be delivered than otherwise would be the case. In a three-sector alternative, both shoreside sectors can trade quota among each other as necessary, thus providing a mechanism for covering unexpectedly large catches of nontarget species in one sector with QS held by the other. This would tend to increase the likelihood that shoreside processors would receive the expected amount of harvest volume.

How will an adaptive management provision affect processors?

If processors do not get an initial allocation of QS, the adaptive management provision provides a mechanism to mitigate harm to adversely impacted processors. This may mean that some processors receive greater landings of groundfish than would otherwise be the case.

If processors are awarded an initial allocation (and therefore cannot be direct recipients of adaptive management quota, which is one option considered by the Council), adaptive management will have a distributional effect on processors. Some processors may gain while others lose because of the distribution of adaptive management quota to harvesters who deliver to certain processors.

Adaptive management could also provide a vehicle for entry of new processors, enable development of specialty processing opportunities addressing niche markets, or create goal-oriented processor-harvester arrangements.

How will area management affect processors?

For processors who operate both in the north and the south, establishing an area management provision (dividing QS at 40° 10' N. latitude) will tend to decrease efficiency and processor flexibility, because large processors would have less ability to optimize the location of their processing and buying activity. Instead, they may need to retain a larger presence in both areas than would otherwise be the case. However, area management could increase the certainty that catch will continue to be delivered in each area, benefiting those locations that might otherwise stand to lose deliveries. Smaller processors that are located in only one of the management areas may be more likely to continue receiving landings in theirregion.

Area management, combined with gear switching provisions for harvesters, may have an indirect effect on processors. If large-scale gear switching occurs off certain areas of the coast, the harvest of many flatfish species may be foregone since nontrawl gear is less effective at catching many types of flatfish. In such an event, the inability to move flatfish quota to another area of the coast, where trawl vessels may be located, may result in lost or decreased potential for flatfish catch. This will decrease the quantity of flatfish available to processors in areas where large-scale gear switching occurs.

How will a carry-over affect processors?

A carry-over provision lowers the cost to harvesters of going into deficit, and, therefore, decreases the risk associated with harvesting activity. Such a change in risk may mean that harvesters are willing to prosecute target species that are associated with high-risk species. This will have a secondary effect on processors, because it may mean that processors are the recipients of shelf flatfish catch.

How will tracking and monitoring affect processors?

At-sea monitoring primarily affects the cost of fishing. It will have only limited effect on processors, except to the extent that harvesters can bid prices received higher to cover added costs. High monitoring costs may also lead to higher levels of fleet consolidation and this may influence processors because of the presence of fewer harvesters from whom to purchase fish. Implementation of shoreside tracking and monitoring, including the use on shoreside compliance monitors, will likely add to processor operating costs. Under the program, processors are obligated to bear the direct costs of providing shorebased compliance monitors at the time of landing. Sharing of monitoring costs with harvesters could be subject to negotiation, depending on the relative bargaining power of the parties. If harvesters are in a relatively stronger position they could demand that a processor pay part of the cost of at-sea monitoring as an incentive to make deliveries, for example. In contrast, if processors have relatively more bargaining power, they could demand that harvesters pay part of the cost of shoreside compliance monitors. Processors would also bear some indirect costs for shoreside compliance monitors. For example, they would have to provide a workspace for the monitors, possibly modify production processes to accommodate monitoring, and incur other costs related to coordinating shoreside monitor activities with landings.

4.9.3.2 Alternative 1 (No Action)

The No Action alternative is largely expected to result in a continuation of existing conditions in the processing portion of the fishery. Harvest volumes in the nonwhiting and whiting portion of the trawl

fisheries are not expected to change dramatically from current conditions and. Therefore. processors are not expected to receive harvest volumes that are much different from status quo. The existing state of processor capital consolidation is not expected to change substantially, though it may continue to become more heavily concentrated into fewer companies. The revenue that processors generate under status quo conditions is not readily known and therefore the amount of revenue generated by processors under the No Action alternative are not readily known.

4.9.3.3 Alternative 2a

The net effect of Alternative 2a on processor net revenues compared to status quo is unclear. However, it is likely that processors will be the least well off under this alternative when compared to the other non status quo alternatives.

Under this alternative, QSs are given to permits based on catch history. As noted above, this will lead to consolidation among the harvester fleet, and harvesters remaining in the fishery will have a stronger position from which to negotiate (and if necessary, hold out) for ex-vessel prices without fear of losing harvest opportunities to others. In addition, the fact that the harvesting sector has control over the QSs means that the fishery is likely to be prosecuted in a manner that benefits harvesters. As illustrated in Appendix C, this is likely to result in geographic effects with some ports standing to be at a disadvantage, and others at an advantage, because of rationalization. Those processors reliant on deliveries to disadvantaged ports stand to see delivery volumes potentially decrease.

Because they would not receive an initial allocation, processors would be worse off under Alternative 2a than Alternatives 3b, 4, 5, or 6. Processors overall would also tend to be worse off under Alternative 2a than under Alternative 2b, which has a provision for adaptive management that could be used for mitigating effects on certain processors. It is not clear whether processors would be better or worse off under Alternative 2a compared to status quo.

Nonwhiting processors

In general, it is expected that processors will pay a higher ex-vessel price under this alternative compared to status quo, principally because the majority of QS is distributed to harvesters. However, the cost of processing production (outside the cost of purchasing fish) may decrease under this alternative as volumes increase in the nonwhiting sector. Under perfectly competitive conditions, those holding the QSs may be expected to bid away all of the profits from others. However, current conditions suggest that existing nonwhiting processors may have some influence over harvesting activity in the nonwhiting sector because a relatively small number of firms process the majority of the harvest and because processors currently exert some influence over the timing of harvesting operations even though harvesters apparently wish to fish at other times. Because of this apparent influence, it is not clear that allocating QSs to harvesters will mean that harvesters can bid away all of the profits generated by processors, if any are actually realized. It is likely, however, that harvesters will increase their influence over ex-vessel prices, therefore increasing the cost processors incur from purchasing fish. On the other hand, the likely increase in harvest volume means that the cost of production may decline. The net effect on processors in this sector depends on the net effect of higher ex-vessel prices versus lower unit costs of production. If ex-vessel prices increase more than unit costs of production decrease, then processors may be worse off, but if unit costs of production decrease more than ex-vessel prices increase then processors may be better off compared to status quo.

The bargaining advantage that harvesters have over ex-vessel prices is likely to exist in the short term and possibly over the long term. While theory would suggest that quota could be purchased by processors over the long term (thus shifting some ex-vessel price negotiation advantage back to

processors), the accumulation limits in this alternative will temper the ability of processors to purchase substantial quantities of quota. Accumulation limits in this alternative would lead to a maximum of 3 percent being controlled by any single entity, which is substantially less than the amount of groundfish currently handled by several west coast processors of trawl groundfish.

Under this alternative, harvesters have greater influence over the geographic distribution of activity than the processing sector, because of their control of QS. This control will have a geographic effect on where landings take place, and this will have impacts to processors. Those processors who rely heavily on ports where landings may diminish may see less volume than under status quo, while processors who rely heavily on ports where landings increase would see more volume than under status quo. Based on the regional comparative advantage analysis, processors of nonwhiting trawl-caught groundfish who rely on landings from Neah Bay, Crescent City, Fort Bragg, Moss Landing, and Half Moon Bay may see landings volume decrease, while processors who rely on activity from other ports may see volume increase. Table 4-57 illustrates the expected geographic effect of landing activity and indicates how that influences processing entities. While specific business information is not provided, the table does indicate that many processing centers may have some of their sources of landings put at risk by geographic shifts in landing activity that could occur under Alternative 2a. However, many of those same centers may stand to gain product because of geographic shifts at the same time (e.g., Astoria). This information is based on the geographic comparative advantage analysis contained in Appendix C, and the information collected on where processing plants are located and the ports from which those plants receive their fish.

Table 4-57. Processing centers with some landings at risk due to regional shifts in fishing and delivery activity.

Astoria	San Francisco
Bodega Bay	San Jose
Eureka	Sand City
Fort Bragg	Santa Rosa
Half Moon Bay	Scotts Valley
Hawaiian Gardens	Watsonville
Morro Bay	

Under Alternative 2a, several processing companies stand to gain QSs. Although quota is not explicitly allocated to processors under this alternative, the fact that several processing companies own trawl permits means that some QSs will be held by processors. Figure 4-45 illustrates the QSs received by processing entities under this alternative.

Under both Alternatives 2 and 6, nonwhiting processors will not receive an initial allocation of QSs, but processors have the opportunity to participate in an adaptive management provision available specifically to nonwhiting (but not whiting sector) processors under Alternative 4b. No such provision exists under Alternative 2a.

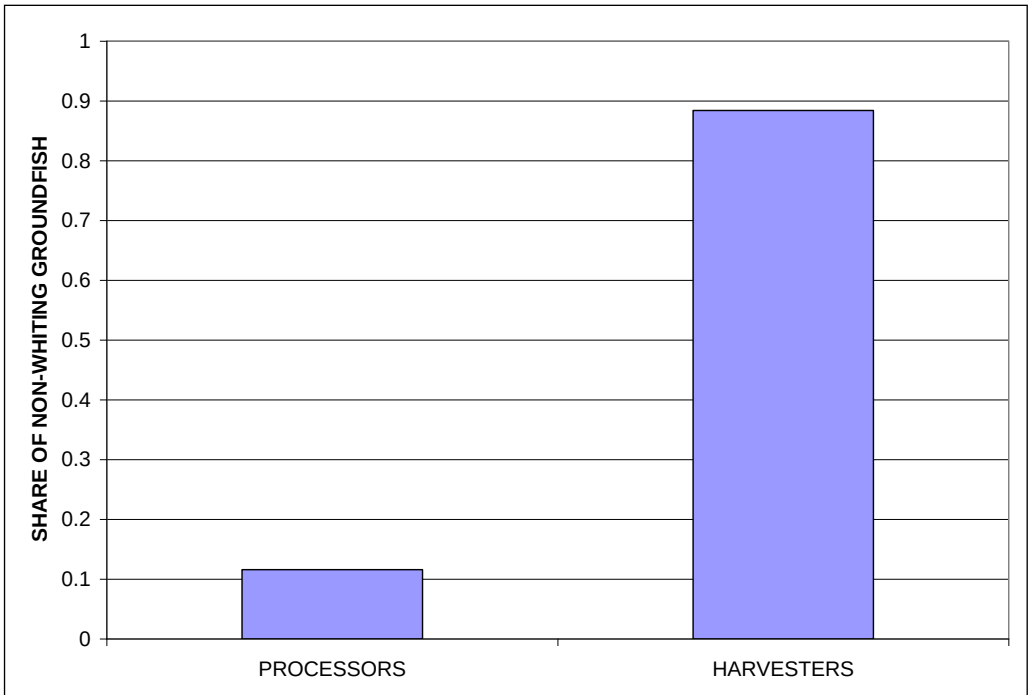


Figure 4-45. Share of nonwhiting groundfish allocated to harvesters and processors in Alternative 2a.

Shoreside Pacific whiting processors

As noted in the harvester section (4.6.2.2), fleet consolidation will take place among shoreside whiting vessels, but not to the extent of the nonwhiting portion of the fishery. Harvest activities are bounded by resource accessibility and seasonality of other fisheries, particularly Alaska pollock in the North Pacific. Geographic migration of the stock to the north imposes a resource access issue because shoreside whiting processors are limited to areas that range from northern California to southern Washington, and the depth-based migration of the stock poses an access issue because harvesters in the shoreside fishery have difficulty fishing at depths where whiting are found later in the year.

Season length in the shore-based harvesting sector is expected to lengthen to some degree under a rationalized fishery. This change in the pace of harvesting will tend to increase product quality and therefore increase the value of Pacific whiting harvests. However, since the holders of QSs are able to bid away profits from others, it is likely that harvesters will bid up higher ex-vessel prices, thus increasing the costs processors must bear for acquiring fish. The elongated season is also likely to result in less processing capital being necessary to handle harvest volumes. If the length of the season increases by 33 to 50 percent, the amount of processing capital needed to handle the same volume may decrease in a similar fashion, because there is less volume at any given time. Such a decrease in processing capital is likely to decrease the cost associated with processing outside the cost of acquiring fish from harvesters. However, this decrease in the need for processing capital will also decrease the asset value of processing equipment that is no longer necessary. Owners of that equipment would tend to be adversely impacted if the equipment cannot be sold or put to another use.

The net effect of this alternative on shoreside whiting processor profits is not clear; however, harvesters may have more leverage over ex-vessel prices in the whiting fishery than in the nonwhiting fishery. Available information indicates that new entry into the whiting processing sector has occurred in recent years, which is a form of competition among processors. This competition means that individual

processing entities may not exert as much influence over harvest operations and prices as in the nonwhiting sector. In addition, the rationalization of the fishery and resulting end of race-for-fish conditions means that harvesters in the whiting fishery can hold out against processors without losing available harvest, increasing their negotiation stance over processors. Such new entry seems not to have occurred in the nonwhiting processing sector, nor has the race for fish occurred in the nonwhiting fishery, meaning that harvesters in that sector currently have the ability to hold out to some degree without losing available harvest volume ―at least within the two-month cumulative trip limit period. Therefore, ex-vessel prices paid by processors for shoreside whiting are likely to increase more than in the nonwhiting sector. However, since the cost of processing is likely to decline because of lower peak harvest volumes, the net effect on the shoreside processing industry in the aggregate is not clear. It is possible, however, that certain processors could be adversely impacted if their assets lose value, while other processors could be positively impacted if their production volume increases.

The negotiation power over ex-vessel prices will shift from processors to harvesters, at least in the short run, in Alternative 2a relative to status quo. Over the long term, however, processors may be able to acquire enough Pacific whiting quota to influence ex-vessel prices. The control limits specified in this alternative could allow four business entities to control the harvest of shoreside whiting. Since there are currently more than four shoreside processing entities, this alternative could conceivably allow processors to control all of the whiting QSs over the long term. In addition, under the initial allocation provision, some processing entities will receive an initial allocation of quota, because they own LE trawl permits.

Geographic shifts in the delivery of shoreside Pacific whiting are not expected to occur. Since shoreside whiting processing facilities are geographically constrained to an area that ranges from central Washington to northern California, there is limited opportunity for additional processors of whiting to become established elsewhere, and therefore there is limited opportunity for harvesters to deliver to other locations. Furthermore, the fact that the processing of shoreside whiting relies on a large investment in relatively specialized capital means that it should be relatively difficult for new companies to enter into the processing of shoreside whiting. Therefore, it is reasonable to expect that the delivery location of shoreside whiting under a rationalized fishery should remain the same or similar to the existing delivery locations. One factor that may influence these patterns, however, is if a large processor of shoreside whiting closes operations because of consolidation in the shoreside whiting processing industry.

Processors of shoreside whiting are expected to receive some QSs even though no explicit allocation is made to processors, because of trawl permits that are held by shoreside processors. Because both the estimated QS processor allocation and the number of processing companies receiving QSs are small, the actual data are not presented. However, processors receive less than 5 percent of shoreside whiting quota under this alternative.

4.9.3.4 Alternative 2b and 2c

Many of the provisions under Alternatives 2b and 2c are similar to those of Alternative 2a, but Alternatives 2b and 2c are designed to compare two methods for addressing processor concerns. One method (Alternative 2b) uses an adaptive management provision to mitigate against adverse impacts to processors.[106] Processors that receive this quota (and the communities in which they reside) will likely

[106] To be clear, the suite of alternatives allows the adaptive management provision to be used for things other than addressing processor concerns, such as mitigating against the effects to adversely impacted communities, and to provide incentives to use habitat- and bycatch-friendly gear.

benefit, although it may not yield the most efficient outcome in terms of national economic development gains expected from rationalization.

The second method (Alternative 2c) initially distributes QSs to processors, including 25 percent of groundfish QSs and 50 percent of whiting QSs. This alternative will have a distinctly positive effect on processors relative to Alternative 2a in terms of their bargaining power over ex-vessel prices. Harvesters with QSs will gain bargaining power because of their holdings of QSs, but also through fleet consolidation. Such fleet consolidation limits the number of vessels that processors can negotiate with, and therefore limits the ability of processors to shop around for harvesters willing to fish at lower ex-vessel prices. The fact that processors begin with some initial allocation means that they can vertically integrate and engage in fish harvesting opportunities to some degree independent of other harvesters. This increases the ability of processors to hold out against harvesters while negotiating over ex-vessel prices. It is almost certain that the ability for processors to negotiate lower prices increases as their ownership of quota increases; however, it is not certain whether the initial allocation options that grant quota to processors will increase or decrease their negotiation stance relative to status quo.

In general, those holding QSs experience more certainty about the future than those entities that do not. This increased certainty provides for better business planning in the long term. This greater degree of certainty can be expected to lead to greater degrees of reinvestment into fishing and/or processing-related capital equipment and technology (Anferova et al, 2005). This is because greater certainty makes profit expectations ―and the ability to pay back loans taken for investments ―more certain. Over time, the reinvestment of financial capital back into fishery related industries may very well improve the overall economic status of fishing-related industries, since such reinvestment will be driven by the expectation of profits associated with that reinvestment. Those entities that do not hold QSs are less likely to reinvest in fishery-related activities, and the result may be deterioration in the status of equipment used by those entities. Such an outcome was observed in the Russian Far East where QSs were auctioned off. The result was a serious deterioration in the economic situation of fishing enterprises (Aneferova, *et al.* 2005). Although auctions work differently than QSs that are initially allocated over the long term (and, therefore, the outcomes may be quite different), the perspective of an entity engaged in purchasing quota through an auction is inherently shorter term than an entity that owns QS. In a program where QSs are intended to be long term, those entities that do not hold QSs are likely to be more uncertain about the future than those entities that do hold QSs. Therefore, if processing companies do not hold QS, the level of reinvestment is likely to be smaller than if they do hold QSs. Furthermore, the level of reinvestment made by each entity is likely to be correlated with the level of QS held by each entity.

Also related to the above discussion is the fact that Alternative 2c effectively grants processors a type of asset, while Alternative 2b does not. With an initial allocation of QSs in Alternative 2c, processors can entice harvesters to deliver to their plants, but, in the event they do not, and that processor cannot continue to justify participation in the fishery, that processor can receive some compensation by selling the QSs received through initial allocation, or by leasing it to an operator. Alternative 2b does not have this capital asset effect.

A distribution of QSs to processors, as in Alternative 2c, will tend to have a geographic effect as those processors direct landings associated with their QSs to particular ports where their plants are located. In contrast, an adaptive management provision (Alternative 2b) will tend to have different geographic consequences as well, if adversely impacted processors are located in areas to which adaptive management shares are directed. Figure 4-46 illustrates the geographic implications of 1) allocating nonwhiting quota to permits entirely, 2) allocating 75 percent of the nonwhiting quota to permits and 25 percent to processors, and 3) allocating 100 percent of nonwhiting quota to permits, but reapportioning 10 percent of that quota through an adaptive management provision to adversely

impacted processors. For analysis, we assume that adversely impacted processors are in Moss Landing and Half Moon Bay.

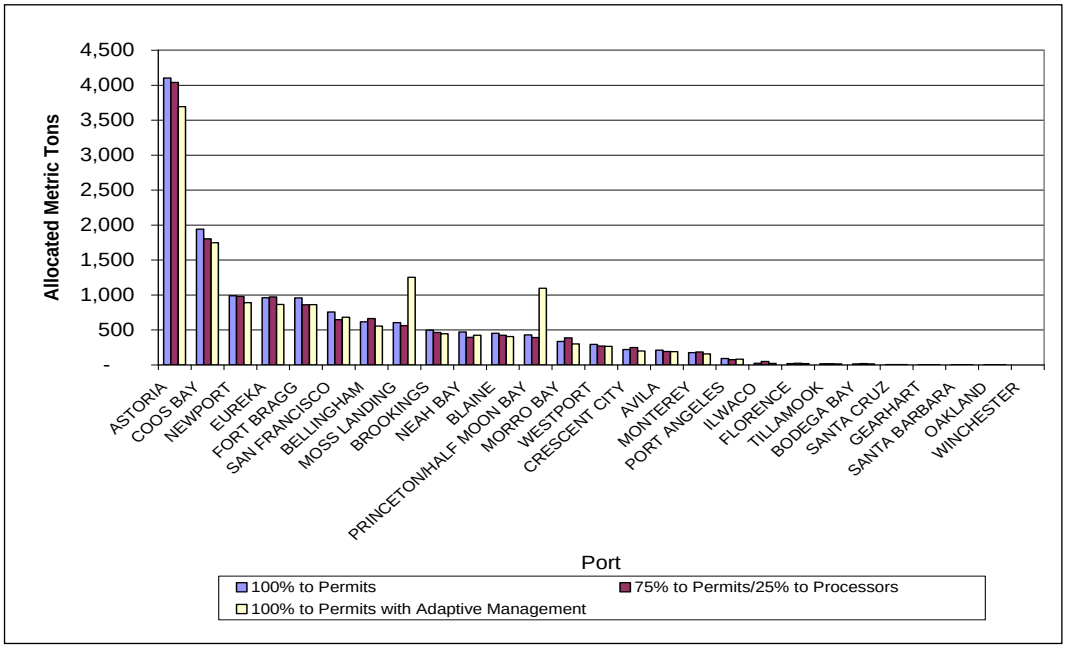


Figure 4-46. Geographic distribution of nonwhiting QS.

In the whiting fishery, the geographic effect is somewhat different than in the nonwhiting fishery. For the at-sea portion of the whiting fishery, allocating to permits or to processors is not expected to change the fact that at-sea activity is primarily tied to the Puget Sound region. For the shoreside whiting fishery, geographic differences exist. In particular, Coos Bay is affected substantially by the choice of whether to allocate in part to processors or not. An adaptive management provision used in the shoreside whiting fishery to mitigate against adverse impacts to processors would presumably alter the geographic distribution of shoreside whiting landings.

The distribution of whiting QSs under Alternative 2b is difficult to predict, because the only port that is engaged in the whiting fishery and labeled as potentially disadvantaged is Crescent City. While it may be possible that all of the adaptive management whiting quota is directed to Crescent City, such a distribution is unlikely since it would represent a higher delivery of Pacific whiting to the port than under status quo conditions. Furthermore, devoting such an amount to Crescent City would exceed the current 5 percent of Pacific whiting devoted to California fisheries prior to the June 15 primary shoreside season start date. Since no change is contemplated in this allocation, devoting such a large share (10 percent) to Crescent City seems unlikely. Therefore, the processors that are possible recipients of shoreside whiting adaptive management quota are largely unknown.

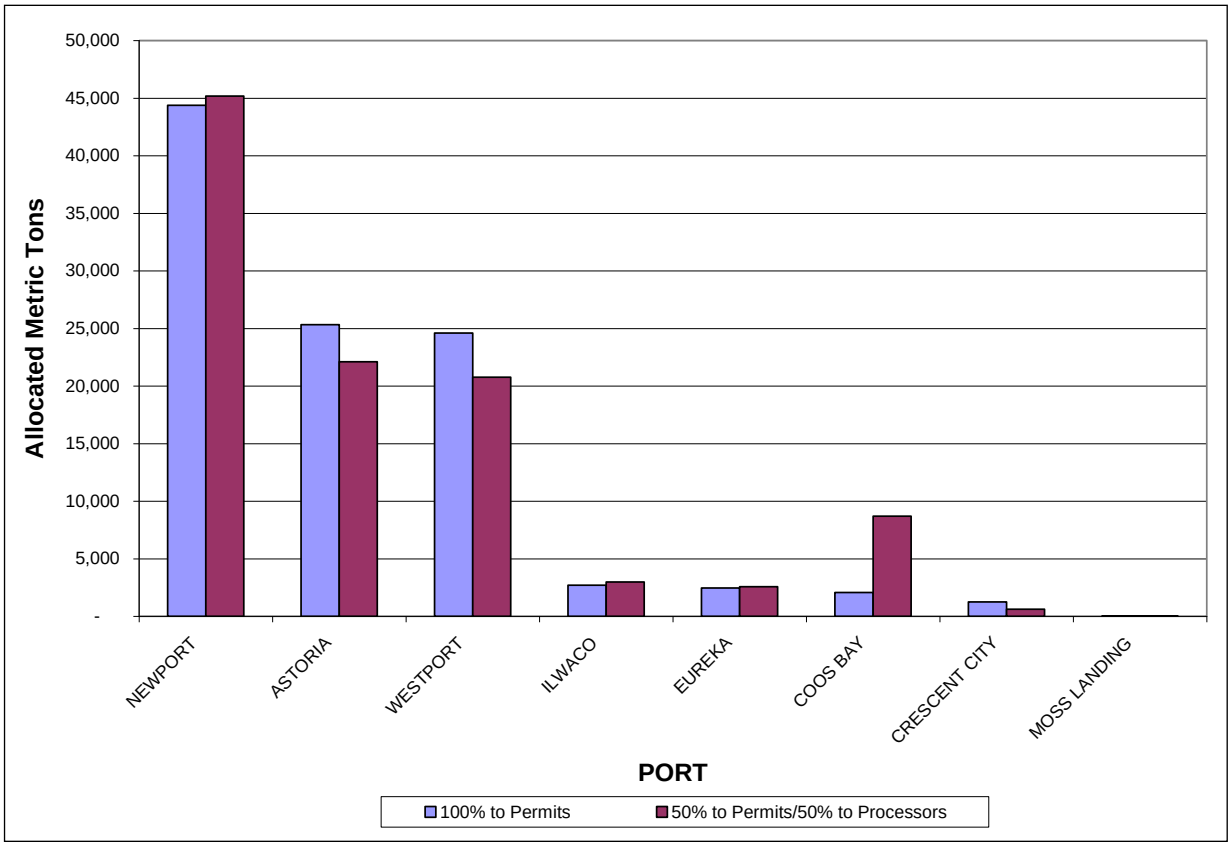


Figure 4-47. Geographic distribution of shoreside whiting quota.

An adaptive management provision may place downward pressure on ex-vessel prices, while possibly benefiting certain processors or communities with processing facilities. However, this is true only if harvesters are prosecuting groundfish subject to adaptive management, which comprises 10 percent of the QSs. A limit on the number of potential buyers may have a downward effect on prices paid for the adaptive management fish. However, the adaptive management provision is not likely to impact ex-vessel prices to the same degree as initial QS allocation to processors, simply by virtue of the difference in volume attributed to processors. In Alternative 2c, the amount of initial allocation to processors is approximately 33 percent for nonwhiting groundfish and approximately 58 percent for whiting.[107] A 10 percent adaptive management provision intended for use by adversely impacted processors is small in comparison.

Over the long run, processors may continue purchasing QSs in the whiting sectors because of the relatively large size of the control limit. The 25 percent control limit specified for the shoreside and mothership whiting sectors means that four entities could, theoretically, control the harvest of whiting in both sectors. It is unlikely that processors will acquire much additional quota in the nonwhiting sector because of the control limits. The 3 percent control limits specified for the nonwhiting sector makes it difficult for the processing sector as a whole to acquire additional quota, unless, over time, the composition of that sector shifts to many small producers. This means that over time, ex-vessel prices in the shoreside whiting sector may fall to some degree since processors have the ability to acquire additional quota, but it is not likely that ex-vessel prices will fall over time in the nonwhiting sector because processors have limited ability to purchase additional quota.

[107] These numbers exceed 25 percent and 50 percent respectively because some processors own trawl permits.

If processors are allocated initial QSs (Alternative 2c), they may play a greater role in directing the location of harvests, since they could enter into harvest contracts that include delivery points. This could help at least partially to offset any negative effects on processors from broader level regional shifts in landings that may occur if harvesters control quota. Vessels in ports where processors are located may have access to more quota than if an initial allocation was made to permits. In addition, initial allocation of QSs to processors could increase their ability to create joint ventures or other arrangements among processors (horizontal integration) and between processors and harvesters (vertical integration).

The distribution of QSs across entities under Alternative 2c is different than under Alternative 2a because of the allocation to processors. One hundred twenty-one entities are expected to receive QSs of nonwhiting groundfish under Alternative 2c, and three of these entities exceed the control limit (but are grandfathered). Under this alternative, the majority of receiving entities receive less than 1 percent of the nonwhiting allocation of groundfish, while a handful of entities receive more than 2 percent. The figures illustrating this concept can be found under the corresponding section on harvesters.

In the whiting sector, there is also a different distributional effect. Interestingly, by including shoreside processors in the initial allocation, the distribution of shoreside whiting becomes relatively more uniform than in Alternative 2a. The largest recipient of shoreside whiting QSs receives less than 10 percent of the shoreside whiting quota, while under Alternative 2a the largest recipient receives almost 12 percent. Sixty-seven entities are estimated to receive shoreside whiting QSs under this alternative. The figures illustrating this concept can be found under the corresponding section on harvesters.

4.9.3.5 Alternative 3

The elements of Alternative 2b and 2c for the nonwhiting fishery differ somewhat from alternative 3. However, there is a considerable difference in the whiting fishery under Alternative 3 in that harvest cooperatives are established for each of the three whiting sectors. This has an effect on processors, primarily in terms of the negotiating relationship over ex-vessel prices and/or profit-sharing arrangements that may develop. With a harvester cooperative, the effect on bargaining position and the change in ex-vessel prices cannot be predicted, because it largely rests upon personal relationships and the bargaining skill of the negotiators. However, if the mothership sector is an indicator, cooperatives may lead to profit-sharing arrangements among processors and harvesters.

A feature unique to Alternative 3 is that there would be four trawl sectors, rather than three for the other alternatives. As indicated above, establishing a four-trawl sector split may inadvertently constrain one or both of the shoreside sectors in certain years if bycatch of a nontarget species is higher than expected. This could occur if Pacific whiting bycatch is higher in the nonwhiting sector than expected and harvesters in that sector have no means of acquiring quota to cover that bycatch. In the worst-case alternative, harvesters in this sector may have their harvest opportunities truncated by the bycatch of Pacific whiting and this may lead to adverse impacts on shoreside processors because of a lack of delivered volume.

The vessel limit for the shoreside groundfish sector is 3 percent under Alternative 3, and lower (more restrictive) than Alternatives 2a, 2b, 2c, 4a, and 4b. The vessel limit generally restricts fleet consolidation. The control limit restricts control, and this may come in the form of vertical integration where processors purchase, or somehow merge operations, with harvesting entities with QSs. The control limit in this alternative is the lowest of all alternatives, meaning it will restrict the ability for entities to acquire QSs and this will restrict the ability for processors to vertically integrate. There is

also no grandfather clause under Alternative 3. This means that relatively large producers who may stand to receive QSs in excess of the control limit would only receive QSs up to the control limit. Some of these entities are processors. If processing entities are potentially restricted by the control limit, and they know that in advance, they may sell some of their LE trawl permits prior to the start of the program so that they are under the control limit and capture the rent associated with the quota that will eventually be associated with that permit. Alternative 4b is similar to Alternative 3 in that it does not have a grandfather clause. Under Alternative 4b, however, the divestiture period takes place four years into the program, allowing entities the ability to fish the overage quota for several years and then divest of that quota under conditions where the value of that quota is likely to be better known.

Nonwhiting processors

As is the case with Alternative 2c above, Alternative 3 provides for an initial distribution to processors of 25 percent of groundfish QSs. This alternative will have a distinctly positive effect on processors in terms of their bargaining power (relative to Alternatives 2a and 4b) with respect to ex-vessel prices and will tend to offset the gains in bargaining power by harvesters. The long run effect on ex-vessel prices is expected to remain relatively unchanged from the period following implementation. This is because the accumulation limits specified under this alternative are relatively small, and will act as a de facto limit to the amount of quota that processors are able to acquire. The 1.5 percent control limit over all nonwhiting groundfish without a grandfather clause provision means that the amount of quota allocated to processors will have to be divided among at least 17 processing companies. Several processors who qualify for an initial allocation will have their initial allocations truncated by the lack of a grandfather clause. That some historically large producers will have their initial allocation truncated means that ex-vessel prices could be higher than they would be under Alternative 2c, where some large producers receive relatively large amounts of quota. Having some entities with relatively large amounts of quota may make those entities more dominant in the negotiation, potentially influencing ex-vessel prices in the aggregate, while not having entities with such large amounts of quota would tend to erode that dominant position.

A distribution of QSs to processors will tend to have a geographic effect as those processors direct landings associated with their QSs to particular ports where their plants are located. An adaptive management provision will tend to have different geographic consequences, if adversely impacted processors are located in particular areas to which adaptive management shares are directed. Figure 4-45 above illustrates a hypothetical geographic distribution of quota under 25 percent to processor allocation rule (Alternative 3).

Compared to Alternative 2c, the area management provision in Alternative 3 (which divides species north and south of 40° 10’ N. latitude) could be beneficial for some processors while adversely affecting others. Area management effectively ensures that markets are retained in each area, and harvest quota will be allocated accordingly. The regional opportunities are enhanced by processor QSs, where they can entice harvesters to contract and deliver to their plants. Processors with plants in both north and south areas could be negatively affected by area management if it causes inefficiencies within the firm’s allocation of capital resources. For example, a processing company may find it most cost effective to close existing plants and concentrate landings in one area of the coast. Area management restricts the ability of processing companies in such a position to reorganize that way, thus restricting potential profits. In addition, area management combined with large-scale gear switching may mean that the harvests of some types of shelf flatfish are foregone, as discussed previously. This would tend to reduce aggregate volume to processors from what would otherwise occur.

Pacific Whiting Processors

The relationship between Pacific whiting harvesters and processors that is formed through co-ops for harvesters in this alternative is different from the relationship established by issuing both sectors QSs. The ex-vessel prices that result through a harvester-processor affiliation (linkage) could very well be different from the negotiated ex-vessel prices when both harvesters and processors receive QSs. While both harvesters and processors can buy and sell QSs and associated fish freely, harvesters and processors in a cooperative with a linkage requirement are contractually bound to limit such exchanges to co-op members (though the linkage can be broken with some effort). This linkage means that negotiation and relationships between the harvester and processor are likely to have a large influence over ex-vessel prices in the short term, as opposed to a market-driven outcome. Over the long term, harvesters and processors can break that arrangement if harvesters fish in the noncooperative portion of the fishery, though this fishery is a competitive, derby-style fishery, which makes it unattractive and arguably less profitable. Though there may, at times, be an incentive to break the linkage and seek higher prices elsewhere, doing so may come at a cost.

The distribution of harvest opportunities under a cooperative structure with harvester-processor linkages is in many respects more similar to Alternative 2a, with 100 percent of the initial allocation going to permits, than for Alternatives 3b and 6, where an initial allocation is made to both harvesters and processors. This is because under a cooperative system with processor linkages, the harvester still controls the opportunity to harvest the available quantity. That quantity is not made available to processors, as would be the case if QS was allocated to processors.

4.9.3.6 Alternative 4a

The elements in Alternative 4a reflect some features of each of the previous alternatives. Alternative 4a differs primarily in the results of the initial allocation formula, the presence of a grandfather clause, the lack of an initial allocation to processors for groundfish but a 50 percent allocation of whiting, the merging of both shoreside sectors into one, area management, and the presence of an adaptive management provision. Other elements of this alternative differ from the other alternatives, but do not appear to have a noticeable effect on the outcome.

A distribution of QSs to whiting processors will tend to influence or direct landings to particular ports where their plants are located; an adaptive management provision will also have geographic consequences. The adaptive management provision could be used to mitigate adverse impacts on communities, particularly ports with nonwhiting processors. It could also be used to encourage gear switching or the development of gear with lower bycatch. Depending on the objective, the distribution of these effects is likely to be different.

An adaptive management provision may place downward pressure on ex-vessel prices. However, this may only be true if harvesters are prosecuting groundfish subject to adaptive management, which comprises 10 percent of the QSs. The fact that the adaptive management provision comprises 10 percent means that the price effect is likely to be relatively small.

An area management provision in Alternative 4a, as in Alternative 3, divides species north and south of 40° 10’ N. latitude. This could be beneficial for certain processors in both areas by effectively ensuring that markets are retained in each area, and harvest quota will be allocated accordingly. The regional opportunities are enhanced by processor QSs, where they can entice harvesters to contract and deliver to their plants. Processors with plants in both north and south areas could be negatively affected by area management if it causes inefficiencies within the firm’s allocation of capital resources. Area management restricts the ability of processing companies to reorganize, thus restricting potential profits.

In addition, area management combined with large-scale gear switching may mean that the harvests of some types of shelf flatfish are foregone, as discussed previously. This would tend to reduce aggregate volume to processors from what would otherwise occur.

Nonwhiting processors

Nonwhiting processors are expected to see lower profits under this alternative compared to some other alternatives. As in Alternative 2a, ex-vessel prices paid to nonwhiting trawl harvesters will tend to be relatively higher because QS is initially allocated only to permits, which enhances harvesters' negotiation power. This bargaining advantage away from processors is likely in the short term and possibly over the long term. Quota could be purchased by processors over time (thus shifting some advantage back to processors); however, the accumulation limits will temper the ability of the larger processors to purchase substantial quantities of quota. Accumulation limits in this alternative would lead to a maximum of 2.2 percent being controlled by any single processor, which is considerably less than the amount of groundfish currently handled by several west coast processors of trawl groundfish.

Pacific whiting processors

Alternative 4a will have a positive effect on whiting processors in terms of their bargaining power with respect to ex-vessel prices because they are allocated 50 percent of initial QSs. Processors can vertically integrate and engage in fish harvesting opportunities independent of other harvesters. The ability of processors to negotiate lower prices increases as their ownership of quota increases, and this alternative results in a large portion of the QSs being allocated to processors.

4.9.3.7 Alternative 4b (Preferred Alternative)

Alternative 4b is the Council's preferred alternative for rationalization of the LE trawl fishery. The Council's preferred alternative includes several components similar to those encompassed within Alternatives 2a through 4a, but includes additional measures that are not. Of significance in Alternative 4a is that shoreside processors in the whiting sector would receive 20 percent of the QS initial allocation; these are somewhat smaller proportions for processors than provided under some of the other alternatives. Under Alternative 4b, nonwhiting processors would not receive an initial allocation, which is also the case in Alternatives 2a, 2b, and 4a.

Many aspects of Alternative 4b are similar to Alternatives 3 and 4a, in particular. For nonwhiting processors, the negotiated ex-vessel price would be comparable to that under Alternatives 2a and 4a, where prices paid to nonwhiting trawl harvesters will tend to be relatively higher because QS is initially allocated only to permits, which enhances harvesters' negotiation power. Among whiting processors, initial allocation of QSs is 20 percent under Alternative 4b, which is much smaller than the 50 percent allocation under Alternatives 2c and 4a. As noted above, distribution of QSs to processors will tend to influence or direct landings to particular ports where their plants are located while also improving their negotiation power over ex-vessel prices.

There is no grandfather clause in Alternative 4b, which is also the case in Alternative 3. However, Alternative 4b differs from Alternative 3 in that there is a divestiture provision allowing those with quota in excess of the limits the opportunity to sell that quota within a specified period. Without a divestiture provision, entities would not receive an initial allocation of QSs above the accumulation limits. Instead, that overage quota would be automatically redistributed among other QS holders. Alternative 4b includes a two-year moratorium on QS sales, followed by a two-year period over which the excess QSs can and must be divested. This waiting period benefits those processors with excess shares, since it eliminates the possibility of an immediate fire sale of quota that must be divested and

allows a longer period for orderly and strategic sale of their QS assets, allowing them to capture the rent associated with that quota and assume the monetary value of that asset.

Both shoreside sectors are combined into a single sector under this alternative. This alleviates the potential that a species may become unexpectedly constraining to one of the shoreside sectors. If one shoreside sector encounters unexpectedly high amounts of a certain species, that sector can compensate by purchasing QPs of that species from the other shoreside sector. The lack of hard allocations across sectors provides flexibility that can reduce the risk of premature closure of a particular fishery, and the accompanying effect on processors.

An adaptive management provision is a feature in Alternative 4b, as it is in Alternatives 2b, 3, and 4a; however, the provision applies only to nonwhiting species, and is not available for whiting. The provision is likely to have geographic consequences and may place downward pressure on ex-vessel prices, which may tend to benefit processors. However, this will happen only if harvesters are prosecuting nonwhiting groundfish subject to adaptive management, which comprises 10 percent of the QSs.

An area management provision is not present in Alternative 4b, as it is in Alternatives 3 and 4a. This can be beneficial relative to Alternatives 3 and 4a for larger processors who own facilities both north and south of 40° 10' N. latitude, because it allows them an efficient allocation of firm resources to where they are needed without having to consider species management limits in each location. It may not be beneficial to smaller processors who are located in a single port if fishing activity tends to migrate to a different area.

Nonwhiting processors

For nonwhiting processors, this alternative has similarities to Alternative 2b, which has no initial allocation of QSs to processors, but an adaptive management provision to mitigate adverse effects. In terms of ex-vessel prices paid to harvesters, the gains in bargaining power accruing to harvesters will tend to push prices higher in their favor relative to other alternatives. As in the other alternatives, the amount of overall catch in the fishery is expected to increase because of a reduction in the bycatch rate of overfished species that, in turn, allows vessels to leverage higher catch amounts of underutilized target species. This increased catch should lead to greater ex-vessel revenues in total relative to status quo and provides opportunities for processors to generate more revenues from that additional fish. The long run effect on ex-vessel prices may remain relatively unchanged from the period following implementation, based on the accumulation limits. These limits will act as a de facto limit to the amount of QSs that processors are able to acquire, limiting processors to an amount of QSs that may allow for one or two full time nonwhiting trawl vessels. As noted above, some entities with relatively large amounts of quota tend to be more dominant in negotiation, potentially influencing ex-vessel prices in the aggregate, while not having entities with such large amounts of quota would tend to erode that dominant position.

An adaptive management provision for nonwhiting species will tend to have different geographic consequences if it is used to help adversely impacted processors, and those processors are located in particular areas to which adaptive management shares are directed. However, there is a two-year waiting period before the adaptive management provision will take effect; as a result, it is possible that some nonwhiting processors who endure adverse effects may close before the adaptive management opportunity becomes available.

Pacific whiting processors

Alternative 4b will have a positive effect on whiting processors in terms of their bargaining power with respect to ex-vessel prices (relative to a case where no initial allocation is made to processors) because they are allocated 20 percent of initial QSs. The effect would be lower than for Alternatives 2c and 4a, which allocates 50 percent of initial whiting QSs to processors. Processors can vertically integrate and engage in fish harvesting opportunities independent of other harvesters.[108] The ability of processors to negotiate lower prices increases as their ownership of quota increases; however, it is not certain at what level an initial allocation to processors offsets the effect of allocating QSs to harvesters. Therefore, while this alternative provides greater leverage to processors when negotiating over prices compared to Alternatives 2a and 2b, for example, it is not clear whether processors will have greater negotiating power than under status quo.

The initial allocation of whiting to shoreside processors also acts as a capital asset. Since consolidation is expected in the processing portion of the whiting fishery, the value of processing capital may decline. In addition, processors who are consolidated out of the fishery are likely to experience a loss of revenue that they realize under status quo conditions. The initial allocation of QSs to processors can offset some of the losses that may be attributed to a decline in asset value and a loss of revenues. Processors who are consolidated out of the fishery may elect to sell that quota or lease it to another operator, and in this way replace the revenue or capital value that was affected by rationalization.

Although whiting processors are provided with an initial allocation of QS, under Alternative 4b they will not become eligible for adaptive management should they become subject to adverse effects of rationalization. The provision is afforded only to nonwhiting species, and therefore is likely to impact only nonwhiting processors.

The species covered in this alternative alleviates some of the risk present in the other alternatives. Some of the risk present in the other alternatives exists because of the coverage of low OY species and species caught irregularly. Not requiring that harvesters cover the catch of these species with quota means that there is more flexibility in prosecuting fishing activity and less risk that an unexpected catch event could shut down fishing opportunity. Processors are impacted indirectly. Since the risk of premature closure of a fishery is reduced, processors have relatively greater expectations regarding catch volumes during the year.

4.9.3.8 Comparative Summary of the Effects of the Alternatives

Alternative 1	• Continued overcapitalization and relatively low processed volume among nonwhiting processors. • Continued overcapitalization as a result of derby conditions in shoreside whiting industry.
Alternative 2a	• Higher cost of purchasing fish from harvesters in nonwhiting and whiting sectors compared to status quo. • Lower cost of production in nonwhiting due to increased harvest volume. Lower cost of production in whiting because of increased season length and processor consolidation. • Geographic shift in processing activity occurring on a localized scale and a wide-scale perspective as a result of shift in landings.

[108] However, the Council recently enacted some limits on quota share ownership, restricting the ability to vertically integrate.

Alternative 2b	• Lower cost of production in nonwhiting sector due to increased harvest; lower cost of production in whiting sector because of increased season length and processor consolidation. • Select, adversely impacted processors receive quota through adaptive management, minimizing disruption of activity. • Processors who are not recipients of adaptive management may be affected similarly to Alternative 2a. • Potentially less geographic shift as a result of adaptive management.
Alternative 2c	• Lower cost of production in nonwhiting sector due to increased harvest; lower cost of production in whiting sector because of increased season length and processor consolidation. • Processors pay lower prices for fish from harvesters than in Alternative 2a. • Differential geographic shift than in Alternatives 2a and 3a—movement of activity toward processors with QS.
Alternative 3	• Lower cost of production in nonwhiting sector due to increased harvest; lower cost of production in whiting sector because of increased season length and processor consolidation. • Nonwhiting processors pay lower prices for fish than in Alternative 2a. • Whiting processors may pay lower prices for fish than in Alternative 2a, or may enter into profit-sharing arrangements with harvesters. • Minimal wide-scale geographic shifts, but some localized shifts affecting localized processors.
Alternative 4a	• Lower cost of production in nonwhiting sector due to increased harvest; lower cost of production in whiting sector because of increased season length and processor consolidation. • Nonwhiting processors may pay relatively high prices for nonwhiting groundfish. • Shoreside whiting processors may pay lower prices for whiting than Alternatives 2 and 3a. Unclear how this compares to Alternative 3. • Minimal wide-scale geographic shifts, but some localized shifts affecting localized processors.
Alternative 4b	• Lower cost of production in nonwhiting sector due to increased harvest; lower cost of production in whiting sector because of increased season length and processor consolidation. • Nonwhiting processors pay comparable prices for fish as in Alternative 2a, but are eligible for adaptive management shares after the first two years. • Whiting processors may pay lower prices for fish than in Alternative 2a, or may enter into profit-sharing arrangements with harvesters. • Minimal wide-scale geographic shifts, but some localized shifts affecting localized processors. • Potential reduction in loss of processing opportunity due to a lower risk of premature whiting fishery closure, as a result of only select species covered by IFQs.

4.9.4 Cumulative Effects on Shoreside Processors

The effect of the alternatives on shoreside processors is combined with past actions, current and future trends, and RFFAs to derive the cumulative effect. Each of these effects is measured using the potential impacts identified in Table 4-55, which include the (cumulative) effect on the net revenues for processors of trawl-caught groundfish. This cumulative effects analysis uses the analysis contained in

the section describing broad level effects of rationalization as well as the effects described in the analysis of alternatives.

In some respects, the effect of rationalization on processors can be viewed as a replacement to present conditions rather than an action that is additive to present conditions. Rationalization is intended to change the system in which the trawl fishery operates, including that of processors.

4.9.4.1 Overview of Past Actions and Trends Affecting Processors

A variety of past fishery management measures and other exogenous trends have affected shoreside processors, and been instrumental in shaping the present structure of the industry. Many of these measures and trends were discussed above in Chapter 3, and in the section on cumulative effects on trawl harvesters, and the details can be found there. Some of the significant ones affecting processors in particular are summarized identified here.

Harvest restrictions started to become prominent during the 1980s due to concern about depressed stocks. MPAs were implemented during the last decade, which closed off wide areas to trawl harvesters. Harvest levels and revenues for nonwhiting harvesters declined, the industry found itself over-capitalized, and many were unable to cover fixed costs of vessel ownership. Reduced harvests carried over to shoreside processors, who also found themselves overcapitalized; a number of facilities closed and companies consolidated or were purchased by larger entities. A 2003 trawl vessel buyback program had the effect of reducing harvest participants and improved the viability of remaining harvesters. The closure rate of shoreside facilities has also slowed; however, revenues and volumes in recent years have not recovered to levels experienced in the 1990s.

A different picture has emerged within the Pacific whiting industry. Processor innovations helped to develop surimi from Pacific whiting, largely for export to the Far East, and the domestic industry began to take hold in the 1980s and 1990s. A setback in the early 2000s was the result of an overfished declaration and concern over Mad Cow disease (Pacific whiting surimi producers used beef plasma in the production of surimi), which reduced the demand and price for whiting surimi. Recent changes in processing methods and products have led to resurgence in the industry, considerably higher prices, and new entrants among processors. There has also been greater Council involvement in harvest restrictions, including Amendment 15, which limited access to specific harvesting sectors of the whiting fishery.

4.9.4.2 Trends and Actions Influencing Shoreside Processors

A number of exogenous trends are influencing the operating environment for shoreside processors. The combined effect of these trends and actions become the cumulative effect of rationalization on shoreside processors. They are discussed in this section and include the following:

- Changes in use of ocean areas
- Changes in use of coastal land areas
- Increased protein demand and production costs
- Increased consideration of demand for ecosystem-wide fishery management approaches
- Increased public awareness and scrutiny of the fishing industry
- Climate change
- Short-term versus long-term trends
- The development and implementation of CFAs

Ocean areas around the world are under increased pressure and scrutiny. Population growth, combined with increased global concern for environmental protection, is leading efforts to ensure fish populations are harvested responsibly without depleting the fishery for future generations and that uses methods that will not cause environmental harm. Other uses for oceans, such as transportation, energy production, environmental recovery, and waste assimilation, can and will continue to lead to conflicts with traditional fishery practices. This trend will continue in the future. For the west coast fishery, conflicts may increase in the future, and these could affect the supply of fish for processors to utilize and send to market.

Conflicts may increase on coastal land areas. Population increases in most areas of the coast can lead to increased conflicts among incompatible land uses. Existing processors can face pressures within communities that are changing emphases to tourism, residential housing, or other land uses that may be considered incompatible with fish processing. Processing companies that wish to establish processing facilities are likely to face greater difficulty in locating suitable sites, particularly in fast growing or changing communities. This trend is likely to continue in the future. In addition to community land use changes, a greater environmental awareness and emphasis on protection of sensitive coastal areas may further restrict the availability of processing sites.

As the world's population increases, there will continue to be a greater demand for protein sources. Fishery resources are generally considered an increasingly important source for meeting the growing world demand. This large-scale trend applies regionally as well: population growth rates in the western United States, particularly near coastal metropolitan areas, are expected to be among the highest in the nation. Demand for fish will increase accordingly; if the trend continues towards higher per capita consumption of fish, demand will increase even more. The demand for wild-caught fish could be met, at least in part, by increases in aquaculture production, however. The degree to which aquacultured fish will meet demand will depend on the substitutability of this product form for wild-caught fish and relative prices, which is a function of supply and production costs. If aquacultered fish are perfectly substitutable for wild-caught fish and supplied at a lower price this would reduce demand for wild-caught fish.

Trends expected to affect the cost of processing in the future include the expectation that resource inputs will remain high relative to prices seen in the past few decades. These include the expectation that steel, fuel, and many other inputs necessary to operate and maintain a processing facility will remain high in the future because of increased global demand for such inputs. Rationalization has the effect of mitigating some of the expected increases in cost that may be exogenous factors as well as factors that are part of Council actions. Since rationalization allows vessels to time deliveries and fishing activity in order to take advantage of market conditions, rationalization has the effect of mitigating some of the cost burden by allowing opportunities to optimize revenues for both harvesters and processors. While various input costs, such as energy, are generally expected to increase at rates higher than other costs, it is also expected that the value of fish products will escalate or remain relatively high on a global basis and the supply of whitefish from sources such as the North Atlantic remain depressed. This increased demand is expected to result in higher prices for raw fish products and this should offset the cost associated with relatively high fuel prices. However, the ability for processors to benefit from this expected increase is tied to harvester/processor negotiation power. This concept is closely related to the decision over the amount of QS that should be allocated to harvesters versus the amount of QS allocated to processors. Those alternatives that allocate relatively more to permits will tend to allow harvesters to benefit from this demand compared to those alternatives where processors are allocated relatively more.

Increased scrutiny of the fishing industry by the public is expected to continue, particularly scrutiny of bottom trawl gears. Such increased scrutiny may not necessarily lead to formal regulation changes, but it may affect the marketability of processed fish from trawl-caught groundfish and groundfish caught

with nontrawl gear. One possible outcome of increased scrutiny is a relatively higher price for nontrawl-caught groundfish. The net effect on processors is not clear, but this trend could affect the source of fish for processors in the future.

Several additional factors that are largely exogenous to the effect of rationalization, but that may influence processor profitability, include the possibility of a stock becoming declared as overfished, the unexpected removal of a stock from overfished status, and the effect of climate change and variability on species abundance and location. While these factors are largely unpredictable, they are best considered within the cumulative effects section because they are not directly related to rationalization. If a stock becomes overfished and a lower OY is implemented, harvesters are likely to see lower revenues due to a loss in harvest of that species, or because that species constrains access to other stocks, or both. The inverse is true if a stock is taken off the overfished list. The effect of climate change and variability on fish abundance and location also influences processor profits. If conditions are such that groundfish migratory patterns differ substantially from one year to the next, the fixed nature of shoreside processor facilities will become compromised.

The final factor considered here which is expected to affect revenues and (potentially) asset values is the development and implementation of CFAs. While it is difficult to predict the effect CFAs will have since they have not yet been formally defined, some assumptions can be made regarding what they will be allowed to do and how they may operate. The first assumption is that a CFA will be allowed to hold quota in excess of accumulation limits. It is also assumed that the goals and objectives of the CFA will take into account the needs of the community, and these goals and objectives may be somewhat different from the goals and objectives of a QS holder or harvester. Since processing facilities are often seen as an important piece of a fishing community, it is not unreasonable to expect that a CFA may be take on actions that assist local processors in some fashion, as long as doing so benefits the local community. This may have some mixed effects across processing companies. Those processing companies that operate in several locations may have to maintain operations in some ports that may not be optimal to the bottom line. For those processors that only have a single location, however, the development of a CFA may be beneficial to that processor as the CFA operates as an entity helping to ensure that fish continue to be landed in that port. However, the possibility of the CFA operating in a manner that helps a local processor is conditioned on the way in which CFAs organize and the way in which the Council outlines the manner in which CFAs can form.

Table 4-58. Trends and factors affecting processor profitability and asset values.

Trends and Factors Affecting Processor Profitability and Asset Value		Score
Due to Rationalization	• SS whiting processor consolidation	
	• Value of capital assets	–
	• Processing cost efficiency	+
	• Increased harvest of under-utilized target species	+
	• Intersector allocations of groundfish	Conditional
	• Changes in the negotiation power of harvesters and processors	Conditional
Exogenous to Rationalization	• Changes in use of ocean areas	–
	• Changes in use of coastal land areas	–
	• Increased global demand for protein	+
	• Rebuilding of depleted groundfish species	+
	• Increasing cost of inputs, including energy	–
	• Possibility that a stock unexpectedly becomes overfished	–
	• Climate change	Unknown
	• Increased public scrutiny of fishing industry	Conditional
	• Community Fishing Associations	Conditional

4.9.5 Summary of the Effects on Shoreside Processors by Alternative

Each of the action alternatives replaces the existing management structure responsible for the past and present condition of the fishery. Processors focusing on nonwhiting species have experienced consolidation over the past several years in response to a decline in harvests of nonwhiting species. Each of the action alternatives is expected to result in an increase in harvests of nonwhiting species, potentially increasing the need for processing activity and capital. In the whiting fishery, each of the action alternatives (except for alternative 3) is expected to result in an elimination of the competitive, race for fish conditions that exist in the current fishery. Alternative 3 is an exception due to the common fishery-wide bycatch limit that exists in that alternative, providing incentives to race for fish via bycatch. The elimination of the competitive conditions that exist in the whiting fishery can be expected to slow down the fishery, reducing peak harvest volumes and the corresponding need for processing capital. This reduction in need for capital in the whiting fishery can be expected to reduce the value of capital.

An initial allocation of QSs to shoreside whiting processors is expected to replace to the lost capital value potentially occurring among whiting processors due a decline in the demand for that capital. Furthermore, an initial allocation to whiting processors will tend to enhance their negotiation power with harvesters over prices. Since nonwhiting processors are not expected to see a reduction in the demand for capital, any initial allocation to processors is likely to impact ex-vessel price negotiations and result in a net increase in capital value.

4.9.5.1 Alternative 1 (No Action)

The current status of shoreside processors would be expected to only change as a result of exogenous factors under Alternative 1. Nonwhiting processors are expected to continue to consolidate, while whiting processors may see some continued increase in processor participation.

4.9.5.2 Alternative 2a

The effect of Alternative 2a is expected to mean a replacement of the current management system responsible for much of the past and current status of shoreside processors. These changes are expected to result in an increase in utilization of processing capacity for nonwhiting species and a reduction in capacity demand for shoreside whiting. In addition, this alternative is expected to place much of the ex-vessel price negotiation power in the hands of shoreside harvesters, which may be a change from status quo. Changes in ex-vessel price negotiations among nonwhiting harvesters and processors are less clear.

When combined with past, present, and future conditions/actions, this alternative is expected to result in impacts on nonwhiting processors that replace some of the harvest volume in the nonwhiting fishery lost during fishery restrictions that started in the 1990s. Such increases in harvest volumes in this fishery provide opportunities for the processing sector to reduce average costs and capitalize on revenue that may be generated from that increase in product volume. Some of this may offset the losses in salmon opportunities that have occurred since the 1980s, losses in groundfish opportunities since the 1990s, and future variations in the catch of other important species such as Dungeness crab.

In terms of shoreside whiting processors, this alternative may allow the processing sector to become more cost-efficient by reducing capital necessary in the fishery. However, this may not mean that processors will benefit from rationalization as whiting processors may stand to lose negotiation power with harvesters and those processors who are consolidated out of the fishery may need to close down their operations while seeing a subsequent decline in the value of their capital assets. When combined with past, present, and future actions/conditions, this alternative can be expected to add to the conditions that have adversely impacted processors in the past (such as groundfish restrictions and salmon restrictions). For those processors who may have capitalized on the recent expansion of the whiting fishery, this alternative may erode some (or all) of the recent gains on which those processors may have been able to capitalize.

4.9.5.3 Alternative 2b and 2c

Similar to the other action alternatives, Alternatives 2b and 2c replace much of the existing management structure responsible for the past and present status of shoreside processors. Alternatives 2b and 2c differ in their approach to specifically dealing with processors. Alternative 2b uses an adaptive management provision for protecting adversely impacted processors while Alternative 2c makes an initial allocation to processors. Each of these measures has a different effect on processors due to the tool used to address processor concerns, the magnitude of the set aside versus the initial allocation, and which processors stand to receive the adaptive management set aside versus the initial allocation of QSs. For reasons described previously, Alternative 2c appears to benefit the processing sector as a whole more than Alternative 2b, but Alternative 2b may benefit specific processors more than Alternative 2c.

When combined with past, present, and future conditions/actions, Alternatives 2b and 2c have differing effects. Alternative 2b would allocate adaptive management quota to processors adversely impacted by rationalization. Assuming it is possible to differentiate between processors impacted by some other measure from those impacted by rationalization, then Alternative 2b will be equivalent to Alternative 2a for many processors—specifically those not receiving adaptive management quota. For those processors that are recipients of adaptive management quota, the effect of Alternative 2b could prove to be quite different than Alternative 2a. The receipt of adaptive management quota could allow adversely impacted processors more say in business planning and execution, potentially giving those processors the tools necessary to respond to adverse impacts as a result of rationalization. This has the added benefit of granting those processors tools that would tend to help make those processors adaptable to

changing future conditions. This is because those processors holding adaptive management quota have control over the way in which that quota is prosecuted, and this can be used to tailor harvest strategies in a way that matches up with their processing needs. While processors may receive this quota to address adverse impacts of rationalization, it has the potential benefit of allowing them to respond to other potentially adverse effects as well.

Alternative 2c is different than alternative 2b in that the processing sector as a whole has more say over the ways in which harvesting activities are prosecuted and can use this to their advantage. Specific processors may not see this alternative as advantageous as 2b if such an initial allocation results in less quota being allocated than could occur with adaptive management. However, unlike adaptive management, an initial allocation of QS acts as a capital asset which can offset changes in capital asset values that may occur through rationalization. When combined with past, present, and future conditions/action, this alternative tends to place the processing sector as a whole in a better position than other alternatives. The value of quota as a capital asset may offset changes in asset values from rationalization, but also due to changes in the decline of the nonwhiting fishery since the 1990s. The initial allocation of quota also allows processors to have more say over the ways in which the fishery is prosecuted, thus granting processors tools which they can use to help respond to changing future conditions such as changes in OYs (ACLs), changes in markets, and changes in the opportunities presented by nongroundfish fisheries.

4.9.5.4 Alternative 3

The effects of Alternative 3 are similar to Alternative 2c for nonwhiting processors. Shoreside whiting processors are impacted differently through the implementation of a cooperative program with a processor linkage. This linkage provision has some similar characteristics to a processor initial allocation in that a processor LE permit with a long-term linkage has the potential to act as a capital asset if that permit is transferable. The linkage provision also provides processors with more influence over the manner in which harvest activities are prosecuted and gives processors leverage in negotiations over prices with harvesters. Alternative 3 results in an outcome on shoreside whiting processors that is similar in some respects to status quo. This is because of the three-sector whiting bycatch limit and the fact that implementing such a limit would tend to create incentives necessary for a race for fish. This means the fishery may not slow down, processing volumes necessary to handle that peak would still be necessary, and, therefore, consolidation of processing capital—and corresponding changes in asset values—is not likely to occur.

When combined with past, present, and future actions/conditions, Alternative 3 tends to place the processing sector as a whole in a better position than many other alternatives. The value of nonwhiting quota as a capital asset is a beneficial outcome for processors. The increase in nonwhiting harvest expected from this alternative is also expected to offset some of the decline of the nonwhiting fishery that has occurred since the 1990s. The shoreside processor linkage can work similar to a capital asset. The initial allocation of quota and the linkage provision also allows processors to have more influence over the ways in which the fishery is prosecuted, thus granting processors tools which they can use to help respond to changing future conditions such as changes in OYs (ACLs), changes in markets, and changes in the opportunities presented by nongroundfish fisheries. However, this is minimized to some degree by the race for fish incentives created through the three-sector common bycatch limit.

4.9.5.5 Alternative 4a

The effect of Alternative 4a on shoreside processors depends on whether the processor is a nonwhiting processor or a shoreside whiting processor. Nonwhiting processors are affected similarly to

Alternative 2b because they receive no initial allocation, but stand to be assisted if adverse impacts occur through the adaptive management provision. The effect of Alternative 4a on shoreside processors is similar to Alternative 2c because shoreside whiting processors receive an initial allocation of quota equal to 50 percent of the shoreside whiting allocation.

When compared to past, present, and future actions/conditions, Alternative 4a creates a system that replaces the system responsible for much of the past and present condition of the fishery. This system allows the fishery to adapt to changing future conditions more readily; however, since nonwhiting processors do not have an initial allocation of quota (and are restricted from acquiring more quota by purchase due to the accumulation limits) nonwhiting processors may not be in a position to adjust harvesting strategies to meet optimal processing conditions. However, shoreside whiting processors are given a tool to help adjust harvesting practices in response to changing future conditions through the processor linkage.

4.9.5.6 Alternative 4b (Preferred Alternative)

The effect of Alternative 4b on shoreside processors depends on whether the processor is a nonwhiting processor or a shoreside whiting processor. Nonwhiting processors do not receive an initial allocation of QSs, but do stand to be assisted through an adaptive management provision if they are adversely affected by rationalization. This makes the effect of Alternative 4b on nonwhiting processors similar to Alternatives 4a and 2b. Shoreside whiting processors are granted an initial allocation of QSs, and this helps offset potential declines in asset values because of rationalization, as well as helping processors negotiate over ex-vessel processors with harvesters.

When combined with past, present, and future conditions/actions, Alternative 4b helps to replace some of the volume nonwhiting processors lost during the downturn of the nonwhiting trawl fishery beginning in the 1990s. This is expected to help nonwhiting processors decrease average costs and to provide opportunities for generating higher gross revenues through the added volume of groundfish species being landed. Shoreside whiting processors are impacted differently. Alternative 4b is expected to result in a decline in processing demand, thus reducing the value of processing capital and potentially leading to a contraction in the number of processing companies processing shoreside whiting. However, this effect is offset by the initial allocation of quota granted to shoreside whiting harvesters. This initial allocation acts as a capital asset, but also places processors in a position of influencing the manner in which harvest activities take place. This means that processors can use their quota to help influence the fishery in a way that allows them to more effectively respond to conditions that may change in the future, such as increases or decreases in opportunities in other fisheries and changing market conditions.

4.10 Mothership Processors of Trawl Groundfish

In this section, we describe the impacts of the alternatives on mothership processors of trawl-caught groundfish. This group is composed of offshore businesses that receive whiting directly from harvesters, and process the fish to make product forms that are usable at the wholesale and/or retail market level. In several cases, entities holding LE trawl permits may also operate motherships. Such entities are included among those examined in this section.

Trawl rationalization may result in a range of impacts to motherships, varying in extent and degree depending upon alternative. As a result of rationalization, it is likely that impacts to motherships will be distributed according to whether harvesters are issued QSs or form cooperatives, and the extent of subsequent consolidation of fishing and processing enterprises. Impacts may also occur based on the extent to which mothership companies gain and control QSs, or catch history, and/or whether linkages

are established between catcher vessels and motherships. The types of impacts to motherships and associated mechanisms relating to the trawl rationalization program are outlined in more detail below.

The section begins with a description of the metrics used to illustrate the effects on motherships. The variables and metrics used, some of which are also used in earlier sections, can be compared and contrasted among the alternatives. The broad-level effects of rationalization on motherships are presented next (page 451), which includes a discussion of important general issues associated with rationalizing the fishery.

Following the description of broad-level effects, we assess the impacts on motherships of the alternatives (page 455). This section begins by identifying the impacts that are expected to occur from each of the elements of the alternatives independently. We then provide an assessment of each alternative on motherships. Finally, we assess cumulative effects of rationalization on motherships. The combined effect of these past, present, and RFFAs are merged with the effect of the alternatives to arrive at the cumulative effect.

4.10.1 Methods for Assessing Impacts

The section describes the methodology we used for assessing the impact of rationalization on motherships, including the ways in which each of the expected impacts is measured and assessed. The potential impacts to motherships are measured as changes in economic performance, or profitability, of individual businesses, and changes in economic efficiency of the processing sector as a whole. Changes are initiated by at least 11 identifiable mechanisms, described in some detail in Appendix C, along with the methods anticipated for examining the impacts.

4.10.1.1 Potential Impacts, Mechanisms, and Metrics

Bargaining Power: The negotiating relationship between motherships and harvesters with respect to ex-vessel prices is a reflection of relative bargaining power. The alternatives would result, at one extreme, in 100 percent of QSs allocated to permits; in this case, mothership operations believe they will be at a relative disadvantage in setting ex-vessel prices. At the other extreme, issuing fishing QSs to motherships would, it is argued, guarantee that certain motherships would have access to product, above and beyond the QSs they may also receive as permit owners. This increased access to product could reduce a mothership company's need to compete in the marketplace for an independent harvester's fish. The establishment of a long-term linkage to mothership processors provides an additional dimension to bargaining power where there is a near balance between the buyer (mothership) and seller (harvester). A short-term, annual declaration provision establishes yet another potential outcome in the negotiations over prices. The effect of this declaration provision on price negotiations may be more akin to a situation where no allocation to motherships is made or where no long-term linkage provision is established.

The relative shift in bargaining power for motherships is assessed qualitatively. A review of the economic literature was presented above with particular emphasis on applications to fisheries or similar common property situations. The experience of other fisheries is also examined for any conditions that may be applicable.

Initial Distribution of IQ, Long Term Linkages, and Annual Declaration: The manner in which QS is initially distributed will have an effect on the mothership sector, especially if motherships receive QSs. The analysis of the initial distribution originates from two models: 1) a quantitative analysis of initial shares based on historic landings and 2) a delineation of processor ownership combined with

historic purchases of landed trawl-caught groundfish. Applying the distribution rules in each of the alternatives to the two models yields output that can demonstrate the patterns of initial QS holdings.

Long-term linkages will affect the bargaining relationship, as noted above, but could also affect how motherships respond to market conditions and how their operations encourage or influence harvester activities. A declaration process will operate differently than a linkage in terms of bargaining power, but will operate similarly to linkages when considering the ability for motherships to engage in short-term business planning.

Harvest Timing: The rationalization program will tend to slow the pace of derby-style fisheries in both the shore-based and mothership sectors of the whiting fishery. Currently, the timing and length of the whiting season is highly influenced by salmon bycatch regulations, timing of the Alaska pollock season in the North Pacific, in which both whiting harvesters and whiting motherships participate, and timing of other whiting sectors or other west coast fisheries. Harvest timing could affect motherships by lengthening the period of harvest somewhat and influencing the hiring and use of processor labor.

Barriers to Entry: At present, the mothership sector is fairly stable in size, because new entrants must overcome significant capital requirements, market structure, and established marketing relationships. In a rationalized trawl fishery, barriers to entry may be altered depending on whether the potential entrant has buying history or acquires QSs through gifting or purchase. Barriers to entry for motherships are assessed qualitatively.

Market Restructuring: The mothership sector is organized around fewer than 10 large or moderate-sized entities and their subsidiaries, and a smaller number operating in any one year. In a rationalized trawl fishery, some changes in the industrial organization of processing companies are anticipated, based on experiences found in other rationalized fisheries, including possible consolidation, joint ventures, other arrangements among motherships (horizontal integration), and arrangements between motherships and harvesters (vertical integration).

The qualitative analysis in this section began with a summary of the market structure developed as a part of Section 3.5. Changes in the market structure in other fisheries that have been rationalized were reviewed as part of that section. Finally, a discussion is included of the anticipated changes that may occur in the groundfish processing sector.

Quality of Landings: In addition to, and influenced by, harvest timing and elimination of the derby-style fishery is an improvement in the quality of landed fish. Harvesters have better opportunity to be more selective in harvests and to manage the harvested fish once on board in such a way as to retain higher quality. The quality could also be affected if the volume of individual landings is reduced. This could lead to generally higher prices received by harvesters, and the effect on motherships could be positive or negative, depending upon the motherships' ability to influence wholesale or retail prices with the higher quality fish. Motherships could also be positively affected if the better quality fish leads to new market opportunities. The analysis addresses these concepts qualitatively.

Processing Costs: In a rationalized fishery, the cost of processing could be affected in a variety of ways. Labor costs per unit of processed fish could be reduced if there is more uniform operation during the season or year, with fewer hires and layoffs and less overtime required. Other costs could be affected depending upon ability to open new markets or change operations. However, harvest timing and associated hires and layoffs are not likely to change as much within the mothership sector as it would among shoreside processors. These issues are discussed qualitatively.

Product Recovery Yield: The effect of harvest timing and quality of landings could positively affect product recovery yields. Reducing the derby-style fishery can lead to more careful management of the fish that are harvested and less waste. However, the motherships in the Bering Sea pollock fishery also participate in the Pacific whiting fishery. This same capital was streamlined and made more efficient as a result of the American Fisheries Act; therefore, further efficiency gains are unlikely, other than minor improvement in product recovery.

4.10.2 Broad-level Effects of Rationalization on Mothership Processors

Broad level effects to motherships from rationalization could include changes in bargaining power over ex-vessel prices, the quality of fish, timing of deliveries, and consolidation among motherships. There were generally three or four motherships active in the whiting fishery each year from 1998 through 2005, with a new entrant in 2006 that did not participate in 2007 or 2008. This means that a relatively small number of companies process whiting on motherships. However, the final processed products from the motherships enter markets where they compete with similar fish products originating elsewhere in the United States and other countries, and, therefore, have more competition in the final processed product market. In other words, mothership processors are generally unable to control market prices for final products.

Harvesters (catcher vessels) and mothership processors are in a dependent relationship, each specializing in certain elements in the supply chain that brings fish to the ultimate consumer. Rationalization will have direct and indirect effects on motherships, and the distribution of QSs (or catch history as is the case with a harvest cooperative structure) will have a direct effect on motherships by potentially altering the bargaining power between processors and harvesters over ex-vessel prices. Assignment of QSs to harvesters directly increases their bargaining power with processors if there is no assignment or linkage to a processor. The type of IFQs and cooperatives being considered here each institute a quasi-permanent harvest privilege assigned to the individual (or cooperative). Even though the harvest opportunity (QPs) must be exercised within the year, the underlying QSs renew the specified opportunity in the next year. IFQ holders even have the ability to sell their QPs and realize some gain from the harvest opportunity they do not exercise. This gives harvesters much greater latitude to hold out for better prices because they have a guaranteed harvest opportunity over a longer period.

QS ownership by motherships would tend to offset the gains for harvesters who may arise through allocation of QSs to harvesters, and bring the relationship closer toward status quo. For example, a processor could use QSs to induce a harvester that is short of QPs for a particular species to make deliveries under specified conditions and prices. At this time, it is unclear what balance of processor/harvester quota ownership would achieve status quo conditions.

Alternatives 3 and 4a implement harvester co-ops with linkages instead of IFQs; long-term processor linkages would have a direct effect on motherships in terms of bargaining power. A long-term linkage provision means that harvesting entities will negotiate with motherships in a sort of bilateral monopoly, essentially as two strong but countervailing powers. In some respects, the resulting negotiated price outcome is not predictable, because it depends upon the relative skill of the negotiators. However, there is some indication that the motherships and linked harvesters may establish profit-sharing arrangements. In that sense, the harvester-processor relationship can operate almost like a vertically integrated firm.

Alternative 4b (reflecting the Council's final preferred alternative) establishes a mothership declaration procedure that obligates deliveries from a catcher vessel to a mothership within a given year. This declaration procedure is short term (only lasts for one season) and can be changed by the catcher vessel

without penalty in the next year. This procedure establishes some business planning certainty to the mothership for the upcoming season, but provides little negotiation power over ex-vessel prices for the mothership compared to a case where no allocation of QSs is made to motherships or no long-term processor linkage exists. The difference in the price negotiation process is merely timing. Whereas price negotiations may be somewhat ongoing throughout a season in a fishery without linkages and without an initial allocation of QSs to motherships, price negotiations in a declaration process are likely to play out prior to the declaration being made. This negotiation is likely to be a relatively competitive process, similar to a case where no long-term linkages exist, and where no QSs are held by motherships. However, the fact that these negotiations may play out several months prior to the start of the season means that the type of outcome may be different than the outcome that would occur if those negotiations were occurring immediately prior to the start of the season, or during the season. Several months prior to the season, there is substantial uncertainty about what the markets will be and, therefore, what an appropriate ex-vessel price may be. Rather than negotiating over a particular price, the negotiations may be over how to share the profits associated with harvesting and processing. The outcome is likely to be one that favors the harvester, but there will be some certainty over the margins each entity can expect from engaging in mothership processing operations and catcher vessel activity.

Rationalization is likely to have some indirect effects on motherships through several fronts. Fleet consolidation would reduce the number of harvesters, thus lessening the motherships' influence over ex-vessel price negotiations by more closely aligning the number of harvesters with the number of motherships. Assignment of up to 50 percent of QS to mothership processors is a feature of Alternative 2c. This would have a countervailing effect because, as suggested above, motherships could use the QSs they control as leverage in forging agreements with harvesters. After trawl rationalization, entry of new motherships could be more difficult. First, they would have to establish business relationships with harvesters who—other things being equal—may be more inclined to deal with motherships with whom they have an existing relationship (but this disadvantage pertains under status quo). They could face a second hurdle if QSs are initially allocated to motherships or long term linkages are established; to be equally competitive they would need to purchase QSs, a cost existing motherships would avoid by any initial distribution, or they may have to entice catcher vessels away from their linked motherships, which can be difficult. A third hurdle exists in the form of the mothership licensing provision, which is another cost to entering the fishery that does not exist under current conditions.

An important effect of rationalization on the harvester side is to eliminate Olympic- or derby-style fisheries, because harvesters control an allocation that they may deploy at will. The mothership whiting sector remains a single, common quota-based fishery. With exception of the catcher-processor sector, which operates as a voluntary cooperative, the whiting fishery can be described as derby-style. To the degree that rationalization allows catch privileges to be assigned to individual harvesters or cooperatives that coordinate their behavior, landings could be more evenly distributed throughout the season. As a result, both the shore-based and mothership sectors should be expected to engage in operations over a longer period. Complete flexibility in the timing of landings is mitigated by regulatory measures to limit the bycatch of salmon and vessels' participation in the Alaska pollock fishery. Chinook salmon bycatch is controlled to a large degree by the May 1 start date; participation in the Alaska pollock fishery will likely induce at least some participants to leave the fishery before the whiting are no longer available to the fishery in late fall or winter.

Currently, the mothership season starts in May and typically lasts about a month, when the motherships depart to participate in the Alaska pollock B season beginning June 10. It is not unreasonable to assume that under rationalization, the MS whiting fishery would turn into two ad hoc seasons with some effort occurring in May and a second effort occurring in September or October, after the pollock B season and/or shoreside whiting season. This may occur because salmon bycatch increases late in the

pollock B season. In addition, literature has shown that the value of whiting increases later in the year. More certainty about autumn fishing opportunities under a rationalized fishery should provide opportunities to capitalize on this value, which should influence the timing of the mothership sector. Figure 4-48 demonstrates one possible seasonal distribution of mothership activity in a rationalized fishery. This is based on the same current seasonal distribution as in the catcher-processor sector, except that it is assumed the mothership participants move to shoreside whiting or Bering Sea pollock in July and August, but return in September.

One important consideration in the figure below is the reduction in peak harvest volume under rationalized conditions. Under status quo conditions, over 50 percent of the sector allocation is caught during the month of May. Sufficient capital must be present in the fishery to process that volume. Under rationalized conditions, that peak harvest period may be reduced and more catch may come in at other times of the year. This reduces the overall need for processing capital in the fishery and is one source for possible mothership sector consolidation. If the information shown in the figure is consistent with eventual harvest timing, then the amount of capital necessary in the fishery could be reduced by almost one half. This will tend to have an effect on the value of mothership capital currently present in the fishery as surplus capital will exist after rationalization. Other things being equal, this surplus availability will tend to reduce the value of mothership assets in the fishery.

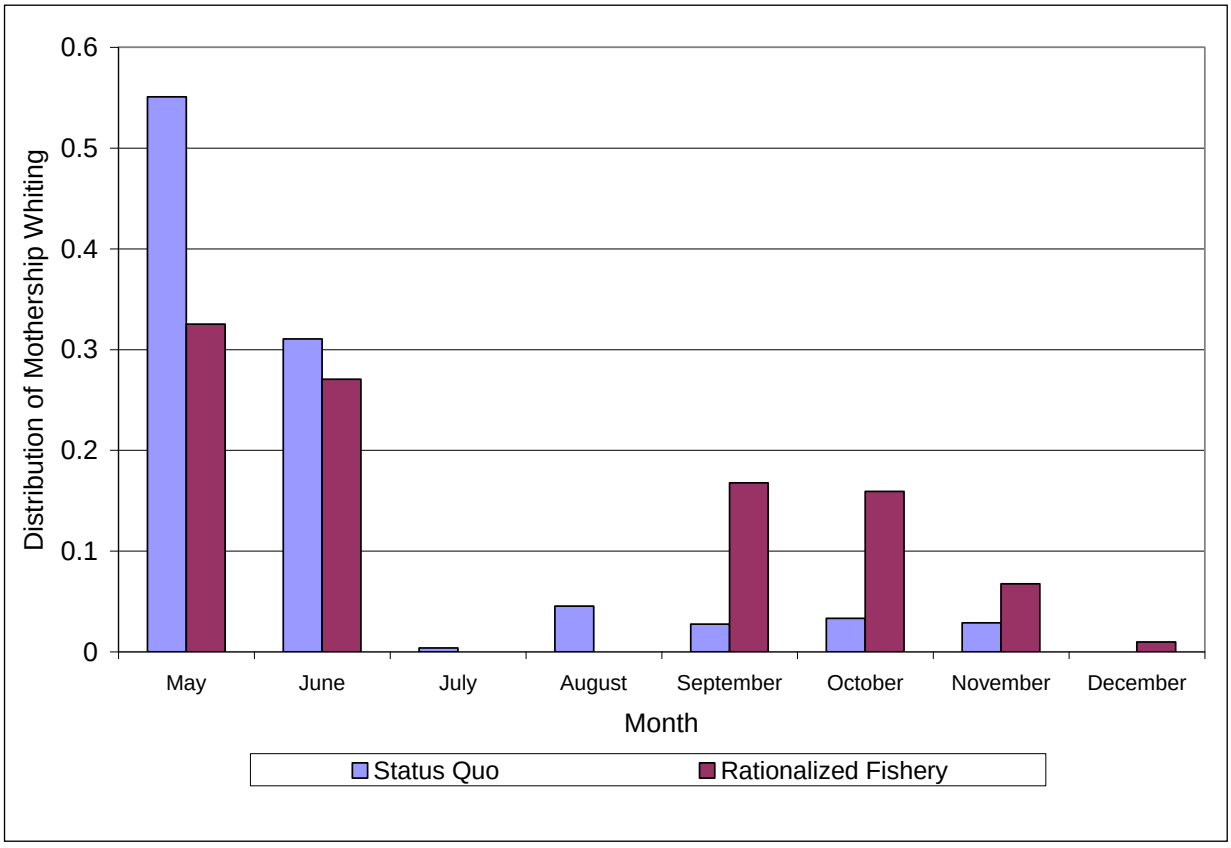


Figure 4-48. Estimated seasonality of mothership whiting harvests.

Rationalization should allow harvesters the opportunity to increase the quality of landed fish, because a more measured pace of fishing will allow more attention to factors affecting quality. This could benefit motherships by assuring a stable, high quality supply, which would make it easier to maintain existing

markets and develop new ones. With more stability in catches, harvesters and motherships may be able to coordinate to develop new products and markets.

In a rationalized fishery, the cost of processing on motherships could be affected in a variety of ways. Labor costs per unit of processed fish could be reduced if the season elongates and fewer motherships may be needed to handle the harvested volume. It is likely that the season will still be compressed to some degree because of constraints within the pollock fishery, the shoreside whiting fishery, and the availability of whiting. Therefore, any mothership engaged in processing operations is likely to be fully engaged, though fewer motherships may be necessary if the season is extended.

Regular supply could also increase product recovery. Although equipment in the mothership sector has been modified by the implementation of the American Fisheries Act in the Bering Sea, rationalization could result in better use of existing capital equipment and labor. Workers could have the opportunity to cut fish more carefully; likewise, equipment could be more easily adjusted to maximize yield. Since whiting is a high volume fishery with a generally highly processed end product, small changes in product recovery yield can lead to a substantial increase in profits. Initial allocation of QSs to motherships, functioning as a means of guaranteeing supply, could provide an incentive to make further adjustments to increase product recovery.

To the degree that IFQs or cooperatives allow harvesters to time landings and coordinate with motherships, rationalization could allow motherships to better respond to changing market conditions along with the ability to develop new markets. Markets respond favorably to uniformity and predictability, and stronger guarantees of steady product deliveries could increase market penetration and the building of stronger relationships with retailers.

As noted above, a rationalized trawl fishery could create new opportunities leading to a restructuring of the overall processing sector, based on the experiences from other rationalized fisheries. Either through consolidation by direct purchase or joint ventures, integration could increase. This includes both horizontal integration—business arrangements among motherships—and vertical integration—arrangements between motherships and harvesters.

An initial allocation of QSs to motherships could also stimulate horizontal and/or vertical integration. First, QSs are likely to encourage consolidation, because firms that are more efficient are willing to buy up QSs owned by less efficient firms. This could occur among processing firms or processing firms could buy up harvesters' QSs (and their physical assets, such as vessels) increasing vertical integration. Depending on the availability of capital, the converse could occur; harvesters who are more efficient could buy up motherships' QSs (and/or their physical assets) to vertically integrate. In general, such consolidation or integration would be encouraged by any resulting returns to scale: increased size and integration across a range of operations would serve to reduce overall costs. Joint ventures serve much the same purpose while retaining existing ownership arrangements.

New motherships entering the whiting sector must overcome barriers to entry, such as meeting the considerable capital requirements required to constitute physical plant and cover operating costs (depending on initial cash flow) and competing with existing motherships to establish business relationships with harvesters, which could require paying higher ex-vessel prices in order to lure harvesters away from their current buyers.

4.10.3 Direct and Indirect Effects of the Alternatives on Motherships

This section analyzes the direct and indirect effects of the alternatives on mothership processors. It begins with an overview of how each of the key elements of the alternatives is expected to impact motherships. The alternatives are evaluated in the remaining subsections, with a comparison to status quo and other alternatives, as appropriate.

4.10.3.1 Expected Effects of Elements of the Alternatives on Mothership Processors

Each of the alternatives will impact motherships in each of the sectors in different ways. Before considering the impacts of the alternatives, we first examine how the elements within the alternatives are expected to impact motherships in a general sense. Following this discussion, we examine the impact of each alternative on motherships.

How do IFQs and co-ops change general operating conditions relative to status quo?

IFQs are likely to decrease the number of harvester vessels and as a result decrease the bargaining power for motherships relative to status quo. IFQs may increase operational flexibility for processors, including motherships, compared to status quo. With potentially greater certainty to harvesters and (in some cases) motherships afforded by QSs, motherships can better plan and more efficiently utilize their facilities. However, bargaining power for ex-vessel prices may shift toward harvesters. With long-term mothership linkages, the negotiation environment will change to one that may be akin to a bilateral monopoly, with essentially balanced power. The co-op also provides an opportunity for mothership owners to establish profit-sharing arrangements with the co-op(s) members, even operating in a vertically integrated partnership. A cooperative system with a mothership declaration process will establish some business planning certainty for motherships, but are likely to act similar to a case where no linkages exist, and/or no motherships hold QSs, when negotiating over ex-vessel prices.

Increased flexibility and certainty over fish for processing can lead to more uniform timing, better product quality, higher recovery yield, and possibly decreased operating costs. This is because whiting processing capital is structured to account for larger pulses of fish consistent with a seasonal race for fish; under a quota system, harvest timing is more controlled, and some capital (i.e., the number of motherships operating at any given time) may not be necessary. This provides opportunities for motherships to have lower per unit costs and, therefore, additional profit.

How does initial allocation of QSs to harvesters make things different for motherships?

Consolidation among harvesters will concentrate QS, among fewer entities, and as a result decrease the bargaining power for motherships relative to status quo. This occurs because there are fewer harvesters to negotiate with, meaning the relative bargaining position of each harvester has improved, simply because he/she harvests a greater portion of the catch and influences a greater portion of the fishery.

Allocating the entire QS, to harvesters may allow them to leverage higher prices from motherships. However, many of the relationships that exist between harvesters and processors in the mothership sector appear to be an extension of those in the BSAI pollock operations, meaning ex-vessel price negotiations may be a function of relations in the BSAI pollock fishery.

Initial allocation of QSs could affect some long-term harvester-processor relationships if the distribution of QS results in smaller allocations to entities than what those entities harvest under status quo levels.

How do mothership initial allocations, long-term linkages, and annual declaration requirements affect motherships?

If motherships receive initial allocation of QSs, then motherships will regain at least some of the bargaining power over ex-vessel prices potentially lost to harvesters, relative to the case where no initial allocation is made to motherships. Motherships with an initial allocation can vertically integrate and engage in fish harvesting opportunities to some degree independent of other harvesters. This increases the ability of motherships to hold out against harvesters while negotiating over ex-vessel prices.

An initial allocation of QSs, or a long-term linkage to motherships, allows motherships to gain increased flexibility for matching catch periods to market demand, and elongating the season for optimal processing efficiency. The mothership sector may evolve into a two-period whiting season. This creates opportunities for lower per unit costs; in combination with expanded market opportunities, this may increase their ability to compete with groundfish providers in the global market.

If harvesters have long-term linkages with motherships, the net effect on ex-vessel prices is likely to be more beneficial to the mothership compared to a case where no linkage or no initial allocation of QSs is made to motherships. The outcome of prices in this case may depend heavily on personal relationships and negotiation skill. In addition, a processor linkage does not decrease the quota available to individual harvesters and, therefore, does not give motherships direct control over harvesting activity.

An annual declaration requirement provides motherships with some business planning certainty in the upcoming season. Motherships do not receive much negotiation power over ex-vessel prices in this alternative because those prices will merely be negotiated in a competitive process prior to the deadline for the declaration. However, negotiations take place in advance of the season, when future market conditions are not known by either buyers or sellers; this may lead to profit sharing arrangements—rather than negotiation over an absolute ex-vessel price—to account for unforeseen price swings in the final product market.

An initial allocation of QSs, or catch history, can act as an asset or a vehicle with which mothership entities can generate revenue. If consolidation occurs among motherships, the entities who own motherships that are consolidated out of the fishery can replace the revenues previously generated by mothership processing activity with the sale or lease of that IFQ.

How will accumulation limits affect motherships?

Accumulation limits generally restrict control and consolidation among motherships. A limit on fleet consolidation will tend to reduce economic performance of harvesters, but will also reduce the likelihood of vertical integration among mothership companies.

Control limits also affect the ability of the mothership sector as a whole to increase the amount of QSs held by motherships. This will have a long-term effect on ex-vessel prices because lower limits will mean fewer QSs held by motherships and, therefore, less leverage over price negotiation. A restriction on control will tend to limit the degree of influence that the largest motherships will have on the program and will, therefore, affect the distribution of economic performance.

A usage limit will restrict the amount of whiting that a single mothership can purchase in a year. This has the effect of ensuring a minimum number of motherships in a given year and restricting the degree of consolidation that could occur among motherships.

How will a grandfather clause affect motherships?

A grandfather clause tends to have a distributional effect on motherships if they stand to receive an initial allocation of QSs. The current participants have historically been moderate to large producers, and some could stand to gain QSs in excess of the accumulation limits if the accumulation limits are relatively small, a grandfather clause is adopted, and an initial allocation is made to motherships.

If large processing entities receive QSs in excess of the accumulation limits, this may have an effect on ex-vessel prices. This is because it creates the potential to have few dominant companies that hold large amounts of QSs.

How does the number of species covered affect motherships?

The number of species covered will affect harvesters directly, and motherships indirectly. As the number of species covered in the program increases, harvester flexibility decreases and this may have an effect on the outcome of the program. Species with low OYs (ACLs) may impose risk to harvesters because of the uncertainty associated with what a vessel will catch while fishing and the cost of going into deficit (Section 4.6.2.4). This risk may affect fishing behavior that can have a secondary effect on motherships if such behavioral changes influence harvest timing or harvest volume.

How does the number of trawl sectors influence motherships?

The number of trawl sectors (three or four) is not likely to affect mothership processors, as they would remain in their own sector under any alternative.

How will an adaptive management provision affect motherships?

The adaptive management provision provides a mechanism to mitigate harm to adversely impacted motherships or to achieve other objectives as may be specified by the Council, such as bycatch reduction or community protection. Awarding adaptive management quota to adversely impacted mothership companies is likely to have a distributional effect, with some motherships receiving that quota and being able to capitalize on the opportunities that holding that quota provides.

If motherships are awarded an initial allocation and therefore cannot be recipients of adaptive management quota (which is one option explored by the Council), adaptive management will provide a distributional effect. Much of this effect may be via a second-order effect through direct effects on harvesters. This is because most motherships potentially operating in the fishery under rationalization would, available data indicate, also receive quota. Therefore, if an initial allocation is made to motherships, adaptive management may be provided only to harvesters. Depending on which harvesters receive that adaptive management quota, the motherships that receive those deliveries could stand to gain indirectly.

Adaptive management could provide a vehicle for entry of new motherships, aid in development of specialty processing opportunities addressing niche markets, or create goal-oriented processor-harvester arrangements.

How will area management affect motherships?

Area management, as envisioned, is not expected to affect motherships because they are restricted to operating entirely in the northern area and the envisioned area management option would not split this area into smaller divisions.

How will a carry-over affect motherships?

A carry-over provision decreases the cost to harvesters of going into deficit, and, therefore, decreases the risk associated with harvesting activity. Such a change in risk may mean that harvesters are willing to prosecute fishing activity in a manner that is somewhat more risky. This will have a limited secondary effect on motherships.

How will tracking and monitoring affect motherships?

At-sea-monitoring primarily affects the cost of fishing. Since this cost is internalized within a mothership operation, it could have some effect on profitability.

4.10.3.2 Alternative 1 (No Action)

The No Action alternative is expected to result in a continuation of the present status of the mothership processing industry. Harvest timing is anticipated to be highly concentrated into the May and June period, with little harvest occurring after that time. While revenues generated by mothership harvesters are not readily known, it is generally believed that the amount of mothership processing capital in the fishery is more than what may be the case in a rationalized fishery, particularly if the season becomes elongated in a rationalized fishery.

4.10.3.3 Alternative 2a

The effect of Alternative 2a on mothership net revenues is unclear in absolute terms. In relative terms, Alternative 2a is less beneficial to motherships than many other alternatives. Ex-vessel prices paid to harvesters are generally expected to increase under this alternative compared to the status quo, primarily because most of the quota is distributed to harvesters, increasing costs for motherships via price negotiation and higher prices paid for whiting. Under a rationalized fishery, the holders of the QSs generally hold the value of the fishery because of their ability to bid away profits from others. However, ex-vessel price negotiations among motherships and harvesters may be driven by whiting allocations, but also relations in BSAI pollock fishery. On the other hand, it is likely that other factors will lead to increased gross revenues for the mothership sector as a whole. Since rationalization provides greater certainty, it is reasonable to expect that some mothership sector operations will occur during the fall months and literature has shown that whiting are more valuable later in the year (Larkin and Sylvia 1999). Therefore, while motherships may pay higher ex-vessel prices to harvesters for whiting, the revenue generated from Pacific whiting may increase if fishing activity occurs later in the year. Therefore, there is reason to believe that motherships will pay more for acquiring fish from harvesters, but they may also receive more for their finished product. This makes the overall effect on mothership net revenues unclear, but relatively worse off than other action alternatives.

Under this alternative, QSs is given to harvesters based on catch history. As noted above (Section 4.6.2.2, page 297), rationalization will lead to consolidation among the harvester fleet, and harvesters remaining in the fishery will have a stronger position from which to negotiate (and if necessary, hold out) for ex-vessel prices without fear of losing harvest opportunities to others. In addition, the fact that the harvesting sector has control over the QSs means that the fishery is more likely to be prosecuted in a manner that benefits harvesters. Harvest activities are bounded by resource accessibility and the seasonality of other fisheries, particularly Alaska pollock in the North Pacific, and shoreside whiting opportunities on the west coast.

The fishing season is expected to lengthen to some degree under a rationalized fishery. This change in the pace of harvesting will tend to increase product quality and therefore increase the value of Pacific whiting harvests. However, since the holders of QSs are able to bid away profits from others, it is likely that harvesters will bid up higher ex-vessel prices, thus eroding potential gains in profits to motherships that would otherwise occur because of changes in product quality. The longer season may also require less processing capital to handle harvest volumes. Such a decrease in processing capital is likely to decrease the per-unit cost associated with processing, thus generating higher profits. However, since harvesters control the majority of quota in this alternative, some or all of those profits are likely to be bid away from the mothership sector toward the harvesting sector in the short run.

Because they would not receive an initial allocation, mothership companies would be worse off under Alternative 2a than Alternatives 2c, 3, or 4a. Mothership processors would also be worse off under Alternative 2a than under Alternative 2b, which has a provision for adaptive management that could be used for mitigating effects. It is also expected that motherships could be made worse off under Alternative 2a than Alternative 4b. While the effect of price negotiations may be similar under both alternatives, Alternative 4b affords motherships the ability to plan more effectively for the upcoming season, and therefore to control costs to a greater degree.

The negotiation power over ex-vessel prices may shift from motherships to harvesters, at least in the short run, in Alternative 2a relative to status quo. Over the long term, however, motherships may be able to acquire enough Pacific whiting quota to influence ex-vessel prices. In addition, under the initial allocation provision, some processing entities will receive an initial allocation of quota because they own LE trawl permits. Compared to Alternative 4b, Alternative 2a also lacks an annual mothership declaration that is required of vessels under Alternative 4b, leaving them without the commitment certainty of harvest necessary for advance planning.

The distribution of rationalization's effect may be somewhat positive to some mothership owners and overall negative to others. If the season elongates and less mothership capital is necessary, then it is reasonable to expect some consolidation to occur among motherships. Those who stay in the fishery stand to see their total production increase as they handle more volume, and this tends to reduce average costs. Those motherships that are consolidated out of the fishery stand to lose a stream of revenue that they generate under status quo conditions and may also experience decline in the value of their assets.

4.10.3.4 Alternative 2b and 2c

Many of the provisions under Alternatives 2b and 2c are similar to those of Alternative 2a, but Alternatives 2b and 2c compare two methods for addressing processor concerns. Alternative 2b includes an adaptive management provision to mitigate against adverse impacts to mothership companies.[109] Such a program is likely to benefit those companies that are recipients of this quota, although it may not yield the most efficient outcome in terms of the national economic gains expected from rationalization.

Alternative 2c includes a second method: initial distribution of QSs to motherships in the form of 50 percent of whiting QS. This alternative will have a distinctly positive effect on motherships relative to Alternative 2a in terms of their bargaining power over ex-vessel prices. Without an allocation of quota to motherships, harvesters with QSs will gain bargaining power because of their holdings of QSs, but also through fleet consolidation. Such fleet consolidation limits the number of vessels that can

[109] As noted in a previous section, the suite of alternatives allows the adaptive management provision to be used for things other than for processor concerns, such as to mitigate the effects on adversely impacted communities and to provide incentives to use habitat- and bycatch-friendly gear.

negotiate with mothership companies, and therefore limits the ability of motherships to shop around for harvesters willing to fish at lower ex-vessel prices. If motherships begin with some initial allocation, they can vertically integrate and also engage in harvesting opportunities (if they own catcher vessels) to some degree independent of other harvesters. This increases the ability of mothership processors to "hold out" against harvesters while negotiating over ex-vessel prices. It is almost certain that the ability for mothership processors to negotiate lower prices increases as their ownership of quota increases and a 50 percent initial allocation is substantial.

An adaptive management provision may place downward pressure on ex-vessel prices. If used as envisioned, such an AMP will tend to assist certain (disadvantaged) mothership companies. However, this is true only if harvesters are prosecuting whiting subject to adaptive management, which comprises 10 percent of the QSs. A limit on the number of potential buyers may have a downward effect on prices paid for the adaptive management fish. However, the adaptive management provision is not likely to impact ex-vessel prices to the same degree as initial QSs to motherships, simply by virtue of the difference in volume attributed to motherships.

Over the long run, mothership companies may continue purchasing QSs in the whiting sector because of the relatively large size of the control limit. The 25 percent control limit specified for both the shoreside and mothership whiting sectors means that four entities could theoretically control the harvest of whiting in both sectors. This means that over time, ex-vessel prices in the shoreside whiting sector may fall to some degree since mothership companies have the ability to acquire additional quota, vertically integrate, and hold out against independent harvesters for more favorable prices.

If motherships are initially allocated QSs (Alternative 2c), they may play a greater role in directing the timing of harvests, since they could enter into harvest contracts that include strategic delivery times. In addition, initial allocation of QSs to motherships could enhance their ability to create joint ventures or other arrangements among motherships (horizontal integration) and between motherships and harvesters (vertical integration).

4.10.3.5 Alternative 3

For the mothership whiting fishery, Alternative 3 differs considerably from Alternatives 2a through 2c in that harvest cooperatives are established. The major effect on motherships is primarily in terms of the negotiating relationship over ex-vessel prices. With a long-term mothership linkage, the fishery could behave similarly to a bilateral monopoly, with a set of reasonably balanced buyers and sellers. The effect on bargaining position and the change in ex-vessel prices cannot be predicted, because it largely rests upon personal relationships and the bargaining skill of the negotiators. As noted above, the whiting ex-vessel price negotiation may be a function of relationships established between motherships and harvesters in a number of fisheries, including BSAI pollock.

There is a 20 percent accumulation limit with Alternative 3, the effect of which is to guarantee at least five motherships will operate in the sector. This is a smaller accumulation than any of the other alternatives, meaning that multiple motherships will remain in the fishery, and consolidation among mothership companies is not likely to occur. This is beneficial to some mothership companies that may stand to be in a position of being consolidated out of the fishery, but may not be beneficial to some other companies that are in a position of growing under a rationalized fishery.

Alternative 3 features an adaptive management provision. The adaptive management provision could be used to mitigate adverse impacts to mothership companies or communities. It could also be used to encourage gear switching or the development of gear with lower bycatch. Depending upon the objective of those administering the quota, the distribution of effects is likely to vary. An adaptive

management provision may place downward pressure on ex-vessel prices. However, this may only true if harvesters are prosecuting groundfish subject to adaptive management, which comprises 10 percent of the QSs.

The relationship between harvesters and motherships that is formed through co-ops for harvesters in this alternative is different from the relationship established by issuing both sectors QSs, as in Alternative 3b. The ex-vessel prices that result through a harvester-processor linkage in the mothership sector could be different from the negotiated ex-vessel prices when both harvesters and motherships receive QSs. Harvesters and motherships that receive QSs can buy QSs from, and sell them to, a large number of potential entities; in contrast, harvesters and motherships in a cooperative structure with a linkage are bound to one another (though the linkage can be broken with some effort). This linkage means that negotiation and relationships between the harvester and motherships could have some influence over ex-vessel prices in the short term. Over the long term, harvesters and motherships can break that arrangement if the harvester fishes in the "noncooperative" portion of the fishery, though this fishery is a competitive, derby-style fishery, which makes it unattractive and arguably less profitable. Though there is an ability to break the linkage and seek higher prices elsewhere, doing so may be costly, meaning there is an ability for the linkage to influence matters over a long term.

The distribution of harvest opportunities under a cooperative structure with harvester-processor linkages is, in many respects, more similar to Alternative 2a, with 100 percent of the initial allocation going to permits, than to Alternative 2c where an initial allocation is made to both harvesters and motherships. This is because under a cooperative system with processor linkages, the harvester still controls the opportunity to harvest the available quantity. That quantity is not made available to motherships, as would be the case if QS was allocated to motherships.

As rationalization provides opportunities for the season to become elongated, there is a subsequent opportunity for consolidation of both harvesting and processing capital to occur. Those motherships that grow their production volume as a result of that consolidation are likely to see some reduction in their average costs as more product is produced over a given amount of capital. However, the mothership limits under this alternative make much mothership sector consolidation unlikely. A long-term mothership linkage has the potential to operate in a way that allows motherships facing consolidation out of the fishery to replace some of that value by selling their permit and associated linkages to another entity. In this way, the mothership permit with linkages acts as a type of asset that can be used to replace some of the revenue they may lose by being consolidated out of the fishery. In other words, long-term linkages to a mothership permit can take on some aspects of a resource access privilege because those linkages are somewhat difficult to break and are tied to a transferable permit. Since there are no limits on the number of mothership permits an entity can hold, mothership entities remaining in the fishery can acquire the permits of other entities which have consolidated out of the fishery (so long as they remain within accumulation limits). The linkages associated with that permit would remain, and those catcher vessels would be obligated to the new entity (unless the catcher vessel elects to fish in the noncooperative fishery and break that linkage). Therefore, while linkages may not act as an asset in the same way that IFQ may, there are some similarities that allow holders of mothership permits with linkages to sell that permit and associated linkages to offset some of the loss in revenues they may face by consolidating out of the fishery.

4.10.3.6 Alternative 4a

The elements in Alternative 4a reflect some features in Alternatives 2a through 3. Alternative 4a differs primarily in the results of the initial allocation formula, the presence of a grandfather clause, and the lack of an initial allocation to motherships but a 50 percent linkage of whiting. Other elements of this

alternative differ, but do not appear to have a noticeable effect on the outcome. A 30 percent accumulation limit means that at least four motherships will operate in the sector.

In Alternative 4a, motherships have a 50 percent linkage with harvesters, in contrast to the 100 percent linkage in Alternative 3. This disadvantages motherships in terms of ex-vessel prices (relative to alternative 3), because harvesters have an opportunity to seek better pricing arrangements for half their quota, rather than being tied to a single mothership. However, because it appears that relationships in the mothership sector are often extensions of relationships that exist in the Bering Sea pollock fishery, and because relatively large degrees of vertical integration are present in the mothership sector, the level of affiliation may not have a large effect on many mothership-catcher vessel relationships. However, because there are relationships between motherships and catcher vessels that do appear to be independent of relations in the pollock fishery, a lesser degree of processor affiliation will tend to disadvantage motherships in those negotiations relative to Alternative 3.

Those motherships that grow their production volume are likely to see some reduction in their average costs as more product is produced over a given amount of capital. For those motherships that consolidate out of the fishery, the linkages established in Alternative 4a may act similarly to Alternative 3, but the value of the permits is likely to be lower, because there is less catch history linked to that permit and, therefore, less certainty over deliveries to that permit. Therefore, for those motherships that attempt to replace some of the lost revenues as a result of being consolidated out of the fishery, the sale of their permits will fetch some replacement value, but probably not as much revenue as under Alternative 3.

4.10.3.7 Alternative 4b (Preferred Alternative)

Alternative 4b is intended to reflect the Council's final preferred alternative for rationalization of the LE trawl fishery. The Council's final preferred alternative as it applies to motherships includes several key components that are not found in the other alternatives. The initial allocation formula for catcher vessels is based on a longer qualification period (1994 to 2003) than the other alternatives. The formula is based on relative history rather than absolute history, there is an annual mothership declaration procedure rather than a mothership linkage and a usage limit that restricts the amount of whiting a mothership can purchase and process from catcher vessels in a given season. The elements that are expected to most impact motherships are the declaration procedure and the usage limit. Generally speaking, the mothership declaration procedure has some advantages over Alternatives 2a and 2b, but does not appear to be as beneficial to motherships as any of the other non status quo alternatives as it appears to be far less beneficial to the mothership than a long-term linkage provision. It also appears to be less beneficial than an initial allocation of QSs of 50 percent since such an allocation is far more secure than a linkage. It is not immediately clear how this alternative stacks up to the No Action alternative when viewed at the individual mothership level, though this option will result in greater efficiencies at a broad level through reductions in average costs for example.

The one benefit of the declaration procedure is that motherships will have some degree of certainty prior to the start of the season regarding from which catcher vessels they can expect to receive deliveries, and by extension, the amount of catch they might be expected to receive from those catcher vessels. This enables motherships to plan accordingly by purchasing adequate supplies for processing and packaging the fish, as well as acquiring adequate markets for selling the final processed product. This enables motherships to more effectively manage costs and develop more optimal business plans. It is unlikely that the declaration procedure will favor motherships to much degree when negotiating over ex-vessel prices. While the mothership and catcher vessel declaration is established prior to the season starting, ex-vessel price negotiations are likely to play out in a competitive process prior to the declaration being made. Since there are no penalty provisions for switching a different mothership in a subsequent year,

the mothership gains little to no power over price negotiations and other matters from the declaration provision as the catcher vessel can simply move in a subsequent year if it is unhappy with the relationship. This differs from a linkage provision where a vessel must participate in the noncooperative portion of the fishery in order to break the linkage. Since participating in that mode is arguably less beneficial to the catcher vessel, the mothership gains some negotiation power through the long-term linkage provision, while it does not gain much through a declaration process (though it does gain some business planning certainty that helps manage costs). However, as noted above, the negotiations in a declaration procedure are likely to result in a profit sharing arrangement rather than an absolute ex-vessel price in order to hedge against possible future swings in the market.

The accumulation limits under Alternative 4b establish a 45 percent usage limit for motherships. This usage limit is expected to allow for some consolidation of mothership activity, but will ensure that there are at least three motherships in any given year (assuming the entire mothership sector allocation is attained). This allowance for growth may benefit some companies, while adversely impacting others. If one company is able to grow operations to the full 45 percent level, some other companies will necessarily see a reduction in their volume. The mothership that is able to grow operations will be able to flow more production over a given platform (which reduces average costs), while other companies will see a reduction or elimination of deliveries (which increases average costs). In some cases certain motherships may elect to leave the fishery because there will likely be a reduction in the amount of capital necessary to process fish caught in the fishery. Consolidation among mothership operations would allow for a more cost efficient utilization of remaining capital. In any case, those companies that do not grow stand to lose volume and, thereby, lose a stream of revenues to which they have access under status quo conditions. Since motherships do not receive an initial allocation of catch history or a long-term linkage (which, if constructed in a certain way can act as a capital asset), those motherships simply lose revenue. While some of that revenue could be replaced with a sale of the permit, that permit will only have value of the purchaser believes that its purchase will provide him/her with a source of revenue. This is compared to a case where consolidation of mothership activity occurs under an alternative where motherships receive an initial allocation of catch history. In a case where motherships receive an initial allocation, they may still leave the fishery, but the revenue from selling or leasing that catch history can offset the revenues lost from leaving the fishery. Finally, while such consolidation could occur under status quo conditions, it seems more likely that consolidation will occur under rationalized conditions because of the enhanced ability for season timing to elongate under a rationalized fishery, reducing the need for much of the capital present in the fishery under status quo where large peak harvest volumes must be accommodated.

Under Alternative 4b, only selected species, rather than all, would be allocated catch history. In addition, at-sea bycatch would be allocated at the co-op level. The fact that mothership catcher vessels would not be responsible for the catch of some rarely encountered species, such as nearshore species and several types of flatfish, means that the probability is reduced of such an encounter prematurely closing the mothership whiting fishery. This means that the expected catch levels in the fishery are more likely to be realized from year to year in the mothership sector under Alternative 4b than Alternatives 2 and 3 because the risk to the fishery posed by catch events of infrequently caught species is reduced.

4.10.3.8 Comparative Summary of the Effects of the Alternatives

Alternative 1	• Continued overcapitalization as a result of short season.
Alternative 2a	• Higher cost of purchasing fish from harvesters compared to status quo. • Potentially lower cost of production as a result of season extension.
Alternative 2b	• Select, adversely impacted motherships receive quota through adaptive management, minimizing disruption of activity. • Motherships that are not recipients of adaptive management quota may be affected similarly to Alternative 2a. • Potentially lower cost of production as a result of season extension.
Alternative 2c	• Motherships pay lower prices for fish from harvesters than in Alternative 2a. • Potentially lower cost of production as a result of season extension. • Motherships consolidated out of the fishery can replace that revenue stream through the sale or lease of IFQ.
Alternative 3	• Motherships may pay lower prices for fish than in Alternative 2a, or may enter into profit-sharing arrangements with harvesters. • Potentially lower cost of production as a result of season extension. • Motherships consolidated out of the fishery may be able to replace some of their lost revenue by selling permits with linkages attached to them..
Alternative 4a	• Motherships may pay lower prices for whiting than Alternatives 2a and 3a; some motherships may pay higher prices for whiting from some catcher vessels. • Potentially lower cost of production as a result of season extension. • Motherships consolidated out of the fishery may be able to replace some of their lost revenue by selling permits with linkages attached to them, though the value of those permits is likely to be less than in Alternative 3..
Alternative 4b	• Higher cost of purchasing fish from harvesters compared to status quo, but similar to Alternatives 2a and 2b. • Potentially lower cost of production as a result of season extension and reduced need for processing capital. • Motherships that grow production may capitalize on new opportunities. • Motherships that are consolidated out of the fishery may lose revenue that they generate under status quo conditions. • More certainty over annual operations than Alternatives 2a and 2b through the declaration provision. • More certainty over harvest volumes than Alternatives 2a and 2b due to the select set of species for which harvesters have catch history.

4.10.4 Cumulative Effects on Motherships

The effect of the alternatives on motherships is combined with past actions, current and future trends, and RFFAs to derive the cumulative effect. Each of these effects is measured using the potential impacts identified in Table 4-55, which include the (cumulative) effect on the net revenues for motherships of trawl-caught groundfish. This cumulative effects analysis uses the analysis contained in the section describing broad level effects of rationalization as well as the effects described in the analysis of alternatives.

4.10.4.1 Overview of Past Actions and Trends Affecting Motherships

Various past fishery management measures and other exogenous trends have affected motherships and other processors and have been instrumental in shaping the present structure of the industry. Many of these measures and trends were discussed in Chapter 3 and in the section on cumulative effects on trawl harvesters; the details can be found there. Some of the noteworthy details affecting motherships in particular are identified here in brief.

Harvest restrictions started to become prominent during the 1980s due to concern about depressed stocks. MPAs were implemented during the last decade, which closed off wide areas to trawl harvesters. Harvest levels and revenues for nonwhiting harvesters declined, and the industry found itself over-capitalized. Many were unable to cover fixed costs of vessel ownership. The 2003 trawl vessel buyback program had the effect of reducing harvest participants, including catcher vessels, and improved the viability of remaining harvesters. This reduced the number of motherships participating in the fishery because they rely on a minimum threshold number of vessels to remain viable.

A different picture has emerged within the Pacific whiting industry. Processor innovations helped to develop high quality surimi from Pacific whiting, largely for export to the Far East, and the domestic industry began to take hold in the 1980s and 1990s. A setback in the early 2000s was the result of an overfished declaration and concern over Mad Cow disease (Pacific whiting surimi producers used beef plasma in the production of surimi). Recent changes in processing methods and products have led to resurgence in the industry, considerably higher prices, and new entrants among mothership processors. There has also been greater Council involvement in harvest restrictions, including Amendment 15, which limited access to specific sectors of the whiting fishery.

A significant factor affecting the participation of motherships is the conditions and trends associated with the BSAI groundfish fisheries, particularly Alaska pollock. Rationalization of the BSAI pollock fishery in the 1990s, combined with increased demand and improved profitability conditions there, has had an important influence on the timing and participation of those motherships in the west coast whiting and nonwhiting fishery.

4.10.4.2 Trends and Actions Influencing Motherships

A number of exogenous trends are influencing the operating environment for mothership processors. The combined effect of these trends and actions become the cumulative effect of rationalization on shoreside processors. They are discussed in this section and include the following:

- Changes in use of ocean areas
- Increased protein demand and production costs
- Increased consideration of demand for ecosystem-wide fishery management approaches
- Increased public awareness and scrutiny of the fishing industry
- Climate change
- Short-term versus long-term trends

Ocean areas around the world are under increased pressure and scrutiny. Population growth combined with increased global concern for environmental protection is leading efforts to ensure fish populations are harvested responsibly without depleting the fishery for future generations, and that uses methods that will not cause environmental harm. Other uses for oceans, such as transportation, energy production, environmental recovery, and waste assimilation, can and will continue to lead to conflicts with traditional fishery practices. This trend will continue in the future. For the west coast fishery,

conflicts may increase in the future, and these could affect the supply of fish to processors, including motherships, impacting ability to use and send product to market.

Additional conflicts relate to the location of harvest operations for catcher vessels. Environmental awareness and the development of MPAs have affected, and will continue to affect, where harvest operations can take place. The farther that catcher vessels must travel, the less profitable the mothership operations.

As the world's population increases, there will continue to be a greater demand for protein sources. Fishery resources are generally considered to be increasingly important sources for meeting the growing world demand. This large-scale trend applies regionally as well: population growth rates in the western United States, particularly near coastal metropolitan areas, are expected to be among the highest in the nation. Demand for fish will increase accordingly; if the trend continues towards higher per capita consumption of fish, demand will increase even more.

Trends expected to affect the cost of processing in the future include the expectation that resource inputs will remain high relative to prices seen the past few decades. These include the expectation that steel, fuel, and many other inputs necessary to operate and maintain a processing facility will remain high in the future because of increased global demand for such inputs. Rationalization has the effect of mitigating some of the expected increases in cost that may be exogenous factors as well as factors that are part of Council actions. Since rationalization allows vessels to time deliveries and fishing activity in order to take advantage of market conditions, rationalization has the effect of mitigating some of the cost burden by allowing opportunities to optimize revenues for both harvesters and processors. While various input costs, such as energy, are generally expected to increase at rates higher than other costs, it is also expected that the value of fish products will escalate or remain relatively high on a global basis and the supply of whitefish from sources such as the North Atlantic remain depressed. This increased demand is expected to result in higher prices for raw fish products and this should offset the cost associated with relatively high fuel prices. However, the ability for processors to benefit from this expected increase is tied to harvester/processor negotiation power. This concept is closely related to the decision over the amount of QSs that should be allocated to harvesters versus the amount of QSs allocated to processors. Those alternatives that allocate relatively more to permits will tend to allow harvesters to benefit from this demand compared to those alternatives where processors are allocated relatively more.

Increased scrutiny of the fishing industry by the public is expended to continue, particularly scrutiny of bottom trawl gears. Such increased scrutiny may not necessarily lead to formal regulation changes, but may affect the marketability of processed fish from trawl-caught groundfish and groundfish caught with nontrawl gear. One possible outcome of increased scrutiny is a relatively higher price for nontrawl-caught groundfish. The net effect on motherships is not clear, but this trend could affect the source of fish for processors in the future.

Several additional factors that are largely exogenous to the effect of rationalization, but that may influence profitability of motherships, include the possibility of a stock being declared as overfished, the unexpected removal of a stock from overfished status, and the effect of climate change and variability on species abundance and location. While these factors are largely unpredictable, they are best considered within the cumulative effects section because they are not directly related to rationalization. If a stock becomes overfished, and a lower OY is implemented, harvesters are likely to see lower revenues due to a loss in harvest of that species, because that species constrains access to other stocks, or both. The inverse is true if a stock is taken off the overfished list. The effect of climate change and variability on fish abundance and location also influences processor profits. If conditions are such that groundfish migratory patterns differ substantially from one year to the next, motherships may be forced

to follow the migrations. This may or may not be possible, depending on environmental limitations, energy costs, and conditions in other fisheries in which the motherships participate.

Table 4-59. Trends and factors affecting mothership profitability and asset value.

Trends and Factors Affecting Mothership Profitability		Impacts
Due to Rationalization	• Consolidation among the mothership sector	
	• Processing cost efficiency	+
	• Asset value	–
	• Changes in ex-vessel price negotiation	Conditional
Exogenous to Rationalization	• Changes in use of ocean areas	–
	• Increased global demand for protein	+
	• Rebuilding of depleted groundfish species	+
	• Increasing cost of inputs, including energy	–
	• Possibility that a stock unexpectedly becomes overfished	–
	• Climate change	Unknown
	• Increased public scrutiny of fishing industry	Conditional

4.10.5 Summary of the Effects on Motherships by Alternative

Motherships stand to be impacted by each of the action alternatives due to a replacement of the current management system (Alternative 1, no action) that is responsible for much of the past and present status of motherships. Under nearly all action alternatives (aside from alternative 3), the season length of the fishery is expected to increase, leading to a reduction in capital necessary to handle the given volume. Some motherships may capitalize on this consolidation, while some motherships may simply leave the fishery and experience a loss in revenue and reduction in asset value—similar to what occurs for shoreside whiting harvesters under some alternatives. However, depending on the action alternative those that remain in the fishery may have enhanced power over ex-vessel prices when negotiating with harvesters.

When combined with past, present, and future conditions/actions, the effect of the action alternatives creates a system that replaces much of the management system responsible for the past and current status of motherships (Alternative 1, no action). When compared to future conditions, each of the action alternatives allows participants in the fishery the opportunity to adapt to future conditions as they change. Depending on the specific action alternative, motherships may or may not be able to capitalize on this adaptability.

4.10.5.1 Alternative 1 (No Action)

Cumulative effects on mothership processors of trawl-caught groundfish under no action, Alternative 1, would result from the ongoing effects of past and present actions and trends and RFFAs operating on the baseline conditions identified in Section 3.10. Actions, trends, and RFFAs affecting this environmental component have been identified in Section 4.10.4.

4.10.5.2 Alternative 2a

Alternative 2a implements a rationalization program that is expected to replace the management system responsible for the past and present condition of the fishery. This alternative does not make an initial

allocation to motherships, nor does it establish a declaration or processor linkage. Therefore, this alternative is expected to be the least advantageous to motherships compared to all other action alternatives. However, as a relatively large amount of vertical integration exists among the mothership sector, the effect of purely allocating to harvesters (and not including a linkage or declaration) may not have as large of an effect on motherships as shoreside processors. However, for those mothership entities that are not vertically integrated, the effect may be relatively adverse.

When compared to past, present, and future conditions/actions, the effect on motherships is a replacement of a system responsible for past and present conditions. The expected result is a decline in the number of motherships necessary to prosecute the fishery, and those motherships that leave are likely to experience a reduction in revenue. This places those motherships that leave the fishery in a position of being more dependent on fisheries in which they remain involved, such as Bering Sea pollock, and with a less diversified portfolio of fishery involvement. This means they may be less able to adapt to future conditions, should they change substantially from status quo. Those motherships that remain may be positively impacted through a reduction in average costs and increased volume per mothership entity, provided those that remain are vertically integrated to an extent that they can successfully negotiate with independent harvesters over ex-vessel prices. The effect on these motherships under future conditions is a system that is more adaptable to dealing with future change.

4.10.5.3 Alternative 2b and 2c

Like other alternatives, Alternatives 2b and 2c replace the management system responsible for much of the past and present status of motherships with another system that is expected to lead to a reduction in the number of motherships active in the fishery. Should such tendencies adversely impact motherships, they may be assisted by both Alternatives 2b and 2c, but in different ways. Alternative 2b would allocate adaptive management to motherships adversely impacted by rationalization, while Alternative 2c would make an initial allocation to motherships. The difference in the two alternatives is that Alternative 2c results in a larger amount of quota being allocated to motherships than would be allocated under adaptive management. Furthermore, the number of motherships receive quota through adaptive management is likely to be smaller than those receiving an initial allocation. Lastly, an initial allocation will tend to act as a capital asset, while adaptive management quota will not tend to have that impact.

Taken in the context of past, present, and future conditions/actions, Alternatives 2b and 2c replace the system responsible for past and present status of motherships with one that is expected to result in a decline in the amount of mothership capital necessary in the fishery. This can have benefits through cost efficiencies, but may adversely impact motherships that are consolidated out of the fishery unless those motherships receive an initial allocation through Alternative 2c. Should Alternative 2b result in keeping motherships that may otherwise depart in the fishery, then potential cost efficiencies may not be realized or may not be realized to the same degree.

When considering future conditions/actions, Alternative 2c will tend to place motherships in a better position of adjusting opportunities in response to changing conditions. Such conditions may mean such events as changing opportunities in other fisheries and/or changing markets. Alternative 2b does not result in the same degree of adaptability because most of the initial allocation is made to harvesters, thus lessening the degree of influence motherships have over fishery activity and the ability to align fishing activity in a manner advantageous to mothership operations.

4.10.5.4 Alternative 3

Alternative 3 replaces the management system responsible for much of the past and present status of motherships with another system that is expected to lead to a reduction in the number of motherships active in the fishery. This alternative establishes a long-term mothership linkage that grants negotiation power to motherships when negotiating over ex-vessel prices. This provision also has the potential to act as a capital asset since the permit to which the linkage is made is transferable and the linkage is difficult to break. This alternative provides an incentive for harvesters to race for fish due to the three whiting sector common bycatch limit, meaning the fishery may still be characterized by a short and intense harvest period. However, motherships still see an improvement under this alternative compared to other alternatives because of the linkage and because they can transfer or stack mothership permits—and associated linkages—to other motherships, meaning there are opportunities for capital consolidation along with increased certainty regarding the volume of deliveries that could be expected during the course of the fishery.

When combined with past, present, and future conditions/actions, Alternative 3 replaces the system responsible for much of the existing status of motherships. The long-term linkage provision provides motherships with added certainty over volume and added influence over harvest arrangements. However, some of this potential is eroded by the three whiting sector common bycatch limit and the incentives to race for fish with such a provision, meaning that opportunities for adjusting harvest timing in response to future changes in the fishery, future changes in other fisheries, and/or future changes in markets may be difficult.

4.10.5.5 Alternative 4a

Similar to other alternatives, Alternative 4a replaces the management system responsible for much of the past and current status of motherships with another system. Where Alternative 4a differs principally from other alternatives is in the partial mothership linkage and the implementation of bycatch limits that are cooperative-specific. The effect of the partial mothership linkage at 50 percent is expected to be substantially different than a full linkage due to the opportunities harvesters have in using the unlinked portion of their catch history in negotiating with motherships. However, the partial linkage still provides business-planning certainty to the mothership and still has the potential to act like a capital asset since the mothership permit is transferable, and the linkage is difficult to break. The cooperative level bycatch limit eliminates the race for fish incentive, leading to the expectation of an elongated mothership fishery and a decline in the amount of mothership capital necessary for the fishery.

When combined with past, present, and future conditions/actions, Alternative 4a creates a system that is expected to lead to a decline in the number of motherships necessary in the fishery. This creates cost efficiencies in the fishery and creates the potential for motherships left in the fishery to generate higher gross revenues through higher volume per mothership. However, the partial processor linkage provision places much of the negotiation power over prices in the hands of harvesters, potentially allowing harvesters to assume the revenues through that cost efficiency. The net effect of these potential outcomes is not clear when compared to the past and present status of motherships. However, the system created by this alternative is expected to mean that the sector is better able to adapt to changing future conditions. This may mean adjustments in harvest timing to respond to opportunities in other fisheries or to changing markets.

4.10.5.6 Alternative 4b

Similar to other alternatives, Alternative 4b replaces the management system responsible for much of the past and current status of motherships with another system. Where Alternative 4b differs principally from other alternatives is in the mothership declaration (rather than a linkage) and the implementation of bycatch limits that are cooperative-specific. The declaration provision provides motherships with relative certainty regarding deliver volumes during the course of a season, but does little to provide motherships with leverage in ex-vessel price negotiations with harvesters. The fact that bycatch is managed at the cooperative level means that the incentives for engaging in race for fish behavior are eliminated, leading to the expectation that the mothership fishery season will become longer, in turn reducing the need for mothership capital.

When combined with past, present, and future conditions/actions, Alternative 4b creates a system that is expected to lead to a decline in the number of motherships in the fishery. This has the potential to result in added cost efficiencies and increased gross revenues for those motherships that remain in the fishery. Those motherships that leave the fishery stand to experience a reduction in revenues with little ability to replace that revenue. This is because the mothership permit with a declaration is not expected to create the same type of asset value as a long-term linkage, principally because the declaration is easy to break. When considering future actions/conditions, Alternative 4b creates a system that makes the mothership sector more adaptable to changing conditions and more able to capitalize on opportunities (or avoid costs) that may arise. The declaration procedure allows motherships the ability to capitalize on this to some degree by binding harvesters and motherships together during the course of a year.

4.11 Trawl Catcher-Processors

In this section, we describe the impacts of rationalization on catcher-processors of Pacific whiting. This group comprises participants that both harvest and process Pacific whiting onboard the same platform and that hold LE trawl permits to do so. At least one company also participates in the mothership sector with a different vessel. Mothership impacts are covered in the previous section (page 445).

Rationalization, under any alternative, is only expected to result in minor changes to the catcher-processor sector, if at all. Rationalization may increase the certainty that catcher-processor participants have overfishing opportunities; however, because this sector currently acts like a rationalized fishery through the formation of the voluntary harvest cooperative, substantial changes are not expected to occur in this fishery. Establishing a system of IFQs may alter the harvest opportunities for companies currently engaged in the sector. For instance, the voluntary cooperative has formed catch-sharing arrangements among member companies. Some companies have entered into agreements where one company will harvest the catch share of another company. Basing an initial allocation of QSs on historical catch practices may fail to recognize some of these practices and disrupt the existing catch sharing arrangements. In addition, if sector- or cooperative-level bycatch limits are specified in a cooperative-based fishery, the certainty that participants in this sector have overfishing opportunities will tend to be greater compared to a case where a common bycatch limit is established for the three nontribal whiting sectors.

The section begins with a description of methods used to assess effects on catcher-processors and the metrics used to illustrate those effects. The variables and metrics used, some of which are also used in earlier sections, can be compared and contrasted among the alternatives. The broad-level effects of rationalization on catcher-processors are presented next (page 472), and contain a discussion of important general issues associated with rationalizing the fishery.

Following the description of broad-level effects, we assess the impacts on catcher-processors of the alternatives (page 475). This section begins by identifying the impacts that are expected to occur from each of the elements of the alternatives independently. We then provide an assessment of each alternative on catcher-processors. At the end of this section, we provide a side-by-side comparative summary of the effects of each alternative on groundfish trawl harvesters (page 481).

Finally, we assess cumulative effects of rationalization on catcher-processors. This cumulative effects section briefly summarizes the past and present actions with ongoing effects on catcher-processors, and the RFFAs that are anticipated to have effects. The combined effect of these past, present, and RFFAs are merged with the effect of the alternatives to arrive at the cumulative effect.

4.11.1 Methods for Assessing Impacts

Table 4-60 shows the impact mechanisms, metrics, and impact assessment methods used to evaluate trawl catcher-processors.

Table 4-60. Overview of analytical approach used to compare baseline and future conditions of trawl catcher processors under the alternatives.

Potential Impacts	Reasons or Mechanisms for Impacts	Metrics or Indicators for Informing Impact Mechanisms	Data, Models, and Methods Used for Assessing Impacts
Changes in vessel profits and fleet efficiency	Fleet consolidation	Number of active vessels	Analysts assessment of fleet consolidation
		Fleet-wide costs	
	Distribution of harvest privileges	Number of initial QS recipients	Model of the effects of initial allocation of IFQ
		Ex-vessel value of QPs allocated to participants	
	Pace and location of harvesting	Length of season	Capacity analysis and timing of resource accessibility
		Geographic distribution of fishing effort	Analysts assessment of geographic shifts in fishing effort
	Flexibility in harvest timing	Opportunities for modifying harvest timing	Qualitative assessment
	Monitoring costs	Cost borne by trawl catcher-vessels to meet monitoring requirements	NMFS research on tracking and monitoring programs
	Harvesting costs	Annual cost of harvesting activity	Analysts assessment of harvesting costs
	Ability to conduct business planning	Relative certainty over future fishing opportunities	Qualitative assessment
Individual and collective harvesting risk	Likelihood of catch events that are greater than QPs	Relative risk to harvesters of exceeding QPs	Qualitative assessment
	Cost of covering deficits	Availability of quota for covering deficits	Qualitative assessment
	Risk associated with the presence of thin market conditions	Risk posed by trading quota in volatile markets	Qualitative assessment
Changes in fishing vessel safety	Fleet size; vessel operational flexibility; and financial ability to invest in vessel maintenance and safety equipment	Occurrence of safety-related incidents	Qualitative assessment based on literature and expertise of analysts

4.11.2 Broad-Level Effects of Rationalization on Catcher-Processors

In general, catcher-processors are expected to be directly affected by rationalization through the harvesting aspect of their operations rather than the processing aspect of their operations. The reason for this is that the alternatives being contemplated for the catcher-processor sector influence the manner in which harvesting privileges are issued and managed. Processing operations on board catcher processors may be influenced from changes in harvesting operations, but, in the end, any effect still occurs on board the catcher-processor vessel. For this reason, many of the effects of rationalization described under the section on LE trawl harvesters are applicable to catcher-processors.

Some effects may be felt in the catcher-processor sector due to a handful of key factors. These key factors include whether to issue IFQ or establish a framework for continued voluntary co-op formation; whether to manage bycatch limits at the co-op, sector, or fishery-wide level; and (if QS is issued) whether to manage all species in the ABC/OY table with quota, or whether to manage a subset of those species with quota. In addition, the initial allocation of IFQs and an adaptive management provision may have some impacts on the catcher-processor sector. Other elements of the alternatives are not expected to have an effect on the performance of the sector. These other elements include accumulation limits, grandfather clause, the number of trawl sectors, and area management.

4.11.2.1 Changes in Profit and Fleet Consolidation

The current voluntary catcher-processor cooperative has led to conditions in the catcher-processor sector that resemble a rationalized fishery. Because of this, further changes in the profitability of entities in this sector are not expected because of rationalization. In addition, further fleet consolidation, changes in the pace and location of harvesting, and changes in the flexibility of harvest timing are not expected because these factors have already changed because of the voluntary cooperative. Rationalization is not expected to result in modifications to the level and cost of monitoring that is currently onboard catcher-processors. Because each catcher-processor currently carries two at-sea observers, additional coverage will likely not be necessary. Therefore, costs borne by participants in the catcher-processor sector to meet at-sea observer requirements are not expected to change.

The formation of the voluntary catcher-processor cooperative led to a reduction in effort in the catcher-processor sector, an increase in the length of the season, and increased communication over—and performance in—bycatch reduction. All of these outcomes are typical of rationalization programs.

Figure 4-49 illustrates the change in seasonality of catcher-processor whiting harvests before and after the formation of the voluntary cooperative. As indicated in the figure, the season has spread out substantially since the formation of the cooperative with substantial portions of the harvest occurring from August to November, whereas little harvest occurred during this period before the formation of the cooperative. Though not shown in the figure, the number of vessels used to harvest the available whiting resource also decreased. Prior to the formation of the cooperative, 9 vessels per year were engaged in the harvesting of whiting on average, while after the formation of the cooperative 6.8 vessels per year on average were engaged in the harvesting of whiting.

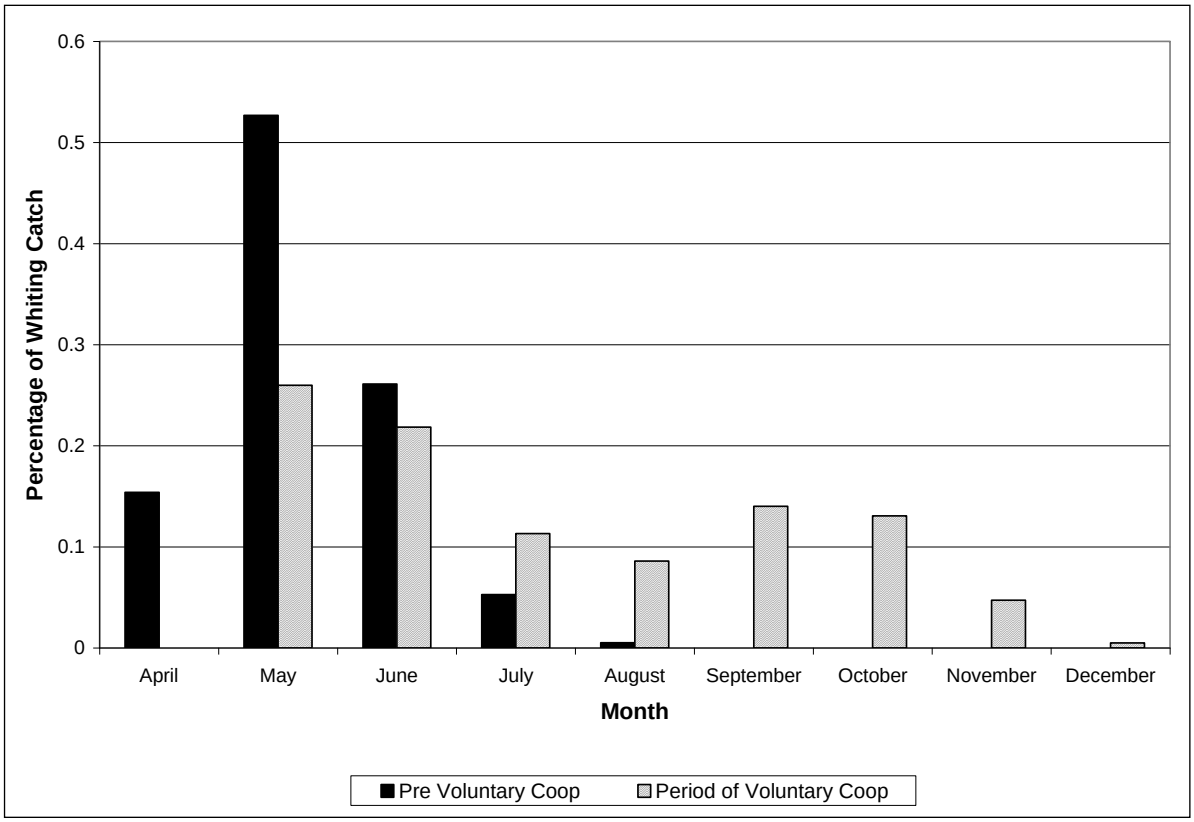


Figure 4-49. Seasonality of whiting harvest in the catcher-processor sector (before and after formation of the voluntary cooperative).

One factor that is related to profitability and fleet consolidation, however, is the possibility of other fishery sectors influencing the opportunities catcher-processors have over fishing activity. If common bycatch limits are specified for all three nontribal whiting sectors, then the actions of harvesters in one sector can impact the opportunities in another. These conditions encourage race-for-fish behavior because of bycatch, and profitability under race-for-fish conditions would be lower compared to a case where race-for-fish conditions do not exist.

The likelihood of catcher-processors engaging in race-for-fish behavior, therefore reducing profitability and increasing the number of vessels in the fishery, depends on whether participants in the catcher-processor sector believe they can successfully prosecute the fishery. The next section describing risk outlines this concept and its effects on profitability and fleet consolidation in more detail.

4.11.2.2 Individual and Collective Harvesting Risk

As outlined in Section 4.6 (page 284, impacts on LE trawl harvesters), catcher-processors may face a variety of risks that can influence the success of the program. Several sources of risk are possible, including risks to individuals and collective risks across all participants in the sector. For reference, Section 4.6.2.4 (page 301) describes risk-related impacts to LE trawl harvesters.

If an IFQ program is implemented, individual risks may exist if participants are held accountable and responsible for their catch of certain species. This is because of the uncertainty associated with fishing, and the fact that accidentally exceeding one's holding of quota—and trying to cover that deficit by

purchasing quota—could be costly depending on the species. If species such as overfished species, nearshore rockfish species, and flatfish are allocated to the catcher-processor sector in quantities that are similar to status quo harvests, then individuals may have to incur substantial costs if encountering more catch than expected.

Another source of risk in an IFQ-based program comes from the concept of thin markets. A thin market for IFQ could occur when allocations of some groundfish species are so small that there are a very limited number of suppliers. Such conditions often lead to volatile price fluctuations (of quota in this case) and quota transactions that involve strategic behavior. Thin markets can create cases where the market is not able to reach equilibrium, and transfers occur based on mechanisms other than market mechanisms (such as personal relationships). In addition, thin market conditions are related to the risk posed by individual accountability. Thin markets may make it problematic for vessels actually to find quota to cover catch deficits, and this poses a financial risk to harvesters. The species for which thin markets may exist in the whiting fishery are covered under Section 4.6 (page 284) describing impacts to LE trawl harvesters.

Catcher-processors incur collective risks if bycatch is managed as a pool. There are three options for managing bycatch in addition to allocating IFQ: managing bycatch at the cooperative level, managing bycatch at the sector level, and managing bycatch at the fishery level (across the three nontribal whiting sectors). Since the catcher-processor sector is made up of one voluntary cooperative, it is assumed that managing bycatch at the sector and cooperative level would result in the same effect on this sector. Therefore, only two bycatch management levels are examined.

In a co-op program, the type of individual risk described above is minimized through collective management that spreads the risk across the multiple participants in the co-op or fishery. However, if the risk is spread across too many participants, the ability of those participants to agree to a bycatch management plan may be jeopardized and there is a potential for a race for bycatch to develop among harvesters.[110] The risk that a race for bycatch may develop depends on the number of co-ops or sectors to which a bycatch limit applies. If a bycatch limit is applied to a relatively small pool of vessels (e.g., to individual co-ops) the possibility of a race for bycatch developing is relatively small. Conversely, if a bycatch limit is applied at a relatively gross level (to all three commercial whiting sectors combined), it is much more likely that a race for bycatch would develop. Under these conditions, the profitability currently seen in the sector, and generally expected under rationalization, would likely be compromised. Racing for bycatch would entail the same outcome as a race for target species with more vessels participating than necessary, a shorter season, and less profitability in the sector than would otherwise be expected.

4.11.2.3 Safety

Fishing vessel safety is generally associated with the ability of vessels to maintain equipment and the flexibility vessels have in avoiding adverse weather conditions. In a rationalized fishery, profit per vessel is expected to increase, leading to better maintenance of equipment onboard vessels. However, since the catcher-processor sector already acts like a rationalized fishery, further improvements in maintenance due to higher profits is generally not expected to occur. In addition, since the sector already acts as a rationalized fishery, vessels need not fish in bad weather to compete with other participants in the sector. Therefore, rationalizing the fishery is not expected to result in a change in the

[110] The term "race for bycatch" is used in this case to describe a type of behavior that occurs when harvesters do not believe that the bycatch limit will be successfully managed. In this event, harvesters believe that they face the risk of being preempted by the attainment of a bycatch limit and, therefore, race for fish to harvest their allocated target species.

timing of harvests. The risk factors described above can have an effect on safety, however. If participants race for bycatch, profitability may decline, and participants may feel the need to fish in poor weather (though the size of most catcher-processor vessels may make fishing in inclement weather a nonissue). This may also reduce maintenance, making vessels less safe than under a rationalized fishery with no incentive to race for bycatch.

4.11.3 Direct and Indirect Effects of the Alternatives on Catcher-Processors

In addition to the general effects described above, each of the alternatives is expected to impact catcher-processors is slightly different ways. These differences in the alternatives are due to variations in the elements that make up each alternative. In this section, we begin by summarizing the effect of elements in the alternatives on catcher-processors. This description serves as an introductory piece of analysis and overview of the way in which rationalization, in general, will impact this particular environmental component. A description of the impacts of each alternative follows (page 475). Alternatives 2a through 2c are grouped together, as are Alternatives 3 and 4a because the grouped alternatives are expected to affect catcher-processors similarly, except for the impacts of one common element, which is identified and discussed.

4.11.3.1 Expected Effects of Elements of the Alternatives on Catcher-Processors

The effect of the alternatives on catcher-processors is evaluated in two ways. First, we evaluate the specific elements, or program features, that are varied across the alternatives (these are the rows in Table 4-2). Second, we evaluate the grouped alternatives (see above).

How do IFQs and co-ops change things relative to status quo for catcher-processors?

Catcher processors may be affected by whether QS is issued to them or whether a LE system is put in place as a means of maintaining the voluntary cooperative. While the catcher-processor voluntary cooperative is expected to continue, permitting the co-op and allocating the entire sector quota to that co-op as an exclusive harvest privilege means the co-op would meet the definition of a LAPP. If the co-op dissolves, each individual permit holder would be allocated QSs under an IFQ program, which would also be defined as a LAPP. This may or may not result in increased costs for the catcher-processor sector. Under LAPP cost recovery provisions catcher-processors the incremental costs of the program could be subject to cost recovery. Since the catcher-processor sector already pays for at-sea observers, incremental costs could be minor if considered for the sector alone. If all sectors are considered part of a single LAPP, the catcher-processor sector could share in the incremental costs of other sectors. The Council will develop cost recovery provisions through a trailing action.

In addition, cooperative formation may have slightly different outcomes than an IFQ program. One reason for the differences is the relationships that develop among fishery participants in cooperative programs compared to IFQ programs (discussed in detail under the section comparing IFQs and cooperative systems). As discussed in earlier sections, cooperatives rely on close-knit relations and good communication for success, while IFQs encourage a more individual perspective and, therefore, may rely less on good relations between harvesters. Such relations, or lack thereof, may have an effect on how participants prosecute the fishery. For example, close-knit relations and good communication may result in a different response time in the aggregate when the fleet is encountering bycatch, compared to a fishery where participants are more independent and may communicate somewhat less.

Finally, issuing IFQs may lead to the termination of the current voluntary cooperative, because it may not be necessary for prosecuting the fishery under an IFQ-based program. The implication of terminating this cooperative is not immediately apparent.

How does initial allocation affect catcher-processors?

The initial allocation of QSs to catcher-processors may alter current harvest arrangements that currently exist under status quo opportunities. Figure 4-50 illustrates the difference between average metric tonnage taken per catcher-processor business entity, and the tonnage that would have been allocated to each entity during that period if an IFQ program was implemented based on the initial allocation formula specified. It shows the outcome of the initial allocation formula relative to the harvest quantities each entity made over the 2004 to 2006 period. These figures assume the same volume taken from 2004 to 2006 would be taken in an IFQ-based fishery. This information shows that one company may be allocated less annual harvest volume than was harvested on average from 2004 to 2006. Three other companies would be allocated more than harvested during that period.

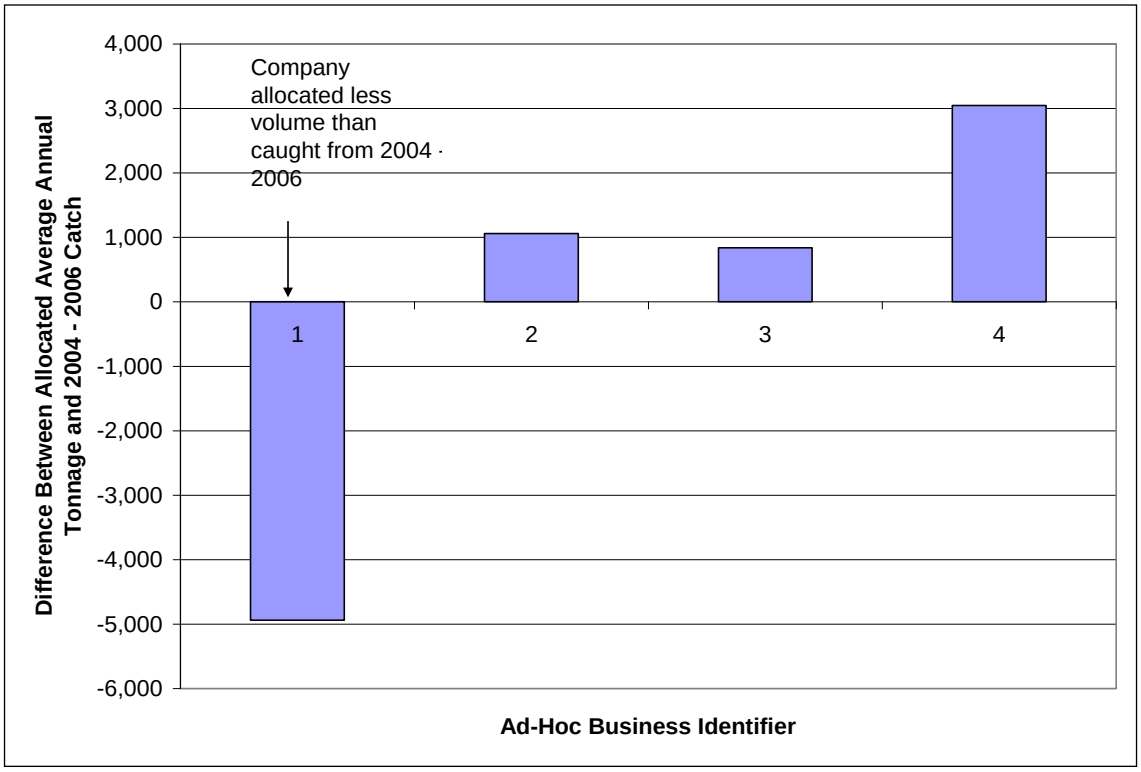


Figure 4-50. Comparison of catch amounts under status quo and an IFQ program.

How will the species covered through the program affect catcher-processors?

The species directly managed in the catcher-processor sector will also have an impact on the outcome of the program. As illustrated in Section 4.6.2.4, several types of species may constrain harvest activities in the catcher-processor sector if managed directly with IFQ. While the list of species that may constrain harvest activities is not repeated here, requiring that participants in the catcher-processor sector cover their catch of flatfish and nearshore rockfish with QSs in general may prove to be equally burdensome as requiring that overfished species be managed under IFQs. This assumes that the allocation to the sector of these species would be on the same order of magnitude as current catch levels.

The implication of covering flatfish and nearshore rockfish species with QSs is that participants in the sector may have to incur a substantial cost by purchasing quota if inadvertently encountering these stocks and going into deficit. Because of the small quantities allocated to the sector, quota for these species may be difficult to acquire. In the worst case alternative, catcher-processors may not be able to acquire quota of these species even if they have funds to do so, simply because that quota may not be available.

Bycatch management may influence the success of the catcher-processor sector. Managing bycatch across all three whiting sectors can induce race-for-fish conditions because of a race for bycatch. While the catcher-processor sector has effectively operated as a rationalized fishery with the common bycatch limit present under status quo, increasing concern over the common bycatch limit has been expressed through public testimony at Council meetings since the premature closure of the whiting fishery in 2007 as a result of bycatch. The potential for a race for fish because of bycatch occurring likely depends on the size of the bycatch limits relative to the size of the whiting tonnage allocated to the catcher-processor sector. If catcher-processors believe that it is likely they can take their allocation without being preempted by the attainment of a bycatch limit, then they are likely to continue fishing in a rational, paced manner that is similar to the manner exhibited since the formation of the voluntary cooperative. If a rationalization program is put in place with bycatch limits that are common to the three whiting sectors, then the outcome for the catcher-processor sector is likely to be same or highly similar as under the status quo management system.

How will an adaptive management provision affect catcher-processors?

An AMP may impact the catcher-processor sector by redistributing a portion of the catcher-processor allocation to particular vessels. The actual impact of an adaptive management provision on the catcher-processor sector ultimately depends on the objectives of the AMP and the way in which the adaptive management quota is used. Several potential objectives have been discussed, including using the adaptive management quota for community protection, using adaptive management quota to assist adversely impacted processors, and using adaptive management for salmon and overfished species bycatch reduction. In the catcher-processor sector, it is unclear how the adaptive management quota would be used to achieve community protection and to protect adversely impacted processors. Since catcher-processors are not associated with particular ports—except perhaps those in the Puget Sound region—it is unclear what using adaptive management quota for community protection would achieve. The same is true for mitigating against adverse impacts to processors, since the processing in the catcher-processor sector is vertically integrated on the same platform as the harvesting. Using the AMP for overfished species and salmon bycatch reduction may, however, have an effect. There are several potential ways of using adaptive management quota to facilitate bycatch reduction. A benchmark could be set, for example, that grants quota from the AMP to individual vessels if they bring their bycatch rate below a certain level. Another method of using the adaptive management quota could be to grant adaptive management quota to vessels that propose the testing of new gears for exploring bycatch reduction. In either case, the use of an AMP is likely to have a distributional effect where certain participants are recipients of the adaptive management quota and other participants are not.

How will the other program elements affect catcher-processors?

Other elements are not likely to have a noticeable effect on catcher-processors. The accumulation limits specified for the catcher-processor IFQ alternative would allow two vessels to harvest the entire sector allocation, and the control limits could allow two companies to own the entire quota. Both cases are substantially more per vessel and entity compared to status quo, which operates as a rationalized fishery. Therefore, these accumulation limits are not expected to be restrictive. The presence of a grandfather clause is not expected to have an effect on the performance of the catcher-processor sector because the

accumulation limits are relatively large, making a grandfather clause irrelevant. The number of trawl sectors specified for the program is not expected to impact catcher-processors because neither the three or four sector alternative impacts the catcher-processors sector directly (both alternatives only contemplate a differentiation or aggregation of the two shoreside sectors). If, however, the three-sector alternative means that the shoreside whiting sector shares bycatch quota with the nonwhiting sector, then this may reduce the overall pool of bycatch available to the at-sea sectors if bycatch management is being contemplated as a common, three-sector pool.

4.11.3.2 Alternative 1 (No Action)

Effect of Alternative 1 on vessel profits and fleet efficiency

The effect of Alternative 1 on vessel profits and fleet efficiency means the continuation of the existing management structure. Under this structure, the catcher-processor sector has been able to form a voluntary harvest cooperative that operates like a rationalized fishery. Under this structure, the season has been extended and the race-for-fish conditions present in the fishery prior to the formation of the cooperative have been eliminated. It is generally accepted that profits and efficiency have improved as a result of the cooperative. The continuation of the existing management structure (and harvest cooperative) is expected to result in similar levels of vessel profit and fleet efficiency as one of the rationalization alternatives. However, Alternative 1 has a risk that one sector can preempt the catch available to catcher-processor participants, and the risk of this event occurring can mean that profits expected in one year may not be realized. This risk exists because of the common bycatch limit that is applied to all three nontribal portions of the whiting fishery.

The risk to profits posed by Alternative 1

The risk of one sector taking the majority, or all, of the three-sector bycatch limit means that the other whiting sectors could experience a form of preemption. This can occur because the attainment of the bycatch limit means all three sectors of the directed whiting fishery will close, and, if one or more sectors have not attained their allocation, then that sector will not realize the profits that may have been expected at the start of the year. The risk of this occurring may change the behavior exhibited by catcher-processor participants and this change of behavior (in an extreme example) could mean that catcher-processor participants begin to exhibit race-for-fish behavior by fishing more intensively at the start of the season out of fear that another sector could preempt their fishing opportunities. This behavior means more intensive and costly fishing and more capital being used than necessary. Both of these factors are likely to reduce the profits that could otherwise be generated in the fishery if such behavior does not occur.

Effect of Alternative 1 on safety

Onboard vessel safety is closely tied to the amount of profit generated by vessels (and the subsequent ability to pay for maintenance) and the amount of time spent fishing during hazardous weather conditions. Ignoring the risk factors discussed above, the profits generated under Alternative 1 are not expected to result in levels of maintenance that differ substantially than the other alternatives. Alternative 1 is also not expected to result in increased levels of fishing during hazardous weather conditions relative to the other alternatives. However, if the risk factors discussed above change behavior, vessel profits may in fact be less under Alternative 1 compared to a alternative where bycatch management is sector-, co-op-, or vessel-specific, and maintenance may be somewhat lower as a result. Furthermore, increased effort at the start of the season may mean more effort spent fishing during hazardous conditions since the incentive to fish early in the season is similar to that incentive created through race-for-fish conditions.

4.11.3.3 Alternatives 2a through 2c

Effect of Alternatives 2 and 3 on vessel profits and fleet efficiency

Alternatives 2 through 2c issue IFQ to catcher processors. Four entities receive QSs under this option. Those four entities have collectively used nine catcher-processing vessels to generate the catch history upon which that IFQ would be based. The largest entity would receive less than the control limits, meaning that the control limits are not expected to constrain any business entities. For confidentiality purposes, the actual estimate of quota distributed to each entity is not illustrated. The fact that the largest entity is apparently expected to receive less than the control limit makes the presence of a grandfather clause irrelevant.

Issuing IFQ is not expected to affect profitability substantially in the catcher-processor sector. IFQ issuance may result in the termination of the voluntary cooperative, and this could have some effects on profitability if there are existing profit-sharing arrangements; however, it is not immediately clear whether those arrangements exist and whether such arrangements would change if the cooperative was terminated.

The risk to profits posed by Alternatives 2a through 2c

The fact that individual entities are allocated quota means that the risk of a race for bycatch developing is minimal. Some circumstances could lead to a race for bycatch as described previously. These circumstances include the possibility of a disaster tow by a catcher-processor that is large enough to close the entire sector. The fact that bycatch encounters are sometimes large and unexpected means that a disaster tow event is possible. However, the individual accountability associated with individual quota increases the risk to each catcher-processor, and the burden they must bear for encountering large amounts of nontarget species. Therefore, issuing IFQ is likely to encourage behavior that is substantially risk averse, decreasing the possibility of a disaster tow occurring, but potentially increasing the financial burden individual catcher-processors must bear from encountering higher than expected amounts of bycatch species.

All groundfish species and Pacific halibut are covered with QS under Alternatives 2a through 2c. This poses risks to individual participants in the catcher-processor sector because of the inexact method of extracting fishery resources and the fact that many of these species are likely to be allocated to the catcher-processor sector in very small quantities. In general, increasing the number of species covered in the program increases the level of accountability, but can also reduce flexibility and impose risk. The imposition of risk on harvesters is one mechanism that results in many of the desired outcomes of rationalization, and therefore imposing risk is not necessarily adverse. However, the risk and constraints catcher-processor participants face under Alternatives 2a through 2c are substantially greater than status quo, which is also a rationalized fishery. The fact that participants in the catcher-processor sector would be responsible and accountable for approximately 40 species means a tenfold increase in the number of species participants in the sector must successfully manage. Assuming many of these species (flatfish, nearshore rockfish, and overfished species) are allocated in small quantities means an increase in the number of species that may prematurely close the fishery if inadvertently caught in sufficient quantities.

One potential method of managing constraining bycatch species in an IFQ program is through voluntary formation of risk pool, or voluntary, arrangements formed by participants for sharing risk. Such pools rely on the collective negotiation of bycatch management terms and terms for sharing quota among participants as necessary. These negotiations rely on there being a similar set of objectives and

relatively balanced negotiation power. Factors influencing the successful formation and maintenance of these risk pools include the manner in which constraining species are allocated to catcher-processor participants. If those constraining species are allocated equally, or on a pro rata basis, to their whiting allocation, then the ability to voluntarily form and maintain risk pools may be greater than if constraining species was allocated less equally.

Effect of Alternatives 2a through 2c on safety

Alternatives 2 and 3 are not expected to have a noticeable effect, if any, on vessel safety. Because Alternatives 2 and 3 generally are not expected to result in a race for fish, nor are they expected to decrease revenues compared to status quo, there do not appear to be mechanisms adversely impacting safety.

4.11.3.4 Alternatives 3, 4a, and 4b

Effect of Alternatives 3, 4a, and 4b on vessel profits and fleet efficiency

The effect of Alternatives 3, 4a, and 4b are likely to result in the same level of profit and fleet efficiency as under status quo, where status quo operates as a rationalized fishery because of the voluntary cooperative. The LE system established for catcher-processors under these alternatives creates a framework that protects the existing cooperative from new entry and, thereby, makes it unlikely that a new entrant would disrupt the existing cooperative's operations. It may be possible for a new participant to purchase a LE permit for the catcher-processor sector and enter the sector. If that is the case, there is a possibility that the new participant may not join the cooperative. Alternatively, if an existing catcher-processor sector participant decides to leave the cooperative, participants in the sector may begin to fish competitively. The likelihood of these events occurring is not known. However, the establishment of a LE system for catcher-processors increases the likelihood that the catcher-processor sector will remain a voluntary cooperative, compared to a case where there is no catcher-processor LE. Therefore, while there is some possibility that events could occur which could disrupt the existing cooperative or lead to its termination, this is less likely with a LE system in place. Because of these reasons, profits and fleet efficiency should be equivalent to status quo, with more certainty that the current level of profitability will continue. However, certain factors may jeopardize the profits that participants in this sector currently realize, and they are discussed below.

The risk to profits posed by Alternatives 3, 4a, and 4b

The risks that participants in the catcher-processor sector face under Alternatives 3, 4a, and 4b are largely a function of how bycatch is managed. Under Alternative 3, bycatch is managed in common across all three nontribal whiting sectors. Under Alternatives 4a and 4b, bycatch is managed at the cooperative level. Since the catcher-processor sector is expected to remain as a single voluntary cooperative under Alternatives 3, 4a, and 4b, bycatch management at the cooperative level is assumed to be the equivalent of managing bycatch at the sector level. In other words, the catcher processor sector is assumed to be managed under a single bycatch limit under both Alternatives 4a and 4b.

The risk faced by participants in the catcher-processor sector differs between Alternative 3 and Alternatives 4a and 4b. Under Alternative 3, there is the risk that all three nontribal whiting sectors will engage in a race for bycatch. This may occur if participants across the three sectors cannot agree to bycatch management terms and it appears unlikely that the whiting allocations can be reached prior to the attainment of a bycatch limit. Under this outcome, participation in the catcher-processor sector may increase and harvest activity is likely to become concentrated toward earlier months—similar to the pattern exhibited prior to the formation of the voluntary cooperative.

The risk faced by participants in the catcher-processor sector under Alternatives 4a and 4b is different in that other sectors are unlikely to affect the harvest opportunities of participants in the catcher-processor sector. It is more likely, however, that participants in the catcher-processor sector will have the ability to preempt harvest opportunities for others in that sector. If one catcher-processor catches an unexpectedly large amount of bycatch species, the sector (or co-op) level bycatch limit may not be large enough to cover it, depending on the size of that catch event relative to the bycatch limit. If this event occurs, it may prematurely shut down the catcher-processor sector but it is less likely to spill over into other fishery sectors compared to a race for bycatch among the three nontribal whiting sectors.

Empirical evidence has shown that participants in the catcher-processor sector are able to achieve lower rates of bycatch than other fishery sectors and have less frequent disaster tow events than other sectors. This has been attributed to the fishing capability of catcher processors. Vessel size and horsepower allows catcher-processors to fish at deeper depths and in worse weather (later in the season), and both factors have been linked to bycatch reduction. This means that the probability of a large catch event occurring in the catcher-processor sector is likely less than in other sectors. This lower probability of an unexpectedly large catch event means that the risk associated with Alternative 4a is less for the catcher-processor sector than the risk associated with Alternative 3.

Effect of Alternatives 3, 4a, and 4b on safety

Alternatives 3, 4a, and 4b are not expected to have a noticeable effect on vessel safety because Alternatives 3, 4a, and 4b are generally not expected to result in a race-for-fish, nor are they expected to decrease revenues compared to status quo.

4.11.3.5 Comparative Summary of the Effects of the Alternatives

Alternative 1	• Continuation of existing cooperative and associated profitability • Risk of a race for bycatch developing among sectors, leading to decreased profitability
Alternative 2a	• Similar profitability as with voluntary cooperative • Low risk of a race for bycatch, but high risk on individual entities
Alternative 2b	• Same as Alternative 2
Alternative 2c	• Same as Alternative 2
Alternative 3	• Continuation of existing cooperative • Risk of a race for bycatch developing among sectors, leading to decreased profitability
Alternative 4a	• Continuation of existing cooperative • Low risk of a race for bycatch
Alternative 4b	• Continuation of existing cooperative • Low risk of a race for bycatch

4.11.4 Cumulative Effects on Catcher-Processors

The effect of the alternatives on catcher processors is combined with past actions, current and future trends, and RFFAs to derive the cumulative effect. Each of these effects is measured using the potential impacts identified in Table 4-60, which include the (cumulative) effect on vessel profits and fleet efficiency, on individual and collective risk, and on safety.

In some respects, the effect of rationalization on catcher-processors can be viewed as formalization of conditions that currently exist in the catcher-processor sector under voluntary terms, rather than an action that is additive to present conditions. Since the catcher-processor sector operates under voluntary terms that effectively make that sector appear rationalized, formally implementing a rationalization program (or implementing conditions that facilitate the continuation of the voluntary cooperative) may mean the sector operates the same as under status quo conditions, but without the risk (or with a lower risk) of the rationalized behavior of catcher-processor participants falling apart. Therefore, implementing the rationalization structure found in the alternatives may be only slightly affect conditions in a cumulative sense.

4.11.4.1 Trends and Actions Influencing Vessel Profits and Fleet Efficiency

Several trends and actions not associated with rationalization are expected to continue, or be implemented in the future, which are expected to have an effect on vessel profits and fleet efficiency. These include the following:

- Relatively high cost of inputs (such as fuel)
- Increased competition for ocean space (state MPAs, wave energy, offshore resource exploration)
- Increased global demand for protein
- Rebuilding of depleted groundfish stocks
- Consumer awareness and scrutiny of the fishing industry
- Implementation of Amendment 21 (intersector allocation)
- Amendment 15 (sunsets with trawl rationalization implementation)
- Ongoing harvest specifications process and OY setting
- Climate change and the effect on species abundance and location
- The possibility that a stock is unexpectedly declared as rebuilt or overfished

A rationalization program implies that Amendment 21 is implemented. Intersector allocations are a necessary component to rationalization because issuing QPs relies on there being a known quantity of fish to distribute across QS holders. Because Amendment 21 will ultimately decide the amount of fish available to trawl harvesters, it has a direct effect on the amount of revenue that can be generated in the fishery. The Council has elected not to revisit the allocations of Pacific whiting and sablefish that currently exist; therefore, the amount of whiting available to the catcher-processor sector is not likely to be affected by the Amendment 21 process. However, other species may constrain access to the Pacific whiting resource, and the level of allocation of these stocks to the catcher-processor sector may dictate the ability for participants to access the Pacific whiting resource. It is not possible at this time to determine whether Amendment 21 would lead to an allocation of a nonwhiting stock that would constrain the catcher-processor sector, so the effect of Amendment 21 is largely unknown.

Rationalization of the catcher-processor sector is not expected to result in added observation or monitoring requirements as this portion of the fishery is already managed with at-sea observers and total catch monitoring. Depending on the form of rationalization that is implemented (either a LE system designed to facilitate the continuation of the existing cooperative, or an IFQ system) fees may be imposed upon catcher-processor participants for cost recovery, and these fees would add to the cost catcher-processor participants already bear for VMS and at-sea observers.

Trends expected to affect the cost of trawling (that are independent of rationalization) in the future include the expectation that the demand for resource inputs will remain high relative to prices seen throughout the 1980s, 1990s, and early 2000s. These include the expectation that steel, fuel, and many

other inputs necessary to operate and maintain a trawl vessel will remain high in the future because of increased global demand for such inputs. It also means that the prices for fish products may remain relatively high, especially since the supply of whitefish from places like the North Atlantic are expected to remain relatively low. These factors mean an increased cost of engaging in fishing activities, but also higher gross revenues from fishing. The net effect is, therefore, unknown.

Other factors expected to continue into the future, which influence the cost of fishing, include increased competition for space in ocean areas (because of wave energy projects, marine reserves, and offshore nonrenewable resource exploration and development). These types of projects will tend to have the result of decreasing the amount of area trawl harvesters may have access to, potentially affecting where harvesters operate and making it more costly to prosecute fishing activity.

Higher populations of rebuilding species may lead to alleviation in the constraining nature that several rebuilding species play on access to the whiting resource, however this depends on the bycatch rate of rebuilding species as they rebuild relative to the OY of those species. If the bycatch rate increases at the same rate as the OY, then the rebuilding period is not likely to result in any alleviation in the constraint those species have on Pacific whiting opportunities. In fact, if the bycatch rate increases more quickly during the rebuilding period than the OY (which can happen for a variety of reasons, including the fact that stock assessments lag the conditions found in the present day by at least two years), rebuilding may actually lead to a larger constraint on fishing than experienced under present day conditions. This term is often called the rebuilding paradox. However, it is reasonable to assume that after rebuilding stocks are declared rebuilt, the constraining nature of these rebuilding stocks will be alleviated.

Public scrutiny of the fishing industry appears to be growing. Groups like the MSC help allow the public to make more informed decisions about purchasing sustainably harvested seafood. A fishery with a MSC certification label may be expected to access different markets than a fishery not certified, and these markets may result in greater revenues to participants in that fishery. As of the drafting of this document, the Pacific whiting mid-water trawl fishery was undergoing the certification process. If this fishery is certified, participants may stand to gain access to more valuable markets. Other aspects of public scrutiny may impact catcher-processor participants in other ways that may or may not result in formal changes in regulations. In general, such scrutiny may mean that it is more difficult to prosecute fishing activities, or fishing industry representatives spend more time dealing with public relations issues. In any event, these types of issues may tend to increase the cost and effort associated with fishing activity.

At times, substantial revisions can be made to the allowable catch of fish species, including nongroundfish, requiring that management and fishing opportunities respond. Such changes can mean fairly noticeable changes in the opportunities harvesters have in prosecuting fish resources, and this will influence the opportunities available to nontrawl harvesters. While actual changes in the available catch of various species in the future cannot be clearly predicted, it is certain that allowable catch levels will be adjusted through time, requiring that management measures and fishing opportunities be adjusted. This means variation in revenues associated with participants in the catcher-processor sector over time.

Several additional factors that are largely exogenous to the effect of rationalization, but that may influence profits and fleet efficiency, include the possibility of a stock unexpectedly being declared as overfished, the unexpected removal of a stock from overfished status, and the effect of climate change and variability on species abundance and location. While these factors are largely related to uncertainty, they are best examined in the cumulative effects section because they are not directly related to rationalization, but may affect the profits and fleet efficiency in a rationalized fishery. If a stock becomes overfished and a lower OY is implemented, catcher-processor participants are likely to see lower revenues either because a species constrains access to whiting, or a reduction in available catch

(if Pacific whiting becomes overfished). The inverse is true if a stock is taken off the overfished list. The effect of climate change and variability on fish abundance and location also influences profit and fleet efficiency. If conditions are such that groundfish migratory patterns differ substantially from one year to the next, the ability of harvesters to make informed decisions about fishing location and the species caught at those locations will become compromised. This can have the effect of increasing the amount of effort (and cost) harvesters must exert in performing fishing activities and result in lower revenues. However, it is not known if these types of climactic events on fish resources will actually occur, so the effect of climate change and variability on trawl harvesters is not known.

Table 4-61. Factors affecting revenues and fleet efficiency.

Factors Affecting Revenues and Fleet Efficiency		Impact
Due to Rationalization	• Level of bycatch management (individual, coop, sector, fishery)	Conditional
Exogenous to Rationalization	• Relatively high cost of inputs (such as fuel)	–
	• Increased competition for ocean space (state MPAs, wave energy, offshore resource exploration)	–
	• Increased global demand for protein	+
	• Rebuilding of depleted groundfish stocks	+
	• Consumer awareness and scrutiny of the fishing industry	Conditional
	• Implementation of Amendment 21 (intersector allocation)	Conditional
	• Amendment 15	+
	• Ongoing harvest specifications process and OY setting	Unknown
	• Climate change and the effect on species abundance and location	Unknown
	• The possibility that a stock is unexpectedly declared as rebuilt	+
	• The possibility that a stock is unexpectedly declared as overfished	–

4.11.4.2 Trends and Actions Influencing Individual and Collective Risk

Several trends and actions are expected to continue, or be implemented in the future, which affect the amount of risk catcher-processors face. These include the following:

- The rebuilding of depleted groundfish stocks
- Amendment 15
- Climate change and the effect on species abundance and location
- The possibility that a stock is unexpectedly declared as rebuilt or overfished

Rationalization can have the effect of imposing additional risk on participants in the catcher-processor sector. Some risks can be described as collective when one group of participants can be affected by the actions of another. Others can be described as individual risk when the aspect of individual accountability combined with catch uncertainty creates the potential for individual participants to have an overage. This can be costly if the quota for that species is expensive or if the participant faces an enforcement action. The level of individual and collective risk largely depends on several factors including the degree of catch uncertainty relative to the OY of each species, the type of species covered with IFQ, and the level of bycatch management in a cooperative program.

When combined with other actions and trends, the risk faced by catcher-processor participants is not expected to be much different than the incremental effect associated with rationalization of the fishery. Furthermore, a rationalization program could be implemented that does not change the amount of risk

catcher-processor participants face at all relative to status quo. No change relative to status quo would occur if the Council adopted a cooperative program for the catcher-processor sectors and spread bycatch management across the three whiting sectors (i.e., retained the three-sector bycatch limit).

Amendment 15 limited access to nontribal sectors of the Pacific whiting fishery. Prior to the implementation of this amendment, there was a risk of new entry into the catcher-processor sector of the whiting fishery. One possible response to a new entrant is the break-up of the existing voluntary cooperative. While the likelihood of such a break-up is not known, there was a risk of such an event occurring. In that event, it is likely that the catcher-processor sector would have engaged in race-for-fish behavior, which is likely to lead to higher rates of bycatch than a fishery operating more rationally. Higher bycatch rates could lead to premature closure of the fishery compared to a case where lower bycatch rates occurred. Therefore, it is reasonably to state that Amendment 15 has had the effect of reducing the risk of the catcher-processor sector reverting to a race-for-fish fishery and, as a result, has reduced the risk of bycatch cap attainment prematurely closing the directed whiting fishery.

Several additional factors that are largely exogenous to the effect of rationalization, but that may influence risk, include the possibility of a stock becoming declared as overfished, the removal of a stock from overfished status, and the effect of climate change on species abundance and location. While these factors are largely related to uncertainty, they are best examined in the cumulative effects section because they are not directly related to rationalization, but may affect the degree of risk catcher-processor participants face in a rationalized fishery. If a stock becomes overfished and a lower OY is implemented, additional risk can be imposed if catch uncertainty is high relative to that OY. However, the level of risk faced depends on the level of uncertainty relative to the OY level that may be specified by the Council, which cannot be predicted here. The inverse is true if a stock is taken off the overfished list. The effect of climate change on fish abundance and location also influences the degree of risk. If conditions are such that groundfish migratory patterns differ substantially from one year to the next because of changes in climate and oceanographic conditions, the ability of catcher-processor participants to make informed decisions about fishing location and the species caught at those locations could become compromised. This could have the effect of increasing the uncertainty associated with harvesting and influence the degree of risk associated with fishing activity. However, it is not known whether climatic events will affect groundfish resources in this manner, and, therefore, the effect of climate change is largely unknown.

Table 4-62. Cumulative factors affecting revenues and fleet efficiency.

Factors Affecting Revenues and Fleet Efficiency		Score
Due to Rationalization	Level of bycatch management (individual, coop, sector, fishery)	Conditional
Exogenous to Rationalization	Relatively high cost of inputs (such as fuel)	–
	Increased competition for ocean space (state MPAs, wave energy, offshore resource exploration)	–
	Increased global demand for protein	+
	Rebuilding of depleted groundfish stocks	+
	Consumer awareness and scrutiny of the fishing industry	Conditional
	Implementation of Amendment 21 (intersector allocation)	Conditional
	Amendment 15	+
	Ongoing harvest specifications process and OY setting	Unknown
	Climate change and the effect on species abundance and location	Unknown
	The possibility that a stock is unexpectedly declared as rebuilt	+
	The possibility that a stock is unexpectedly declared as overfished	–

4.11.4.3 Trends and Actions Influencing Vessel Safety

Safety conditions are largely related to profitability, the subsequent ability to pay for and conduct maintenance, and the ability to avoid fishing in hazardous weather conditions. As a result, many aspects affecting safety are the same as those factors affecting vessel profits and fleet efficiency. Rather than repeating the factors that are expected to result in changes in vessel profits and fleet efficiency, the reader is referred to the subsequent section describing the effect on profits and fleet efficiency. Factors improving profits and fleet efficiency should be beneficial toward safety conditions, while those that may adversely affect profits and fleet efficiency should be adverse toward safety conditions.

Factors that may lead to fewer occurrences of vessels fishing in hazardous weather conditions are limited to those factors directly related to the effects of rationalization. Therefore, the cumulative effects are the same as the incremental effect of rationalization.

4.11.5 Summary of the Effects on Catcher-Processors by Alternative

The cumulative effects of all of the alternatives is not expected to differ substantially by alternative, except in the way in which nontarget species are managed and whether catcher-processors are managed with IFQs or harvest cooperatives. In general, implementation of any of the action alternatives is not expected to alter the w the catcher-processor fishery is prosecuted under Alternative 1 (no action), except with regard to Alternative 3 (which may mean that catcher-processors race for fish to some extent via bycatch, thus eliminating some of the potential cost efficiency improvements that may be realized) and Alternatives 2a, 2b, and 2c that implement IFQs for catcher-processors and require that they are accountable for all groundfish species in the ABC/OY table.

4.11.5.1 Alternatives 2a, 2b, and 2c

Implementing an IFQ system on catcher-processors has the potential to alter the way in which the existing sector prosecutes its available harvest. This alteration may come in the form of a break-up of the existing cooperative, though it is not immediately clear what the implication of breaking up the cooperative could be, nor is it clear how likely that potential is. Having the catcher-processor sector be accountable for all species in the ABC/OY table imposes risk to individual catcher-processors that may come in the form of large expenditures to acquire QPs in order to cover catch deficits or face an enforcement action.

When taken in the context of past, present, and future conditions/actions, Alternatives 2a through 2c change some of the conditions that have led to the existing status of the catcher-processor sector. The implementation of an IFQ system has the potential to change the arrangements that currently exist in the catcher-processor sector, though those changes are not expected to lead to a reversion to race for fish conditions prior to the formation of the voluntary cooperative. The principal impact is expected to come in the form of enhanced risk (in the form of higher costs to cover catch events) to individual catcher-processor entities and this is expected to add to costs that some catcher-processors face for participating in the fishery when and if those inadvertent catch events of infrequently encountered species occurs. Under conditions expected of the future, the IFQ system allows the catcher-processor sector flexibility to adapt harvesting strategies to respond to changing conditions that may mean changes in other fishery opportunities or changes in markets.

4.11.5.2 Alternatives 3, 4a, and 4b

Alternatives 3, 4a, and 4b all result in an impact on catcher-processors that is equivalent to Alternative 1(no action), except for the way bycatch is managed in Alternative 3. In Alternative 3, bycatch is managed as a common pool across all whiting sectors, leading to conditions that encourage a race for fish via bycatch. The result of these alternatives is a continuation of the existing catcher-processor cooperative and effects that look similar, or identical, to Alternative 1.

When combined with past, present, and future conditions/actions, these alternatives result in a system that continues the recent past and present status of the catcher-processor sector (that timeline since the voluntary cooperative has been in effect). This cooperative structure creates conditions that allow the catcher-processor sector the ability to adapt to changing conditions in the future, such as changing OYs (ACLs), opportunities in other fisheries, and changing markets.

4.12 Processing and Other Labor

The proposed action is expected to affect labor indirectly through changes to the harvester and processor sectors. The action alternatives are expected to be indirectly affected by the allocation of QS or co-op processors' ties. Otherwise, effects attributable to the specific program features that differentiate the alternatives cannot be discerned. For this reason, broad-scale effects of the action alternatives against status quo, or Alternative 1. A discussion of effects by alternatives appears at the end of this section.

4.12.1 Methods for Assessing Impacts

Table 4-63 is a schematic of the way in which effects to labor are evaluated here. Fundamentally, the effects on labor due to trawl rationalization will be changes in personal income and employment, but whether the result is an increase or decrease in either depends both on the characteristics of the firm employing the labor and how the rationalization program affects its decisionmaking. Because of differences in the operational characteristics of processors of whiting versus nonwhiting groundfish processors, labor in these two sectors in turn may be affected differently. No matter the type of processor, labor will be indirectly affected by whether QSs are allocated to processors. With respect to harvester cooperatives for the whiting sector, a requirement for vessels to be tied to a specific processor could have a similar effect. Under the preferred alternative, which includes a co-op for the whiting at-sea sectors, a one-year obligation is required in the mothership sector. The current single co-op for the catcher-processor sector, which would continue, is voluntary. Allocating QSs to processors or requiring processor ties would give them more leverage in negotiations with harvesters, likely increasing profitability. This would affect business planning in ways that are likely to affect wages paid and the number of processing-related jobs. Although measurement criteria are listed, because the evaluation is qualitative, there are no numeric predictions of changes in these metrics.

Table 4-63. Impacts, mechanisms and metrics for labor.

Potential Impacts	Impact Mechanisms	Measurement Criteria or Indicators	Data and Models
Increase/decrease in income and employment in processing and related occupations	Economic performance (e.g., productivity) of processing firms affecting labor productivity	• Change in the number and location of related jobs • Change in wages and salary in related occupational categories	• Qualitative assessment based on expert opinion • Projections of geographic shifts in delivery and fishing activity • Indirect effects from impacts on processors
	Changes in the operational characteristics of processing facilities		
	Change in number of processing facilities		
	Change in the location of processing facilities		

4.12.2 Direct and Indirect Effects of the Alternatives on Labor

The principal difference among processing firms likely to affect labor is the size of their processing facilities and the degree to which they are able to switch production to different product forms. Shore-based whiting processors currently must handle large volumes of fish in a relatively short period because the whiting fishery tends to function like a derby with harvesters competing to catch the available quota. During the part of the year when there is no whiting fishery, processors have an incentive to diversify into processing other products in order to maximize returns to the larger plant capacity they have to invest in. Similarly, their labor demand will vary through the year, to the degree they are unable to keep their plant at operational capacity. For example, if the plant cannot be put to another use outside of the whiting season, such as processing nonwhiting groundfish or Dungeness crab, most of the jobs in the facility will be seasonal. This is less of a problem in the at-sea sector because motherships and catcher-processors are mobile and can be deployed to the Alaska pollock fishery. (Furthermore, the measures proposed for the catcher-processor fleet largely maintain the status quo so related processing labor would be unaffected.) Processors specializing in nonwhiting groundfish deal with lower volumes and a steadier supply because of cumulative trip limits under Alternative 1, No Action. They may also require somewhat different types of labor than whiting processors if their operation is less mechanized and they deal with a greater variety of species and product forms.

The decision to allocate QSs to processors, and how much is allocated to them, affects their bargaining position vis-à-vis harvesters (Section 4.4). The processor tie requirement in the mothership and shore-based cooperative alternatives may have a somewhat analogous effect. Any resulting increase in bargaining power will tend to reduce ex-vessel prices and increase processor profit margins. Changes in processor profit margins are expected to have an indirect effect on processor labor. It is reasonable to expect that changes in profit margins for processors will have a corollary impact on wages paid to laborers, though perhaps not at a one-to-one ratio.

To the degree that increased profitability stimulates new capital investment, to increase either the scale or scope of current operations, could affect labor demand. Investment to scope could mean the development of new product forms and new markets, possibly accompanied by greater specialization in one product category and an adjustment in the skill required of processing laborers. Investments to increase the scale of operations (the ability to process larger volumes) could also create greater demand for skilled labor, if larger operations are more mechanized. A move to specialize, whether or not accompanied by the development of new product forms, could likewise create demand for skilled labor, perhaps of a different sort. For example, such operations might be less mechanized but require more

skilled hand-processing of fish. In either case, the final effect on employment and income would be related to changes in productivity. This could reduce overall employment if fewer people are needed per unit of product processed. While an increase in demand for more skilled jobs would imply higher wages and an increase in personal income, the degree to which this occurs would depend on labor supply and the degree to which firms are willing to pass on productivity gains to workers in the form of increased wages. Increased labor supply would tend to decrease wages. The pool of available labor could increase for closely related reasons if processing firms lay off workers because of productivity increases. However, labor availability would probably be more affected by general trends in employment and the wages workers would be willing to accept. Changes in the meatpacking industry offers an example of how a variety of factors, including industrial consolidation and greater availability of immigrant labor, have led to a decline in wages without substantial gains in productivity (Kutalik 2008).

One of the broad effects of rationalization is to even out the supply of fish over the year. As discussed above, this is more of a factor in the whiting fishery since it tends to operate as a derby fishery. If plants are able to operate for a larger part of the year with less variation in throughput, this would make employment less seasonal, that the degree to which needed plant capacity or the number of plants is reduced as a result (and the correlation between physical capacity and labor requirements) could result in fewer jobs, but ones that are more stable. The net effect on personal income partly depends on whether seasonal workers are under-employed (because they cannot find comparable off-season work). Steadier supply might contribute to the ability of processors to specialize or develop new product forms and markets. If this demands skilled labor, it could lead to wage increases.

A rationalized fishery may facilitate long-term planning leading to new investment, the development of new product forms and new markets. The phenomenon would be more likely if processors are allocated QSs because of the greater control it would give them over the timing and location of deliveries and the price paid. A desire to increase efficiency and profitability could lead to the consolidation of operations, meaning fewer, but perhaps larger, processing facilities. Another factor that could influence the location of facilities would be the potential change in trawl vessels' homeports because of fleet consolidation and the comparative advantages of some ports (Section 4.14.5). Allocation of QSs to processors could temper this effect if they want to maintain facilities in less advantageous ports. Whatever the outcome, these factors could change which communities the jobs are in and the overall number of jobs. If the consolidation of processing facilities results in greater mechanization, this could change the types of jobs in demand and related jobs in the same way as discussed above.

If geographic shifts in fish delivery and processing activity occur as a result of rationalization, processing labor is likely to be affected on a regional scale. Based on the regional comparative advantage analysis, some processing centers in central and southern California may see some amount of groundfish processing decrease and as a result the demand for processing labor in these areas may decline. Conversely, other areas of the coast may see an increase in the amount of delivery and processing activity, meaning the demand for processing labor may increase leading to more processing labor jobs and/or increases in the wages paid to processing laborers.

4.12.3 Cumulative Effects on Processing and Other Labor

Labor is affected by a multitude of factors in addition to rationalization. The opportunities that laborers in the processing industry have are affected by harvest volumes, harvest timing, and the degree of mechanization found in the workplace, among others. Skilled processing labor relies on a relatively stable degree of employment and recent management actions taken in the groundfish fishery designed to minimize the catch of depleted stocks has made opportunities available to processing labor relatively

less stable than had been the case historically. One goal of the groundfish fishery is to have a year-round fishery, and the effect of this goal would be to sustain skilled labor throughout a year. Actions taken in 2004 and 2005 restricted the amount of fishing at the end of the year, and processing labor likely suffered as a result due to lack of volume during the end of the year.

Reductions in harvest volumes of nonwhiting groundfish have also affected labor because of less volume for processing and a reduction in the demand for labor to handle such volume. Inversely, the development of the Pacific whiting fishery increased the demand for a different kind of labor in west coast processing facilities. Laborers involved in the shoreside whiting industry use more mechanized equipment and only handle whiting seasonally. These workers may be engaged in other processing activities (such as sardines or Dungeness crab) during other times of the year. These laborers are generally considered different from those that may engage in the hand filleting nonwhiting groundfish species.

Laborers are also affected by opportunities outside the seafood industry. Such laborers may elect to engage in other forms of employment, for example. As a result, the trend of increasing population in coastal communities and the potential for diversification of coastal economies through such industries as tourism are likely to change the opportunities for laborers. When combined with the effect of rationalization, the overall status of labor is highly uncertain.

4.12.4 Summary of the Impacts of the Alternatives on Processing Labor

As discussed above, the action alternatives are likely to affect labor differently compared to the no action alternative, Alternative 1. The action alternatives could reduce labor demand overall, but remaining jobs could be higher paying (due to productivity increases) and more stable (due to more continuous supply of fish). These effects would be felt in the whiting sector, because it tends to operate more like an Olympic fishery under the no action alternative, Alternative 1. There may be no difference between the no action alternative and the action alternatives for processing labor in the nonwhiting sector, because cumulative trip limits under no action tend to result in a more even supply of fish throughout the year. Exogenous factors producing cumulative effects are likely to be greater than direct and indirect effects of the alternatives, but would have the same magnitude of effects across all of the alternatives. Principal exogenous factors are harvest specifications, which affect the volume of fish available for processing, and broad changes in labor demand across the economy, affecting employment.

The feature of the action alternatives most likely to affect labor income and employment compared to the no action alternative (Alternative 1) is allocation of IFQs to processors or the nature of the co-op tie. Allocation of IFQs to processors or a stronger delivery obligation for harvesters in co-ops would give processors more bargaining power over harvesters with respect to prices. Resulting increases in revenues or profits could positively affect wages paid. Processor allocations/affiliations under the alternatives are as follows:

- Alternative 1 (no action) has no processor allocations/affiliations.
- Alternatives 2a and 2b do not allocate IFQ to processors.
- Alternative 3 allocates 25 percent of nonwhiting groundfish to processors and requires a 100 percent processor affiliation in co-ops for mothership and shoreside whiting sectors.
- Alternative 4a allocates 50 percent of whiting IFQ to shoreside processors and includes a 50 percent processor affiliation in the whiting mothership sector.
- Alternative 4b (preferred alternative) allocates 20 percent of whiting IFQ to shoreside processors; mothership co-op require only an annual declaration.

Based on the discussion above, Alternative 3 could have the least adverse/most beneficial impact on processing labor compared to the other action alternatives; Alternatives 2a and 2b could have the least beneficial/most adverse impacts; Alternative 4a and 4b would be intermediate.

4.13 Input Suppliers

As with processing and other labor (Section 4.12), while there are likely to be substantial effects to input suppliers, it is not possible to discern effects among the alternatives, because the differences in program features are not great enough to vary what are expected to be only indirect effects.

Businesses that supply inputs to groundfish trawl harvesters may be indirectly affected by trawl rationalization if the program causes behavioral changes in trawl groundfish harvesting operations. At the level of the firm, these effects depend on an input supplier's size and location. While a variety of businesses supplies inputs to the trawl sector, for many, the trawl sector accounts for a small proportion of sales, either because they sell to firms and individuals across the economy (e.g., grocery wholesalers/retailers), or because they sell to harvesters in many other fisheries (e.g., marine electronics retailers). Smaller, specialized retailers located in ports where groundfish trawlers are an important component of the local fleet (in terms of purchases, not necessarily number of vessels) would be more affected by changes in demand for inputs. Those most affected depend on the trawl sector for a large proportion of their sales. The types of suppliers most affected by the proposed action would be the following:

- Small retailers of specialized equipment and materials (e.g., ship chandlers, hardware stores).
- Dockside fuel suppliers.
- Suppliers of specialized services (e.g., welders, riggers, equipment installers).
- Equipment manufacturers for whom groundfish trawl vessels account for a large proportion of sales (e.g., boat builders, net manufacturers). These manufacturers fabricate specialized equipment and sell either directly or through local retailers.
- Firms that contract observers to the groundfish trawl sector.
- Brokerage firms that handle the sale/transfer of IFQs.

Although crew labor is generally considered a variable input, effects on crew are discussed in Section 4.7.

4.13.1 Methods for Assessing Impacts

Table 4-64 shows how impacts to input suppliers are evaluated. The impact mechanisms are related to the type of input. Certain inputs can be related to variable costs and capital investment. Food, fuel, and other expendable supplies, services, as well as certain equipment that must be regularly replaced, are variable costs related to operations. Capital investment represents large fixed costs such as the purchase of new vessels or processing facilities.

Contracting of fishery observers is also a variable cost related to fleet-wide days at sea. The provision of fishery observers will, however, be affected by other factors aside from vessel operations related to the implemented monitoring and reporting program, so it is considered separately.

Brokerage firms handle the transfer of IFQ (QSs or QPs), and their fee structure is related to sale/transfer activity. Although such transactions could be negotiated by the IFQ owner and potential purchasers, information constraints (knowing who wants to buy what and at what price) would likely

make the use of a broker more cost effective in many cases. IFQ sales would be related to consolidation as some permit owners sell out and exit the fishery. Such sales could also occur if those operations that stay in business need to rebalance their IFQ portfolio, for example to match a particular fishing opportunity in which they want to specialize. QS leasing would essentially serve the same functions without permanent transfers and such arrangements could also be mediated by brokers. QP sales would most likely occur to cover unexpected overages.

Table 4-64. Overview of analytical approach used to compare baseline and future conditions of input suppliers under the alternatives.

Potential Impacts	Impact Mechanisms	Measurement Criteria or Indicators	Data and Models
Changes in the economic performance (e.g., profitability) of individual input suppliers	Consolidation of harvesting sector as well as spatial redistribution of fishery related activity	Fuel expenditures Food expenditures Expenditures on services (maintenance and repair) Expenditures on frequently replaced equipment and materials	• Qualitative assessment based on expert opinion • Projections of geographic shifts in delivery and fishing activity • Indirect effects from impacts on harvesters
	Changes in the economic performance (e.g., profitability) of harvesters and processors	Capital investments made by processors and harvesters	
	Reporting and monitoring requirements	Expenditures on observers	
	Transfers of QSs and QPs and cumulative trip limits	Ex-vessel value of transfers	

4.13.2 Direct and Indirect Effects of the Alternatives on Input Suppliers

Consolidation means that fewer vessels would operate in the groundfish trawl fishery. This is expected to lead to an overall reduction in demand for inputs specifically related to the trawl fishery. However, if vessels leaving the groundfish trawl fishery continue to operate on the west coast in some fashion (in other fisheries, for example) the drop in demand could be modest, since many inputs are not so specialized as to be used exclusively when trawl fishing. By the same token, if the vessels leave the region or are scrapped, this would contribute to a fall in demand for inputs. The relocation of vessels is related to consolidation and the comparative advantage of ports and would adversely affect retailers and service providers located in disadvantaged ports.

Fuel represents a major variable cost in fishing operations. Local fuel suppliers would be similarly affected by vessels relocating. Since fleet consolidation is intended to increase efficiency, it is expected to reduce overall demand for fuel. For example, a fewer number of larger vessels would likely use less fuel overall. An ability to optimize fishing activities over the course of the year, which, as discussed elsewhere, would be a bigger factor in the whiting fishery, could also decrease fuel expenditures. This would tend to occur as vessels fish at a more rational pace and optimize their costs relative to revenues. This could mean that the overall amount of time spent at sea decreases as effort is spread across more months of the year. Input suppliers that operate on a larger regional scale (such as net manufacturers that sell to vessels all along the west coast) would be largely unaffected by shifts in the location of vessels but could be adversely affected if fewer of these types of inputs are needed.

Trawl rationalization is expected to increase the profitability of harvesters, and processors depending on the allocation of IFQ. This could lead to greater capital investment, benefiting some input suppliers. Harvesters remaining in the fishery could invest in new vessels, or vessel configurations better matched to changes in operational characteristics resulting from rationalization (e.g., change in the pace of fishing, specialization). For the most part, processors have investments in plants and equipment that may be impracticable or not cost-effective to move if they relocate operations or consolidate to certain locations. This could stimulate the purchase of land, buildings, and equipment.

Observer coverage will undoubtedly increase under a rationalization program. An increase in observer coverage levels could be counterbalanced somewhat over the long term if the fleet consolidates to a fewer number of vessels. Thus, firms that contract fishery observers are likely to benefit from trawl rationalization.

Any of the alternatives that include IFQs will benefit brokerage firms that handle IFQ transactions. The level of transfer activity, which dictates the fees they receive, depends on the level of consolidation and the need for operators to balance share portfolios to match the mix of species they plan to harvest or actually harvest (the latter might be covered by QP purchases instead, but such transfers could still involve brokerage firms). Portfolio rebalancing is likely to be an ongoing activity but, over the long term, would tend to involve transacting fewer shares as portfolios better match harvesters' operational characteristics. Consolidation will likely occur over the long term but involve a larger volume of shares overall.

4.13.3 Cumulative Effects on Input Suppliers

Input suppliers represent a fairly broad category of entities affected by rationalization of the west coast trawl fishery. As a result, the cumulative effects of rationalization are relatively broad and may differ among the various types of input-supplying entities. Input suppliers are impacted via a second order effect on harvesters and/or processing entities. Therefore, cumulative effects on harvesters and processors may be reflected in input suppliers. Input suppliers may be exclusively tied to the seafood industry, or may be diversified into other industries. As a result, factors other than those related to fisheries may affect input suppliers.

Over time, activity in the west coast seafood industry has varied and the effects on input suppliers have varied as a result. Harvest restrictions in the west coast groundfish and salmon fisheries have led to a reduction in fishing effort, participation, and landings. The reduction in effort and participation is directly related to the demand seafood industry participants have for inputs such as gear and equipment, services, and fuel. As a second-order effect, this has likely affected input suppliers who relied on participants in those fisheries. Inversely, the recent success of the Dungeness crab fishery, the domestication of the Pacific whiting fishery, and the reemergence of the west coast sardine fishery may have offset much of the losses input suppliers suffered declines in more traditional groundfish activities and in salmon fisheries, though the effect almost certainly differs across the various types of input suppliers.

Exogenous actions (including RFFAs) expected to influence input suppliers include harvest reductions, which have affected groundfish harvesters and processors, harvest reductions in salmon fisheries, counteracting increases in Dungeness and sardine landings, and broad changes in the economy affecting demand for goods and services. Overall input suppliers will be differentially affected depending on their degree of specialization. (Less specialized input suppliers would be less vulnerable to changes in the seafood processing industry but still affected by broad-scale economic changes such as a national recession.)

4.13.4 Summary of the Impacts of the Alternatives on Input Suppliers

In the discussion above, consolidation in the harvester fleet is identified as a principal factor producing indirect effects on input suppliers. Consolidation could reduce demand for both variable inputs (e.g., fuel, supplies) and fixed inputs (e.g., new equipment) compared to the no action alternative (Alternative 1); however, increased profitability could partially offset this reduction. Remaining fishery participants may replace fixed capital more rapidly, for example by purchasing new equipment or vessels. Cumulative effects are due to the economic performance of the seafood industry and the broader economy affecting demand. Reporting and monitoring requirements and IFQ transfers could have a positive impact on input suppliers providing related goods and services compared to the no action alternative (Alternative 1).

Program features affecting consolidation are accumulation limits, grandfather clause, and number of sectors. Use of IFQ as the catch control tool could increase demand for brokerage services compared to the no action alternative. The application of IFQ also varies among the action alternatives. The same reporting and monitoring program is included in all the action alternatives, so they do not differ in terms of effect but collectively would increase demand for observer coverage and related inputs compared to Alternative 1 (no action).

Alternative 2 would likely result in the greatest level of consolidation because it has relatively higher control limits, a grandfather clause, and merges shoreside whiting and nonwhiting into a single sector (allowing greater consolidation within the one sector). Greater profitability of remaining firms could at least partially offset this adverse effect.

Alternative 3 has the lowest accumulation limits, no grandfather clause, and four sectors. It also has an area management provision whereby nonwhiting sector IFQ is differently denominated. This could increase IFQ trading and thus demand for brokerage services. This alternative may have the least adverse effect on input suppliers.

Alternative 4 has accumulation limits intermediate between Alternatives 2 and 3. Alternative 4a has the grandfather clause, while Alternative 4b (the preferred alternative) has a divestiture provision, which would allow use of QPs over the limits for up to four years at the outset of the program. A single shoreside sector would be created, combining whiting and nonwhiting managed with IFQs. Alternatives 4a and 4b would likely be intermediate in the level of consolidation compared to Alternatives 2 and 3. Effects on input suppliers would likely be modest and both beneficial (brokerage and observer services) and adverse (fewer harvester firms purchasing products and services partially or wholly offset if increased profitability increases purchases by remaining firms) compared to Alternative 1 (no action).

4.14 Communities

In this section, we describe the impacts of the alternatives on communities. The MSA defines a fishing community as "a community which is substantially dependent on or substantially engaged in the harvest or processing of fishery resources to meet social and economic needs, and includes fishing vessel owners, operators, and crew and United States fish processors that are based in such community" (MSA §303(a)(9)). In interpreting this definition, NMFS has stated that "A fishing community is a social or economic group whose members reside in a specific location..." (63 FR 24211). As such, we interpret community to mean a geographic location, as opposed to an occupational community or a community of interest.

This section begins with a discussion of how trawl communities are identified, followed by a discussion of methods and metrics used to illustrate impacts. Next, we discuss the broad-level effects of rationalization on communities, including lessons learned from other rationalization programs. This section provides a big-picture look at issues, independent of the differences between the alternatives. Community impacts depend in large part on impacts to harvesters and processors, captains and crew, nontrawl harvesters, shoreside processors, etc.

Following the description of broad-level effects, we assess the impacts of the alternatives (see page 498). This section begins with a discussion of the community implications of each alternative, followed by a discussion of each element in the alternatives. Following this section, we discuss impacts on specific communities, when possible.

At the end of this section, we provide a summary of the effects of trawl rationalization on each trawl community identified. Finally, we assess cumulative effects. This section briefly summarizes past and present actions with ongoing effects on communities, and RFFAs that are expected to affect communities. The effects of these past, present, and RFFAs are combined with the effects of the alternatives to arrive at cumulative effects.

The trawl rationalization process could have a profound impact on many coastal communities that depend on trawling as a source of revenue. If the history of the implementation of other IFQ programs is a guide, rationalization will result in social impacts being felt in a range of communities, as fewer vessels participate in the fishery and fewer communities are the sites of processing effort. Trawl rationalization is expected to result in changes in the spatial distribution of effort and processing, along with consolidation of vessels and processors. These changes will have both positive and negative impacts on fishing communities.

The transition to a trawl IFQ program is intended to result in an overall gain in value of the fishery. As fishermen find creative ways to avoid overfished stocks and access underutilized target species, overall harvest levels are expected to increase. At the same time, catch and efficiency will increase, along with participants' ability to pursue value-added opportunities. There will be fewer, yet more stable, jobs across a range of sectors, and a redistribution of income and revenue opportunities will occur. The elements of rationalization that relate to community impacts are outlined in more detail below.

4.14.1 Methods for Assessing Community Impacts

In this section, we describe the methodology for assessing the impacts of rationalization on trawl communities. Section 4.14.1.1 explains how trawl communities were identified. Section 4.14.1.2 discusses impacts, mechanisms, and metrics.

4.14.1.1 Identification of Trawl Communities

Trawl communities were defined based on whether they were a principal port for active trawlers. A principal port is one where the majority of a trawl vessel's whiting and nonwhiting landings took place from 2004 to 2007. Ports meeting this principal port criterion include Astoria, Bellingham Bay, Blaine, Brookings, Charleston/Coos Bay, Crescent City, Eureka, Fort Bragg, Ilwaco, Monterey, Morro Bay, Moss Landing, Neah Bay, Newport, Princeton/Half Moon Bay, San Francisco, and Westport.

Of these ports, Blaine and Monterey were removed from the list of current trawl ports. Blaine was removed because the last remaining processor of trawl-caught groundfish closed in late 2006, and trawlers that delivered to that processor have started delivering to Bellingham. It is possible that Blaine

will once again be an active trawl port if a processor reopens there. Monterey was removed because trawlers have generally stopped delivering there. Other communities, such as Port San Luis/Avila, were recently considered trawl ports, but over time, trawl activity has dissipated, and now only marginal amounts of landings occur in these ports. No trawlers currently use these ports as their principal port, so these ports are not defined as trawl communities.

Morro Bay is a special case. Trawl activity was nearly eliminated in Morro Bay due to a The Nature Conservancy buyout in 2006, in which seven trawl permits and four trawl vessels were purchased by the nonprofit (these permits are now held in San Francisco, where The Nature Conservancy is located). However, The Nature Conservancy has indicated that it plans to use those permits and associated IFQ on vessels fishing out of Morro Bay in the future. Therefore, this community is identified as a trawl community.

In addition to these ports, we consider impacts to Anacortes and Seattle. Anacortes is primarily a business center for the at-sea whiting fishery, while Seattle is both a business center and a home base for the at-sea fleet. Table 4-65 (in geographical order) summarizes the primary trawl activities of each community.

Table 4-65. Principal groundfish ports.

Port name	Whiting	Nonwhiting
Bellingham, Washington		X
Anacortes, Washington	X	
Neah Bay, Washington		X
Seattle, Washington	X	
Westport, Washington	X	X
Ilwaco, Washington	X	
Astoria, Oregon	X	X
Newport, Oregon	X	X
Charleston/Coos Bay, Oregon	X	X
Brookings, Oregon		X
Crescent City, California	X	X
Eureka, California	X	X
Fort Bragg, California		X
San Francisco, California		X
Moss Landing, California		X
Princeton/Half Moon Bay, California		X
Morro Bay, California		X

4.14.1.2 Impacts, Mechanisms and Metrics

Table 4-66 summarizes potential impacts, mechanisms for such impacts, and metrics and methods for assessing impacts. Impacts fall under six general topics: changes induced from changes to trawl harvesters, changes induced from changes in the processing sector, impacts to nontrawl communities and fisheries, cultural and social changes, changes in municipal revenues and community stability, and infrastructure impacts.

Table 4-66. Overview of impacts, mechanisms, and metrics used to assess community impacts.

Potential Community Impacts	Mechanisms for Impacts	Metrics or Indicators	Data, Models, and Methods for Assessing Impacts
Changes in amount of trawl vessel activity	Fleet consolidation Geographic shifts in delivery activity	Vessel and permit count, type, and location	Consolidation model; Geographic shifts in fishery patterns; Initial allocation of IFQs
Changes in crew wages and number of crew jobs	Fleet consolidation Changes in crew compensation structure	Estimated income in harvesting sector, fleet consolidation data; number and location of crew employed; hours of crew employment	Consolidation model; Input from key informants
Changes in the relationships between crew and captains	Changes in compensation structure	Wages paid to crewmembers	Literature review of Ethnographic information; Qualitative assessment
Changes in the level of processing activity	Consolidation of processing sector; changes in bargaining power over ex-vessel prices, changes in the timing of deliveries	Number and type of active processors; municipal income data	Geographic shifts in fishery patterns; Consolidation model
Changes in the number of processing jobs and the seasonality of processing jobs	Changes in volume of landed catch; changes in the location of delivered catch; changes in the timing of harvest	Number and type of employment in processing sector; amount of seasonal/temporary employment vs. permanent employment	Geographic shifts in fishery patterns; Catch estimate model; qualitative assessment
Cultural and social changes	Families may experience increased stress due to economic and cultural change	Relationship between economic change and family stress	Qualitative assessment from relevant ethnographic studies
	Community identity may change if certain fishery sectors are lost	Relationship between potential loss of an industry and community identity	Qualitative assessment from relevant ethnographic studies
Changes in municipal revenues and community stability	Public revenues may be lost if trawl or processing sector shrinks	Estimated municipal revenues; raw and processed product cost/value	Income impacts derived from other EIS sections
	Depending on the importance of a "working port" to tourism to a community	Information on how important the local fishery is to the tourist industry	Qualitative discussion; community profiles; consolidation and geographic shift models.
Infrastructure impacts	Infrastructure may be lost if trawl or processing sector is reduced	Quality of infrastructure; vessel numbers, pounds of harvested species, change in landing patterns	Qualitative discussion; consolidation and geographic shift models.
Impacts to nontrawl communities and fisheries	Nontrawl communities may be affected by increased competition, impacts on infrastructure in trawl communities (resulting from gear switching and other fishery shifts)	Estimates of gear switching and shifts to other fisheries	NWFSC Consolidation Model; Geographic shifts in fishery patterns; Initial allocation of IFQs; NWFSC community profiles

4.14.2 Broad-Level Effects of Trawl Rationalization on Communities

As described in previous sections, a rationalized fishery is expected to change profit motivations and increase individual accountability, which, in turn, will change the way fisheries are pursued. These changes will tend to indirectly impact communities. The magnitude and location of fishing effort and processing, the volume and type of species harvested and processed, harvesting methods, and the number of vessels used to pursue fishing activity may all be affected. If rationalization is implemented, these changes will take place no matter which alternative (or alternative) is selected. However, options within the alternatives—such as accumulation limits, an adaptive management provision, and processor shares—will also influence communities.

In addition to a literature review, models were used to analyze the impact of the initial allocation of IFQ, the amount of fleet consolidation expected to occur, the potential for shifts in the location of fishing effort, the potential for changes in revenue and catch as a result of changes in bycatch rates, the comparative advantage of ports and regions in a rationalized fishery, and the regional economic impacts of trawl fishing activity. Theoretical tools were used to describe the outcomes of negotiation and power shifts between harvesters and processors. These models and tools are described in more detail in Appendix C, with some results described below.

Briefly, the main lesson learned from the literature on rationalization programs is that managers must balance the desire for increased efficiency in the fleet as a whole with the desire to protect communities by using limits on consolidation and transferability. A General Accounting Office study (2004) neatly summarizes both the lessons learned from other rationalization programs and the tradeoffs that must be considered:

> While an IFQ is a fishery management tool put in place to protect the resource, as well as reduce overcapacity, these laudable goals may have unintended consequences: the loss of communities historically engaged in or reliant on fishing and reduced participation opportunities for entry-level fishermen or fishermen who did not qualify for quota under the initial allocation. New IFQ programs or modifications to existing programs may be designed to address these problems by incorporating community protection and new entry goals. However, because the goals of community protection and new entry run counter to the economic efficiency goals, fishery councils face a delicate balancing act to achieve all goals. (page 29)

Similarly, a NRC study notes the following:

> Achieving the goals of increased overall economic efficiency, more effective enforcement or administration, or more effective conservation through the use of IFQs may lead to reduced breadth of participation by fishermen, reduced total employment in the harvesting sector, and other shifts in the distribution of benefits from the fishery. The critical point is that these trade-offs be clearly identified, estimated prior to decisionmaking, and monitored subsequent to program implementation to provide information for adjusting the program over time and for designing subsequent programs(NRC 1999).

Concerning both the New Zealand and B.C. halibut programs, Dewees (1998) notes the following:

> Probably the most important part of IFQ implementation involves the stakeholders deciding what they want the fishery to look like. Methods of initial quota allocation, aggregation limits, and transferability are the key issues that will affect outcomes. For

> example, if the goal is to sustain communities, some quota could be allocated to the community rather than to individuals. . . .

Below is a more detailed description of observed and anticipated outcomes of rationalization. Because of the cascading and interconnected nature of these impacts, we start with the major impacts of rationalization (consolidation and geographic shift) and move through impacts on harvesters and processors before discussing related impacts on communities, families, and nontrawl communities.

4.14.2.1 Community Impacts from Fleet Consolidation

Varying levels of consolidation have been documented in all existing IFQ programs, and models predict consolidation in the west coast nonwhiting groundfish trawl fleet of approximately 55 to 66 percent. The distribution of consolidation is of vital importance to communities. The literature suggests that consolidation tends to happen quickly after rationalization is implemented, even with limits in place.

Consolidation in the trawl sector is expected to increase revenue in the fishery, and to lead to a decline in the number of vessels. On a fleetwide scale, the reduction in the number of vessels engaged in the fishery is expected to reduce annual fixed costs. The distribution of this reduction is of particular importance to communities. Some communities—particularly those with robust existing infrastructure, efficient fleets, and close to fishing grounds with low bycatch constraints—will benefit, while other communities with less efficient fleets, less infrastructure, and near higher bycatch areas, will likely contract.

Accumulation limits are an anticonsolidation measure that could benefit some communities by reducing fleet consolidation and maintaining a minimum number of businesses involved in the fishery. Accumulation limits and expected levels of consolidation are discussed below, in Section 4.14.4, under "*How will accumulation limits affect communities?*"

Case studies of rationalization programs around the world have documented varying degrees of consolidation. McCay (1995) writes "…a review shows that the general pattern is one of consolidation and rationalization of harvesting capacity, though there are some exceptions.… Rapid consolidation may occur even though the system is designed to limit transferability." Since each IFQ program reviewed takes place in a different fishery, with a different socioeconomic context and different program design, it is important to consider these differences before generalizing. However, it is clear that constraints on consolidation can have an important impact on communities. For example, in the Icelandic cod fishery, massive consolidation led to a relatively small number of large companies owning the majority of the quota; in 1994, 70 percent of the smallest IFQ holders held just 10 percent of IFQs. This has led to public discontent, strikes by fishermen, the loss of fishing activity, and high rates of unemployment in small communities (Palsson and Helgason 1995). In the Atlantic surf clam and ocean quahog fishery, McCay et al. (1995) found "a very rapid decline in the number of vessels actually involved in the fishery," declining from 135 vessels in 1990 to fewer than 50 in 1994. They note that, by 1995, nine firms controlled 82 percent of the IFQ for surf clams, and 10 firms controlled about half the IFQ for ocean quahogs. Still, Adelaja et al. (1998) argues that monopolies did not develop in that fishery. Wilen and Casey (1997) found a small amount of consolidation in the B.C. halibut fishery, where relatively strong anticonsolidation measures were included in the program design.

As predicted, economic efficiency of the fleet as a whole does seem to increase under rationalization. Several of the case studies described below document increased efficiency in the fishery. McCay et al. (1995) writes that in the surf clam and ocean quahog fishery, both fishing hours and productivity per vessel increased.

4.14.2.2 Community Impacts from Geographic Shifts in Fishing Effort

As a result of consolidation and increased efficiency, shifts in the geographic distribution of fishing and processing activity are expected to result from rationalization. In some areas, the presence of constraining overfished species will be an important factor. Vessels that traditionally operate in areas with relatively high bycatch rates (such as Neah Bay) will find themselves at a disadvantage. They are more likely to reach their quota of constraining stocks earlier, and be forced to stop fishing earlier than vessels in other areas. As a result, vessels will likely modify their behavior to decrease bycatch of overfished species. This could be achieved by switching to nontrawl gear, changing the location of fishing, moving to another port, or selling QSs to another vessel and leaving the fishery. These actions could affect the trawlers' home and delivery ports, as well as other nontrawl ports that depend on the infrastructure present in nearby trawl ports.

Such geographic considerations are likely to be influenced by market conditions as well. If a vessel fishes in an area with a relatively high bycatch rate for overfished stocks, but is economically efficient and delivers to a port with good market conditions, hen it may find ways to adapt in order to continue to fish in that area while avoiding bycatch.

Quota allocation may also affect geographic shifts. Depending on the allocation formula, some permit holders and catcher vessels may receive a greater or lesser amount of allowable catch than under status quo conditions. In addition, they may receive a different mix of species allocated as quota compared to the mix of species currently harvested. In the long run, transfers of fishing privileges should occur in a way that is more optimal to individual harvesters, but that transfer will act as a cost to some individuals and as a benefit to others, with subsequent impacts on their ports and processors.

Consolidation is likely to have a geographic effect as well. Based on analysis of cost-earnings data, vessels of a particular size are more cost efficient than others. This relative degree of cost efficiency will mean that ports with a relatively large presence of efficient vessels may see less consolidation than those ports with less efficient vessels. If enough vessels are lost from a particular community, it may mean a decrease in the amount of fishing related activity occurring in that area.

4.14.2.3 Community Impacts as a Result of Changes in Fishing Employment

Studies of existing IFQ programs have documented impacts on fishing employment that include job loss, shifts in the compensation system from shares to wages, higher wages for remaining crew (despite lower crew shares), longer hours, changing skill requirements, changes in bargaining power between quota owners and crew, and quota owners charging crew for use of quota. Researchers have also observed the development of new businesses based on leasing quota rather than harvesting.

The consolidation occurring in the trawl sector, and resulting impacts on fishing employment, will have varying effects by community. As some vessels become more efficient and others drop out of the fishery, there will likely be a loss of skipper and crew employment opportunities in some communities, and a gain in others. Unemployment caused by rationalization could lead to secondary impacts on community businesses if residents lose purchasing power; for example, during the implementation of rebuilding plans for overfished groundfish species, Goblirsch (2002) reported impacts on such businesses as car dealerships and restaurants. On the other hand, the crewmembers who remain in the fishery may earn more income and work more hours. Since crew are not individually licensed, trends in crew employment are difficult to track, but it seems reasonable to expect that the communities expected to benefit from rationalization will experience increased crew wages and crew hours; conversely, those that are expected to lose trawl activity will also lose crew employment opportunities.

Copes (1997:68) notes that a loss of fishing employment can have particularly negative impacts in isolated communities where there are few alternative employment opportunities. McCay et al. (1995) estimated a one-third decline in labor in the Atlantic surf clam and ocean quahog fishery between 1990 (when rationalization was implemented) and 1992. Surveys indicated that displaced workers tried to stay in the fishing industry but were unable to find work, in part because of downturns in other fisheries in the region. This is particularly relevant to the west coast due to the widespread closures of the salmon fishery in 2008 and 2009.

4.14.2.4 Other Impacts on Communities and Harvesters

Other community-related impacts on harvesters include new economic hurdles for those who are not allocated quota, increased incentives to switch gear types in some communities, changing crew needs for those switching gear, impacts of gear switching on suppliers, changes in ex-vessel prices, impacts of leasing, and increased (or decreased) safety. The potential development of CFAs could also affect harvesters and communities. CFAs are discussed in more detail in the section on RFFAs, below.

Hurdles for New Entrants

Under rationalization, harvesters who do not receive an initial allocation of quota will find it difficult to participate in the trawl fishery due to the cost of entering into the fishery. Even under status quo, however, would-be participants have to purchase a permit to participate, which is also a barrier to entry. McCay (1995) writes: "After the initial allocation, it is usually difficult for others to acquire shares because of the large value immediately created." The GAO review of IFQ programs (2004) similarly notes the following:

> IFQ programs have also raised concerns about opportunities for new entry. As IFQ programs move toward achieving one of their primary goals of reducing overcapitalization, the number of participants decreases and consolidation occurs, generally reducing quota availability and increasing price. As a result, it is harder for new fishermen to enter the fishery, especially fishermen of limited means, such as owners of smaller boats or young fishermen who are just beginning their fishing careers.

Gear Switching

Regional differences in bycatch rates may encourage some vessels to remain in the same port, but switch to other groundfish gear to reduce bycatch. For example, some vessels operating in high bycatch areas may choose to use pot gear instead of trawl gear. This could lead to new skill requirements for crewmembers and differences in the number of crew required on a vessel. Pot fishing could result in higher prices, since fish caught with pot gear tend to be of better quality, but will also likely result in a decrease in harvest volume since pot gear is less effective at catching many types of flatfish. Such a reduction in harvest volume may translate into fewer jobs on shore that would otherwise be needed to handle, process, and transport the harvest volumes associated with trawl gear. However, communities as a whole could be expected to benefit from gear switching options if the only alternative is a departure of fishing activity from that port because of bycatch issues.

Gear switching could have secondary impacts on suppliers. For example, price differences for different types of gear could reduce or improve supplier profits. In addition, suppliers may need to form new relationships with wholesalers and manufacturers of new gear types. If gear switching occurs suddenly, a supplier could be stuck with gear that cannot be sold.

Changes in Ex-vessel Prices

Ex-vessel price is generally expected to increase relative to status quo if the entire allocation of IFQ is made to permit holders. Again, the distribution of these benefits to communities will depend on the distribution of consolidation and geographic shift. In addition, as processor initial allocation is increased, ex-vessel price is expected to decrease. In a cooperative program with linkages between harvesting and processing entities, it is unclear what will happen to ex-vessel prices.

Impacts of Quota Pound Transfers (Leasing)

In a rationalized fishery, QPs may be transferred to others, creating a short-term means of providing alternative income to QS owners and allowing QP purchasers (lessees) to fish without the cost of purchasing QSs outright. However, Pinkerton and Edwards (2009), in their study of the B.C. halibut IFQ program, note that for fishermen leasing QSs, the cost of the lease can erode ex-vessel profits. In addition, quota owners benefited at the expense of skippers and crew. Pinkerton and Edwards write (2009) "There is now a widespread industry practice of taking a lease fee 'off the top' as a trip cost (subtracting it from the amount to be divided among the crew), even if a fisherman-skipper owns the quota (and thus pays the lease fee to himself)… Thus even owner-operated vessels which do not have to lease quota usually pay reduced wages to crew. The existence of the IFQ system has altered accounting practices in ways which fundamentally alter wealth distribution." The authors cite a NRC study (NRC 1999) that notes the following:

> Leasing of QSs should generally be permitted but, if necessary, with restrictions to avoid creation of an absentee owner class. Making shares freely transferable is generally desirable to accomplish the economic goals of an IFQ program. However, if it is desired to promote an owner-operated fishery or to preserve geographic or other structural features of the industry, it may be necessary to restrict long-term transfers of QSs to bona fide fishermen or to prohibit transfers away from certain regions or among different vessel categories.

QP transfers (leases) may impact communities in a couple of ways. First, new entrants may initially enter the fishery as lessees, and it may be difficult for them to purchase their own QSs without assistance. Without new entrants, communities may gradually lose fishing enterprises and fishing knowledge. In other cases, community members may no longer see fishing as a viable career path because the cost of owning quota is too daunting. In addition, communities wishing to form CFAs will have to overcome the same cost hurdle.

The adaptive management provision may mitigate some of the costs for lessees and new entrants. Assuming that the provision is used to allocate QPs to new entrants for free (or for a relatively low cost), it will serve as a lever to help new entrants or CFAs to become QS owners.

Safety

Safety onboard fishing vessels is generally expected to improve as a result of rationalization. Vessels do not fish in hazardous weather conditions to the same degree after the fishery is rationalized, and vessel owners are more able to maintain vessels and safety equipment. This maintenance is directly associated with the amount of net revenue generated by fishery participants, and therefore, a fishery that experiences an increase in net revenue will likely experience a decrease in safety-related incidents. In a survey of Alaska halibut fishermen under an IFQ program, Knapp (1999) found that more than 85 percent of halibut fishermen said IFQs had made fishing for halibut safer. Knapp noted that persons who liked or disliked IFQs for other reasons were more or less likely to state that IFQs made fishing

safer. However, when asked about the most positive impacts of the IFQ program, safety was mentioned most frequently. On the other hand, McCay et al. (1995) found that crew felt that safety had declined in a rationalized Nova Scotia fishery, because crew worked longer hours and experienced more fatigue.

4.14.2.5 Impacts on Fishery Processors, Infrastructure, and Suppliers

In summary, a wide variety of potential impacts on processors has been predicted and documented in other rationalization programs. Like fishing businesses, processors are expected to consolidate and possibly move. This will have subsequent impacts on processor labor and municipal revenue. In addition, infrastructure could be positively or negatively impacted by geographic shift, having ripple effects on local nontrawl communities as well as the trawl sector. Businesses that support the trawl sector will also be impacted, depending on their location, specialization, and reliance on the trawl sector.

Processors

Other rationalization programs show mixed results related to seafood processors. Impacts will depend on the extent to which processing companies gain and control QSs. In Alaska, sources suggest that halibut and sablefish processors were negatively impacted by an IFQ program because harvesters were able to leverage higher prices from processors (Matulich and Sever 1999). In British Columbia, some processors benefited from trawl IFQs, while others were negatively affected because of a change in the seasonality and distribution of landings.

Changes that have been projected include changes in bargaining power between processors and harvesters; regional shifts in landings due to market restructuring; regional impacts depending on how IFQ is initially distributed; changes in quality, quantity, and mix of catch as operations become more flexible and market-driven; changes in harvest timing; potentially lower processor costs; and changing product output mix.

Many of these potential changes could have ripple effects on communities, particularly if processors relocate, consolidate, or change their hiring practices. If increased profitability stimulates development of new product forms and new markets, the ability to process larger volumes, increases in the scale of operations, and increased specialization could affect the demand for labor. For example, new skills may be required in some cases; in other cases, increased mechanization may mean a loss in jobs combined with a need for different skills. While an increase in demand for more skilled jobs would imply higher wages and an increase in personal income, the degree to which this occurs would depend on labor supply and the extent to which firms are willing to pass productivity gains on to workers in the form of increased wages. At the same time, the pool of available labor could increase if processing firms lay off workers because of productivity increases. Increased labor supply tends to decrease wages. However, labor availability would probably be more affected by general trends in employment and the wages workers would be willing to accept. Changes in the meatpacking industry offer an example of how a variety factors, including industrial consolidation and greater availability of immigrant labor, has led to a decline in wages without substantial gains in productivity (Kutalik 2008).

In addition to changing labor demands, changes in the processing sector could affect municipal income to communities. For example, revenue from landings taxes may increase as the catch of nonwhiting increases in some ports.

Some specific effects on processors that may affect communities include the possibility of consolidation among whiting processors and the possibility of increased processed volume among nonwhiting processors. As discussed under the section on processors, it is likely that the rationalization of the

whiting fishery will end the current condensed season because of the elimination of derby fishing. This extension in the season means that less processing capital will be necessary to handle the given volume, potentially leading to consolidation of processing activity. If consolidation means the closure of an existing plant (or plants), this could have adverse impacts on communities where those plants are located. However, plants that remain in the fishery could be more profitable because of a decrease in the cost associated with processing activity, and this could potentially benefit those communities where remaining processors are located.

In the nonwhiting processing industry, harvest volumes may increase because of a decrease in constraining species bycatch and a subsequent increase in underutilized target species catch. This increase in target species catch may mean more utilization of processing capital and processing activity, meaning that the possibility of capital consolidation in the nonwhiting sector is less than in the whiting sector. However, geographic shifts in fishing effort could lead to consolidation in processing activity at a localized or regional scale and an expansion in processing activity elsewhere.

Infrastructure

Infrastructure includes physical infrastructure such as docks and marinas; support services, such as gear stores, fuel stations, and ice suppliers; and fish buyers and processors. Due to consolidation and geographic shift, some communities could lose infrastructure or experience a decrease in the quality of infrastructure. In addition to affecting the communities where this takes place, this could affect local nontrawl communities that depend on infrastructure in trawling communities. For example, the loss of an ice plant in a community could affect all fisheries in that community, as well as neighboring communities. On the other hand, communities that host the remaining trawl fleet could see improved infrastructure as a result of increased profits and market stability. The development of associations that act on behalf of the community (such as Community Fishing Associations) could help stabilize fishing infrastructure if standards are placed upon CFAs which help facilitate such stabilization. CFAs are discussed in more detail under the section describing Cumulative Effects as CFAs are still in the development stage and have not been acted on by the Council.

Suppliers

Impacts on input suppliers are described in detail in Section 4.13 (page 491). Clearly, fewer vessels operating in the trawl fishery will lead to an overall reduction in demand for support resources. The relocation of vessels is related to consolidation and the comparative advantage of ports and would adversely affect retailers and service providers located in disadvantaged ports.

Businesses that support groundfish trawl harvesters may be indirectly affected by trawl rationalization if the program causes behavioral changes in trawl groundfish harvesting operations. These impacts will depend on an input supplier's size and location. Although a variety of businesses support the trawl sector, for many, the trawl sector accounts for a small proportion of sales, either because they sell to firms and individuals across the economy (e.g., grocery wholesalers/retailers), or they sell to harvesters in many other fisheries (e.g., marine electronics retailers). Smaller, specialized retailers located in ports where groundfish trawlers are an important component of the local fleet (in terms of purchases, not necessarily number of vessels) would be more affected by changes in demand for inputs. Those most affected depend on the trawl sector for a large proportion of their sales. The types of suppliers most affected by trawl rationalization would be the following:

- Small retailers of specialized equipment and materials (e.g., ship chandlers, hardware stores).
- Dockside fuel suppliers.
- Suppliers of specialized services (e.g., welders, riggers, equipment installers).

- Equipment manufacturers for whom groundfish trawl vessels account for a large proportion of sales (e.g., boat builders, net manufacturers). These manufactures fabricate specialized equipment and either sell directly or through local retailers.
- Firms that contract observers to the groundfish trawl sector.
- Brokerage firms that handle the sale/transfer of IFQs.

If vessels leaving the trawl fishery continue to operate in some fashion (in other fisheries, for example), the drop in demand could be modest, since many support resources are not exclusive to trawl fishing. Similarly, if vessels leave the region or are scrapped, demand for support would shrink.

Fuel represents a major variable cost in fishing operations. Consolidation is intended to increase efficiency, so it would be expected that overall demand for fuel would decline (for example, fewer large vessels would use less fuel overall). An ability to optimize fishing activities over the course of the year, which would affect the whiting fishery more than the nonwhiting fishery, could also decrease fuel expenditures. This would occur if the overall amount of time spent at sea decreased as it was spread across more of the year, because vessels could more effectively harvest fish as a result. Input suppliers that operate regionally (such as net manufacturers that sell to vessels all along the west coast) would be unaffected by shifts in the location of vessels but could be adversely affected if fewer of these types of inputs are needed.

Trawl rationalization is expected to increase the profitability of harvesters and processors, depending on the allocation of IFQ. This could lead to greater capital investment, benefiting some input suppliers. Harvesters remaining in the fishery could invest in new, larger vessels, or vessel configurations better matched to operational changes resulting from rationalization. The movement or consolidation of processors could also stimulate the purchase of land, buildings, and equipment in the communities where consolidation takes place.

4.14.2.6 Effects on Community Stability and Culture

Community stability is often cited as a goal in natural resource management, particularly forestry (Robbins 1987; Schallau 1989a; Schallau 1989b). A community stability program was initially included in the package of rationalization options, but was removed by the Council in March 2007 and replaced with an adaptive management proposal that could be used to serve a variety of purposes. CFAs are a possible outcome and may be related to the AMP. If adaptive management quota is used to help establish CFAs, the two tools could be used together, with the AMP helping to facilitate the formation of community associations, and the CFAs operating under goals and objectives designed to facilitate community stability. This is described further under Cumulative Effects.

Rationalization could have both positive and negative impacts on community stability, depending on the distributional impacts of the program and the inclusion of mitigating measures such as the AMP and CFAs. In communities where fishing is culturally important, the loss of trawl activity is likely to be a hardship. This is discussed in further detail below, under cultural impacts. However, under the status quo, fishing community residents have reported a lack of community stability due to fluctuations in fishing activity and an inability to plan for the future (Goblirsch 2002).

It is misleading to discuss potential community impacts of rationalization without also discussing the current challenges facing fishing communities. During the past decade, the groundfish fishery has experienced major declines in harvest levels, increasing regulation and area closures, and a 2003 buyout of trawl vessels. Many communities have already lost large portions of their trawl fishery, either through the trawl buyout or through dissipation of the fleet caused by declines in harvest limits. Thus,

some have already begun to adapt (for better or worse) to the loss of the trawl sector. Any stability that remains in these communities is largely due to diversification, both within fisheries and outside the fishing industry. In some ways, rationalization is expected to improve stability in those communities that benefit from the program. By allowing for better business planning, higher wages for those remaining in the fishery, and better stewardship of the resource, rationalization should increase stability in those communities that benefit from rationalization.

However, it is clear that some communities will lose harvesting and processing activity; and with the loss of this activity, infrastructure that supports other fisheries is likely to suffer. Whether these communities would continue to decline under the status quo is arguable, but it is likely that current trends in increased regulation and decreased harvests would continue, at least until overfished groundfish species are rebuilt.

Not surprisingly, impacts on communities from rationalization depend in large part on a community's dependence on the sector being rationalized. In Iceland, where (in 1996) approximately 73 percent of the value of goods exported consisted of fish and fish products, and approximately 11 percent of the population was employed in fishing, rationalization had exceptionally negative impacts on small communities that depended on fishing (Palsson and Helgason 1995, NRC 1999). Since west coast communities are not as dependent on fishing as Icelandic communities, similar impacts are not likely here; however, vulnerable communities could experience declines if trawl activity is lost. In the United States, McCay et al. (1995) provides an example from the Atlantic surf clam and ocean quahog fishery where "the sell-out of the IFQ and harvesting and processing capital by a large multinational corporation resulted in the complete cessation of clamming and processing for one major coastal community of New Jersey for at least a year." Other potential problems noted by McCay (1995) include the loss of professional expertise, knowledge, and traditional culture in families and communities if IFQs lead to large-scale sell-outs. For this reason, many IFQ systems include special features to preserve community perceptions of equity, at least during the early period of the program. However, McCay notes that many of these equity preservation measures lose their effectiveness over time and may be abandoned as operators find innovative ways to get around them.

4.14.2.7 Cultural Impacts

Fishing, in all its diversity, is culturally important to the communities that will be affected by trawl rationalization. The cultural importance of fishing is reflected in community symbolism, such as statues or memorials to fishermen lost at sea (Seattle, Newport, and San Francisco), municipal celebrations like the Blessing of the Fleet (Ilwaco, Westport, Newport, San Francisco, and Morro Bay), and other activities such as the Brookings 10K Salmon Run, Newport Seafood and Wine Festival, Charleston Seafood Festival, Coos Bay Salmon Derby, Seaman's Day (Warrenton), Astoria-Warrenton Crab and Seafood Festival, World's Largest Salmon Barbeque (Fort Bragg), and Morro Bay Harbor Festival.

In none of the trawl communities possibly affected by rationalization is trawling the sole fishing activity. The communities where the most trawl fishing activity takes place, such as Newport and Astoria, are also the communities where the most other fishing activity takes place. Both Newport and Astoria are expected to benefit from rationalization. For diverse communities, a decline in trawl fishing activity might not change a community's symbolic identification with fishing, although it could have substantial impacts on the economic structure of all fisheries if it leads to a decline in infrastructure, and social impacts on those directly affected by rationalization.

Most trawl communities have a long history of involvement in other fisheries. Virtually all of the communities analyzed here had active Native American subsistence fisheries stretching back hundreds, if not thousands, of years. Commercial fishing on the west coast largely began in the mid- to late-

1800s, following a gold rush that directly or indirectly affected the entire west coast. Salmon was the mainstay for most early fisheries from San Francisco north; further south, fisheries relied more on CPS such as sardines, as well as abalone and other species.

Trawling came relatively late to the west coast. The first sporadic trawl efforts began shortly after World War II, mostly in Oregon and Washington, and targeted pink shrimp. Foreign trawl effort in west coast waters began in the mid 1960s, and the passage of the MSA in 1976 began the process of domesticating the trawl fishery. Low interest loans and subsidies helped the trawl fishery and processing industry grow in the late 1970s. Meanwhile, a joint venture fishery allowed domestic catcher vessels to deliver product to foreign factory ships for processing. By the late 1980s, processing infrastructure had developed sufficiently to support the domestic trawl fleet, and foreign trawlers disappeared from the EEZ by 1991.

Based on the brief history of trawling relative to other fisheries, it seems likely that even communities that lose trawl activity would retain their identification as fishing communities. The number of trawlers remaining in most communities is relatively small, and other recreational and commercial fisheries would remain. However, as noted above, if infrastructure that depends on the trawl fishery is lost (e.g., a processor or a cold storage facility), other fisheries that depend on such infrastructure could also be affected, leading to further impacts on community identity. Even in communities where the loss or decline of the trawl fishery does not have a significant impact on community identity, families who are affected by the social change of leaving the trawl fishery could be affected. Such impacts are described in the next section.

The literature describes equity issues that may arise depending on how initial allocation is conducted and how the ability to lease is managed (Pinkerton and Edwards 2009). Differences between those initially receiving quota and those not receiving quota can lead to conflict and perceptions of unfairness. Creed (1994) conducted research in two fishing villages of southwestern Nova Scotia that suggested that the egalitarian ethos of those communities was severely constrained by the ability of a few processors and entrepreneurs to take advantage of the IFQ system, which exacerbated differences in wealth and status within the community. Similarly, Macinko (1997) notes that one impact of the way initial allocation was conducted in the Alaska halibut/sablefish IFQ program was to introduce "heightened social divisiveness within fishing communities and within the management process between haves and have-nots." As described above, Pinkerton and Edwards (2009) describe equity problems associated with the leasing of quota, where quota owners benefited while skippers and crew earned less and lost bargaining power. This could potentially create divisions in the community and would alter the culture of the fishing industry itself.

4.14.2.8 Impacts on Families

Families could be negatively affected by the loss of trawl and processing activity in communities that do not benefit from rationalization. In communities that do receive quota, the literature documents complications in family fishing businesses arising from the increasing value of fishing quota. Such complications relate to the "newly taxable dimensions of exit and the newly costly conditions of entry" (McCay 1995).

Since rationalization is expected to increase efficiency in the fleet as a whole, the mechanism for leaving the fishery will be to sell quota and associated vessels and equipment, so economic impacts of leaving the fishery will be somewhat mitigated. However, the noneconomic impacts of leaving the fishing industry may be substantial. For example, a person leaving the harvesting sector and selling or leasing quota could experience a major change in personal identity and job satisfaction. In addition, the daily life of a fishing family, particularly a fishing family that has been involved in fishing for a

substantial amount of time, could be expected to change dramatically if the family were to leave the fishing industry altogether. In some communities, loss of fishing jobs has been linked to increased marital stress and divorce (Goblirsch 2002). Similarly, losses of businesses that depend on the trawl fishery can also cause social and economic upheaval. McCay (1995) writes, "Among the social implications of IFQs in fisheries are job losses, changing social relationships of production, changing social structures within communities, and increased concentration of rights, power and wealth within an industry." McCay continues (1995) as follows:

> ITQs have potentially profound consequences for fishery-dependent families and communities, consequences which are likely to vary according to the design of the ITQ regime, the prevailing kinship, inheritance and taxation systems, and other factors… Generally, with the rising value of ITQs, retirement and succession within family businesses have become problematic, and the solution of incorporation has its own costs that make it unacceptable to some, including, Hoefnagel writes (1994), 'the implied socio-cultural shifts and the potential loss of fishing rights for those members of the household—wives and daughters—not normally engaged in fishing.' Death and divorce can also force the exit of otherwise healthy firms from the fishery, as people find themselves forced to sell fishing rights to meet inheritance taxes or divorce settlements. Thus, a family-based fishery business may be particularly vulnerable to the newly taxable dimensions of exit and newly costly conditions of entry.

4.14.2.9 Impacts on Tourism

Tourism is also increasingly important to many west coast communities. Tourism magnifies and exaggerates community symbolism; tourist operations often focus on whatever is symbolic to a community, whether it is fishing vessels, loggers, or the Golden Gate Bridge. In fishing communities, tourism businesses are usually centered on a wharf or port area. Bellingham, Seattle, Newport, Morro Bay, and San Francisco are examples of communities where port areas are centers of both fishing activity and tourism. Such tourism may include fishing-related activities, whale watching, viewing commercial fishing vessels at work, dining, or shopping for fishing-related curios.

In some communities, such as Newport and Morro Bay, fishery-related tourism, including the draw of a working waterfront, is an important factor in the local economy. Langdon-Pollock (2006) writes, "The working waterfront also attracts the tourism industry to [Newport]. Tourists visit Newport to observe harvesters and processors on the bay front, participate in charter fishing activities, and purchase fresh fish directly from fishermen on the fishing vessels or from seafood markets. While the tourism industry does not provide many 'living wage jobs' to local residents, it does produce a lot of revenue for the overall community." If a large sector of the fishing industry were to disappear, tourism revenues could be lost.

4.14.2.10 Impacts to Nontrawl Communities

Impacts on nontrawl commercial harvesters are discussed in detail in Section 4.8. The discussion is based on the NWFSC Consolidation Model, models looking at geographic shifts in fishery patterns, initial allocation of IFQs, regional impacts from rationalization, and potential gear, area, and species conflicts that arise through the gear switching provisions of the rationalization alternatives.

Nontrawl communities could be affected by rationalization in several ways:

- **Increased competition**. If the intersector allocation process allocates species (such as nearshore rockfish) to the trawl sector that they currently cannot target, they may be able to switch gears through the rationalization process and target these species, thereby competing with existing nontrawl fisheries.
- **Gear conflicts**. The gear switching provisions in the trawl rationalization program may induce more fixed-gear effort than under status quo, potentially leading to on-the-water conflicts over available space for these gear types.
- **Impacts on the support sector**. The support sector (gear stores, repair shops, etc.) could be impacted by gear switching and by geographic shifts in fishery patterns.
- **Infrastructure impacts**. Nontrawl communities that depend on nearby trawl communities for processing or other support services could be affected by changes in those trawl communities. For example, trawl processors may also purchase fish from nontrawl communities. If these processors are adversely impacted, this could, in turn impact the nontrawl communities that depend on those processors.
- **Marketplace impacts**. Nontrawl commercial harvesters' profits may be affected if trawl vessels change production in such a way that trawl vessel catch competes with nontrawl catch in the marketplace.

These impacts could have the subsequent effects on communities and families that are described above.

4.14.3 Decision Points Affecting Communities

Communities will be affected by five major decisions made by the Council during the trawl rationalization planning process. These are as follows:

- IFQs or co-ops
- Initial allocation
- Accumulation limits/grandfather clause
- Area management
- Adaptive management

These decision points will be described in more detail in the section below that discusses alternatives. In addition, a 2004 GAO study (GAO 2004) reviewed an array of community protection measures used in domestic and international quota programs. Some of these measures are being considered by the Council; some were considered and rejected during the scoping process, and still others could potentially be implemented later. The study listed several methods for protecting communities and facilitating new entry into IFQ fisheries. The "easiest and most direct way to help protect communities," the study noted (2004), was to allow communities themselves to hold quota, and to decide how to use it to protect local fishermen (for example, by keeping quota in the community or leasing it to local fishermen). This action could also be taken after implementation of an IFQ program. One potential mechanism for communities to own quota is through a CFA, which could acquire QSs through the AMP, when enacted; through divestiture; or through direct purchase.

Other community protection methods have been used elsewhere. They include rules to protect certain groups of fishery participants (such as small boat fishermen), rules governing who is eligible to hold and trade quota, temporary prohibitions on quota sales for a given time after implementation (the Council's preferred alternative contains a two-year moratorium on quota sales), geographic restrictions on quota transfers, limitations on quota leasing, separate quotas for different sectors of the fishery, owner-on-

board requirements, and restricting landings to certain ports. Although these actions protect communities to a certain extent, many also decrease overall economic efficiency or are difficult to implement (such as the owner-on-board provision).

4.14.4 Direct and Indirect Effects of the Alternatives on Communities

In addition to the general effects described above, each of the alternatives would impact communities in different ways. The alternatives result in different impacts because of variations in the elements of those alternatives. This section analyzes the direct and indirect impacts of the alternatives on communities.

In this section, we begin by describing the manner in which each of the elements of the alternatives would be expected to impact communities. This description of expected effects serves as an overview and introduction to the way in which the elements of the alternatives would impact this particular environmental component. Immediately following the overview of how the elements of the alternatives impact communities is a description of the impacts of each alternative. Where appropriate, these impacts are compared to status quo conditions and to the other alternatives. Following the description of impacts of each alternative is a comparative summary of the effects of each of the alternatives.

How do IFQs and co-ops affect communities (relative to status quo)?

Changing the catch control tool in the fishery to IFQs and/or harvest co-ops is expected to impact communities in a variety of ways described throughout this section. Apart from this primary question, the main difference among the alternatives here is whether to have co-ops or IFQs for the whiting sector, and, if so, whether these co-ops should be for the at-sea whiting sector (Alternative 4) or the entire whiting sector (Alternative 3).

The relationships and profits generated in an IFQ system versus a cooperative system with processor linkages may result in some differences that are recognized in a community. A cooperative structure with processor linkages may lead to profit sharing arrangements, where profits are shared between motherships or shoreside processors and catcher vessels. Under an IFQ system, the first receivers of quota would benefit, and revenues generated from the harvest of that QS would tend to stay with the QS owner. The effect on communities from these decisions will most likely reside principally with the decision to use IFQs versus cooperatives with linkages in the shoreside portion of the whiting fishery. The at-sea portion of the whiting fishery is primarily based in the Puget Sound region, which has a large and diverse economic base, meaning changes to the fishery structure are not likely to resonate with those communities on the whole. The shoreside fishery is more closely tied to coastal communities of which fishing is often a relatively large piece of the economy. In those communities where fishing is a relatively large piece of the economy, changes in the relations between harvesters and processors may be felt.

How does initial allocation affect communities?

Initial allocation and qualification could have significant impacts on communities by benefiting some harvesters (and their communities) and putting other harvesters and communities at a disadvantage. Astoria, Bellingham, Brookings, Coos Bay, Eureka, Fort Bragg, Newport, San Francisco, and Moss Landing are expected to benefit from initial allocation, regardless of whether some of the QSs are equally allocated. Princeton/Half Moon Bay may benefit, depending on the allocation rule. Neah Bay, Westport, Ilwaco, Crescent City, and Morro Bay are expected to receive less than the average amount of quota allocated to all communities.

Under Alternatives 2, 3a, and 3b, initial allocation is based purely on catch history. Distribution of the initial allocation across members of various communities would be less equal, although individual fishermen might see it as more representative based on their past performance. Under Alternative 3, buyback history would be divided and shared equally in the nonwhiting fishery. Alternative 4a would share buyback history equally in the shoreside fishery, while Alternative 4b (Council preferred alternative) would allow equal sharing of buyback history in the non catcher-processor sectors. Some communities could benefit from this more equitable distribution while others may see it as a loss. For communities, the differences between Alternatives 3 and 4 are minimal.

One factor that might influence communities is the ability of harvesters to form voluntary associations to manage risk. The term "risk pools" has been used to describe these arrangements. Such risk pools could contribute to stability in the communities that host them. If the initial allocation of groundfish—particularly constraining stocks—allows a relatively small number of entities to receive a large amount of constraining species quota, harvesters could have difficulty forming and maintaining voluntary risk pools.

With a quota allocation to processors, it is likely that processors will adjust operations so that ports where processing plants are already located will receive more landings. Therefore, ports without processors (such as Neah Bay, Brookings, and Crescent City) may see a reduction in landings with a processor allocation.

How will accumulation limits affect communities?

As discussed above, accumulation limits could have an important impact on communities. A vessel limit would set a minimum on the number of vessels in the fishery and spread the amount of fishing activity across a wider number of entities. With higher vessel accumulation limits, consolidation would tend to restructure the fleet toward the most economically efficient vessels, increasing fleet-wide economic efficiency and decreasing the number of vessels. Although vessel accumulation limits tend to lower economic efficiency and restrict profitability for the average vessel, they could help retain vessels in communities because more vessels would remain.

As noted above, the Council also is considering control limits, or a limit on the amount of quota an individual entity could hold. These are different from vessel limits. Under the preferred alternative, aggregate control caps for the shoreside nonwhiting groundfish fishery are 2.7 percent of the total QSs, while for the shoreside whiting fishery the cap would be 10 percent of the total QSs. A control cap applies to any QSs owned by an individual or controlled by that individual under the form of a corporation; it prevents one individual (or corporation) from controlling an excess of quota. Under the preferred alternative, excess QSs would need to be divested during years three and four of the program. This could provide new avenues for community involvement in the fishing industry that could benefit communities both socially and economically.

Theoretically, if there were no control limits (which is not an option included in this EIS), one community or company could buy up all the QS, to the detriment of all other communities and businesses. Therefore, control limits may indirectly protect some communities while preventing others from having a large influence over the harvest. Alternative 2 allows the most accumulation of IQ, Alternative 3 allows the least. Alternative 4 lies in the middle. Alternative 4b, the preferred alternative, has a 2.7 percent control cap and a 3.2 percent vessel limit for the shoreside nonwhiting groundfish fishery, a 10 percent control cap and 15 percent vessel limit for the shoreside whiting fishery, a 45 percent processing cap for motherships, and a 20 percent ownership limit and 30 percent usage limit for mothership catcher vessels.

Because of the nature of vessel efficiency in this fishery, the number of vessels is not expected to fall so far that the consolidation limits will be reached. It is possible that the number of vessels could diminish by 50 to 66 percent, to a nonwhiting fleet size of 40 to 60 vessels, however this number is based on several assumptions that seem unlikely in practice—namely that all nonwhiting trawlers will become specialists and abandon participation in other fisheries. It is almost certain that nonwhiting vessels will continue participating in other fisheries, meaning the fleet size should stay above the 40- to 60-vessel estimate. The number would have to diminish to about 30 vessels to reach the proposed fleet consolidation limits. Vessels that are larger or smaller may find it more profitable to sell QSs and leave the fishery rather than remain. In the whiting fishery, fleet size may shrink from 37 vessels to 23 in the shoreside fishery and from 20 vessels to 14 in the mothership fishery. Some communities will experience the negative impacts of losing fishing activity, while others will benefit from the increased revenue of the successful fishing enterprises that remain.

The question of who is eligible to own quota is applicable here. Under the preferred alternative, any individual or legal entity eligible to own a U.S.-documented fishing vessel is also eligible to own IFQ. The IFQ owner need not actually own a U.S.-documented fishing vessel to own QSs or QPs. This option is the most open and flexible, but does not require any connection to fishing in order to own IFQ. QSs would behave more like shares of stock in a company, which anyone can own, and could be bought, sold, or traded through a broker. If a significant number of QSs are owned by nonfishing entities, this could reduce fishing income for communities.

How will a grandfather clause affect communities?

All alternatives except Alternatives 3 and 4b (the preferred alternative) include a grandfather clause. Alternative 4b has no grandfather clause, but allows entities to divest their excess QSs in years three and four of the trawl rationalization program.

The grandfather clause affects the initial allocation of quota and accumulation limits by allowing some entities to have quota in excess of accumulation limits, based on their history. More highly productive vessels and processors would be able to maintain that relatively large degree of production, thereby temporarily protecting the status quo. This effect would be transitory, in effect slowing the shift from the status quo to a new market-based system. Over time, the grandfather clause would expire, and the excess quota would be redistributed through the market.

A grandfather clause could also influence the negotiations that occur between harvesters and processors over ex-vessel prices. With a grandfather clause, large producers could be in a strong position during such negotiations. Community impacts of such negotiations would depend on the locations of the processors and harvesters involved.

A grandfather clause is related to the concept of risk pools, described above. A grandfather clause may increase the negotiation power of individuals, potentially disrupting the ability of harvesters to form risk pools for dealing with low OY species if the grandfathered quota holder can exert a dominant position over the risk pool arrangement. Communities that stand to benefit from the presence of these risk pools may be better off without a grandfather clause—particularly for constraining species.

Having no grandfather clause (as in Alternative 4, and, after a period of two years, in Alternative 4b) could make it more difficult for highliners and large processors to maintain historic levels of production. No grandfather clause could also limit the amount of quota in a community; for example, a community with several large producers would receive fewer benefits than if there were a grandfather clause. Instead, excess quota would be distributed among IFQ holders. In general, a grandfather clause might

distribute quota less equally among communities, but perhaps more representatively, based on past performance. A grandfather clause could also benefit vulnerable communities with a few large producers that might suffer if there were no grandfather clause and excess quota were distributed to less vulnerable communities.

Under Alternative 6, there is no grandfather clause, but individual and corporations are given two years in which to divest their excess quota. This divestiture could help communities if the QSs being divested are kept within the community.

How do processor allocations/ties affect communities?

An initial allocation of QSs to processors and/or processor linkages in a co-op program would allocate quota to processors and, for the co-op alternative, create affiliations between harvesters and processors, influencing relationships and negotiations over ex-vessel prices. With no processor ties or quotas (as under Alternatives 2a and 2b), harvesters in co-ops would have more bargaining power. They could deliver to places of their choosing and might be able to leverage higher prices from processors. If there are processor ties and/or processors own QSs (under Alternatives 2c, 3, 4a, and 4b [for whiting]), processors may be better able to influence where deliveries are made. The more QSs processors have, the more bargaining power they have. Such leverage will affect their profitability, and processor ownership of QSs may provide them with more flexibility for consolidation or movement. Many processors have corporate owners and may not necessarily be tied to an individual community. Therefore, an allocation of quota to processors does not necessarily lead to quota remaining in a particular community. Similarly, some permit owners do not live in the community where their vessels are located and are also free to move their harvesting operations to a different community. The initial allocation provides only the starting point. Over time, processors or harvesters may acquire greater proportions of QSs than reflected by the initial allocation.

With whiting co-ops and processor linkages (Alternatives 3, 4a and 4b), harvesters may find it more difficult to change processors, which could affect communities positively (if such linkages discourage harvesters or processors from leaving a community) or negatively (if local harvesters are forced to sell product for less than another processor might offer). A whiting processor could move, but a move outside of the current geographic distribution (southern Washington to northern Oregon) is unlikely due to geographic constraints and availability of infrastructure to support a large whiting processor.

How will the species covered through the program affect communities?

The species covered by the program could have an impact on communities, particularly in regard to risk imposed by the coverage of some species with IFQ. The number of species managed in the nonwhiting fishery is the same across all alternatives except Alternative 4b, which would only cover select groundfish species and Pacific halibut in the shoreside sectors. Alternative 4b would not include rarely encountered, nonoverfished species, and therefore would reduce risk to harvesters who caught these species incidentally.

In Alternative 3, bycatch is pooled across the three whiting sectors, possibly leading to a race for fish (because of a race for bycatch). The entire whiting sector could close early once the bycatch cap is reached, impacting shore-based whiting communities such as Ilwaco, Astoria, Westport, Newport, Coos Bay, and to a lesser extent Eureka, Crescent City, and Fort Bragg, which have engaged in some whiting processing. California whiting fisheries occur early in the year and are small; therefore, the California fishery and associated communities might not be affected by a fishery-wide bycatch cap. Under Alternative 2, bycatch is managed at an individual vessel level, which does not create a race for fish.

With all the alternatives, geographic shifts are expected to occur as fishing effort shifts to avoid bycatch, and because of regional differences in consolidation and economic activity.

Nontrawl communities are concerned that if trawlers have an incentive to fish for nearshore species, competition with nontrawl fisheries (like Port Orford's) could occur. Trawlers would probably have to switch gear types to target such species, because of their association with habitat not easily trawled. Targeting opportunities on these nearshore species would occur only if allocations that are larger than current catch levels are made to the trawl sector. Whether such allocations occur will be decided separately from the rationalization process, as part of the Intersector Allocation process, or as part of the routine biennial management of groundfish.

In general, the more species covered, the more constraints there would be on individual vessels' harvesting opportunities. The fewer species covered, the more flexibility vessels would have, though at the extreme, a lack of species covered with QSs could lead to a race for fish. In dealing with species with small allocations, quota may become costly, and markets may become unstable and less efficient. Quota to cover catch deficits may also become unavailable. Communities might benefit from the increase in flexibility from having fewer species covered, but limiting the number of species increases the chances that the trawl sector will impact other sectors through competition over fish resources.

For some species, a disaster tow" is possible. If it is difficult to purchase protective quota, and, with the risk of a disaster tow, harvest activity may creep earlier in the year and take on the characteristics of a derby fishery, because a disaster tow would mean that harvesters risked being preempted by other harvesters. It is difficult to judge the potential impacts of this possibility on communities, but if a disaster tow causes the fishery to close prematurely, communities would certainly be impacted.

How do the number of trawl sectors influence communities?

This section addresses the difference between having three or four trawl sectors. All the alternatives except Alternative 3 combine shoreside whiting and nonwhiting into one sector. Under Alternative 3, these are divided into two sectors. The main issue here is how much flexibility to allow. In general, combining these into one sector allows for more flexibility because of fewer separations between sectors and, therefore, fishing opportunities.

With a divided shoreside sector (Alternative 3), the Council would allocate between the shoreside whiting and nonwhiting fishery those nonwhiting species taken in both fisheries (directly in the nonwhiting fishery and incidentally in the whiting fishery). If the incidental catch allocations provided to the shoreside whiting sector were not sufficient to take all of the whiting, the sector would not be able to acquire additional quota to cover the incidental catch, and whiting would go unharvested. At the same time, if the whiting sector were allocated more than the amount needed to cover incidental catch, there would be no mechanism for moving the excess back to the shoreside nonwhiting fishery for its use, and the excess allocation would go unharvested.

Managing the fishery as a single sector is expected to increase the likelihood that available harvest is fully taken and to ensure that the allocation is distributed to that segment of the shoreside fishery that is able to generate the most profit from its use. Most likely, this means that total community benefits would be greater with a single shoreside sector.

Additionally, if shoreside whiting and nonwhiting are separated, as in Alternative 3, new and existing harvesters who wanted to target both types of fish would need to buy quota in both sectors. For example, in some years, the bycatch of sablefish in the whiting fishery has been relatively large. Under a three-sector alternative, shoreside whiting harvesters could purchase enough sablefish quota to cover

their bycatch and resume targeting Pacific whiting. If there are four trawl sectors, then the shoreside whiting sector could have trouble fishing if sablefish bycatch is higher than expected, as described above.

One purpose of having four sectors would be to restrict the ability of one sector to acquire large amounts of quota and therefore limit the access of the other sector to quota or to fishing opportunity. This could have both positive and negative impacts on communities if such an occurrence is possible. However, as discussed under the section describing the impacts to harvesters, rationalization is expected to align the profitability of nonwhiting and shoreside whiting harvesters, meaning that it is unlikely one type of shoreside harvester would have more ability to purchase quota over a harvester specializing in the other type of shoreside activity.

How will an adaptive management provision affect communities?

The AMP is a trailing amendment that will be finalized during the two years after trawl rationalization goes into effect. Adaptive management allows a certain amount of quota to be used to protect vulnerable communities from the adverse effects of trawl rationalization, favor harvesting techniques and technologies that reduce environmental impacts, and support existing business relationships between harvesters and processors. If adaptive management were targeted toward gear incentives, community impacts would be hard to judge, other than noting that communities with creative and proactive vessel owners might benefit. If adaptive management is used to mitigate adverse impacts on processors, a very small number of processors would benefit, but communities could benefit if those processors are more likely to stay put. Communities could benefit it adaptive management quota were used to create or strengthen entities or associations that are important within a community. For communities there is no difference between Alternatives 3 and 4, except that with the adaptive management set-aside in Alternative 4b, some communities would benefit and others would have their quota reduced in order to pay for the adaptive management provision.

How will area management affect communities?

Area management refers to the splitting of QSs between the north and south, as in Alternatives 3 and 4a. For the last few years, there has been less trawl activity off central and southern California, and more in northern California and Oregon. This option would essentially freeze this ongoing south-to-north shift, and may reverse it, depending on how quota is distributed. This could benefit central and southern California communities by lessening the ability of northerners to accumulate southern QS.

How will a carry-over affect communities?

Carryover increases flexibility for individual harvesters, because QSs would be carried over from one year to the next (but for one year only). A carryover allowance allows harvesters to avoid penalties associated with a deficit condition. In general, flexibility creates options that typically lead to better economic conditions. Communities would benefit from carryover.

How will tracking and monitoring affect communities?

Tracking and monitoring will reduce the short-term profitability of harvesters, because they will have to pay for part of the tracking and monitoring effort. In the long term, however, at-sea monitoring will help ensure the continued viability of stocks. Better catch accounting improves stock assessments, even if the primary objective for such accounting is not biological but administrative. The option will not affect communities differentially; however, those communities where trawl groundfish is harvested and/or

harvested in small amounts may be impacted if the costs of tracking and monitoring no longer make such activities profitable (see small purchaser analysis in Appendix H).

4.14.4.1 Alternative 1 (No Action)

Many fishing communities are faltering under the status quo. The need to protect overfished species has led to increasingly strict regulations, including lower harvest limits, gear restrictions, and no-trawl zones. The lack of long-term planning ability has made it difficult for both fishing and support businesses to remain viable, and the number of trawl vessels has been shrinking (in part due to the 2003 buyout). The effects of these changes are captured in public testimony received at Council meetings and through written comments on past actions. Public testimony under groundfish management agenda items has repeatedly emphasized the difficulties communities and businesses experience in the face of increasing regulation. A summary of major themes presented in public testimony during the 2007-08 groundfish specification process (PFMC 2006) includes comments on the following:

- The negative cumulative effects of both Federal regulations (such as closed areas, fathom restrictions, season restrictions, and VMS) and nonfederal actions (cable crossings, proposed state restrictions) on fisheries, businesses, and communities
- Crumbling infrastructure (processors, buyers, ice plants, and businesses that support processors closing or consolidating, docks and harbors not being maintained; market infrastructure collapsing);
- Recreational and commercial fishing vessels going out of business or being forced to diversify;
- Fishing-related businesses, such as gear stores, boat repair shops, tackle shops, and fishing equipment manufacturers, and nonfishing-related businesses, such as hotels, restaurants, and car dealerships, feeling the impacts of reduced fishing income, including laying off employees or closing
- Decreasing tax bases due to business closures
- Increasing social tensions in communities, such as psychological impacts, marital tension, divorce and suicide
- Difficulty in making business decisions and planning for the future
- Further dependence on groundfish due to salmon cutbacks

Although these effects relate to all groundfish fisheries (not just the commercial trawl fishery), they give an indication of the state of the status quo in west coast fishing communities.

4.14.4.2 Alternative 2a

Under this alternative, which is the most liberal of the alternatives, the differential distribution of community impacts would be most pronounced. The provisions contained in this alternative, such as higher accumulation limits, a grandfather clause, and carryover, would allow more consolidation in the fishery than other options. As a result, some communities (such as Astoria and Newport) would benefit from the consolidation of fishing activity, while others with less trawl activity and less efficient fleets could lose their trawl fishery altogether. Available information suggests a general regional shift in trawl fishing activity toward ports found in Oregon and northern California. That activity may be drawn from ports in central California. The lack of area management and the lack of an adaptive management provision provide little recourse for readjusting the location of trawl fishing activity should communities in one region be adversely impacted.

4.14.4.3 Alternatives 2b and 2c

The differences between Alternative 2b and 2c are that Alternative 2b includes an adaptive management provision (targeted at processors that are adversely impacted by a rationalization program), and Alternative 2c provides an allocation to processors (but no adaptive management provision). The two methods have substantially different philosophies, and presumably different impacts. The initial allocation of QSs to processors would tend to leave many aspects of the outcome up to private industry and the market, whereas an AMP would allow the Council more direct influence over impacts of the program on processors, leading to indirect effects on communities.

While Alternatives 2b and 2c are likely to have different effects on communities, it is not immediately clear what those effects will be. Some effects are likely to be distributional with fishing activity concentration being different in Alternative 2b compared to Alternative 2c. For example, Alternative 2b might have a distributional effect that is similar to Alternative 2a in an aggregate sense since most of the quota will be in the hands of harvesters, but with a small subset of quota being directed to a small set of processors through the adaptive management provision, indirectly affecting a small set of communities. Alternative 2c might look different from this as processors hold a relatively greater proportion of QSs and use them in a way that benefits them, resulting in a geographic outcome different than Alternatives 2a and 2b.

4.14.4.4 Alternative 3

Alternative 3 has the most constraints of all the alternatives and would distribute IFQ more evenly among communities. This alternative uses market-mitigating factors and harvest co-operatives (instead of IFQ) for the whiting fishery. Harvest co-operatives are like a community where members collectively decide the prosecution of fishing opportunities. Under an IFQ system, in contrast, harvesters would be expected to act more independently and the difference in organization among the industry may have some impacts on communities. This alternative gives a relatively large influence over harvesting activity to processors by giving them relatively large IFQ allocations and requiring that co-ops be linked to shore-based processors and motherships. This means that communities with processors may stand to be impacted in a relatively beneficial manner compared to alternatives without these processor provisions.

Alternative 3 is likely to result in a wider distribution of fishing activity because of a lack of a grandfather clause and relatively small control and accumulation limits. This would tend to distribute quota among a greater number of entities, and, to the extent that a greater number of entities means a wider geographic distribution, a relatively wider set of communities may be the site of fishing activity. However, the fact that four trawl sectors are established and with no carryover inserts a factor of risk for some trawl vessels. If this risk results in adverse impacts to trawl harvesters being realized (such as premature closure of the fishery), communities may be affected indirectly.

The adaptive management provision present under this alternative may be used to mitigate against adverse impacts to communities, but may be used for other purposes. The presence of this provision can prove useful to those communities that may be adversely impacted, but may mean a reduction in some activity from those communities better positioned to take advantage of a rationalization program.

4.14.4.5 Alternative 4a

Many elements of Alternative 4a can be viewed as falling between Alternatives 2a and 3. This is because Alternative 4a allows for more market-driven outcomes than Alternative 3. While the adaptive management provision is only applied to the shoreside sectors, the same level of community impact is

expected to occur as with an adaptive management provision that applies to all trawl sectors. This is because the at-sea fisheries are heavily associated with the Puget Sound region and any application of adaptive management to those sectors is not likely to change that regional association.

The grandfather clause in this alternative allows historically large producers to retain a relatively large amount of QSs initially allocated to them. This would tend to have a beneficial impact to communities where those entities do business, meaning that communities with a relatively heavy involvement in trawling may be more likely to continue that role than if a grandfather provision is not made available.

4.14.4.6 Alternative 4b (Preferred Alternative)

Alternative 4b contains elements of alternatives 3 and 4a, as well as new variations on processor allocations and covered species. Two notable changes include an initial allocation of whiting to shoreside processors of 20 percent (less than in other alternatives, but more than some others) and the exclusion of some groundfish species under the rationalization program, instead of including all species in the ABC/OY table.

Together, a combined shoreside sector, a reduced list of IFQ species, and the equitable distribution of bycatch species in the non catcher-processor sectors mean that this alternative poses the least risk to harvesters (and subsequently their communities) of all the alternatives. These factors tend to reduce the risk of the catch of one species prematurely closing the fishery and help ensure that risk pools are formed and remain relatively stable. This alternative also contains an adaptive management provision that could aid some communities, and allocates quota more equivalently across communities through equal distribution of buyback quota.

This alternative establishes IFQ for both the shoreside whiting and nonwhiting sectors of the trawl fishery, effectively combining both shoreside sectors into one. Combining these shoreside sectors allows them to trade quota with one another, reducing the risk of one sector catching the entire quota of a particular constraining species and being unexpectedly shut down. Furthermore, a subset of species is covered with IFQ, rather than all species in the Council's ABC/OY table for groundfish. The species not covered by IFQ are rarely encountered, nonoverfished species. However, harvesters will still be responsible for overfished species. For these species, quota may become costly, and quota to cover catch deficits may potentially become unavailable. Dealing with overfished species—and the risk posed to harvesters by such species—is affected by the way in which overfished species are initially allocated. The allocation based on a bycatch rate in the nonwhiting portion of the fishery, and on a pro rata distribution for the whiting portion of the fishery, tends to match up overfished species quota relative to what harvesters "need" on a relative basis. This helps ensure negotiations over risk pooling are stable and that a single entity cannot dominate those negotiation. Fostering the development of risk pools helps reduce risk to individual fishermen and their communities.

Accumulation limits for shoreside fisheries groundfish fisheries are set at a 2.7 percent control limit and a 3.2 percent vessel limit for nonwhiting. The shoreside whiting fishery has a 10 percent control limit and a 15 percent vessel limit, while motherships cannot process more than 45 percent of the catch, and catcher vessels have a 20 percent ownership/30 percent usage limit. Accumulation limits could have an important impact on communities, as discussed in detail above.

Under this alternative, the initial allocation of IFQ to the non catcher-processor sectors divides the buyback portion of catch history equally. Distribution would be more equal than if buyback quota were distributed based on catch history, but individual fishermen might see it as less representative based on their past performance. Some communities could benefit from this more equitable distribution while others may fare better under a catch history based distribution.

Alternative 4b includes no grandfather clause provision but allows two years for entities to divest their excess QSs. While such a divestiture provision may mean that quota leaves particular communities, allowing for divestiture provides for an opportunity for that quota to remain in a community. This is different than a case without a grandfather clause and without a divestiture period where quota would automatically be redistributed across initial recipients, potentially reducing the amount of harvest in some communities relative to current conditions.

This alternative includes an adaptive management provision for shoreside nonwhiting species. This allows a certain amount of quota potentially to be used to help adversely affected communities and/or provide incentives to use habitat- and bycatch-friendly gear. The benefits of the adaptive management provision (if used for communities) are entirely distributional at the community level: some communities would benefit, and others would have their quota reduced in order to pay for the adaptive management provision.

Shoreside processors are allocated 20 percent of the shoreside whiting IFQ. Processors will have more influence in negotiations over ex-vessel prices than if they received no IFQ, and may be better able to influence where deliveries are made. Such leverage could make their operations more efficient. However, consolidation in the processing sector is still expected to occur and this consolidation of shoreside whiting processors will have an effect on communities.

Gear switching is assumed to exist for this alternative. Gear switching could benefit communities by allowing more harvesting flexibility and this flexibility may mean an increase in target species (because gear switching allows more tools for balancing catch accounts) and/or higher prices for landed species. However, wide-scale gear-switching may mean that landings in some communities would decline if harvesters moved toward gears that do not catch species such as flatfish as effectively. This would tend to reduce the need for processing labor and as a result decrease the number of fishing related jobs in some communities.

This alternative includes a limited carryover provision. Carryover provides flexibility in making harvesting choices across years and would benefit communities by allowing more flexibility and, by extension, more profitable fishing enterprises.

4.14.5 Impacts on Specific Communities

Next, we review each trawl community, reviewing its levels of dependence and vulnerability, along with expected effects of trawl rationalization as revealed by alternative. Much of the information on the current status of these communities comes from the short-form community profiles prepared by NWFSC. Additional details about the current status of these communities are included in Section 3.14 (page 163) (affected environment), and in Appendix C.

The Comparative Advantage model (described in Appendix C) uses four variables to assess the relative advantage or disadvantage of each port. The four variables are 1) bycatch rates of constraining stocks that are in preferred fishing grounds of various ports, 2) relative economic efficiency of vessels in that port, 3) the relative amount of fishing business and infrastructure in that port, and 4) the initial distribution of QS to those ports relative to status quo, and relative to the distribution made to other ports. Appendix C details how these variables were measured.

The model shows that Bellingham, Neah Bay, Newport, and Princeton/Half Moon Bay have greater than 50 percent of their nonwhiting trawl catch occurring in areas identified as moderately high or high

bycatch areas. This gives them a disadvantage compared to other communities. The Newport fleet fishes in a moderately high bycatch area; it is so designated because it is made up of species (Pacific ocean perch and darkblotched) that are less constraining to harvest activity than other species. See Table C-6, Appendix C.

Although these ports are engaged in relatively high constraining bycatch areas, other factors influence the comparative advantage that vessels have in a rationalized fishery. These include fleet efficiency, the amount of infrastructure that exists in various ports, and the amount of groundfish allocated to entities and its location.

4.14.5.1 Efficiency

The efficiency of the local fleet will affect how a port fares as a result of rationalization and consolidation. Using information from the cost efficiency and fleet consolidation model (described in Appendix C), the relative efficiency of vessels delivering to various ports can be assessed. The efficiency score is best measured as a state variable (versus a relative variable). Those ports with the largest number of efficient vessels score high, while those ports with the smallest number of efficient vessels score low. Using this method, the ports of Astoria and Coos Bay, for example, score high, while Neah Bay scores low.

While this information is based on vessels that currently exist in the fishery (in the longer run, we would expect newer, more efficient vessels to be constructed), the initial state can have long-term impacts. Ports with relatively efficient trawl vessels at the start of a rationalization program may end up better off than ports with relatively inefficient vessels. Tables C-3 and C-4, in Appendix C, show that none of the trawl ports on the west coast has a fleet that is more than half composed of efficient vessels; Coos Bay/Charleston has the most, at 48 percent of its fleet. However, merely comparing percentages of efficient and inefficient vessels is misleading, since the total number of vessels in a community's fleet also contributes to the overall score. For example, using a relative method, Neah Bay is the next most efficient, with 43 percent of its fleet passing the efficiency test. However, Neah Bay has only seven vessels that have delivered to the area in recent years (the actual number of vessels homeporting there is less) and the port has minimal infrastructure. Coos Bay has 27 vessels making deliveries and extensive infrastructure.

4.14.5.2 Infrastructure

The amount of agglomeration in shoreside business and infrastructure in various ports has an effect on the longer-term ability of those ports to maintain fishing activity. Ports with larger degrees of agglomeration will be more able to attract and maintain fishing activity. From north to south, Bellingham, Seattle, Astoria, Newport, Coos Bay, Princeton/Half Moon Bay, and San Francisco have high levels of infrastructure, with facilities such as cold storage and maintenance. Westport, Eureka, Crescent City, Fort Bragg, Morro Bay, and Moss Landing have medium levels of infrastructure. Neah Bay and Brookings have low levels of commercial infrastructure.

4.14.5.3 Proximity to Markets and Transportation

The remoteness or connectedness of various ports to the market will alter the impacts of rationalization. Most coastal communities are fairly removed from major markets. Bellingham, Seattle, Fort Bragg, Moss Landing, Princeton/Half Moon Bay, and San Francisco are the most well-connected in terms of market proximity.

4.14.5.4 Initial Allocation of Harvest Privileges

The initial allocation of quota will favor some geographic areas over others. Using the initial allocation rules being considered, Figure 4-51 through Figure 4-54 show the amount of QPs that would be allocated to each port if existing harvest volumes are maintained.

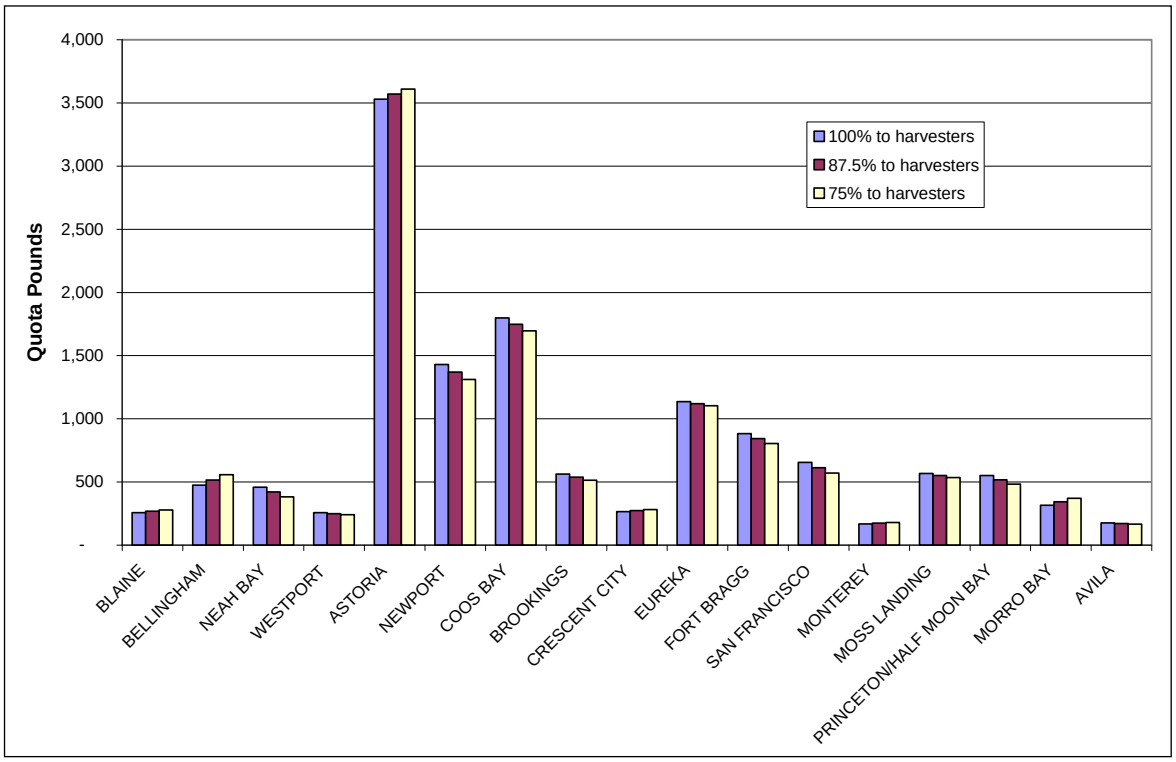


Figure 4-51. Nonwhiting allocation with equal sharing of buyback history.

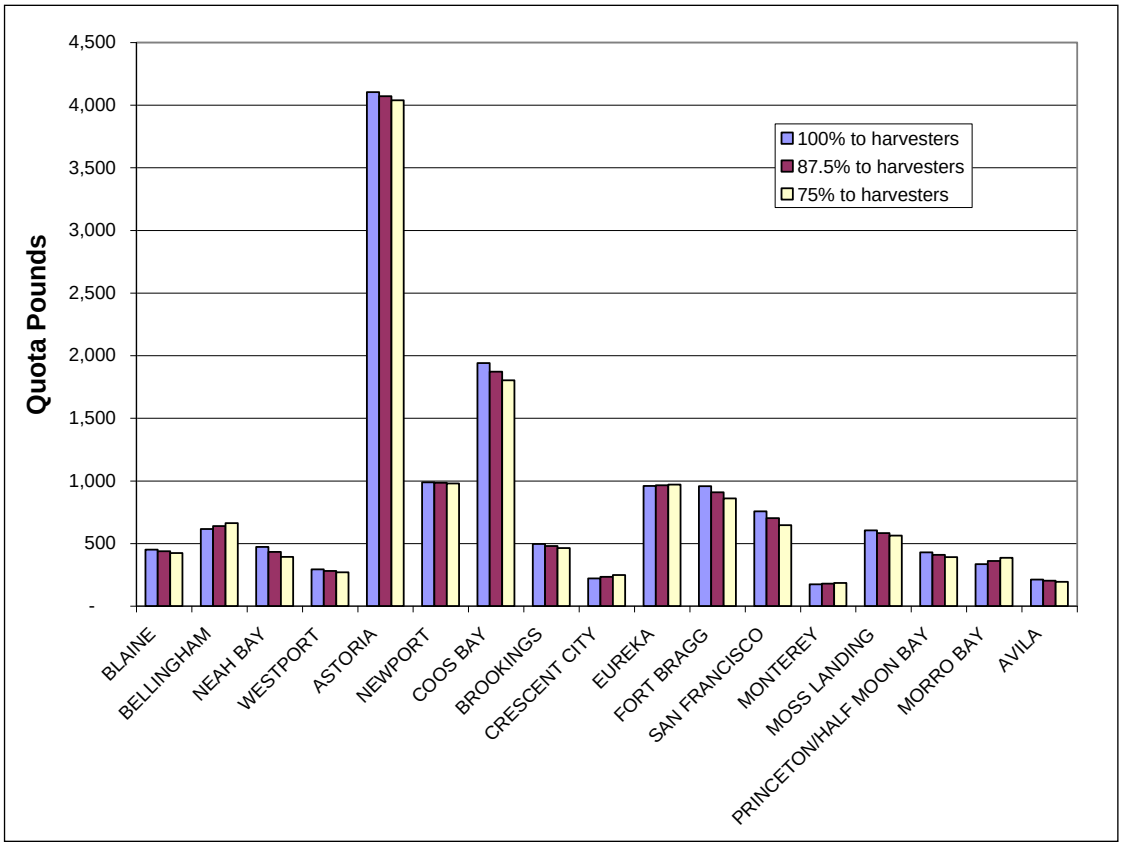


Figure 4-52. Nonwhiting allocation based entirely on catch history.

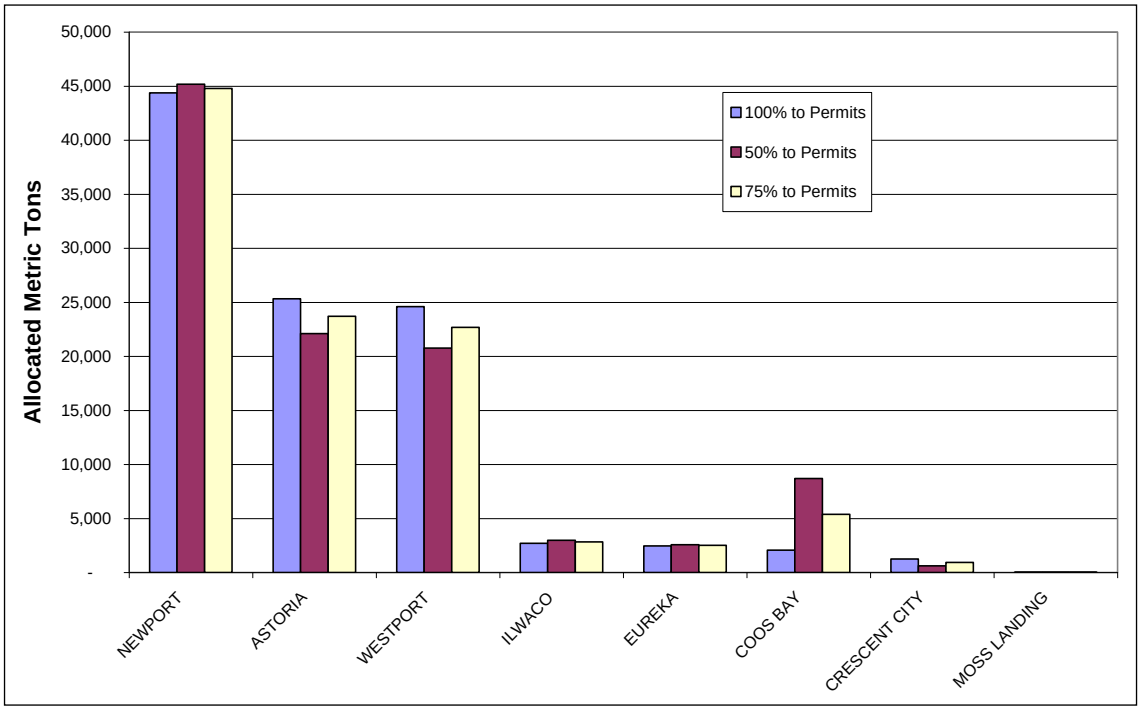


Figure 4-53. Shoreside whiting allocation based entirely on catch history.

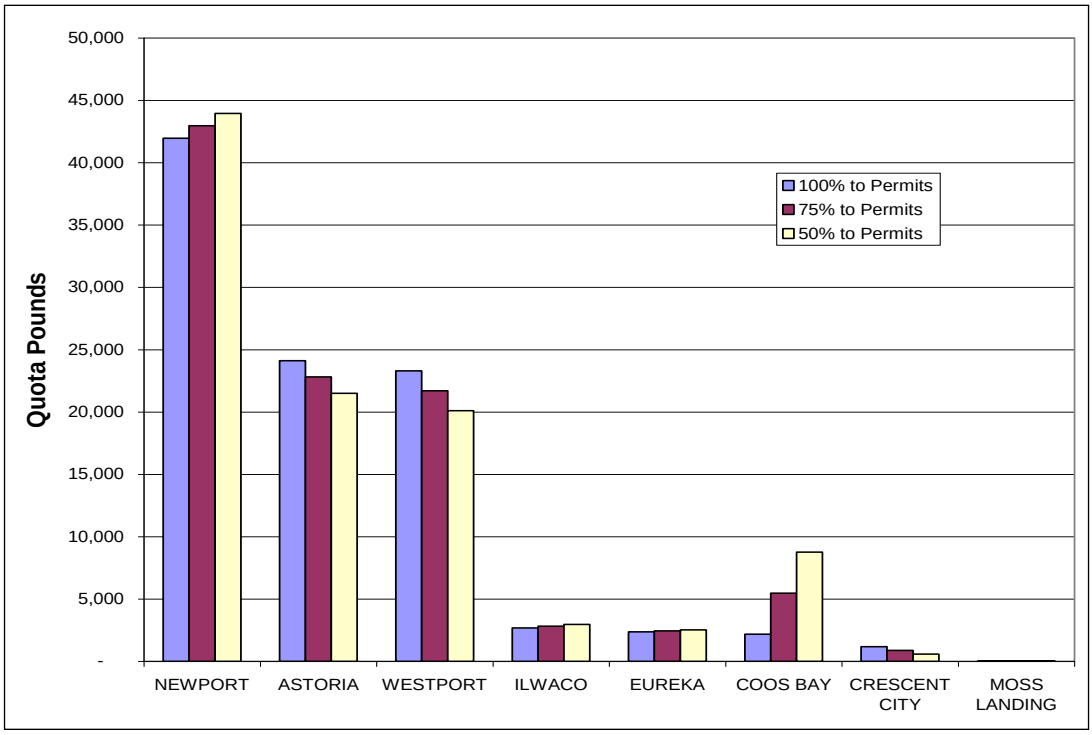


Figure 4-54. Shoreside whiting allocation with equal sharing of buyback history.

The figures above show that regardless of the type of initial allocation, a large share of quota will end up in specific ports. With equal sharing of buyback history Figure 4-51), Astoria, Bellingham, Brookings, Coos Bay, Eureka, Fort Bragg, Newport, San Francisco, and Moss Landing should benefit from initial allocation of nonwhiting QS, regardless of the percentage of buyback quota allocated to harvesters. Princeton/Half Moon Bay may benefit, depending on the initial allocation rule. With nonwhiting quota allocation based entirely on catch history (Figure 4-52), Astoria, Coos Bay and Bellingham benefit the most, regardless of the percentage of buyback quota allocated to harvesters. Newport, Astoria, and Westport all stand to benefit from the initial allocation of shoreside whiting (Figure 4-53 and Figure 4-54).

4.14.5.4.1 Initial Allocation of Overfished Species

As discussed in Section 4.6.2.5 (page 313), the amount of overfished species quota will play a large role in determining access to target species. At a community level, the amount of overfished species quota in that community will determine the access that harvesters in that community will have to target species to some degree. This is also dependent on the abundance of overfished species in fishing grounds which local harvesters within a community depend upon. For instance, if overfished species abundance is relatively low in fishing grounds prosecuted by harvesters within a community, then harvesters in that community may need relatively less overfished species quota.

In an attempt at identifying the regional interaction of overfished species at a port level, we use an analysis created by the GMT to support the 2007-08 Groundfish Harvest Specifications EIS examining overfished species interaction by community and gear type. We then compare the initial allocation of overfished species to that fishery interaction analysis.

Table 4-67, below, shows ports, overfished species, and the interaction of each port's LE fixed gear (FG) sablefish fishery and trawl fishery with those overfished species. These two sectors, or fisheries, are included because trawl vessels may engage in gear switching under the program and the most likely

species which trawlers will switch gears to focus on appears to be sablefish. As illustrated in Table 4-67, canary rockfish has perhaps the largest geographic distribution and largest interaction across sectors of all overfished species. Bocaccio is managed south of Cape Mendocino, so ports north of that area do not interact with that stock. The same is true for cowcod. Recently available data indicate that interactions with bocaccio and cowcod are highest around the Monterey Canyon area (generally extending from an area south of San Francisco to the southern end of Monterey Bay). Darkblotched is generally a trawl associated overfished species that is oriented to deep water strategies north of 38° N. latitude. Pacific ocean perch is similar, though it has a more northern orientation than darkblotched. Widow tends to impact midwater trawl strategies and is also a northern oriented species. In recent years, however (after the GMT analysis was created), widow rockfish have shown up in the bottom trawl fishery in greater numbers, and also south of Cape Mendocino. Yelloweye rockfish is generally a northern oriented species and is more susceptible to fixed gear than trawl gear. However, the amount of yelloweye likely to be available to the fishery is low, and, therefore, any interaction with yelloweye is likely to be important.

Table 4-67. Interactions between ports, fishery sectors, and overfished species.

Sub Region	Port	Super Sector	Sector	Overfished Species Interaction						
				Boc	Can	Cow	Drk	POP	Wid	Yel
N 40 10	Astoria	LE Fixed Gear	LE FG-Sablefish	LOW	MED LOW	LOW	LOW	LOW	LOW	MED HIGH
		LE Trawl	LE B-Trawl Deep	LOW	MED LOW	LOW	HIGH	HIGH	LOW	LOW
			LE B-Trawl Shelf	LOW	HIGH	LOW	LOW	LOW	LOW	LOW
			LE Mw-Trawl Whiting	LOW	MED HIGH	LOW	LOW	LOW	HIGH	LOW
	Bellingham Bay	LE Fixed Gear	LE FG-Sablefish	LOW	MED LOW	LOW	LOW	LOW	LOW	MED HIGH
		LE Trawl	LE B-Trawl Deep	LOW	MED LOW	LOW	HIGH	HIGH	LOW	LOW
			LE B-Trawl Shelf	LOW	HIGH	LOW	LOW	LOW	LOW	LOW
	Blaine	LE Fixed Gear	LE FG-Sablefish	LOW	MED LOW	LOW	LOW	LOW	LOW	MED HIGH
		LE Trawl	LE B-Trawl Deep	LOW	MED LOW	LOW	HIGH	HIGH	LOW	LOW
			LE B-Trawl Shelf	LOW	HIGH	LOW	LOW	LOW	LOW	LOW
	Brookings	LE Fixed Gear	LE FG-Sablefish	LOW	MED LOW	LOW	LOW	LOW	LOW	MED HIGH
		LE Trawl	LE B-Trawl Deep	LOW	MED LOW	LOW	HIGH	HIGH	LOW	LOW
			LE B-Trawl Shelf	LOW	HIGH	LOW	LOW	LOW	LOW	LOW
	Coos Bay	LE Fixed Gear	LE FG-Sablefish	LOW	MED LOW	LOW	LOW	LOW	LOW	MED HIGH
		LE Trawl	LE B-Trawl Deep	LOW	MED LOW	LOW	HIGH	HIGH	LOW	LOW
			LE B-Trawl Shelf	LOW	HIGH	LOW	LOW	LOW	LOW	LOW
			LE Mw-Trawl Whiting	LOW	MED HIGH	LOW	LOW	LOW	HIGH	LOW
N 40 10	Crescent City	LE Fixed Gear	LE FG-Sablefish	LOW	MED LOW	LOW	LOW	LOW	LOW	MED HIGH
		LE Trawl	LE B-Trawl Deep	LOW	MED LOW	LOW	HIGH	HIGH	LOW	LOW
			LE B-Trawl Shelf	LOW	HIGH	LOW	LOW	LOW	LOW	LOW
			LE Mw-Trawl Whiting	LOW	MED HIGH	LOW	LOW	LOW	HIGH	LOW
N 40 10 cont.	Eureka	LE Fixed Gear	LE FG-Sablefish	LOW	MED LOW	LOW	LOW	LOW	LOW	MED HIGH
		LE Trawl	LE B-Trawl Deep	LOW	MED LOW	LOW	HIGH	HIGH	LOW	LOW

Sub Region	Port	Super Sector	Sector	Overfished Species Interaction						
				Boc	Can	Cow	Drk	POP	Wid	Yel
			LE B-Trawl Shelf	LOW	HIGH	LOW	LOW	LOW	LOW	LOW
			LE Mw-Trawl Whiting	LOW	MED HIGH	LOW	LOW	LOW	HIGH	LOW
	Ilwaco	LE Fixed Gear	LE FG-Sablefish	LOW	MED LOW	LOW	LOW	LOW	LOW	MED HIGH
		LE Trawl	LE Mw-Trawl Whiting	LOW	MED HIGH	LOW	LOW	LOW	HIGH	LOW
	Neah Bay	LE Fixed Gear	LE FG-Sablefish	LOW	MED LOW	LOW	LOW	LOW	LOW	MED HIGH
		LE Trawl	LE B-Trawl Deep	LOW	MED LOW	LOW	HIGH	HIGH	LOW	LOW
			LE B-Trawl Shelf	LOW	HIGH	LOW	LOW	LOW	LOW	LOW
	Newport	LE Fixed Gear	LE FG-Sablefish	LOW	MED LOW	LOW	LOW	LOW	LOW	MED HIGH
		LE Trawl	LE B-Trawl Deep	LOW	MED LOW	LOW	HIGH	HIGH	LOW	LOW
			LE B-Trawl Shelf	LOW	HIGH	LOW	LOW	LOW	LOW	LOW
			LE Mw-Trawl Whiting	LOW	MED HIGH	LOW	LOW	LOW	HIGH	LOW
	Westport	LE Fixed Gear	LE FG-Sablefish	LOW	MED LOW	LOW	LOW	LOW	LOW	MED HIGH
		LE Trawl	LE B-Trawl Deep	LOW	MED LOW	LOW	HIGH	HIGH	LOW	LOW
			LE B-Trawl Shelf	LOW	HIGH	LOW	LOW	LOW	LOW	LOW
			LE Mw-Trawl Whiting	LOW	MED HIGH	LOW	LOW	LOW	HIGH	LOW
38 - 40 10	Fort Bragg	LE Fixed Gear	LE FG-Sablefish	MED LOW	MED LOW	LOW	LOW	LOW	LOW	LOW
		LE Trawl	LE B-Trawl Deep	MED LOW	MED LOW	LOW	MED HIGH	LOW	LOW	LOW
			LE B-Trawl Shelf	MED LOW	MED LOW	LOW	LOW	LOW	LOW	LOW
36 - 38	Monterey	LE Fixed Gear	LE FG-Sablefish	MED LOW	MED LOW	MED LOW	LOW	LOW	LOW	LOW
		LE Trawl	LE B-Trawl Deep	MED LOW	MED LOW	LOW	LOW	LOW	LOW	LOW
			LE B-Trawl Shelf	HIGH	MED HIGH	MED HIGH	LOW	LOW	LOW	LOW
	Moss Landing	LE Fixed Gear	LE FG-Sablefish	MED LOW	MED LOW	MED LOW	LOW	LOW	LOW	LOW
		LE Trawl	LE B-Trawl Deep	MED LOW	MED LOW	LOW	LOW	LOW	LOW	LOW
			LE B-Trawl Shelf	HIGH	MED HIGH	MED HIGH	LOW	LOW	LOW	LOW
	Half Moon Bay	LE Fixed Gear	LE FG-Sablefish	MED LOW	MED LOW	MED LOW	LOW	LOW	LOW	LOW
		LE Trawl	LE B-Trawl Deep	MED LOW	LOW	LOW	LOW	LOW	LOW	LOW
			LE B-Trawl Shelf	HIGH	MED HIGH	MED HIGH	LOW	LOW	LOW	LOW
	San Francisco	LE Fixed Gear	LE FG-Sablefish	MED LOW	MED LOW	MED LOW	LOW	LOW	LOW	LOW
		LE Trawl	LE B-Trawl Deep	MED LOW	MED LOW	LOW	LOW	LOW	LOW	LOW
			LE B-Trawl Shelf	HIGH	MED HIGH	MED HIGH	LOW	LOW	LOW	LOW

Boc: bocaccio; Can: canary rockfish; Cow: cowcod; Drk: darkblotched rockfish; POP: Pacific ocean perch; Wid: widow rockfish; Yel: yelloweye rockfish

Viewing the initial allocation of overfished species to permits by the permits' principal port provides an indication of the geographic distribution of overfished species initial allocation (Table 4-68). This

information is useful when comparing it to the information above illustrating the interaction of various fishery sectors and overfished species by area. What is clear in Table 4-68 is that the initial allocation of overfished species to permits varies (sometimes widely) depending on the formula used for making that initial allocation.

In general terms, the initial allocation patterns (on a geographic basis) tend to follow the pattern shown above in Table 4-67 indicating the geographic-based interaction of overfished species by fishery sector. However, there are some noteworthy differences depending upon the formula chosen. These are itemized by species below:

- Bocaccio: Using any of the landings-based formulas distributes a noteworthy amount of quota to permits north of Cape Mendocino, where it is not needed.
- Canary: The alternatives that do not include the "equal sharing of buyback history" component results in several instances of zero, or nearly zero, amounts being allocated to permits along the coast. This can be problematic to those communities receiving these minimal amounts as canary is widely distributed and nearly every community needs some access to canary.[111]
- Cowcod: Both of the landings-based allocations for cowcod allocate a relatively large amount of quota to areas north of Cape Mendocino, where it is not needed. Both of the bycatch rate-based formulas allocate a relatively larger amount of areas from San Francisco through the southern end of Monterey Bay area, where recently available data indicate it may be more needed.
- Darkblotched: Each of the allocation formulas results in a relatively similar average amount of QS to permits within each port, except for Fort Bragg where the pure landings-based formula results in noticeably more quota being allocated to permits there than other formulas. Also, ports south of Fort Bragg receive no darkblotched under the pure landings-based formula, though available information indicates that darkblotched are found in these areas.
- Pacific ocean perch: Follows the same general pattern as darkblotched where the initial allocations of Pacific ocean perch tend to be northern oriented and also tend to vary relatively little across the various initial allocation formulas.
- Widow: Aside from a handful of exceptions, each of the allocation formulas distributed widow rockfish to permits along the entire coast. The exceptions are for the pure landings-based allocation formula which allocates close to zero quota to permits in communities from Half Moon Bay south.
- Yelloweye: Under all allocation formulas, the amount of quota poundage of yelloweye is equivalent to a handful of individual fish even in the best-case scenario. The distribution of QSs is oriented toward the north and off southern Oregon where available information indicates that yelloweye is most abundant. Permits in other areas of the coast will receive very little, and this will be challenging to vessel operators and communities in which they reside.

Table 4-68. Average allocation of overfished species to permits by principal port, allocation formula, and overfished species.

Port	Formula	Boc	Can	Cow	Drk	POP	Wid	Yel
Bellingham	Bycatch rate (pro rata for whiting) only	0.0%	2.1%	0.0%	0.4%	1.3%	0.4 %	2.6%
	Bycatch rate (pro rata for whiting)	0.1%	1.4%	0.3%	0.5%	0.9%	0.5	1.9%

[111] In November 2009, shortly before the release of the DEIS, the Council revised the final preferred alternative adopted in June 2009 to change the allocation scheme for canary rockfish to include an equal sharing element, similar to the formula used for nonoverfished species (although the bycatch rate formula is still applied to quota not derived from the equal sharing element).

Port	Formula	Boc	Can	Cow	Drk	POP	Wid	Yel
	plus equal sharing of BB History						%	
	Landings history only	1.3%	1.4%	0.0%	0.7%	1.7%	1.2 %	2.1%
	Landings history plus equal sharing of BB history	1.1%	1.1%	0.3%	0.6%	1.2%	1.0 %	1.5%
Neah Bay	Bycatch rate (pro rata for whiting) only	0.0%	1.6%	0.0%	0.1%	0.2%	0.1 %	2.3%
	Bycatch rate (pro rata for whiting) plus equal sharing of BB History	0.1%	1.0%	0.3%	0.3%	0.3%	0.2 %	1.7%
	Landings history only	0.0%	0.5%	0.0%	0.0%	0.2%	0.1 %	0.1%
	Landings history plus equal sharing of BB history	0.1%	0.4%	0.3%	0.3%	0.3%	0.2 %	0.3%
Westport	Bycatch rate (pro rata for whiting) only	0.0%	0.7%	0.0%	0.3%	0.4%	0.7 %	0.5%
	Bycatch rate (pro rata for whiting) plus equal sharing of BB History	0.1%	0.7%	0.3%	0.4%	0.5%	0.6 %	0.5%
	Landings history only	0.0%	0.4%	0.0%	0.1%	0.2%	0.3 %	0.1%
	Landings history plus equal sharing of BB history	0.1%	0.5%	0.3%	0.3%	0.4%	0.4 %	0.2%
Astoria	Bycatch rate (pro rata for whiting) only	0.0%	0.6%	0.0%	0.6%	0.9%	0.8 %	0.7%
	Bycatch rate (pro rata for whiting) plus equal sharing of BB History	0.1%	0.6%	0.3%	0.6%	0.8%	0.7 %	0.7%
	Landings history only	0.1%	0.6%	0.0%	0.5%	1.2%	0.5 %	0.4%
	Landings history plus equal sharing of BB history	0.2%	0.6%	0.3%	0.5%	0.9%	0.5 %	0.4%
Newport	Bycatch rate (pro rata for whiting) only	0.1%	0.6%	0.1%	0.7%	0.9%	1.1 %	0.2%
	Bycatch rate (pro rata for whiting) plus equal sharing of BB History	0.2%	0.7%	0.3%	0.6%	0.8%	0.9 %	0.3%
	Landings history only	0.1%	1.0%	0.0%	0.7%	0.7%	1.0 %	0.9%
	Landings history plus equal sharing of BB history	0.2%	0.9%	0.3%	0.6%	0.7%	0.9 %	0.8%
Coos Bay	Bycatch rate (pro rata for whiting) only	0.1%	0.4%	0.0%	0.9%	0.6%	0.5 %	0.3%
	Bycatch rate (pro rata for whiting) plus equal sharing of BB History	0.1%	0.4%	0.3%	0.7%	0.6%	0.5 %	0.4%
	Landings history only	0.5%	0.6%	0.0%	1.1%	0.3%	0.5 %	1.3%
	Landings history plus equal sharing of BB history	0.5%	0.6%	0.3%	0.8%	0.4%	0.5 %	1.1%

Port	Formula	Boc	Can	Cow	Drk	POP	Wid	Yel
Brookings	Bycatch rate (pro rata for whiting) only	0.0%	0.4%	0.0%	0.8%	0.2%	0.3%	0.2%
	Bycatch rate (pro rata for whiting) plus equal sharing of BB History	0.1%	0.5%	0.3%	0.7%	0.4%	0.4%	0.3%
	Landings history only	0.1%	0.4%	0.0%	0.4%	0.1%	0.7%	0.2%
	Landings history plus equal sharing of BB history	0.2%	0.4%	0.3%	0.5%	0.3%	0.6%	0.3%
Crescent City	Bycatch rate (pro rata for whiting) only	0.2%	0.4%	0.1%	0.5%	0.2%	0.2%	0.3%
	Bycatch rate (pro rata for whiting) plus equal sharing of BB History	0.2%	0.4%	0.3%	0.5%	0.3%	0.3%	0.4%
	Landings history only	0.5%	0.1%	0.0%	0.3%	0.0%	1.3%	0.2%
	Landings history plus equal sharing of BB history	0.5%	0.2%	0.3%	0.4%	0.2%	1.0%	0.3%
Eureka	Bycatch rate (pro rata for whiting) only	0.1%	0.4%	0.1%	0.6%	0.1%	0.1%	0.3%
	Bycatch rate (pro rata for whiting) plus equal sharing of BB History	0.2%	0.4%	0.3%	0.6%	0.3%	0.2%	0.4%
	Landings history only	0.2%	0.2%	6.4%	0.5%	0.2%	0.3%	0.2%
	Landings history plus equal sharing of BB history	0.3%	0.3%	3.1%	0.5%	0.4%	0.3%	0.3%
Fort Bragg	Bycatch rate (pro rata for whiting) only	1.0%	0.0%	0.2%	0.4%	0.0%	0.2%	0.0%
	Bycatch rate (pro rata for whiting) plus equal sharing of BB History	0.9%	0.2%	0.4%	0.5%	0.2%	0.3%	0.2%
	Landings history only	1.3%	0.2%	0.0%	1.4%	0.1%	0.2%	0.1%
	Landings history plus equal sharing of BB history	1.2%	0.3%	0.3%	1.0%	0.3%	0.3%	0.3%
San Francisco	Bycatch rate (pro rata for whiting) only	2.2%	0.2%	2.0%	0.4%	0.1%	0.4%	0.3%
	Bycatch rate (pro rata for whiting) plus equal sharing of BB History	1.9%	0.4%	1.2%	0.5%	0.3%	0.4%	0.4%
	Landings history only	3.9%	0.4%	0.0%	0.5%	0.1%	0.6%	0.5%
	Landings history plus equal sharing of BB history	3.3%	0.4%	0.3%	0.5%	0.3%	0.6%	0.5%
Half Moon Bay	Bycatch rate (pro rata for whiting) only	4.9%	0.2%	6.5%	0.1%	0.1%	0.1%	0.9%
	Bycatch rate (pro rata for whiting) plus equal sharing of BB History	4.1%	0.3%	3.2%	0.3%	0.3%	0.2%	0.8%
	Landings history only	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Landings history plus equal sharing of BB history	0.5%	0.2%	0.3%	0.3%	0.2%	0.2%	0.2%

Port	Formula	Boc	Can	Cow	Drk	POP	Wid	Yel
Moss Landing	Bycatch rate (pro rata for whiting) only	2.0%	0.3%	1.9%	0.3%	0.1%	0.4%	0.4%
	Bycatch rate (pro rata for whiting) plus equal sharing of BB History	1.7%	0.4%	1.1%	0.4%	0.3%	0.4%	0.4%
	Landings history only	2.0%	0.2%	0.0%	0.3%	0.2%	0.2%	0.3%
	Landings history plus equal sharing of BB history	1.8%	0.3%	0.3%	0.4%	0.4%	0.3%	0.4%
Monterey	Bycatch rate (pro rata for whiting) only	3.0%	0.1%	3.7%	0.1%	0.0%	0.1%	0.5%
	Bycatch rate (pro rata for whiting) plus equal sharing of BB History	2.6%	0.2%	1.9%	0.3%	0.2%	0.2%	0.5%
	Landings history only	1.9%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Landings history plus equal sharing of BB history	1.7%	0.2%	0.3%	0.3%	0.2%	0.2%	0.2%
Morro Bay	Bycatch rate (pro rata for whiting) only	1.0%	0.1%	0.6%	0.3%	0.1%	0.2%	0.1%
	Bycatch rate (pro rata for whiting) plus equal sharing of BB History	0.9%	0.2%	0.6%	0.4%	0.3%	0.3%	0.3%
	Landings history only	0.7%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%
	Landings history plus equal sharing of BB history	0.6%	0.2%	0.3%	0.3%	0.2%	0.2%	0.3%

Boc: bocaccio; Can: canary rockfish; Cow: cowcod; Drk: darkblotched rockfish; POP: Pacific ocean perch; Wid: widow rockfish; Yel: yelloweye rockfish

4.14.5.5 Comparative Advantage

Based on these data, combined with the weight of nonwhiting groundfish landed by port and vessel efficiency category (Table C-4, Appendix C), we established the following summary of relative comparative advantage for nonwhiting trawl communities. In particular, the port of Neah Bay appears to be at a disadvantage in a rationalized fishery because of its lack of fleet efficiency, lack of shore-based infrastructure, and the high degree of dependence that vessels in this port have on areas defined as "high bycatch." Conversely, the ports of Astoria and Coos Bay appear to be at a relative advantage compared to other ports. Astoria has the benefit of a relatively efficient fleet, a relatively large presence of shore-based infrastructure, and a low dependence on fishing grounds located in high bycatch areas. Coos Bay also appears to be at a relative advantage because of fleet efficiency and the relatively large amount of shore-based infrastructure. While catch landed in Coos Bay has historically been caught in high bycatch areas, this amount of catch does not constitute the majority. Therefore, it is likely that vessels originating in Coos Bay will adjust fishing practices to avoid bycatch, but the community is not likely to suffer as a result.

The comparative advantage of other communities is less certain. Bellingham and Half Moon Bay may see their vessels' ability to fish highly constrained because of their reliance on fishing grounds in high bycatch areas. Vessels in Half Moon Bay are relatively less efficient, and, while Bellingham has a number of vessels that fall within the efficient range, vessels from that area have a much longer travel distance to and from fishing grounds relative to vessels from other ports. This increases costs for these vessels relative to vessels from other ports, suggesting that they may be more appropriately categorized as inefficient.

The effect on Fort Bragg and Crescent City is also somewhat uncertain. While there are several scores that appear to work in Fort Bragg's favor, this community does not score in the top bracket on any of the determinant variables and may have a fleet consisting of inefficient vessels, though several vessels are near the efficient range. Crescent City scores in the negative category on several variables and positively in others. The overall effect on Crescent City may depend on the relative importance of the variables. If bycatch dependency is the overall driving factor, then Crescent City may actually be at an advantage, even though it has a relatively inefficient fleet and a relatively small amount of quota initially allocated to it.

The table below summarizes the comparative advantage of nonwhiting communities. Ports that are at a disadvantage from consolidation and geographic shift have a relatively inefficient fleet (vessels with a relatively long travel time to fishing grounds and those with relatively unsuccessful operators, costly vessels, and inefficiently sized vessels contribute to the fleet efficiency score in the table below), insufficient infrastructure, and are adjacent to fishing grounds with high constraining overfished species abundance ("bycatch dependence" in the table below). The table also includes a positive or negative score for "initial allocation of groundfish," as determined by the initial allocation estimates. The implications of these scores for each community will be described further below.

Table 4-69. Comparative advantage of nonwhiting trawl communities under rationalization.

Port	Fleet Efficiency Score	Bycatch Dependent Area Score	Shore-based Infrastructure	Initial Allocation of Groundfish	Score
Bellingham	?	− −	+ +	+	
Neah Bay	−	− −	− −	−	−
Westport	−	+	+	−	
Astoria	+	+	+ +	+ +	+
Newport	+	−	+ +	+	
Charleston (Coos Bay)	+	+	+ +	+	+
Brookings	+	+	−	+	
Crescent City	−	+	+	−	
Eureka	+	+	+	+	+
Fort Bragg	−	+	+	+	
San Francisco	−	−	+ +	+	
Moss Landing	−	− −	+	+	
Princeton/Half Moon Bay	−	− −	+	+	
Morro Bay	?	+	−	−	

While this information suggests that shifts in fishing effort may occur as a result of rationalization, with subsequent impacts to communities, these shifts can be mitigated or restricted to some degree by various aspects of the alternatives. The proposed rationalization program contains an option for area management that would create separate QSs for north and south of 40°10'. In general, northern areas have received a larger share of trawl-caught groundfish during recent years, and this appears to have been a pattern that could continue if the fishery is rationalized. Several large trawlers from the south have also relocated to the north, specifically Astoria. In addition, the geographic shift and regional comparative advantage analysis indicates northern communities have more factors working in their favor than southern communities. This may lead to a shift in fishing activity toward the north. Area management would presumably help retain catch in those southern communities. Adaptive management could be used to assist adversely impacted communities as well. Directing the adaptive

management quota to specific communities that have demonstrated harm, or a likely harm, could maintain fishing activity in a community that may otherwise stand to lose that activity.

Whiting communities are not as likely to see a shift in Pacific whiting fishing activity. This is because of resource access and access to infrastructure necessary to support a processing plant for Pacific whiting. Since the whiting fishery operates in northern California, Oregon, and Washington, community-based activity is not likely to deviate from communities in this area. In the shoreside whiting fishery, processors range from northern California to central Washington. The range is not expected to grow further since the fishery does not operate further south and, north of Westport, because of a lack of support infrastructure and fresh water, which is necessary to support a large Pacific whiting processor. Therefore, while some redistribution of whiting activity may occur across communities currently engaged in the whiting fishery, it does not appear likely that there would be a wholesale shift in the location of where this activity takes place. The at-sea fishery is an even more extreme example. Since entities involved in the whiting fishery also tend to participate in the Bering Sea pollock fishery, many of these entities are based in the Puget Sound region of Washington. This is because of the travel distance to and from the Bering Sea (basing further south would mean more travel distance) and because of the amount of infrastructure and business in the Seattle area that can handle the needs of the at-sea sector. Therefore, rationalization is not likely to displace the major centers for at-sea whiting activity from the Puget Sound area.

4.14.5.6 Resilience and Dependence

Knowing the resilience and dependence level of coastal communities helps to assess impacts from the trawl rationalization program. Impacts that may be minor to a very resilient community (like Seattle) could be substantial for a community with low resilience (like Neah Bay). Section 3.7.4 summarizes work done on dependence on the groundfish fishery and resilience in fishing communities for the 2007-08 groundfish harvest specifications (PFMC 2004a). The study uses as indicators the number of Federal and state groundfish permits in the community, number of commercial fishing vessels, revenue from fish landings, percentage of groundfish revenue as a percentage of total fisheries revenue, and number of processors and buyers to determine engagement and dependence on commercial fisheries. The study uses an industry diversity index, unemployment rate, percentage of population living below the poverty line, isolation of cities, and population density to determine resilience. The table below summarizes dependence and resilience of west coast trawl communities.

Most vulnerable communities (medium dependence on groundfish, least resilience)

Neah Bay	Moss Landing

Relatively lower dependence, but low resilience

Ilwaco

Relatively higher dependence, medium resilience

Bellingham	Crescent City
Astoria	Eureka
Coos Bay	Fort Bragg

Relatively higher dependence, higher resilience

Newport	Morro Bay

Medium dependence but higher resilience

Westport

Relatively lower dependence and relatively higher resilience

Warrenton

Higher dependence, but high resilience (not considered "vulnerable")

Brookings	San Francisco

Low dependence, high resilience (not considered "vulnerable")

Anacortes	Hammond
Seattle	Half Moon Bay

As a reminder, the term "dependence" involves use of groundfish specifically, while "engagement," when used, refers to engagement in west coast fisheries as a whole. In addition, the list above is slightly different than the list of trawl communities identified for this EIS. In our analysis, Astoria and Hammond are joined as one community. Coos Bay includes the port of Charleston.

The discussion below focuses on impacts from the options in the alternatives to individual communities. The larger-scale impacts of rationalization (discussed in detail in Section 4.14.2) also apply here. When it is possible to differentiate among communities, relevant concerns are included below. In addition, there are several options within the alternatives that do not vary by community. Each community would be affected equally (in proportion to its trawl activity) by tracking and monitoring provisions and carryover. Depending on how an adaptive management provision is administered, it could either benefit communities (by providing more quota) or adversely impact them by reducing the total available quota.

As discussed above, area management refers to the splitting of QSs between the north and south. This could benefit central and southern California communities by maintaining more quota in the south.

The grandfather clause could also affect communities differentially. However, there are currently insufficient data to determine how communities would be affected, and confidentiality issues would prevent a detailed discussion of individual community impacts.

4.14.5.7 Impacts on Individual Communities

The following section outlines the impacts of rationalization, when predictable, on individual trawl communities. For more background on these communities, please see Chapter 3. For cumulative impacts on individual trawl communities, please see

Table 4-71.

Bellingham, Washington

Bellingham is located on Bellingham Bay in north Puget Sound, in Whatcom County. The closest major U.S. city is Seattle, a 90-mile drive south, while Vancouver, British Columbia, is a 54-mile drive north. Bellingham is a nonwhiting port.

Bellingham is considered vulnerable because it is highly engaged in Pacific fisheries in general, highly dependent on groundfish, and has medium resilience.

Bellingham has two processors that process groundfish landed in Bellingham Bay and Neah Bay. Bellingham also has access to a large seafood cold storage facility and has a relatively well-developed level of port infrastructure. Bellingham is located on the I-5 corridor, which enhances access to distribution facilities in the Seattle area.

The Comparative Advantage Model shows that 69.9 percent of Bellingham's nonwhiting trawl catch occurs in an area identified as a high bycatch area. Yelloweye and canary rockfish are the main species of concern, and both are very constraining. Because of this, Bellingham vessels are relatively constrained compared to other ports. In addition, vessels from Bellingham have a much longer travel distance to and from fishing grounds compared to vessels from other ports. This increases cost for those vessels, suggesting that the four of eleven vessels that fall within the efficient range may be more appropriately categorized as inefficient. However, the efficiencies created by Bellingham's shore-based infrastructure help make up for the burden created by constraining bycatch species and lack of efficiency.

Effects of alternatives

- Since Bellingham is a nonwhiting port, it would not be significantly affected by decisions relating to co-ops.
- The three or four sector issue would not impact Bellingham differently than other nonwhiting communities, at least to a degree that can be identified at this time.
- Bellingham should benefit from initial allocation, particularly if 100 percent of the buyback history is equally allocated to harvesters.
- Bellingham has two processors that could benefit from initial allocation of IFQ to processors and processor linkages.
- Since Bellingham is close to a high bycatch area, it could be affected by the choice of which species to cover with IFQ, since harvesters would need a relatively large amount of quota for constraining species and would be at risk of a disaster tow.

Anacortes, Washington

Anacortes, in Skagit County, is 80 miles north of Seattle and 40 miles southwest of Bellingham. Anacortes is primarily a whiting port; the at-sea whiting fleet docks there, and one at-sea whiting companies have their corporate headquarters in Anacortes. Perhaps because of this, commercial fishing in Anacortes has employed few workers, but has paid some of the area's highest salaries. In 2000, the annual average wage for commercial fishermen in the county was $57,810. That year, the finfish fishery (which includes whiting) employed 53 workers making $83,016 annual average pay. In the same year, only 91 Skagit County residents identified themselves as commercial fishermen.

Anacortes is not considered vulnerable. It is engaged in Pacific fisheries in general, but it is not considered dependent on groundfish and it is highly resilient.

Anacortes currently has no groundfish processors. Many seafood processors operating in the area have closed. However, several seafood companies from Western Washington come to Cap Sante Boat Haven to purchase product (not groundfish) from local fishermen.

Effects of alternatives

- Anacortes' involvement in the trawl fishery is limited to the at-sea whiting fleet, specifically the catcher-processors sector.
- Unlike Bellingham, commercial groundfish vessels in Anacortes are not at a disadvantage due to their long travel time to fishing grounds or their proximity to the high bycatch area off northern Washington, because they are primarily at-sea whiting vessels that are not tied to a specific geographic area.
- Since the community has no trawl groundfish processors and no Federal nonwhiting trawlers, it will only be affected by the alternatives as they pertain to the whiting fishery. Variations in the way the catcher-processor sector is managed are not expected to impact Anacortes because the effect of those variations on catcher-processors does not differ substantially from the status quo.

Seattle, Washington

Seattle is on the east side of the Puget Sound between Elliot Bay and Lake Washington, in King County. According to the 2000 U.S. Census, Seattle's population was 563,374. The larger metropolitan area (comprising all or parts of Snohomish, King, Pierce, Thurston, and Kitsap Counties) was home to 3,554,760 in 2000.

Seattle is an important whiting port, with docks for the at-sea fleet and corporate headquarters. Most of the 24 Federal trawl permits owned in Seattle are used in the at-sea whiting fishery.

Although nonwhiting permit holders live in Seattle, none actively fish out of Seattle, so Seattle's proximity to a high bycatch area is irrelevant.

In 2000, west coast fisheries landings in Seattle were delivered by 909 unique vessels, including 253 commercial vessels, 498 tribal commercial vessels, and 158 personal use vessels. Nine vessels landed 109 mt of groundfish.

Seattle is not considered vulnerable. It is engaged in Pacific fisheries in general, but it is not considered dependent on groundfish and it is highly resilient. Seattle has a high level of fisheries infrastructure.

Effects of alternatives

- Seattle is primarily an at-sea whiting port.
- It is too early to say how initial allocation might affect Seattle, and vessel efficiency data are not available for the at-sea fishery.
- The three or four-sector alternative should not significantly affect Seattle since Seattle does not have vessels actively engaged in shoreside fisheries.
- Seattle would not be affected by area management, since it is a whiting port and whiting are found in the north.

- Seattle could be affected by decisions regarding management of the mothership sector because of its engagement in the at-sea whiting fishery. Mothership sector co-op linkages or an initial allocation of whiting IFQ to motherships may affect companies differently. Variations in management of the catcher-processor sector are not expected to affect Seattle because the alternatives do not vary substantially from status quo.
- Seattle has several motherships that could benefit from initial allocation of IFQ to processors and processor linkages.

Neah Bay, Washington

Neah Bay is at the northwestern-most point of the contiguous United States, across the Strait of Juan de Fuca from Vancouver Island, British Columbia. Situated in Clallam County, Neah Bay is the main settlement on the Makah Indian Reservation. The nearest major U.S. city is Seattle, a 165-mile drive and ferry ride southeast.

Neah Bay is considered quite vulnerable. It is not deeply engaged in Pacific fisheries in general, but it is dependent on groundfish and has very low resilience.

There are no known processing facilities of trawl groundfish in Neah Bay. Vessels deliver to buyers who subsequently deliver to processors in Seattle, Bellingham, Astoria, and elsewhere. Port and harbor facilities are limited, and the location is considered remote and removed from distribution and transportation networks. No Federal trawl permits are owned by community members. Vessels fishing out of Neah Bay are owned by nonresidents. As recently as 2005, there were eight vessels that made deliveries to Neah Bay, but anecdotal information indicates that many of these vessels have since left the business due to management restrictions. As of 2008, no trawlers are believed to be operating out of Neah Bay.

Effects of alternatives

- Neah Bay is a small, vulnerable nonwhiting port that is at risk of losing its trawl fleet due to rationalization. Four of seven vessels delivering to Neah Bay in recent years are of inefficient size, and these four vessels constitute the majority of recent trawl landings.
- Neah Bay would not be affected by decisions regarding co-ops since it has no processors and no whiting fishery.
- Neah Bay does not benefit substantially from initial allocation, receiving less than the average allocated to all ports. Of the three buyback allocation options, Neah Bay would fare best under the 100 percent to harvesters option.
- Because Neah Bay has no permanent processors of trawl groundfish. It may experience a reduction in landings if processors are allocated quota, because processors with quota will likely direct landings to ports that already have processing plants.
- Vessels fishing out of Neah Bay are at a disadvantage because of its proximity to a high bycatch area. Of Neah Bay's nonwhiting trawl catch, 95.5 percent occurs in an area identified as a high bycatch area, constrained by canary and yelloweye rockfish. Because of this, Neah Bay could be affected by the choice of which species to cover with IFQ, since harvesters would need a relatively large amount of (possibly expensive) quota for constraining species and would be at risk of a disaster tow.
- Neah Bay might benefit from having three, rather than four, trawl sectors. Since having three sectors increases the pool of available quota to nonwhiting harvesters (which includes all Neah Bay harvesters), three sectors would give them more ability to trade quota as necessary, while four sectors could inadvertently constrain them in some years if whiting bycatch is high.

- Of all communities, Neah Bay may benefit the most from an adaptive management provision to mitigate the impacts of rationalization.
- Although there has been a gradual shift in trawling to the north, trawl activity has no been moving to Neah Bay. However, area management could help because there would be less competition for the same fish and less risk of localized depletion.

Westport, Washington

Westport is on the southernmost peninsula in Washington, Point Chehalis, in Grays Harbor County. The nearest major U.S. city is Seattle, a 130-mile drive northeast. Westport is primarily a whiting port, though two small nonwhiting vessels also deliver there.

Westport is considered vulnerable. It is deeply engaged in Pacific fisheries in general, and it is fairly dependent on the groundfish fishery, but it is also fairly resilient.

Westport has a single processor that processes trawl groundfish landed in the community. This facility concentrates primarily on Pacific whiting and is one of the largest shoreside processors for this species. Facilities near the Port of Grays Harbor include vessel fabrication services and supply centers. Westport is somewhat removed from distribution centers. Fish landed in Westport are also processed in Astoria and Ilwaco.

Effects of alternatives

- Westport would be affected by options impacting whiting harvesters, nonwhiting harvesters, and processors. Processor ties in the shoreside whiting fishery could guarantee landings of whiting to Westport.
- Because of its involvement in Pacific whiting harvesting and processing activities, Westport would be affected by decisions relating to co-ops and processor ties, and initial allocation to harvesters and processors.
- Westport receives less nonwhiting quota under the initial allocation options than the average allocated to all ports. Among the three buyback allocation options, Westport would fare best if buyback were allocated 100 percent to harvesters.
- Westport has one processor that could benefit from initial allocation of QSs to processors and processor linkages.
- Since Westport is not close to a high bycatch area, it may not be substantially affected if constraining stocks are managed with IFQ.
- The nonwhiting harvesters delivering to Westport are categorized as inefficient, meaning fleet consolidation may remove nonwhiting activity from this port.
- Since Westport is engaged in both whiting and nonwhiting activity, the decision to have three or four sectors will impact this port. The three-sector option will provide more flexibility since it expands the pool of quota available to harvesters in both sectors, making it more likely that expected harvest volumes will be reached.

Ilwaco, Washington

Ilwaco is on the Long Beach Peninsula in southwest Washington. Situated in Pacific County, the community encompasses 2.06 square miles of land and 0.31 square miles of water. The closest major U.S. city is Portland, Oregon, a 110-mile drive southeast, while Seattle is a 170-mile drive northeast. Ilwaco is primarily a whiting port.

Ilwaco is considered vulnerable. It is deeply engaged in Pacific fisheries in general, but it is not very dependent on groundfish. Ilwaco is fairly lacking in resilience.

Ilwaco has a relatively small but sufficient amount of infrastructure, with one processor, a marina, a fish wholesaler, and sources for fishing and marine supplies.

Effects of alternatives

- Ilwaco is primarily a whiting port, and would be affected by options impacting the shoreside whiting fishery.
- Ilwaco receives less initial allocation of nonwhiting groundfish than the average allocated to all ports. In addition, initial allocation reduces the amount of fish available to Ilwaco harvesters compared to status quo.
- Ilwaco has one processor that could benefit from initial allocation of QSs to processors and processor linkages.
- Since Ilwaco's engagement in the groundfish trawl fishery is limited to shoreside whiting activity, establishing three or four sectors will impact the community. If four sectors are established, yet the shoreside whiting fishery is managed with co-ops and shares bycatch limits with the at-sea sectors, a four-sector option may not constrain harvest activity. However, if four sectors are established and the shoreside whiting fishery is managed as its own sector with a specific allocation, harvest activity may be constrained during years when nontarget catch is higher than anticipated. Managing the shoreside whiting fishery with three sectors is likely to provide more flexibility in prosecuting shoreside whiting activity since harvesters in both shoreside sectors can trade quota as necessary.

Astoria/Warrenton, Oregon

Astoria and Warrenton are adjacent to one another and are located in Clatsop County on the northwestern tip of Oregon, bordered by the Pacific Ocean on the west and the Columbia River on the north. Portland is the nearest major city, 91 miles to the east.

Astoria is considered vulnerable. It is deeply engaged in Pacific fisheries in general, and it is relatively dependent on groundfish. Astoria has medium resilience. Warrenton is not considered vulnerable. It is not very engaged in Pacific fisheries, and not very dependent on groundfish. Warrenton is also fairly resilient.

Astoria has the benefit of a relatively efficient fleet, a relatively large presence of shore-based infrastructure, and a low dependence on fishing grounds located in high bycatch areas. However, Astoria is fairly removed from distribution centers.

Effects of alternatives

- In general, Astoria is expected to benefit from rationalization, with a large initial allocation, and possibly increased harvesting and processing activity in the future as landed catch volumes in the nonwhiting sector increase. Astoria/Warrenton would benefit the most from initial allocation of nonwhiting quota relative to the average allocated to all ports, especially under the 100 percent buyback history to harvesters option.
- Both Astoria and Warrenton are whiting and nonwhiting ports and would be affected by options impacting whiting and nonwhiting harvesters.

- Combined, Astoria and Warrenton have four processors that process trawl groundfish from Astoria, Aberdeen, Garibaldi/Tillamook, Neah Bay, Port Angeles, and Westport. In addition, several support businesses exist in the area, and dock and harbor facilities are fairly well developed. Astoria/Warrenton could benefit from initial allocation of IFQ to processors and processor linkages.
- Since Astoria/Warrenton is not close to a high bycatch area, it would probably not be substantially affected by the choice to cover constraining stocks with IFQ.
- As with other communities that have both a whiting and nonwhiting sector, establishing three or four trawl sectors may impact Astoria/Warrenton. If four trawl sectors are established, either shoreside sector may face difficulties prosecuting fishing activity if a species becomes unexpectedly constraining. Such difficulties may be felt in communities via a second-order effect on harvesters.

Newport, Oregon

Newport is located in Lincoln County at the mouth of the Yaquina River. The northern portion of unincorporated South Beach is within the City of Newport's boundaries. The closest major metropolitan area is Portland, 136 miles to the northeast. Newport is both a whiting and nonwhiting port.

Newport prides itself in and protects its working waterfront, realizing that the seafood industry is at the core of Newport's history and culture. Tourism on the historic bayfront compliments its mixed use. While new revitalization plans have enhanced the local tourism economy, they have also increased tensions between the tourism and seafood industries.

Newport is considered vulnerable. It is deeply engaged in Pacific fisheries in general, is very dependent on groundfish, but is also fairly resilient.

In addition, several support businesses exist in the area and dock and harbor facilities are fairly well developed. Newport is fairly removed from distribution centers.

Effects of alternatives

- In general, Newport is expected to benefit from rationalization, with a large initial allocation, and possibly increased harvesting and processing activity in the future as landed catch volumes in the nonwhiting sector increases. Newport would receive more IFQ through initial allocation than the average allocated to all ports. Of the three buyback history distribution options, Newport benefits the most from the 87.5 percent to harvesters option.
- Newport is both a whiting and nonwhiting port and would be affected by options impacting whiting and nonwhiting harvesters.
- Newport has three processing facilities engaged in trawl groundfish. Newport could benefit from initial allocation of QSs to processors and processor linkages if doing so increases the likelihood that fishing activity will remain there.
- Newport is located near a high bycatch area (58.4 percent of its nonwhiting trawl catch occurs in an area identified as a moderately high bycatch area). The species of concern are Pacific ocean perch and darkblotched rockfish, which are less constraining than canary and yelloweye rockfish. Newport could, therefore, be affected by covering constraining species with IFQ. However, since the constraining species found off Newport are not as constraining as some, their presence may not have a substantial effect on Newport.
- As with other communities that have both a whiting and nonwhiting sector, establishing three or four trawl sectors may impact Newport. If four trawl sectors are established, either shoreside

sector may face difficulties prosecuting fishing activity if a species becomes unexpectedly constraining. Such difficulties may be felt in communities via a second-order effect on harvesters.

Coos Bay/Charleston, Oregon

Coos Bay and its port, Charleston, are located at the mouth of Coos Bay in Coos County, Oregon. Coos Bay is both a whiting and a nonwhiting port. Charleston, where most of the port activity takes place, is unincorporated. Coos Bay is located 226 miles south of Portland, on Highway 101, and 539 miles north of San Francisco.

Coos Bay is considered vulnerable. It is deeply engaged in Pacific fisheries in general, very dependent on groundfish, and has medium resilience. Charleston is not considered vulnerable. It is not as engaged in Pacific fisheries or as dependent on commercial groundfish fisheries as Coos Bay (it scored higher on recreational measures, however), and it is considered resilient.

There are several support businesses in the area, and dock and harbor facilities are fairly well developed. However, Coos Bay is fairly removed from distribution centers.

Coos Bay appears to be at a relative advantage because of fleet efficiency and the relatively large amount of shore-based infrastructure.

Effects of alternatives

- In general, Coos Bay and Charleston are expected to benefit from rationalization, with a large initial allocation, and possibly increased harvesting and processing activity in the future as landed catch volumes in the nonwhiting sector increase. Coos Bay/Charleston would receive more IFQ than the average allocated to all ports. Of the three buyback history distribution options, Coos Bay/Charleston benefits the most from the 100 percent to harvesters option.
- Coos Bay/Charleston is both a whiting and nonwhiting port and would be affected by options impacting whiting and nonwhiting harvesters.
- Coos Bay has five groundfish processors that process fish from Brookings and Newport, as well as Coos Bay. Fish landed in the community are processed in the community, as well as in Newport and Santa Rosa. Coos Bay/Charleston could benefit from initial allocation of IFQ to processors and processor linkages if it increases the likelihood that processing activity will remain in those ports.
- While catch landed in Coos Bay historically has been caught in high bycatch areas, this amount of catch does not constitute the majority. Therefore, it is likely that vessels originating in Coos Bay will adjust fishing practices to avoid bycatch, but the community is not likely to suffer as a result.
- As with other communities that have both a whiting and nonwhiting sector, establishing three or four trawl sectors may impact Coos Bay. If four trawl sectors are established, either shoreside sector may face difficulties prosecuting fishing activity if a species becomes unexpectedly constraining. Such difficulties may be felt in communities via a second-order effect on harvesters.

Brookings, Oregon

Brookings, located in Curry County, is the southernmost coastal city of Oregon. It is situated at the mouth of the Chetco River, approximately 345 miles south-southeast of Portland. According to the Port

of Brookings-Harbor, it is the busiest recreational port on the Oregon coast with more than 95,000 anglers taking more than 31,000 trips.

Brookings is not considered vulnerable. It is quite engaged in Pacific fisheries in general, and it is very dependent on groundfish, but it is also considered very resilient. Brookings depends heavily on the recreational salmon fishery, which was closed in 2008; therefore, it may be somewhat less resilient now than it was in the past.

Brookings is fairly removed from distribution networks. The fleet is characterized as relatively efficient because five vessels fall within the efficient category.

Effects of alternatives

- Brookings is a nonwhiting port, and would be affected by options affecting nonwhiting harvesters, but not by options impacting whiting harvesters.
- Brookings would benefit slightly from initial allocation. Of the three buyback history distribution options, Brookings benefits the most from the 87.5 percent to harvesters option.
- Brookings has no known processing facilities of trawl groundfish. Groundfish landed in Brookings are processed in Eureka, Santa Rosa, and Charleston. Brookings may not see any benefit from initial allocation of QSs to processors and processor linkages. In fact, such processing linkages and initial allocation may draw trawl activity away from Brookings if processors elect to put that activity into ports where processing plants are located.
- Brookings is not adjacent to areas with high bycatch and would, therefore, not be substantially affected by covering constraining species with IFQ.
- The establishment of four sectors may make it difficult for nonwhiting trawlers out of Brookings to acquire quota necessary to cover catch of some species if the catch of those species is higher than expected. Three trawl sectors would allow Brookings-based trawlers to trade quota with shoreside whiting trawlers, potentially alleviating these constraints.

Crescent City, California

Crescent City is in Del Norte County in northern California, approximately 330 miles south of Portland, Oregon, and 356 miles north of San Francisco. The Crescent City Harbor supports recreational and commercial fisheries, along with tourism. The harbor includes an ice plant, hoist, fuel supplier, boatyard, tackle shops, dry storage, marine supply store, vessel repair and maintenance, and other amenities.

The Groundfish Vessel Buyback Program and sales of other local vessels have removed many of the larger rent-paying vessels from the port. The absence of this revenue stream has reportedly caused an increase in rent. A new port master plan aims to attract shops and other business.

Crescent City is considered vulnerable. It is very engaged in Pacific fisheries in general, and it is quite dependent on groundfish, with medium resilience. In addition, Crescent City has been affected by the recent closure of the commercial and recreational salmon fishery.

Effects of alternatives

- Crescent City is a whiting and nonwhiting port and would be affected by options impacting both whiting and nonwhiting harvesters.

- Crescent City would receive an initial allocation that is less than average. Of the three buyback history distribution options, Crescent City benefits the most from the 75 percent to harvesters option.
- Crescent City has one processing facility that has engaged in minor quantities of trawl groundfish. Fish landed in Crescent City are also processed in Eureka, Fort Bragg, and San Francisco. Crescent City is fairly removed from distribution centers, but has several support businesses and infrastructure components.
- Crescent City scores in the negative category on several variables, but scores positively in bycatch dependency. The overall effect on Crescent City may depend on the relative importance of these variables. If bycatch dependency is the overall driving factor, then Crescent City may actually be at an advantage, even though it has a relatively inefficient fleet and relatively small amount of quota initially allocated to it.
- The establishment of three or four trawl sectors would affect Crescent City similarly to other ports engaged in both nonwhiting and whiting trawl fisheries. The establishment of four trawl sectors may make it difficult, in some instances, for harvesters to work around a species that has become unexpectedly constraining, while the establishment of three trawl sectors would allow harvesters in both shoreside trawl activities to trade quota, potentially alleviating this constraint.

Eureka, California

Eureka is the county seat of Humboldt County in northern California on Humboldt Bay south of Redwood National Park. San Francisco is 272.3 miles south. The economic base of Eureka was founded on fishing and timber. Commercial fishing has downsized in recent years, and now the major industries are tourism and timber. Eureka is located on Humboldt Bay, the only deep-water port between Coos Bay and San Francisco.

Eureka has one large processing facility engaged in trawl groundfish. This processor also processes fish landed in Bodega Bay, Brookings, Fort Bragg, San Francisco, and Crescent City. Fish landed in Eureka are also processed in Fort Bragg and Watsonville. Eureka's harbor facilities include berthing, dry storage, cold storage, a hoist, a boatyard, fuel facilities, ice, vessel repair and maintenance, electrical services, marine supplies, and other amenities.

Eureka is relatively removed from transportation networks and seafood distribution facilities.

Eureka is considered vulnerable. It is very engaged in Pacific fisheries in general, and it is very dependent on groundfish, with medium resilience. Like Crescent City, Eureka has been affected by the recent closure of the commercial and recreational salmon fishery.

Effects of alternatives

- Eureka is both a whiting and nonwhiting port, and would be affected by options impacting both whiting and nonwhiting harvesters.
- Eureka would receive more IFQs under the initial allocation options than the average allocated to all ports. Of the three buyback history distribution options, Eureka benefits the most from the 87.5 percent to harvesters option.
- Harvesters based in Eureka do not regularly trawl areas defined as high bycatch. Therefore, covering constraining overfished species with IFQ is not likely to have a substantial impact on Eureka.
- The establishment of three or four trawl sectors would affect Eureka similarly to other ports engaged in both nonwhiting and whiting trawl fisheries. The establishment of four trawl sectors

may make it difficult, in some instances, for harvesters to work around a species that has become unexpectedly constraining, while the establishment of three trawl sectors would allow harvesters in both shoreside trawl activities to trade quota, potentially alleviating this constraint.

Fort Bragg, California

Fort Bragg is in Mendocino County on northern California's Pacific Coast. The community is bordered on the north by Pudding Creek, which flows into the Pacific Ocean through a narrow inlet. Noyo Harbor is at the southern edge of the city. Noyo Bay provides a natural harbor and access to ocean fisheries.

Fishing has historically been, and remains, an important part of Fort Bragg's economy and community identity. Many boat owners offer private charter services for tourists and sport fishermen. In addition to salmon, commercial and recreational fishermen take rockfish, abalone, crabs, and mussels. Several festivals point to the city's dependence on fishing and logging. The city has two fish processors, a liquid fish fertilizer processing plant, and numerous businesses associated with fishing and coastal tourism. Harbor facilities include berthing, two hoists, dry storage, fuel, ice, marine supplies, vessel repair and maintenance, and other amenities.

Fort Bragg is considered vulnerable. It is very engaged in Pacific fisheries in general, and it is very dependent on groundfish, with medium resilience. As with other California and Oregon communities, Fort Bragg has been affected by the recent closure of the commercial and recreational salmon fishery.

Effects of alternatives

- Fort Bragg is a nonwhiting port, and would be affected by options impacting nonwhiting harvesters, but not by options impacting whiting harvesters.
- While there are several scores that appear to work in Fort Bragg's favor, this community does not score in the top bracket on any of the variables used for indicating how this community may fare under rationalization. In addition, Fort Bragg has a fleet comprised of inefficient vessels, though several vessels are near the efficient range.
- Fort Bragg would receive more IFQs under the initial allocation options than the average allocated to all ports. Of the three buyback history distribution options, Fort Bragg benefits the most from the 87.5 percent to harvesters option.
- Fort Bragg has one known processing facility engaged in trawl groundfish. This processor also processes fish from Eureka and San Francisco, while fish from Fort Bragg are also processed in Eureka and Santa Rosa. Fort Bragg is relatively close to the distribution centers in San Francisco.
- Fort Bragg's vessels do not appear to rely on fishing grounds with a relatively high bycatch of constraining overfished stocks. Therefore, covering constraining overfished species with IFQs is not expected to substantially affect Fort Bragg.
- The three or four sector issue would not impact Fort Bragg differently than other nonwhiting communities, at least to a degree that can be identified at this time.

San Francisco, California

San Francisco is located on the San Francisco Peninsula. A large and diverse city, San Francisco still has active commercial and recreational fisheries. San Francisco-area fisheries, like many west coast fisheries, fluctuate depending on fisheries management decisions, ocean and weather cycles, and economic factors. Fishermen's Wharf is the traditional home of the fishing fleet and still serves commercial fishermen, although to a lesser extent than in the past; it is now primarily a tourist

attraction. The Port of San Francisco provides berthing for commercial fishing boats at Fisherman's Wharf. The port offers full service ship repair, two dry docks, fuel, ice and other supplies, and numerous portside facilities. Additionally, the wharf's Pier 45 houses the west coast's largest concentration of commercial fish processors and distributors. It is port policy that commercial fishing vessels have top priority for berths at the harbor. Many of the fishermen in the wharf community are not San Francisco residents due to San Francisco's high cost of living. Fishermen live in the nearby communities of East Bay, South Bay, Sonoma, Peninsula, and others.

San Francisco is not considered vulnerable. It is very engaged in Pacific fisheries in general, and its fisheries are quite dependent on groundfish, but it has very high resilience.

Effects of alternatives

- San Francisco is a nonwhiting port and would be affected by options impacting nonwhiting harvesters, but not by options affecting whiting harvesters.
- San Francisco would receive more IFQ through the initial allocation than the average allocated to all ports. Of the three buyback history distribution options, San Francisco benefits the most from the 100 percent to harvesters option.
- San Francisco has at least six processors engaged in trawl groundfish. These processors process fish from several ports in California. San Francisco has a relatively developed port and harbor infrastructure. San Francisco is one of the primary distribution centers on the west coast, meaning fishing-based activity may remain in this port under rationalized conditions.
- Vessels based in San Francisco are defined as inefficient, meaning fleet consolidation may remove trawl fishing activity from this port.
- Vessels based in San Francisco have historically fished in areas with a relatively high rate of overfished species bycatch. Therefore, covering overfished species with IFQs may negatively impact San Francisco-based trawlers.
- The three or four sector issue would not impact San Francisco differently than other nonwhiting communities, at least to a degree that can be identified at this time.

Moss Landing, California

Moss Landing is in Monterey County on the eastern shore of Monterey Bay at the mouth of Elkhorn Slough. The community is 25.4 miles south of Santa Cruz and 95.8 miles south of San Francisco.

Fisheries in Moss Landing traditionally targeted sardines and other CPS species. After the sardine population collapsed, fishermen and buyers shifted their focus to anchovies, mackerel, and squid. Over time, fisheries for groundfish, halibut, spot prawn, crab, salmon, albacore, and other species developed at Moss Landing. Today Moss Landing Harbor is one of the largest commercial fishing ports in California. In 2001, it ranked third in pounds landed behind the Los Angeles and Ventura/Port Hueneme/Oxnard Harbor complexes and fourth in ex-vessel revenues behind the San Francisco Bay area. Moss Landing Harbor, Woodward's Marine (a small supply/tackle store and fuel dock), a boatyard with travelift, a marine electrician, a marine diesel mechanic, a marine covers/upholstery shop, and a metal fabricator/welder provide fishing-related goods and services. Fish landed in Moss Landing are processed in San Francisco, Santa Rosa, Watsonville, and Hawaiian Gardens.

Moss Landing's economy is now based on commercial fishing, research, and recreation and tourism.

Moss Landing is considered vulnerable. It is quite engaged in Pacific fisheries in general, and it is somewhat dependent on groundfish. It has very low resilience.

Effects of alternatives

- Moss Landing is a nonwhiting port and would be affected by options impacting nonwhiting harvesters, but not by options impacting whiting harvesters.
- Moss Landing would receive more IFQ during initial allocation than the average allocated to all ports. Of the three buyback history distribution options, Moss Landing benefits the most from the 100 percent to harvesters option.
- Because Moss Landing has no permanent processors of trawl groundfish, it may experience a reduction in landings if processors are allocated quota. This is because it is likely that processors with quota will adjust operations so that ports where processing plants already exist have more landings.
- The fleet based at Moss Landing is considered inefficient, meaning fleet consolidation may remove trawl fishing activity from this port.
- Vessels from Moss Landing have historically fished in areas defined as relatively high bycatch. Therefore, managing overfished species with IFQ may negatively impact Moss Landing.
- The three or four sector issue would not impact Moss Landing differently than other nonwhiting communities, at least to a degree that can be identified at this time.
- Moss Landing might benefit from area management, since the gradual shift of trawl activity from south to north would be halted.

Princeton/Half Moon Bay, California

Princeton, also known as Princeton-by-the-Sea, is one of several unincorporated coastal communities south of San Francisco. It is 25 miles south of San Francisco and 44 miles northwest of San Jose. Half Moon Bay is located nearby. Princeton generally serves as the port for Half Moon Bay.

Neither Princeton nor Half Moon Bay is considered vulnerable. As their relatively high median household income shows, both are quite well off, though Princeton also has a high percentage of residents whose income is below poverty level. Both communities' dependence on the groundfish fishery is low, and both are highly resilient.

Originally envisioned as an ocean resort, Princeton is now known principally for its harbor, Pillar Point. The land adjacent to Pillar Point is primarily industrial for boatbuilding and other marine-related industries. Pillar Point is a working fishing harbor with 369 berths. The harbor was constructed in 1961, and the inner breakwater was added in 1982. Pillar Point offers a modern fish dock, six-lane boat launch ramp, ice-making facility, and serves as a fish-buying hub for local commercial vessels.

Effects of alternatives

- Princeton/Half Moon Bay is a nonwhiting port and would be affected by options affecting nonwhiting harvesters, but not by options impacting whiting harvesters.
- The amount of IFQ allocated to entities active in the Princeton/Half Moon Bay area may be higher or lower than average, depending on the initial allocation formula. Of the three buyback history distribution options, Princeton/Half Moon Bay benefits the most from the 87.5 percent to harvesters option.
- Princeton and Half Moon Bay are located near a high bycatch area (94.7 percent of nonwhiting trawl catch occurs in an area identified as a high bycatch area; the species of concern are cowcod and bocaccio). Therefore, management of overfished stocks with IFQ may negatively impact Princeton/Half Moon Bay.

- Vessels in Half Moon Bay are relatively inefficient, and therefore fleet consolidation may remove vessels from this port. However, the presence of shore-based infrastructure may make up for the burden created by constraining bycatch species and vessel inefficiency.
- Together, Princeton and Half Moon Bay have three processing facilities engaged in trawl groundfish, so these communities could benefit from processor allocations. These processors also process groundfish from Santa Cruz and Vallejo. Groundfish landed in Princeton/Half Moon Bay are also processed in Hawaiian Gardens, Santa Rosa, and El Granada.
- The three or four sector issue would not impact Princeton/Half Moon Bay differently than other nonwhiting communities, at least to a degree that can be identified at this time.
- Princeton/Half Moon Bay might benefit from area management, since the gradual shift of trawl activity from south to north would be halted.

Morro Bay, California

Morro Bay is considered vulnerable. It is quite engaged in Pacific fisheries in general, and it is very dependent on groundfish, but it also is very resilient.

In 2006, The Nature Conservancy purchased six Federal trawling permits and four trawling vessels from commercial fishermen in Morro Bay. In addition to the six permits, the Conservancy purchased four trawling vessels and is exploring alternative uses for them. One vessel associated with the acquired trawling permits remains with its current owner, who holds permits for other types of fishing, but is not trawling at this time. The vessel is legally constrained from bottom trawling for groundfish in the future. Any fisherman who sells his or her permit to the Conservancy cannot reenter the trawl groundfish fishery.

There are currently no trawlers operating out of Morro Bay. For now, all but one of The Nature Conservancy permits are inactive. In the future, however, it may lease back permits to central coast fishermen who would use more selective gear; Morro Bay fishermen will be given preference for using these permits. Therefore, it is impossible to predict how efficient Morro Bay's future fleet may be, though The Nature Conservancy materials suggest it is unlikely that much trawling will take place there.

Groundfish landed in Morro Bay are processed in Atascadero (15 miles away), San Francisco, Watsonville, and Port San Luis/Avila. The town is relatively removed from distribution facilities, but infrastructure exists in the harbor area to support commercial fishing operations.

Effects of alternatives

- Morro Bay is a nonwhiting port and would be affected by options affecting nonwhiting harvesters, but not by options impacting whiting harvesters.
- Morro Bay would receive less during initial allocation of IFQs than the average allocated to all ports. Of the three buyback history distribution options, Morro Bay benefits the most from the 75 percent to harvesters option.
- Since Morro Bay is a nonwhiting port, it would not be significantly affected by decisions relating to co-ops.
- The three or four sector issue would not impact Morro Bay differently than other nonwhiting communities, at least to a degree that can be identified at this time.
- Morro Bay might benefit from area management, since the gradual shift of trawl activity from south to north would be halted.

4.14.6 Cumulative Effects on Communities

Cumulative impacts are a combination of baseline conditions, RFFAs, ongoing trends, and the proposed action. Due to the complexity of the alternatives and the number of communities impacted, it is impossible to predict cumulative impacts from every potential event and trend, for every community, under every alternative. The potential impacts of rationalization were discussed in detail above and are summarized, along with a brief summary of cumulative impacts for each community, in

Table 4-71 (below). This discussion presents a general narrative of how past and present management actions have affected communities, and how RFFAs and trends are expected to affect communities along the west coast. In accord with Table 4-66, we focus on economic changes (changes in the amount of trawl vessel activity, in crew wages and number of crew jobs, in the relationships between crew and captains, in the level of processing activity, in the number of processing jobs and in the seasonality of processing jobs), social/cultural changes, and physical changes (changes in municipal revenues and community stability; infrastructure impacts).

Every management action affecting the viability of fish harvesters and processors also affects communities. To simplify this analysis and reduce repetitiveness, the reader is asked to refer to previous sections on cumulative impacts related to trawl harvesters, crewmembers, and processors.

Chapter 3 lists past, present, and RFFAs. Many of these have become part of the status quo, which will effectively be replaced by trawl rationalization, should it be implemented. Of the RFFAs listed in Chapter 3, those that have affected communities in the past and that are most likely to affect communities in the future include the following:

- Implementation of rebuilding plans
- Bycatch reduction and monitoring (observers, VMS)
- Trawl vessel buyback program
- Limited entry
- EFH designation and implementation
- MPA implementation
- Development and implementation of CFAs

Chapter 3 also lists past, present, and reasonably foreseeable future trends. The trends that seem most likely to impact communities include the following:

- Changes in the use of ocean areas
- Changes in coastal economies and land use
- Profitability of fishing and processing enterprises (including increased demand for protein, changes in production costs, and increased consumer awareness affecting purchasing decisions)
- Rebuilding of overfished species
- Cyclical and continuing climate change

4.14.6.1 Discussion of RFFAs and Trends

Overall, the trawl industry is becoming more controlled, monitored, clean, streamlined, and small. Figures 4-5 through 4-9 show the decline in the number of trawl vessels home-ported in west coast communities between 1994 and 2007, including those in communities that are no longer the site of trawl activity. Managers have recently implemented, or are proposing, a number of actions—including trawl rationalization—that will continue this trend. From a community perspective, this means that fewer communities will benefit from trawl activity, while those that do benefit should see a long-term improvement in the viability of their smaller, but more profitable, trawl fleet.

Due to the need to rebuild overfished stocks and meet the mandates of the SFA, the trawl fishery has been subject to increasingly stringent restrictions since the 1980s, beginning with LE in 1992. Prior to

LE, there were between 337 and 469 trawl vessels making landings on the west coast.[112] The LE program resulted in the creation of approximately 260 trawl permits.

In December 2003, a buyback program permanently retired 91 of the remaining permits, roughly 35 percent of the total. The buyback generally increased revenue per vessel, although these effects varied by region. Some ports lost a disproportionate share of their trawl fleet, while others lost relatively few vessels. Figure 4-55 through Figure 4-59 demonstrate the effect of the buyback on the number of vessels home-ported in each community. The buyback had the greatest impact on California ports; the number of trawl vessels landing in the major trawl ports of Eureka, Crescent City, and Avila declined by 50 percent or more.

As of 2008, there were 178 LE trawl permits remaining on the west coast (PFMC 2008c). The long-term decline in the number of trawl vessels, and later permits, led to complete cessation of trawl activity in many communities (such as Aberdeen and Chinook, Washington; Garibaldi, Oregon; and Bodega Bay, California) and a sharp decline in trawl activity in others. Some communities, particularly Astoria, Newport, and Coos Bay, retained active trawling and processing industries and now stand to benefit from trawl rationalization. The following figures show the declining number of LE trawl vessels that were principally ported in Washington, Oregon, and California communities between 1994 and 2007. Communities with currently active trawl fleets, and those whose trawl fleet has disappeared, are included.

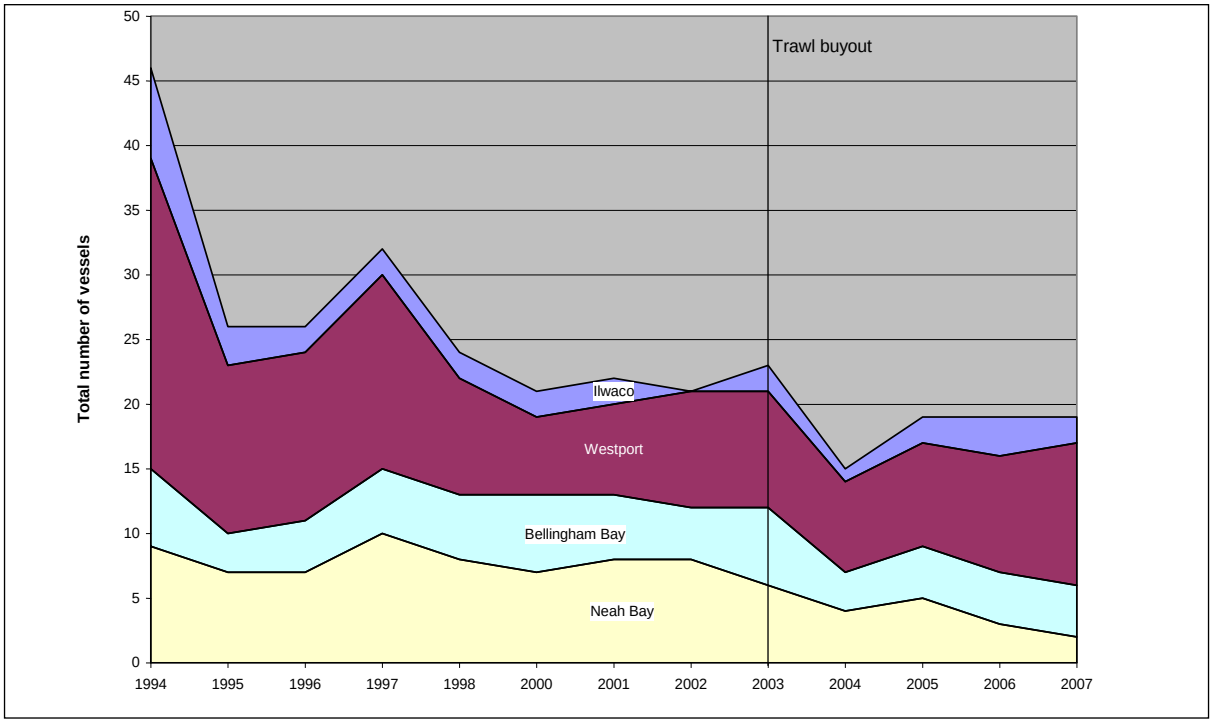


Figure 4-55. Limited entry trawl vessels principally ported in currently active Washington trawl communities, 1994—2007 (1999 data missing). (Figures 4-5 through 4-9 based on PacFIN data).

[112] That is, 337 vessels making at least one landing in 1987, and 469 making at least one landing between a window from 1984 to 1988 (PFMC 1992).

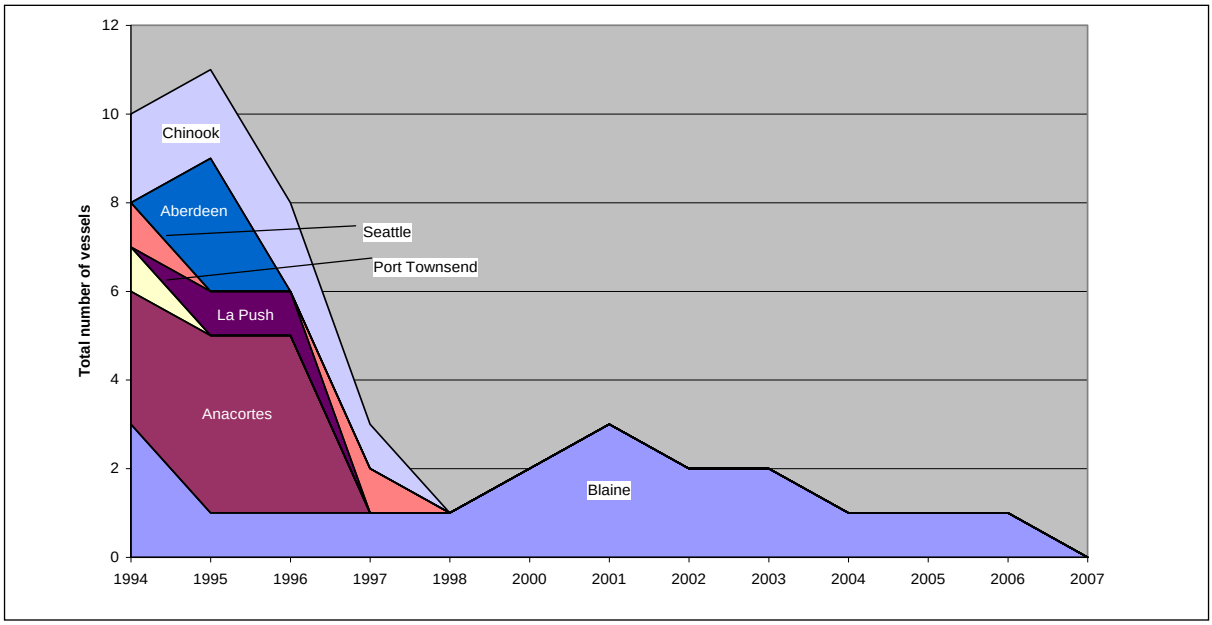


Figure 4-56. Limited entry trawl vessels principally ported in currently inactive Washington trawl communities, 1994—2007 (1999 data missing).

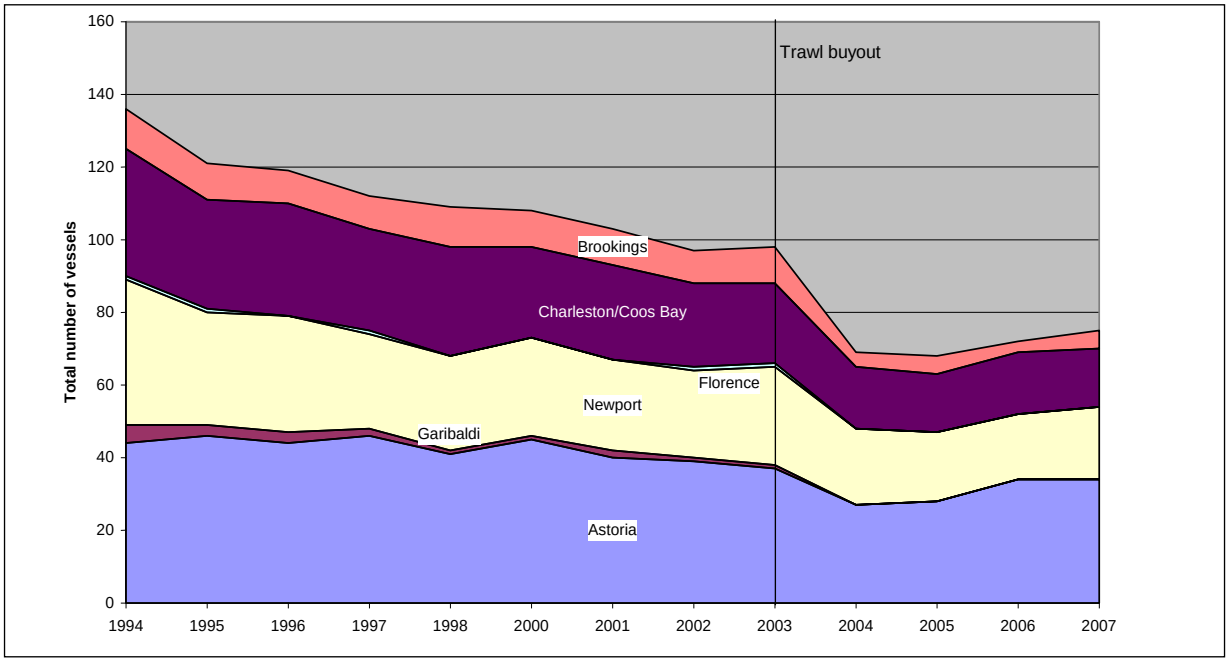


Figure 4-57. Limited entry trawl vessels principally ported in Oregon trawl communities (currently active and inactive), 1994—2007 (1999 data missing).

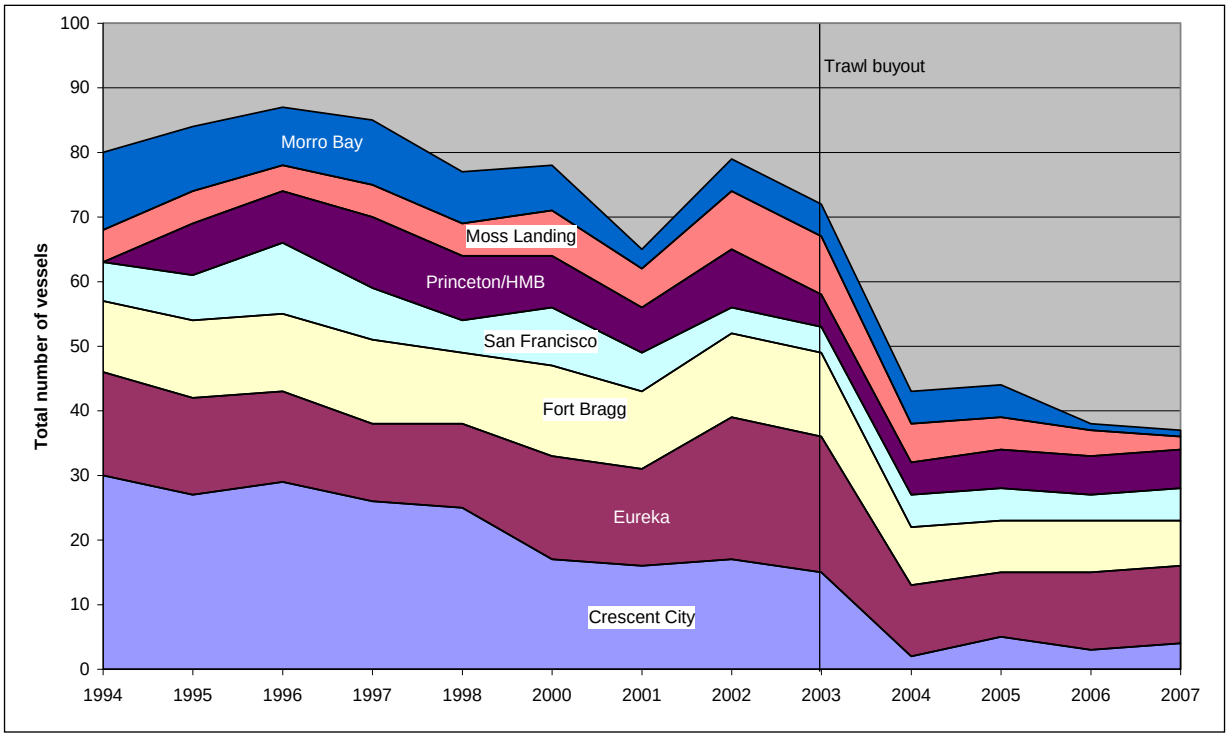


Figure 4-58. Limited entry trawl vessels principally ported in currently active California trawl communities, 1994—2007 (1999 data missing).

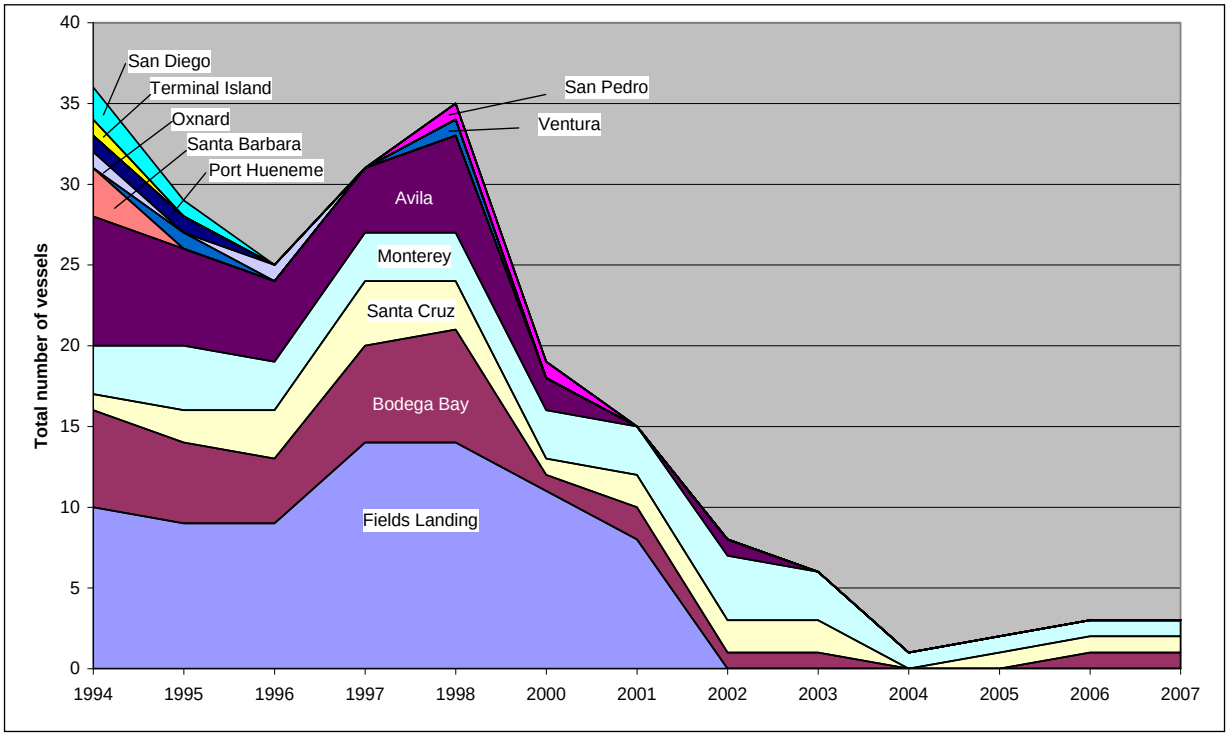


Figure 4-59. Limited entry trawl vessels principally ported in currently inactive California trawl communities, 1994—2007 (1999 data missing).

Since 2000, the management of west coast groundfish fisheries has been heavily centered on the need to rebuild overfished groundfish species. Rebuilding plans have been implemented for nine overfished groundfish species (two of which have subsequently rebuilt), resulting in depth-based closures, gear restrictions, and other regulations that limited the profitability of fishing operations. Communities in the north, where more trawlers were located and, coincidentally, where the closed areas were larger, were especially hard hit. The negative assessment of fishing community stability described in Section 4.1.4.1 derives in large part from restrictions created by rebuilding plans, combined with other long-term fishery restrictions. When overfished stocks are rebuilt, some of these restrictions will be lifted, allowing the fishery to become more profitable. However, rebuilding is a long-term process and may be complicated by factors such as climate change. In the short term, both widow rockfish and Pacific ocean perch are likely to be rebuilt by 2017, benefiting the whiting fishery and deepwater trawlers in Washington and Oregon. Later, bocaccio, canary rockfish and darkblotched rockfish are expected to be rebuilt by 2028. The rebuilding of bocaccio will benefit Fort Bragg and points south; canary rockfish will benefit communities in Washington and Oregon, and to a lesser extent communities south of Fort Bragg (apart from Morro Bay); and the rebuilding of darkblotched rockfish will primarily benefit deepwater trawlers in Washington and Oregon. Much later, cowcod and yelloweye are expected to be rebuilt by 2084 (or 2098 at the latest, given current knowledge). The rebuilding of cowcod will benefit trawlers in Monterey, Moss Landing, Princeton/Half Moon Bay, San Francisco, and Morro Bay. Yelloweye are generally not caught by the trawl fishery, but rebuilding of yelloweye will benefit fixed-gear fishing communities (including all of the communities identified as trawl communities) in Washington, Oregon, and northern California.

In addition to the depth-based closures to protect overfished stocks, both state and Federal MPAs have been put in place during recent years, particular in California. Although not all MPAs are no-take zones, trawlers in communities near some MPAs may have to shift their effort to other locations. The California MLPA process has created a cluster of MPAs near Santa Cruz, Monterey, and Morro Bay in central California, most of which allow no commercial take. The MLPA process is now focusing on proposed MPAs in north central California, from Pigeon Point to Point Arena. In 2008 and 2009, the MLPA process moves on to the south coast (Point Conception to the California/Mexico border) and then to San Francisco Bay. In addition to the MLPA areas, MPAs have also been designated, or are being considered, in National Marine Sanctuaries along the west coast. Finally, the designation of EFH areas in 2006 closed more areas to trawling, including 34 bottom trawl closed areas in Washington, Oregon and California and a bottom trawl footprint closure that closes areas in the EEZ between 1,280 meters (700 fathoms) and 3,500 meters (1,094 fathoms). A five-year-review of EFH will occur in 2011 and may create new closures or, alternatively, open up areas that were previously closed.

In conjunction with these area closures, trawlers have been required to purchase new VMSs, reducing their profitability. In addition to VMS, trawl rationalization will likely require harvesters to carry and pay for additional observation systems, such as human observers or cameras, leading to increased operational costs. Although bycatch reduction and monitoring will have a long-term positive impact by allowing the fishery to be more sustainable, the financial burden of meeting these requirements may be a hardship for financially stressed trawlers.

Overall, revenues in the nonwhiting fishery have declined through time, leading to the depressed status of many trawl harvesters remaining in the fishery. A severe recession in 2008 and 2009 is affecting all sectors of the economy. Changes in production costs have made it more expensive to harvest and process fish, and are likely to continue doing so. Fuel and steel are expected to become more expensive. Such high costs may cause harvesters to target more valuable fish to recoup their investment. It may also put pressure on owners to reduce wages further for captains and crew. In the late 1990s and early 2000s, many nonwhiting trawl harvesters found it difficult to generate enough revenue to pay crew; vessel owners crewed for other vessel owners, and vice-versa. At the same time, the whiting fishery

experienced a temporary decline when whiting was listed as overfished, and processing methods underwent a change. From a community perspective, the recent closure of the salmon fishery has posed a hardship to both commercial and recreational fishing businesses, particularly those in northern California and Oregon (Astoria, Newport, Coos Bay, Brookings, Crescent City, Eureka, and Fort Bragg). In many communities where fishing was once a primary activity, it is now overshadowed, from an economic standpoint, by other activities.

Above, we discussed long-term management actions that will affect trawl communities. Even apart from changes in the fishing industry, west coast fishing communities are undergoing considerable economic and social change. North of San Francisco, this change has been driven by a decline in the natural resource-based economy (including fisheries, timber, and agriculture). Many communities in Washington, Oregon, and northern California are still recovering from timber cutbacks in the 1980s and 1990s. According to the Oregon Historical Society, the following occurred:

> In October 1979, the bottom fell out of the wood-products market, and over the next three years lumber prices dropped more than 48 percent. The recession of the early 1980s was a nationwide phenomenon that hit resource-dependent communities — which covers just about every community along the coast — particularly hard. A wave of mill closures left many workers jobless, and in some coastal towns the unemployment rate topped 25 percent. The effects of the shutdowns rippled through communities, bringing hard times to retailers and other businesses, slashing local tax revenues, and starving community-service organizations. … (Wells 2008)

Against the background of this fundamental economic and social change, communities are also experiencing demographic change. Trawl communities in Oregon and Washington are experiencing population growth, while some trawl communities in California are losing population. In Washington, Westport grew 18 percent between 2000 and 2007 (U.S. Census data). In the same period, Anacortes and Bellingham each grew 14 percent, while Ilwaco and Seattle grew by 5 percent. Data were not available for Neah Bay. In Oregon, Brookings grew by 13 percent, Warrenton grew by 9 percent, Newport grew by 4 percent, Coos Bay grew by 3 percent, and Astoria grew by 1 percent. Several California communities actually lost population. Crescent City grew the most at 5 percent, and Half Moon Bay by 4 percent (no data were available for Princeton); meanwhile, Eureka and Fort Bragg both shrank by 3 percent; San Francisco by 2 percent, and Morro Bay by 1 percent. No data were available for Moss Landing. Table 4-65 shows population changes since between 2000 and 2007 in coastal counties. Although the coastal population in some California communities has lessened, coastal density in California's coastal areas grew from 270 people per square mile in 1980 to 419 people per square mile in 2008 (NOAA). Many of these areas are highly urbanized.

The following table shows changes in population in coastal counties since 2000 (from Census Bureau data):

Table 4-70. Population change in coastal counties, 2000-07.

County	Trawl Communities	Population Change Since 2000
Whatcom (WA)	Bellingham	15.7
Anacortes (WA)	Anacortes (at-sea only)	13
King (WA)	Seattle (at-sea only)	7
Clallam (WA)	Neah Bay	9.8
Grays Harbor (WA)	Westport	6.2
Pacific (WA)	Ilwaco	2.4
Clatsop (OR)	Astoria, Warrenton	4.9
Lincoln (OR)	Newport	3.1
Coos (OR)	Coos Bay, Charleston	1.1
Curry (OR)	Brookings	3
Del Norte (CA)	Crescent City	5.5
Humboldt (CA)	Eureka	1.9
Mendocino (CA)	Fort Bragg	No change
San Francisco (CA)	San Francisco	-1.5
Monterey (CA)	Moss Landing	1.5
San Mateo (CA)	Princeton/Half Moon Bay	No change
San Luis Obispo (CA)	Morro Bay	6.4

Census data also shows that the coastal population is aging. Some of this aging is driven by outmigration of young adults; some by inmigration of older adults, including retirees; and some by the natural aging of the American population, which can be seen in Figure 4-60 through Figure 4-62. In Oregon and Washington, residents of coastal counties tend to be older than the state at large. In Washington, Pacific and Clallam Counties (locations of Ilwaco and Neah Bay, respectively) have older residents than the state average. In contrast, Whatcom County has a slightly younger population, probably due to Western Washington University, which has more than 13,000 students located there.

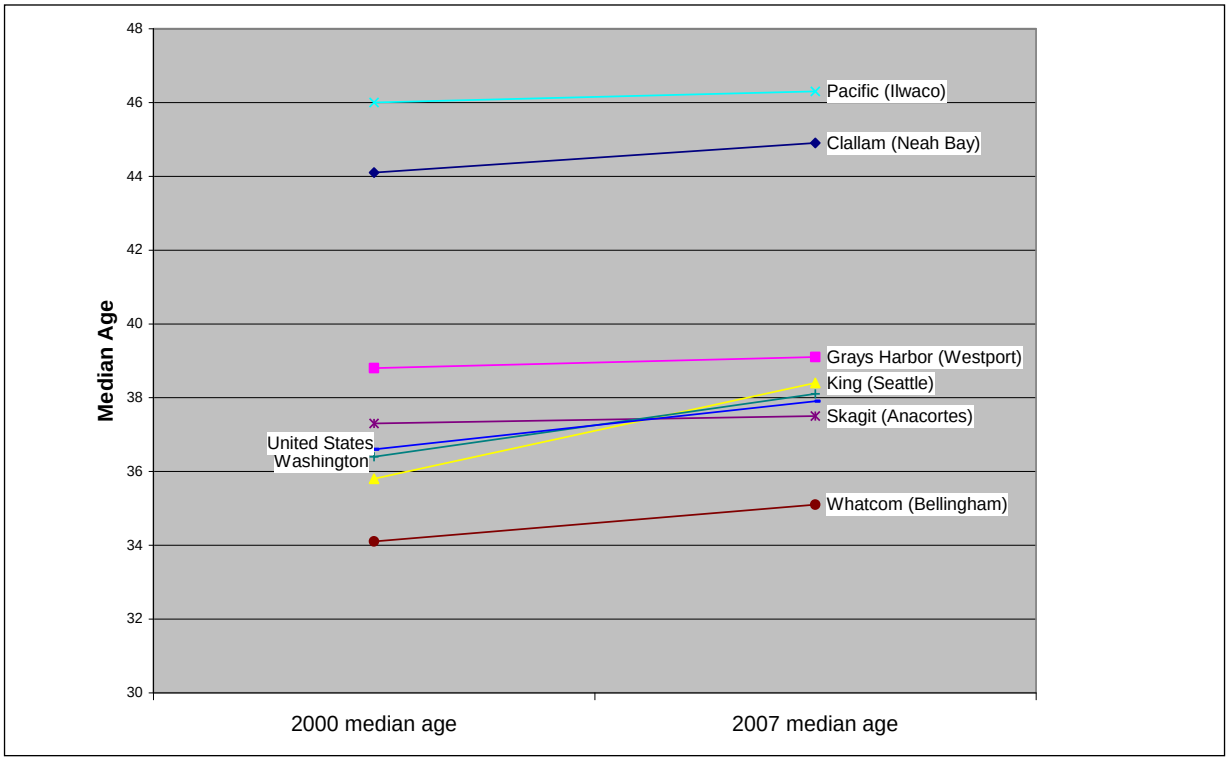


Figure 4-60. Growth in median age in Washington coastal counties.

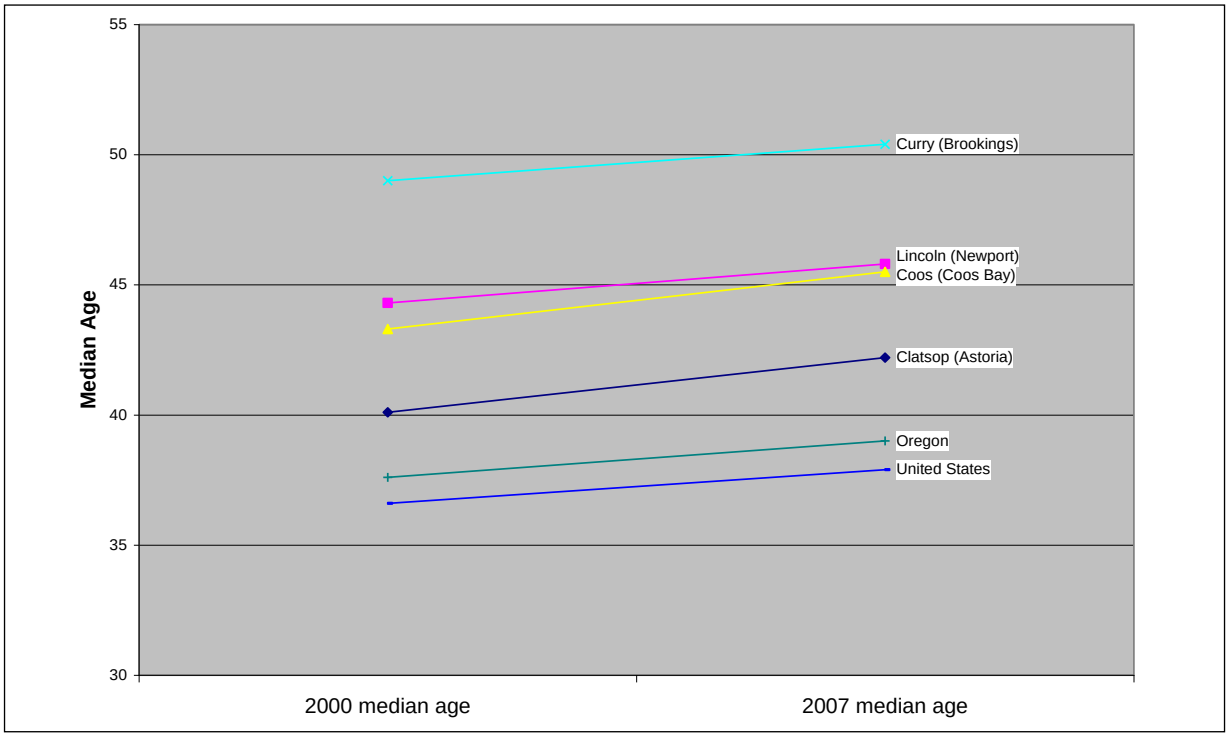


Figure 4-61. Growth in median age in Oregon coastal counties.

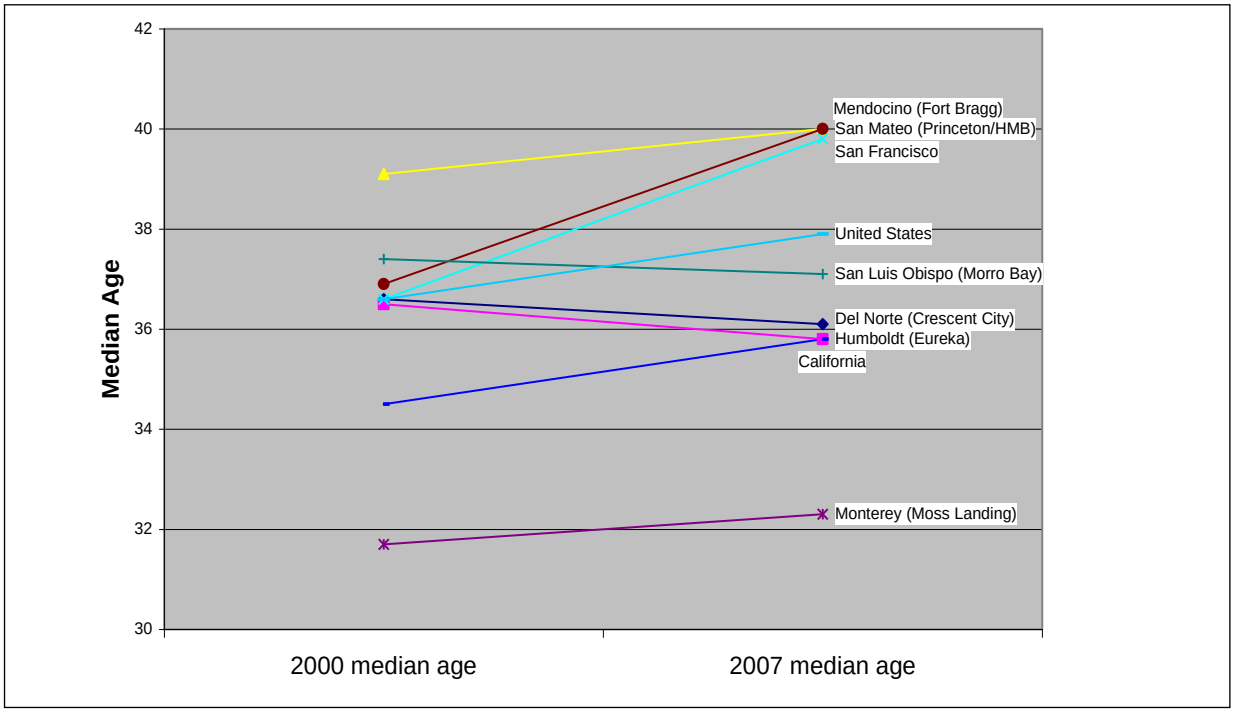


Figure 4-62. Change in median age in coastal California counties.

In Oregon, one-third of coastal residents are over the age of 55 (U.S. Census Bureau). Curry County (location of Brookings) has the oldest population among the coastal trawl communities, averaging more than 50 years old. Brookings, which is known as the "banana belt" of Oregon, has attracted large

numbers of retirees; as noted above, its population grew 13 percent between 2000 and 2007. Other Oregon coastal counties also show aging populations.

The aging of the coastal population may represent an increased burden on coastal communities. As the retired population increases relative to the working population, the social system is put under economic and political pressure (Gavrilov and Heuveline 2003). A study of the implications of aging populations on rural communities (Rogers 2000) notes that "the number of persons at risk of disability and chronic conditions increases, creating a greater need for medical, rehabilitative, and social services. Low-density, sparsely populated non metro communities are limited in their ability" to provide these services (2000). In addition, "poverty rates of older non metro residents are higher than those of metro residents, a disparity that is even more pronounced among the oldest old (age 85 and older)" (2000:2). Since older citizens pay less state and local tax as a percentage of their income (Childress 2001), the increased cost of caring for the elderly also comes with a decrease in community revenues, particularly if there is outmigration of younger, tax-paying workers.

In California, the population picture is more complex. The average population in California is younger than that for the United States as a whole (whereas Oregon is older, and Washington is almost the same). The population in Monterey County (Moss Landing) is still younger—around 32 years old. Average ages in San Luis Obispo County (Morro Bay), Del Norte County (Crescent City), and Humboldt County (Eureka) are actually declining, while populations in Mendocino County (Fort Bragg) and San Francisco County (San Francisco) are aging at a faster rate than the rest of the state. California's demographics are complicated by the large immigrant population (with faster or slower growth rates for different ethnic groups); an increasingly high cost of living in certain areas (which may explain the older populations in San Francisco and Princeton/Half Moon Bay); increasing numbers of retirees as baby boomers age; and increasing out-migration caused in part by the high cost of living (Myers, *et al.* 2005).

In California, and to a lesser extent in Oregon and Washington, fishing communities are experiencing gentrification, or the displacement of traditional fishing infrastructure with nonfishing-related businesses and activities. Hall-Arber et al. (2001, pp. 112-113) writes the following:

> "Gentrification… of a fishing community implies a shift in power from the working men and women of the fishing industry to 'those from away,' those in white-collar jobs, or tourist (service) industries, and/or those who do not value the reality of a working waterfront. When intense external capital flow comes into a community, it necessarily increases the vulnerability of existing total capital networks. Traditions—existing ways of working, socializing, sharing, learning, and extracting economic capital—are lost or weakened as new, often mono-cultural, patterns come to dominate. Boat owners stop sharing fish at the dock, and banks stop giving loans to the fishing industry. More frequently, land use patterns change, shoreline property prices inflate and the fishing industry is displaced, with less access to the waterfront… Such external influences can engulf and transform unique fishing cultures and communities following the natural resource way of life."

Although gentrification can contribute to the loss of fishing activity, it can also encourage residents to safeguard and celebrate their fishing heritage. National studies show that there is a growing demand for heritage-based tourism among travelers in the United States (Claesson, *et al.* 2005). Festivals such as the Blessing of the Fleet or local seafood festivals attract tourists to waterfront areas. In some cases, such activities may eventually supplant actual fishing activities. On the east coast, researchers found that "Seacoast fishermen surveyed … revealed that historical/cultural preservation was more important to

them than restoration of wild fish stocks, indicating a stronger concern for preservation of a traditional way of life than for preservation of a food source" (Claesson, *et al.* 2005).

Many of the trawl communities analyzed here rely heavily on tourism. However, as the Oregon Historical Society notes (Oregon Historical Society 2008) the following:

> Although it opens entrepreneurial opportunities, tourism generates mostly low-wage, part-time, unskilled jobs. It depends on an economy of surplus somewhere else, in which people have leisure time, money, and gasoline to spend, and so it is as vulnerable to boom-and-bust cycles as timber ever was. On a less tangible level, tourism forces year-round residents of the coast to be touts and hawkers of their own homeland, panderers to strangers.

Coastal economies will continue to change. As the population ages, retiring baby boomers will likely contribute to increased housing demand in coastal communities. Tourism may also increase (or decrease) as rising fuel prices change peoples' destination plans and encourage them to vacation closer to home.

Rising fuel prices are linked to increased public concern about energy dependence. In the last three years, interest has grown in alternative energy (wave energy, tidal energy, and wind power) off the west coast. The number of proposals varies, but generally exceeds 20 for the three coastal states. Because of the nature of currents and wave activity off the Pacific Northwest, the Washington and Oregon coastlines are thought to have the best wave energy development potential in the United States (Renewable Northwest Project 2007). Such projects could lead to additional closed areas and will likely have other, currently unknowable, effects on fisheries and habitats. At the same time, they could bring new employment and new industries to coastal areas, possibly revitalizing coastal communities that are undergoing the long-term transition from a timber and fishing economy. Recent proposals to renew offshore oil drilling activities could also affect fishing activity off the west coast in the long term.

Other nonfishing activities, such as the laying of underwater fiber-optic cables, could further disrupt fishing activity, either temporarily or permanently. In Section 4.6.4, we note that harvesters will be more able to respond to these impacts under rationalization than they would under status quo management. Under a rationalized system, harvesters will be more able to move or transfer harvest privileges to another harvester, adapting to new conditions fairly readily, while maintaining fishing activity. Although harvesters could move and adapt under the status quo, the individual accountability aspects of rationalization will allow them to adapt in more creative ways that are more favorable to their operations.

Other external trends could influence groundfish trawlers and trawl communities. One such trend is an increasing consumer awareness of the ecological impacts of fish consumption. The Monterey Bay Aquarium, Environmental Defense and other nonprofits have developed seafood guides that describe the eco-friendliness of various seafoods. Some grocery stores and restaurants are already using these guides to encourage customers to make sustainable choices. This may affect the marketability of trawl-caught seafood, which is often described as unsustainable or deserving of caution due to the environmental impacts of trawling (Duchene 2004). When combined with rationalization, this may lead to increasing numbers of trawlers switching to nontrawl gear. The effect of this switch on revenues is unclear, since the amount of fish landed would be expected to decline, while the price of such fish would be expected to increase. Likewise, the demand for fish protein is expected to increase (Tidwell and Allan 2001). However, if gear switching occurs, it may impact the number of crewmembers per vessel, the need for crew to learn new skills, and the need to fish in new places; this could subsequently affect communities in both positive and negative ways.

Two further, unpredictable, factors should be noted. First is the possibility of a stock being declared as overfished, or stock unexpectedly rebuilding before scheduled. If a stock becomes overfished and a lower OY is implemented, harvesters are likely to see lower revenues, while the inverse is true if a stock is declared rebuilt. Second, cyclical and continuing climate change will affect stock productivity in the northeast Pacific. Cyclical events include ENSO and the PDO. Both events have been linked to changes in the relative productivity of different marine organisms, affecting ecosystem components on the regional scale (California Current ecosystem). These changes, in turn, affect the abundance of fishery resources. Global climate change, with its associated ecosystem impacts (including ocean acidification, increased dead zones and severe weather events) could potentially lead to permanent changes in stock structure and productivity. If groundfish migration patterns change substantially, harvesters could find it difficult to make informed decisions about fishing location, increasing cost and effort for harvesters and compromising stocks in those locations. This could, in turn, have severe impacts on communities if stocks move substantially, or if productivity of coastal ecosystems changes in such a way that a local fishery is not possible. At this time, not enough is known about climate change to be able to predict these impacts in an informed way.

Although the AMP is described as part of the proposed action, trailing actions will occur to further define the program and implement it. For that reason, it may also be considered an RFFA. One of the goals of the AMP is to assist communities that may be adversely affected by rationalization. Even though the specifics of the AMP have not been developed, some guiding principles, goals, and objectives have been developed that can be used to inform the likely effects of the AMP on communities. The fact that the AMP will allocate QPs in a formulaic fashion means that it is likely that some entities may receive those QPs based on criteria that can be measured, such as past catch history (in the case of a vessel), or past purchasing history (in the case of a processor). One example for how the AMP may work is to allocate those AMP pounds to catcher vessels or processors in a community, conditional on the basis that they agree to use those pounds in a manner that benefits that community. While this does not guarantee the continued presence of fishing activity in a particular port, it provides an incentive for fishery participants to continue activity in communities or ports that the Council deems have been adversely affected by rationalization.

Community fishing associations, or CFAs, could help communities that may be adversely affected by rationalization. CFAs are currently being tested under an EFP in the Morro Bay area. A CFA can generally be described as a community-based entity with special privileges and responsibilities designed to operate for the benefit of communities. CFAs, if explicitly allowed, would have higher accumulation limits than other quota-owning entities, but would also have unique standards placed upon them in order to be allowed to hold QSs at those higher limits. A CFA could acquire QSs through divestiture, QPs through the AMP, or direct transfer from another entity.

Some of the potential benefits of CFAs include ensuring access to the fishery resource in a particular area or community to benefit the local fishing economy, enabling the formation of risk pools and sharing monitoring and other costs, ensuring that fish delivered to a local area will benefit local processors and businesses, providing a local source of QSs for new entrants and others wanting to increase their participation in the fishery, increasing local accountability and responsibility for the resource, and benefiting other providers and users of local fishery infrastructure (The Nature Conservancy comments on Agenda Item F.4.a, Attachment 2, April 2009). The development of CFAs could have a positive impact on the culture of fishing communities. Although little research has been done on the effect of CFAs on culture, it seems likely that CFAs could strengthen a community's cultural associations with fishing by contributing to a unique sense of identity, increasing accountability for both natural and cultural resources, and building and strengthening connections among community members.

To summarize, rationalization is scheduled to take place after a long period of economic change and economic decline in west coast fishing communities. Changing demographics, changing public values regarding fisheries and fishery management, the increased number of areas closed to fishing, community gentrification, and the unknown factor of global climate change all pose challenges to coastal communities. New alternative energy technologies may have a positive benefit on coastal economies if they move forward, but such benefits could come at a cost to fishing fleets.

Since one of the goals of trawl rationalization is to make the trawl fleet more flexible, rationalization could help trawlers and trawl communities adapt to these changes more easily. Without mitigating provisions, however, some communities could lose trawl activity. The AMP and CFAs—if implemented and well managed—are two mitigating factors that may work in harmony to help preserve community stability.

Table 4-71 summarizes some of the major impacts of rationalization, as well as cumulative impacts, for west coast trawl communities.

Table 4-71. Summary of the impacts of rationalization on communities.

Community	General Impacts	Vulnerability	Cumulative Impact Notes
Bellingham	Benefits from initial allocation, allocation of IFQ to processors; but close to high bycatch area.	Vulnerable. Medium dependence and medium resilience.	Long-term decline in natural resources employment, but diversified economy. Population has grown 14% since 2000. Increasing gentrification. Young population.
Anacortes	Not strongly affected by rationalization due to nature of fishery (at-sea catcher-processors)	Not vulnerable.	Long-term decline in natural resources employment. Increasing tourism and retiree destination. Population has grown 14% since 2000. Should benefit from whiting amendments (10 and 15).
Seattle	Not strongly affected by rationalization due to nature of fishery (at-sea whiting), diversity and size of community	Not vulnerable.	Diversified economy with strong fishing infrastructure. Population has grown 5% since 2000. Should benefit from whiting amendments (10 and 15). Increasing gentrification.
Neah Bay	At risk of losing trawl fleet. Receives less than average in initial allocation. May experience reduction in landings if processors are allocated quota.	Extremely vulnerable.	Relatively heavy reliance on natural resource jobs. Impacted by 2008 salmon closures. Near marine sanctuary and wave energy site. Older-than-average population.
Westport	Would receive less than average initial allocation. Processor could benefit from processor QS. Consolidation could remove nonwhiting activity from port.	Vulnerable. Fairly dependent on groundfish fishery, but fairly resilient.	Tourism and natural resources both historically important to economy. Impacted by salmon closure. Luxury boatbuilding, important to economy, could be affected be economic downturn.
Ilwaco	Primarily a whiting port. Receives less than average initial allocation of nonwhiting. Processor could benefit from QS.	Vulnerable. Low dependence on groundfish, but low resilience.	Increasing population (5%). Older-than-average population. Impacted by 2008 salmon closure. Should benefit from whiting amendments (10 and 15).
Astoria/Warrenton	Expected to benefit from rationalization, with large initial allocation and possibly increased harvesting and processing activity.	Astoria is vulnerable; Warrenton is not. Medium to high resilience.	General long-term decline in natural resources employment. Astoria population stable; Warrenton population increasing. Slightly older-than-average population. Impacted by 2008 salmon closures. Should benefit from whiting amendments (10 and 15). Increasing tourism (with accompanying low-paying jobs) and increasing gentrification, especially in Astoria. Some population leaving to find higher-paying jobs.

Community	General Impacts	Vulnerability	Cumulative Impact Notes
Newport	Expected to benefit from rationalization, with large initial allocation and possibly increased harvesting and processing activity.	Vulnerable. Very dependent on groundfish fisheries, but also fairly resilient.	General long-term decline in natural resources employment. Active tourist industry and increasing gentrification. Older-than-average population. Slightly increasing population. Impacted by salmon closure. Should benefit from whiting amendments (10 and 15). Wave energy projects have been proposed for nearby waters.
Coos Bay/ Charleston	Expected to benefit from rationalization, with large initial allocation and possibly increased harvesting and processing activity.	Somewhat vulnerable. Dependent on groundfish with medium resilience.	Heavily dependent on natural resource economy. Impacted by salmon closure. Should benefit from whiting amendments (10 and 15). Slight population increase since 2000. Older-than-average population. Large wave energy project proposed for nearby waters.
Brookings	Would benefit slightly from initial allocation. Currently no processors of trawl groundfish; processing could be less likely to move to Brookings under rationalization.	Not vulnerable. Dependent on groundfish, but high resilience.	General long-term decline in natural resources employment. Greatly increasing population (23.8% between 1990-2000, 15.9% between 2000-2007), many retirees. Much older-than-average population. Heavily reliant on recreational fishing. Impacted by 2008 salmon closures.
Crescent City	Would receive lower-than-average initial allocation. Relatively inefficient fleet; however, scores well on bycatch dependency, which could mitigate other factors.	Vulnerable; relatively dependent on groundfish, with medium resilience.	General long-term decline in natural resources employment. Many large rent-paying vessels removed by 2003 trawl buyback. Reliant on tourism. Slightly increasing population. Impacted by salmon closure.
Eureka	Would receive higher-than-average initial allocation. Located in low-bycatch area.	Vulnerable; relatively dependent on groundfish, with medium resilience.	General long-term decline in natural resources employment; reliant on tourism, timber, and fishing. Sixteen groundfish vessels retired through trawl buyback. Decreasing population (3%). Impacted by salmon closure. Four wave energy projects are proposed for nearby state and Federal waters.
Fort Bragg	Would receive higher-than-average initial allocation. Located in low-bycatch area. However, a relatively inefficient fleet.	Vulnerable; relatively dependent on groundfish, with medium resilience.	General long-term decline in natural resources employment (large mill closed in 2002). Decreasing population (3%). Older-than-average population. Impacted by 2008 salmon closure. Increasing gentrification. Three wave energy projects are proposed for nearby state and Federal waters. Several MPAs located in nearby waters.

Community	General Impacts	Vulnerability	Cumulative Impact Notes
San Francisco	Would receive higher-than-average initial allocation. Strong infrastructure. However, located in a high-bycatch area. May lose some of its relatively inefficient fleet.	Not vulnerable.	Decreasing population (2%). Ongoing gentrification of fishing facilities. Wave energy projects proposed for nearby waters (mainly bay). Impacted by 2008 salmon closure.
Princeton/ Half Moon Bay	Initial allocation may be higher or lower than average, depending on allocation formula. Located near high bycatch area. Relatively inefficient fleet (some vessels may be lost), but strong infrastructure may mitigate these factors.	Not vulnerable.	Historically dependent on tourism; active tourist industry. Slightly increasing population; older-than-average population. Increasing gentrification. Near Monterey Bay Sanctuary and newly designated California MPAs.
Moss Landing	Would receive higher-than-average initial allocation. May experience reduction in landings if processors are allocated quota. Inefficient fleet near high bycatch area.	Vulnerable; somewhat dependent on groundfish, with low resilience.	Historically reliant on sardine and other fisheries. Near Monterey Bay Sanctuary and newly designated MPAs. Affected by 2008 salmon closure.
Morro Bay	Currently no trawlers are trawling out of Morro Bay. Permits bought out by The Nature Conservancy. Impossible to predict how efficient fleet may be in future. Would receive less than average initial allocation of QS.	Vulnerable. Medium dependence on groundfish, but highly resilient.	Active tourist industry. Slightly decreasing population. Increasing gentrification. Impacted by salmon closure. Five groundfish vessels participated in buyout. New MPAs located in nearby waters. One wave energy project currently proposed for nearby waters.

4.14.7 Summary of the Impacts by Alternative

The cumulative effects of the alternatives on communities consider the effect of past, present, and RFFAs and conditions and combine those with the direct and indirect effects of the alternatives. As indicated above, west coast fishing communities have gone through substantial change over the past 20 years in response to salmon fishery restrictions, restrictions on forestry practices, reduction in groundfish fishing activity, and the development of the Pacific whiting fishery, among others. Without a change in fishery management practices, the trends invoked by these circumstances are expected to continue. These trends are likely to come in the form of a gradual decline in nonwhiting trawl activity, a continued presence of Pacific whiting (but with little additional growth), and continued attempts at economic diversification among west coast communities.

In addition to these factors and trends, the demographics of west coast fishing communities have tended to change in terms of population size, population age, average income, and sources of employment. Some communities have adapted relatively better than others to changing conditions. Some communities appear to have diversified into industries such as tourism, while others have struggled with the decline in their resource-base industries. Still, other communities have capitalized on the development of the Pacific whiting fishery and have seen reinvestment in the fishing industry coming in the form of fishing vessels and shoreside processing.

Rationalization has the potential to impact fishing communities in a variety of ways, with some communities potentially becoming better off, while others become worse off. Communities appear to

be largely affected through a handful of key mechanisms, including fleet consolidation; changes in timing and volume of deliveries; changes in harvester, captain, and crew income; impacts on shoreside processors; changes in the amount of shoreside labor and other forms of necessary labor; initial allocation of QSs; whether an adaptive management provision is part of a rationalization program; and whether that provision is used to help communities in some fashion.

4.14.7.1 Alternative 1 (No Action)

Much of the cumulative effect of Alternative 1 is captured in the above discussion. Without a change to existing fishery management systems, the current trend in west coast fishing communities is expected to continue. This includes a gradual decline in nonwhiting fisheries and associated shoreside businesses, a continued presence of the shoreside whiting fishery, and continued economic and demographic adjustments in west coast communities, among others.

4.14.7.2 Alternative 2a through 4b

The cumulative effects of the action alternatives on communities can be broken down into variations in a handful of elements of the alternatives.

Initial Allocation

The initial allocation of QSs will tend to place communities in different relative starting places at the outset of rationalization. Those alternatives that allocate QSs based on catch history will tend to benefit relatively larger ports with relatively larger fishing vessels, while those alternatives that allocate based on catch history plus an equal sharing of buyback history will tend to benefit relatively smaller communities with smaller operations. Finally, those alternatives that make an initial allocation to processors will tend to advantage those communities where processing facilities are present and disadvantage those communities where harvesters are present but processors are not.

Fleet Consolidation

Each of the alternatives is expected to result in the same level of fleet consolidation. This consolidation may mean a relatively large reduction in the number of nonwhiting trawl vessels and a reduction in the number of shoreside whiting vessels. Such consolidation is not likely to be homogeneous across communities, meaning that some communities will lose more vessels than others for a variety of reasons. Many of these disadvantaged communities can be assisted through an adaptive management provision, which is explained below.

Volume and timing of deliveries and effects on shoreside processing and labor

As articulated previously, the volume of deliveries of nonwhiting species is expected to rise, leading to an increase in the demand for shoreside processing and associated labor. The timing of whiting deliveries is expected to change, leading to a decline in peak harvest volumes, hence a decline in necessary whiting processing and labor. However, the duration of jobs involved in whiting processing and other shoreside business would be expected to increase.

The increase in nonwhiting delivery volume is expected to stem the tide of shoreside nonwhiting processor consolidation that has been occurring in recent years. This would tend to halt some of the declining trend that has been occurring and impacting communities where nonwhiting processing is present. However, the decline in the amount of processing capital necessary for the whiting fishery may mean that some communities lose processing facilities, while others experience a longer period of

Pacific whiting processing activity and may tend to see that longer period as beneficial due to longer duration of employment and incoming revenue.

Harvester, Captain, and Crew Income

Due in large part to a reduction in the number of vessels, remaining harvester, captain, and crew income is expected to increase while the number of those employed is expected to decrease. Communities that experience relatively less consolidation may see the increase in these incomes as beneficial due to improvements in the income received from fishing activity and the impact that has on communities where harvesters, captain, and crew reside. However, those communities that experience relatively greater amounts of fleet consolidation may not be made better off even if those remaining in the fishery in those communities receive higher incomes.

Adaptive Management

The adaptive management provision has the potential to assist communities that may stand to be adversely impacted from rationalization. This measure can direct quota in a manner that directly influences how communities adapt to changes brought about as a result of rationalization.

Combined Effect

When combined with the past, present, and future conditions/actions, the alternatives will tend to beneficially impact some communities, while adversely impacting others. This compares with Alternative 1 (No Action) where most communities will continue to suffer. The utilization of adaptive management will tend to assist those communities that may be adversely impacted, and, when combined with the possibility that CFAs will be implemented, these measures may work in concert to help disadvantaged communities under a rationalized fishery structure. Other communities that are not recipients of adaptive management quota will tend to be beneficially impacted by rationalization through higher wages for harvesters and their captain and crew, more processing activity and demand for related shoreside business, and other matters. Furthermore, the fishery structure created by the rationalization program grants fishery participants with tools which allow them to better adapt to varying future conditions, providing a beneficial second-order effect to communities.

4.14.8 Regional Economic Impacts

Table 4-72 compares estimated income impacts from commercial fishing and processing for different cross-sections of the west coast commercial fishery under the three bycatch avoidance scenarios against income impacts in 2007. The table shows that change is projected to occur only in the nonwhiting trawl sector. For example, under the low bycatch avoidance scenario, income impacts are estimated to increase by $15.2 million compared with 2007. The increase is $25.5 million and $27.1 million under the moderate and high bycatch avoidance scenarios, respectively. Compared with 2007, these dollar changes under the three scenarios represent increases of 35.3 percent, 59.3 percent and 63 percent, respectively, in income impacts attributable to the nonwhiting trawl sector.

Table 4-72. Estimated income impacts from harvesting and processing of Council managed species for different cross-sections of the west coast commercial fishery under three bycatch avoidance scenarios compared with 2007.

Cross-section of the West Coast Commercial Fishery	2007	Low	Moderate	High
Income Impacts (million $)				
Total West Coast Landings (including at-sea and tribal)	662.4	677.5	687.9	689.5
Nontribal Groundfish Landings (including at-sea)	145.3	160.4	170.8	172.4
Total LE Trawl Groundfish Landings (including at-sea)	123.4	138.5	148.9	150.5
Shoreside LE Trawl Groundfish Landings Including Whiting	80.7	95.8	106.2	107.8
Shoreside LE Trawl Groundfish Landings Excluding Whiting	43.0	58.2	68.6	70.1
LE Trawl Whiting Landings (shoreside and at-sea)	80.3	80.3	80.3	80.3
LE Fixed Gear Groundfish Landings	14.5	14.5	14.5	14.5
Open Access Groundfish Landings*	7.3	7.3	7.3	7.3
Tribal Groundfish Shoreside Landings (including whiting)	11.8	11.8	11.8	11.8
Tribal Groundfish At-Sea Landings (whiting)	1.8	1.8	1.8	1.8
Change compared to 2007 \(million $)				
Total West Coast Landings (including at-sea and tribal)		+15.2	+25.5	+27.1
Nontribal Groundfish Landings (including at-sea)		+15.2	+25.5	+27.1
Total LE Trawl Groundfish Landings (including at-sea)		+15.2	+25.5	+27.1
Shoreside LE Trawl Groundfish Landings Including Whiting		+15.2	+25.5	+27.1
Shoreside LE Trawl Groundfish Landings Excluding Whiting		+15.2	+25.5	+27.1
LE Trawl Whiting Landings (shoreside and at-sea)		-	-	-
LE Fixed Gear Groundfish Landings		-	-	-
Open Access Groundfish Landings*		-	-	-
Tribal Groundfish Shoreside Landings (including whiting)		-	-	-
Tribal Groundfish At-Sea Landings (whiting)		-	-	-
Change compared to 2007 (percent)				
Total West Coast Landings (including at-sea and tribal)		+2.3%	+3.9%	+4.1%
Nontribal Groundfish Landings (including at-sea)		+10.4%	+17.6%	+18.7%
Total LE Trawl Groundfish Landings (including at-sea)		+12.3%	+20.7%	+22.0%
Shoreside LE Trawl Groundfish Landings Including Whiting		+18.8%	+31.6%	+33.6%
Shoreside LE Trawl Groundfish Landings Excluding Whiting		+35.3%	+59.3%	+63.0%
LE Trawl Whiting Landings (shoreside and at-sea)		-	-	-
LE Fixed Gear Groundfish Landings		-	-	-
Open Access Groundfish Landings*		-	-	-
Tribal Groundfish Shoreside Landings (including whiting)		-	-	-
Tribal Groundfish At-Sea Landings (whiting)		-	-	-

Table 4-73 displays estimated income impacts from commercial fishing and processing activities under the three bycatch avoidance scenarios and in 2007 split north and south of 40°10' N. latitude for west coast fishery sectors. The table shows, for example, that in 2007, the nonwhiting LE trawl sector contributed $61 million of a total $335 million income impacts accruing north of 40°10' N. latitude, and $13.4 million of a total $282 million south of 40°10' N. latitude. Under the three bycatch avoidance scenarios, the contribution of the nonwhiting trawl sector north of 40°10' N. latitude is projected to increase to $71.4 million, $76 million, and $77.5 million, respectively and to $18.2 million, $23.9 million, and $24 million, respectively, south of 40°10' N. latitude. Finer geographic regions are not shown due to the inability to predict changes in landed catch activity at a finer scale.

Table 4-73. Estimated income impacts ($ million)by commercial fishing sector north and south of 40°10' N. latitude resulting from harvesting and processing of Council managed species in 2007 and under the trawl rationalization bycatch avoidance scenarios.

Fishery Sector / Region	2007	Low	Moderate	High
North of 40° 10' N. Latitude				
Nonwhiting Groundfish LE Trawl	61.06	71.37	76.05	77.54
Shoreside Whiting	6.25	6.25	6.25	6.25
LE Fixed Gear	10.10	10.10	10.10	10.10
OA Exempted Trawl	0.05	0.05	0.05	0.05
OA Nontrawl	2.88	2.88	2.88	2.88
Non Groundfish	230.14	230.14	230.14	230.14
Treaty Nonwhiting Groundfish	4.53	4.53	4.53	4.53
Treaty Shoreside Whiting	7.31	7.31	7.31	7.31
Treaty Nongroundfish	13.11	13.11	13.11	13.11
North Total	335.44	345.75	350.43	351.92
South of 40° 10' N. Latitude				
Nonwhiting Groundfish LE Trawl	13.36	18.22	23.90	24.00
LE Fixed Gear	4.44	4.44	4.44	4.44
OA Exempted Trawl	0.05	0.05	0.05	0.05
OA Nontrawl	4.37	4.37	4.37	4.37
Non Groundfish	260.17	260.17	260.17	260.17
South Total	282.40	287.26	292.94	293.04
At-Sea Whiting				
Whiting Catcher-Processors	25.83	25.83	25.83	25.83
Mothership Whiting	16.87	16.87	16.87	16.87
Treaty Mothership Whiting	1.82	1.82	1.82	1.82
At-Sea Whiting Total	44.51	44.51	44.51	44.51
Coastwide Total	662.35	677.52	687.88	689.47

Table 4-74 highlights the dollar changes in income impacts shown in the prior table. Compared with 2007, income impacts for the nonwhiting trawl sector north of 40°10' N. latitude are estimated to increase by $10 million, $15 million, and $16.5 million, respectively, under the three bycatch avoidance scenarios. South of 40°10' N. latitude, increases in income impacts are estimated to be $4.9 million, $10.5 million, and $10.6 million, respectively, under the three bycatch avoidance scenarios.

Table 4-74. Estimated change (from 2007) in income impacts by commercial fishing sector north and south of 40°10' N. latitude resulting from harvesting and processing of Council managed species under the trawl rationalization bycatch avoidance scenarios ($ million).

	Change in Income Impacts ($ millions)			
	2007	**Low**	**Moderate**	**High**
North of 40° 10' N. Latitude				
Nonwhiting Groundfish LE Trawl		+10.3	+15.0	+16.5
Shoreside Whiting		-	-	-
LE Fixed Gear		-	-	-
OA Exempted Trawl		-	-	-
OA Nontrawl		-	-	-
Non Groundfish		-	-	-
Treaty Nonwhiting Groundfish		-	-	-
Treaty Shoreside Whiting		-	-	-
Treaty Nongroundfish		-	-	-
North Total		+10.3	+15.0	+16.5
South of 40° 10' N. Latitude				
Nonwhiting Groundfish LE Trawl		+4.9	+10.5	+10.6
LE Fixed Gear		-	-	-
OA Exempted Trawl		-	-	-
OA Nontrawl		-	-	-
Non Groundfish		-	-	-
South Total		+4.9	+10.5	+10.6
At-Sea Whiting				
Whiting Catcher-Processors		-	-	-
Mothership Whiting		-	-	-
Treaty Mothership Whiting		-	-	-
At-Sea Whiting Total		-	-	-
Coastwide Total		+15.2	+25.5	+27.1

Table 4-75 translates the dollar changes in the previous table into percentage changes. The table shows that compared with 2007 income impacts under the low, moderate and high bycatch avoidance scenarios for the nonwhiting trawl sector increase by 16.9 percent, 24.6 percent, and 27 percent, respectively, north of 40°10' N. latitude. South of 40°10' N. latitude income impacts in nonwhiting trawl sector under the three scenarios increase by 36.4 percent, 78.8 percent, and 79.6 percent, respectively.

Table 4-75. Estimated percent change (from 2007) in income impacts by commercial fishing sector north and south of 40°10' N. latitude resulting from harvesting and processing of Council managed species under the trawl rationalization bycatch avoidance scenarios.

	Change in Income Impacts (%)			
	2007	Low	Moderate	High
North of 40° 10' N. Latitude				
Nonwhiting Groundfish LE Trawl		+16.9%	+24.6%	+27.0%
Shoreside Whiting		-	-	-
LE Fixed Gear		-	-	-
OA Exempted Trawl		-	-	-
OA Nontrawl		-	-	-
Non Groundfish		-	-	-
Treaty Nonwhiting Groundfish		-	-	-
Treaty Shoreside Whiting		-	-	-
Treaty Nongroundfish		-	-	-
North Total		+3.1%	+4.5%	+4.9%
South of 40° 10' N. Latitude				
Nonwhiting Groundfish LE Trawl		+36.4%	+78.8%	+79.6%
LE Fixed Gear		-	-	-
OA Exempted Trawl		-	-	-
OA Nontrawl		-	-	-
Non Groundfish		-	-	-
South Total		+1.7%	+3.7%	+3.8%
At-Sea Whiting				
Whiting Catcher-Processors		-	-	-
Mothership Whiting		-	-	-
Treaty Mothership Whiting		-	-	-
At-Sea Whiting Total		-	-	-
Coastwide Total		+2.3%	+3.9%	+4.1%

4.15 Treaty Tribe Harvesters

This section evaluates impacts to fisheries prosecuted by the Northwest treaty tribes. Native Americans may also participate in other groundfish and nongroundfish fisheries, but impacts to Native Americans not exercising treaty rights would be generally equivalent to those described in other sections of this EIS, such as impacts to nontrawl harvesters, captain and crew, and communities.

4.15.1 Methods for Assessing Impacts

Tribal fisheries are not subject to the proposed action and all effects are indirect. In general, these impacts are similar to those described in Section 4.8, for nontrawl harvesters. The discussion below compares the general effects of trawl rationalization with status quo. Section 4.15.4 summarizes the effects of the alternatives. Of the impact mechanisms described for nontrawl commercial harvesters, the following spillover effects would also apply to tribal fisheries:

- Fleet consolidation could make more fishing vessels available, potentially decreasing the capital costs for tribes to increase fleet size. On the other hand, if these vessels enter other fisheries in

which tribes participate (e.g., Pacific halibut and Dungeness crab), market and resource competition in these fisheries could increase.

- As discussed in Section 4.14, fleet consolidation could result in loss of port infrastructure if trawl vessels are a major source of revenue. Neah Bay, the principal port for Makah tribal fisheries, was identified as particularly vulnerable.
- An increase in the bycatch of nontarget species by the trawl fishery, especially Pacific halibut, which is targeted in tribal fisheries, could affect catch opportunity.
- Increased flexibility due to rationalization increases market competition.

Some of the impact mechanisms described for nontrawl commercial harvesters are less likely to affect tribal fisheries to the degree that implementation of treaty obligations shields tribal harvesters from some forms of direct competition. Fishing grounds competition is likely to be less intense since tribal fisheries occur in designated U&A areas. Resource competition was also identified for nontrawl harvesters. However, as noted in Section 4.8, this type of competition would only become an issue if target species allocations to the trawl sector were increased in response to gear switching or for other reasons. Tribal fisheries may be further insulated to the degree that treaty obligations place a higher legal bar for protecting tribal fishing opportunity.

Table 4-76. Overview of impacts, mechanisms, and metrics used to compare the general effects of the no action alternative and the action alternatives on tribal harvesters.

Potential Impacts	Reasons or Mechanisms for Impacts	Metrics or Indicators for Informing Impact Mechanisms	Data, Models, and Methods used for Assessing Impacts
Changes in profits and participation of tribal harvesters	Fleet consolidation increases supply of vessels for use in nontrawl fisheries	Increased participation in nontrawl fisheries leading to decreased resource availability, change in supply and prices	Expert opinion, comments made by tribal fishing representatives at Council meetings, and other pertinent information
	Access to processors and markets	Reliance of tribal harvesters on the port infrastructure supported by trawl harvesters	
	Spillover from increased catch of nontarget species, principally Pacific halibut	Changes in trawl vessel effort and catch	
	Potential impacts on ex-vessel prices due to greater flexibility, especially from increased fixed-gear catch as a result of gear switching	Price changes of select groundfish as a result of increased quantities of fixed-gear harvest	

4.15.2 Direct and Indirect Effects of the Alternatives on Tribal Harvesters

4.15.2.1 Vessel Participation in Tribal Fisheries due to Consolidation

As discussed in Section 4.8, rationalization could have several, countervailing mechanisms affecting tribal fisheries. First, greater control over future fishing opportunity in a rationalized trawl fishery could lead to greater specialization and less interest by groundfish trawl vessels to participate in other fisheries, principally pink shrimp and Dungeness crab fisheries. On the other hand, fleet consolidation

could make more vessels available for sale. Increased supply would lead to lower prices for vessels, lowering the barrier for entry into tribal fisheries, depending on other entry costs (such as the purchase of any required LE permits). These lower capital costs could have a beneficial impact on tribal harvesters, in that the tribes could increase their fleets at less cost. For the same reason, nontribal harvesters would also benefit from the lower cost to entry represented by the availability of surplus trawl vessels. This could increase market and resource competition in those fisheries.

4.15.2.2 Loss of Port Infrastructure Affecting Market Access

Section 4.14 discusses impacts to communities, including processors, infrastructure, and suppliers. The impacts analysis shows that Neah Bay is likely to be adversely affected by trawl rationalization. It is also the principal port for the Washington treaty tribes, particularly the Makah, whose reservation lands are located around the port. Although some LE trawl vessels operated out of this port in the recent past, they have already relocated. There is also no local groundfish processing in Neah Bay; landings are trucked to Westport and Astoria. Consolidation in both the harvesting and processing sectors is likely to raise the barriers to any increase in nontribal trawl harvesters operating out of this port. This could result in withdrawal of services and less financial support for business infrastructure. For example, if lower volumes are landed, groundfish buyers may be less inclined to make purchases or may offer less favorable prices.

4.15.2.3 Change in Catch of Pacific Halibut in the Trawl Fishery

Section 4.8.2.2 references bycatch of Pacific halibut, which is an important target species in tribal fisheries. Rationalization is predicted to result in increased target species catches in the groundfish trawl fishery. With increases in effort and catch, unless the bycatch rate decreases, more halibut bycatch could occur in the trawl fishery. Area-specific TAC levels are decided by the IPHC. An estimate of bycatch in nontarget fisheries is deducted from an estimate of allowable biological catch to determine the Pacific halibut TAC for the west coast, referred to as Area 2A. The bycatch deduction for the trawl fishery is based on estimates prepared by the NMFS NWFSC derived from observations in a recent year. For example, estimates of bycatch in the 2007 groundfish trawl fishery are given to the IPHC to use in establishing the TAC for 2009 halibut fisheries. To date, an estimate of bycatch in the groundfish fixed-gear fishery has not been applied in determining the TAC. Recent observer data suggest that there may be a comparable level of bycatch mortality in this fishery. Determining the TAC thus depends on stock assessment results combined with bycatch estimates. While Pacific halibut stock status appears robust over the long term, a deduction for fixed-gear bycatch could lead the IPHC to reduce the TAC. Potential changes in the groundfish trawl sector bycatch under the alternatives are discussed in the next paragraph.

As discussed in Section 4.8.2.2, Pacific halibut bycatch could increase as trawlers find more efficient ways to avoid overfished stocks and access target species, especially flatfish species that co-occur with halibut. However, a Pacific halibut IBQ is a feature of Alternative 2a-c and Alternative 4b (the preferred alternative); under these alternatives, the IBQ would cap the amount of Pacific halibut caught in the nonwhiting trawl fishery. This would work similarly to IFQs except that retention would be prohibited. Like the IFQ system, IBQ would impose individual accountability and allow for more precise monitoring of halibut bycatch. The accountability feature could motivate harvesters to reduce their halibut bycatch rates. Under these alternatives, IBQ would cover legal and sublegal size Pacific halibut bycatch mortality in the area north of 40°10 N. latitude, and bycatch mortality would be estimated on an individual vessel basis. The actual amount allocated or credited to the groundfish trawl fishery to account for Pacific halibut bycatch was determined under the Amendment 21 intersector allocation process. This is further discussed under cumulative effects since it is an exogenous action. In

general, a reduction in Pacific halibut bycatch in the trawl fishery is expected. This could benefit the tribal fishery. As noted in Section 4.8.2.2, implementation of an IFQ program in the B.C. groundfish trawl fishery that included vessel limits on Pacific halibut bycatch was followed by a reduction in bycatch. [113]

4.15.2.4 Spillover due to Increased Flexibility in a Rationalized Trawl Fishery

Section 4.8.2.2 identifies nontrawl sablefish harvesters as potentially indirectly affected by gear switching by trawl harvesters in a rationalized fishery. This is likely to be the main potential impact to tribal harvesters since they participate in the sablefish fishery. Because of treaty rights, including tribal U&As, it is less likely that the other effects identified in that section—resource and fishing grounds competition—would affect tribal harvesters. The analysis in Section 4.8.2.2 indicates that sablefish caught on the west coast is sold into a global market, with Japan being a major importer. Moreover, higher quality fixed-gear-caught fish likely sells into a different market from trawl-caught sablefish. Given that level of market specialization, gear switching could depress the price of fixed-gear-caught sablefish slightly if IFQ holders are more efficient producers.

4.15.3 Cumulative Effects on Tribal Harvesters

Exogenous factors affecting tribal harvesters are as follows:

- Increased consumer awareness of the impact of fishing in relation to retail products
- High and increasing demand for protein
- High and increasing production costs
- Overfished species rebuilding

This is a subset of the factors listed for nontrawl harvesters in Section 4.8. Two other exogenous factors are potential changes in accounting for fixed-gear Pacific halibut bycatch being considered by the IPHC in setting the Area 2A TAC and the allocation formula under Amendment 21 for Pacific halibut IBQ. If, as preliminary data suggest, the bycatch mortality in the fixed gear fishery is large, it could result in substantial reductions in the TAC for directed fisheries.

Under Amendment 21, the allocation formula would be set at 15 percent of the Area 2a constant exploitation yield for legal size halibut, not to exceed 130,000 pounds for the first four years of the trawl rationalization program and not to exceed 100,000 pounds starting in the fifth year. The bycatch allocation could be adjusted up or down from this formula through the groundfish biennial harvest specifications process. This bycatch allocation applies to the whole groundfish trawl fishery, and set-asides would be established for sectors and areas not managed with IBQ (at-sea whiting fishery, groundfish trawl fishing south of 40°10' N. latitude). Because IBQ accounts for both legal and sub-legal sized fish and covers bycatch mortality, the actual deduction from the allocations to other fisheries (including the directed tribal fishery), which are computed in terms of legal size fish, would be less than the amounts indicated in the formula above. In general, the bycatch allocation formula would represent a substantial reduction in trawl bycatch compared to status quo.

The other factors, bulleted above, are pervasive, affecting fishery sectors across the board. Consumer awareness, tied to a presumption that trawling has greater adverse environmental effects in comparison

[113] According to testimony by Mr. Gregg Williams of the IPHC at the June 2009 Council meeting, halibut bycatch in the B.C. groundfish trawl fishery has been reduced by approximately two-thirds compared to levels prior to program implementation.

to other gear types could affect the price of fish caught with trawl gear. This would depend, first, on the level of consumer knowledge and whether purchasers can distinguish retail products according to fishing method (as opposed to other factors such as the stock status of the species involved) and, second, on the degree to which such information affects purchasing decisions. If this trend also results in a price premium for other gear types, tribal harvesters would see both beneficial and adverse impacts.

Increased demand not matched by supply increases results in price inflation. For harvesters, this has both beneficial and adverse impacts since the price of inputs (fuel being a prime example) increases costs while price increases for fish would benefit revenues. The net effect depends on the difference in commodity-specific price inflation. If fish consumers are less willing to substitute other products in comparison to harvesters' ability to substitute inputs or increase efficiency, then harvesters could benefit.

As discussed elsewhere, overfished species rebuilding is likely to have a beneficial impact over the long term. Tribal harvesters are subject to set-asides of overfished species yield agreed upon during the biennial harvest specifications process. As stocks recover, and OYs (ACLs) can be increased, these set-asides can be increased. In the short term, the rebuilding paradox confronts all groundfish harvesters. This phenomenon is due to increases in bycatch as stocks rebuild that cannot be easily compensated for by the OY increases set by the rebuilding policy. The effect depends on the relationship between gear selectivity and the rebuilding trajectory. For 2009-10, tribal set-asides have been established for canary, widow, and yelloweye rockfish, and Pacific ocean perch; the set-asides are larger for the nonwhiting portion of the tribal fishery. Yelloweye would be the most constraining stock for tribal fixed-gear fisheries and canary for tribal trawl fisheries.

4.15.4 Summary of the Impact of the Alternatives on Tribal Harvesters

Impact mechanisms discussed above are related to increased fleet consolidation (potential for price competition) and changes in Pacific halibut resulting from increased target species catch in the groundfish trawl fishery and the application of IBQ. Gear switching by vessels with groundfish trawl permits could also increase competition compared to the no action alternative (Alternative 1). Gear switching under the IFQ program is an element in all of the action alternatives. Exogenous factors would have the same effect across all the action alternatives, changing the intensity of impacts, but not the relative magnitude among the alternatives. Exogenous factors have both beneficial effects (increased demand, overfished species rebuilding) and adverse effects (increased costs). Increased consumer awareness could have either beneficial or adverse impacts.

Compared to Alternative 1 (no action) the action alternatives are likely to lead to greater price competition and either higher or lower Pacific halibut bycatch by the groundfish trawl fishery, depending on the application of IBQ.

Alternative 2 would likely lead to greater consolidation compared to the other alternatives (due to higher accumulation limits, grandfather clause, three-sector management). This alternative includes Pacific halibut IBQ.

Alternative 3 would likely lead to the least consolidation compared to the other alternatives (lower accumulation limits, no grandfather clause, and four sectors). This alternative does not include a halibut IBQ.

Alternative 4 would be intermediate compared to Alternatives 2 and 3 in terms of consolidation. Alternative 4a does not include IBQ; Alternative 4b (the preferred alternative) does.

4.16 Management Agencies

4.16.1 Methods for Assessing Impacts

Table 4-77 provides an overview of the analytical approach used to compare baseline and future conditions of the management and enforcement needs under the alternatives. The analytical approach includes 1) potential impacts, 2) mechanisms that relate the proposed action to the impacts, 3) measurement criteria or indicators used in assessing each type of impact, and 4) models and data sets used in the analysis.

The same tracking and monitoring program would be implemented under all the action alternatives. Additional costs associated with tracking and monitoring is the principal effect to Federal and state agencies in terms of staffing levels and data collection and sharing. However, the MSA allows cost recovery for management, data collection, and enforcement under a LAPP up to 3 percent of the ex-vessel value of fish harvested (§304 (d)(2)(B)).

Table 4-77. Overview of analytical approach used to compare baseline and future conditions of the management agencies under the alternatives.

Potential Impacts	Impact Mechanisms	Measurement Criteria or Indicators	Data and Models
Changes in Level of Staffing	Changes in number of staff or reprogramming of current staff	Number of new hires, change in percentage of time dedicated by current staff to LE trawl management/enforcement	Qualitative and quantitative assessment
Changes in Inseason Management	Change in time dedicated to in-season adjustments	Time spent by the GMT, GAP, Council and management agencies to deal with issues that arise during the fishing season	Qualitative assessment
Changes in Data Collection and Data Sharing	Changes in the amount and type of data collected at sea and dockside, and Changes in uniformity of data collection	Percentage or hours spent on observing, enforcement, and shoreside monitoring. Time, effort, and funds utilized for data conformity and sharing mechanisms.	Qualitative assessment

4.16.2 Direct and Indirect Effects of the Alternatives on Management Agencies

Because the action alternatives do not differ in terms of the features affecting management agencies, the action alternatives are collectively compared to status quo in terms of impacts shown in Table 4-77.

4.16.2.1 Changes in Level of Staffing

In comparison to status quo management, rationalization will require increases in NMFS Northwest Region, NOAA General Counsel, NWFSC, and the Northwest/Southwest Offices of Law Enforcement staff. State fisheries management and enforcement staff will also have to be increased. Additional equipment, training, and information technology resources (hardware and software) will also needed by both state and federal agencies. The Council will incur additional costs in the early years of the program.

Listed below are examples of anticipated additions to state and federal staff levels due to rationalization.

- Staff for cost recovery, permitting and, quota tracking, and appeals processes
- Staff and contracting for performance monitoring including mandatory economic data collection
- Observers, debriefers, and, port samplers
- Law enforcement officers, technicians, equipment and training
- Lawyers, policy analysts, and regulation writers to adopt Federal and state regulations in support of the Program and address enforcement issues
- Information technology (IT) resources (FTEs, hardware, and software) to support electronic reporting (logbooks, fish tickets, observers, compliance monitoring, etc.).
- State and Federal outreach

Based on the preferred alternative, NMFS has developed the following preliminary estimates of potential costs.

- Implementation Costs (one-time costs to develop the tracking and monitoring programs)
  - State management and enforcement — $300,000 to $500,000 per state
  - NMFS management and enforcement — $2.1 million
  - NMFS (NWFSC) Observer Program and Economics Data Collection Programs — $3.150 million
  - **Total (approximate): $6.5 million**
- Annual Costs (State and Federal costs associated with running the Program when fully implemented.)
  - State management and enforcement — $750,000 to $1.5 million per state
  - NMFS management and enforcement — $1.7 million
  - NMFS (NWFSC) Observer Program and Economics Data Collection Programs — $3.15 million
  - **Total (approximate): $8 million**

Council costs are expected to accrue based on various activities, including meetings associated with reviewing draft regulations (e.g., a February 2010 GMT meeting scheduled to review draft regulations), development of a trailing amendment on CFAs (commencing prior to program implementation), development of criteria and recommendations for the AMP (to be implemented by the third year of the program), and review of program performance (preparation for the review in the fourth year and participating in the review in years 5 and 6). These costs are expected to be $150,000 per year, including implementation years, and may potentially rise to $300,000 in years where the Council is undertaking review of program performance.

4.16.2.2 Changes in Inseason Management

Rationalization is expected to decrease the high level of inseason management done under status quo; however, savings in this area would likely go towards other groundfish management tasks, such as inseason QS/QP transfers, dealing with the nuances of the carryover and AMP provisions, and continued monitoring of in-season performance by other groundfish sectors.

4.16.2.3 Changes in Data Collection and Data Sharing

Rationalization would change the type and increase the amount of data collected by observers, because observer coverage would greatly increase in the shoreside nonwhiting fishery, expanding the amount of fishery dependent data collected. The annual cost of dealing with a higher volume of observer data, training, and management is estimated at $3 million and would be incurred primarily by the NWFSC. Rationalization would also require a uniform mode of electronic recording and reporting of catch/landings information, as well as sharing that information across state and federal jurisdictions in the form of an electronic fish ticket system. The electronic fish tickets are being developed under status quo, so that cost is not directly attributable to trawl rationalization and is not part of this cost comparison.

4.16.2.4 Income Tax Revenue

One effect that may impact government tax revenue is the amount of income tax received by the government as a result of rationalization. To the degree these revenues make their way to the budgets of management agencies, these taxes may impact those agencies. As indicated in the analysis by Lian et al (2008), the potential amount of income potentially generated by nonwhiting harvesters could be approximately $300,000 if harvesters base their decisions about fleet consolidation and cost cutting measures purely on economic efficiency (though this number will vary to some degree with variations in certain design elements of the program). This amount of income is compared to existing conditions where the average nonwhiting harvester generates zero economic profit. The term "zero economic profit" means that the average harvester would be equally well off engaging in a similar form of labor, such as construction. The bureau of labor statistics indicates that the mean annual wage of those in construction and extraction occupations is $48,735 per year, placing those occupations at a 25 percent tax rate. Under status quo conditions, there are approximately 100 nonwhiting trawlers in any given year, meaning that income taxes received by the government from these operations is approximately $1,218,375 per year. Under a rationalized nonwhiting fishery, the fleet could consolidate to 40 vessels if harvest volumes do not change. If these vessels generate income levels predicted by Lian et al (placing them in an income tax bracket of 33 percent), the income taxes received by the government could be approximately $3,960,000. If harvest volumes increase in the fishery as expected, the number of vessels in the nonwhiting fishery could be somewhere on the order of 60, meaning tax revenues to the government could be approximately $5,940,000. However, these estimates will tend to decline over time. As second-generation quota owners enter the fishery and take out loans for QSs, the revenues those second-generation quota owners generate will be lower due to costs they must bear to pay back those loans. This would tend to decrease the amount of income tax revenue that the government receives.

Table 4-78. Estimated income taxes paid to the U.S. government from nonwhiting trawl activity

Estimated Income Tax under Status Quo	Estimated Income Tax under IFQ Program with No Increase in Harvest Volume	Estimated Income Tax under IFQ with Increase in Harvest Volume
$1,218,375	$3,960,000	$5,940,000

4.16.3 Cumulative Effects on Management Agencies

Exogenous actions and trends affecting management agencies include costs related to other management responsibilities and the level of agency budgets. The responsibilities of management agencies has been increasing over time due to responsibilities added through the revised MSA, increasingly complex

fishery management regulations designed to protect weak stocks while still allowing fisheries to be prosecuted, and other matters. In some respects, the increasing responsibilities that have been constructed under the existing management system will be replaced with responsibilities to meet the needs of operating a rationalization program, shifting the workload within the various agencies. It is not clear whether a rationalization program will increase or decrease workload overall. However, when combined with past, present, and future actions/conditions, the workload and resources demanded of various agencies will—at best—remain the same, but may very well continue to increase due to other demands to which agencies will have to respond.

4.16.4 Summary of the Impact of the Alternatives on Management Agencies

Management under the action alternatives would produce more data than under a fishery operating under Alternative 1 (no action). The associated cost increases of the action alternatives compared to no action would also fall primarily on Federal management agencies and offices. However, some of these cost increases may be compensated through the cost recovery program as specified in the MSA. When comparing the total estimated incremental costs for management, data collection, and enforcement with the total estimated ex-vessel value of the LE trawl fishery, the costs are approximately 4 or 5 percent of the total value. This is close to the allowable 3 percent that can be recovered. Because both the costs and the future ex-vessel value are estimates, it is possible that the actual management costs would fall entirely within that 3 percent recoverable range. If there is full cost recovery, the action alternatives could have a beneficial effect on Federal agency costs compared to no action. Federal and state staff time spent on inseason management of the trawl fishery may also be reduced compared to no action (Alternative 1) since most nonwhiting species would no longer be subject to cumulative trip limits, which are frequently adjusted under status quo management (Alternative 1).

4.17 Fish Resources

Limited entry groundfish trawl harvesters, whose behavior would be affected by the proposed action, catch management unit species in the groundfish FMP and other species (usually in small amounts). Catch may be characterized in various ways. Although overall, the groundfish fishery is considered multi-species, some distinction can be made between targeted stocks and those caught incidentally. If they have market value, incidentally caught species may be retained for sale. As defined by the MSA, bycatch applies to fish that are discarded, typically at sea, although the term is colloquially applied to all incidental catch. Groundfish fishery management unit (FMU) species are categorized by stock status according to the management framework: healthy stocks, precautionary zone stocks, and overfished species. Under the status quo catch control tool, cumulative trip limits, retention of certain overfished species may be prohibited or trip limits set at low levels. Although some retention may be allowed, overfished species are often referred to as bycatch in the sense that targeting is discouraged, and the fact that trip limits (which apply to landings, not total catch) result in discarding once the limit is reached, assuming that target species cumulative trip limits have not been reached.

4.17.1 Methods for Assessing Impacts

Table 4-79 provides an overview of the analytical approach used to compare baseline and future conditions of the groundfish stocks and halibut under the alternatives. The analytical approach includes 1) potential impacts, 2) mechanisms that relate the proposed action to the impacts, 3) measurement criteria or indicators used in assessing each type of impact, and 4) models and data sets used in the analysis.

Table 4-79. Overview of analytical approach used to compare baseline and future conditions of the groundfish resource under the alternatives.

Potential Impacts	Impact Mechanisms	Measurement Criteria or Indicators	Data and Models
Changes individual species stock abundance	• Increase in target species catch • Reduction in bycatch rates for overfished species • Increase/decrease in Pacific halibut bycatch • Improved monitoring leading to better specification of harvest levels	• Biomass trajectory • Bycatch rates • Accuracy of catch estimates	Stock assessments Empirical models Qualitative assessment
Changes in regional abundance of individual species stocks	Shifts in location of catch	Fishing concentration and likelihood of localized depletion Avoidance of certain bycatch species by harvesters	Qualitative assessment

The impact mechanisms identified in Table 4-79 are discussed below.

Change in the amount of target species catch: Trawl rationalization under the action alternatives is expected to result in an increased amount of target species catch. Existing management measures constrain the harvest of many types of target species to protect weak stocks under rebuilding plans. This greater utilization of healthy species could have impacts on individual stocks of groundfish as their mortality rates are increased. This potential impact was evaluated by applying several possible catch amounts to species stock assessment models. Each target species that could experience an increased catch amount was examined for the predicted biological responses in spawning stock biomass and the management thresholds governing the status of groundfish stock health.

Reduction in bycatch rates for overfished species: The existing framework of top-down management (which provides little incentive for harvesters to actively and voluntarily avoid rebuilding stocks) would be replaced by IFQs/co-ops under the action alternatives, which provide large incentives to avoid overfished stocks. One incentive to reduce the catch rate of overfished stocks is that harvesters can access some of the underutilized target stocks that are not being harvested to their potential. The catch control tools also would reduce bycatch in the form of regulatory discards, because catch is controlled directly through quotas. Since overfished species are marketable, they could be retained, reducing bycatch.

Improved monitoring: Under all the action alternatives, all the groundfish trawl sectors would be subject to 100 percent at-sea observer coverage or electronic monitoring (shore-based whiting catcher vessels and mothership catcher vessels are subject to full retention requirements, which may be monitored by video rather than direct human observation). For the nonwhiting sector, this represents an increase from current levels. Improved monitoring allows more accurate estimation of total catch, which can improve stock assessments, leading to better specification of harvest levels. It also makes it less likely that harvest limits will be exceeded because of inaccurate catch estimates and/or a lag between actual catch and post-hoc estimation of total catch.

Regional shifts in catch: Trawl rationalization is expected to result in geographic changes in harvest patterns, and consequently, the potential for localized depletion of some groundfish stocks. These changes could have an effect on stocks that are limited in range, do not range extensively to breed, or have little larval dispersion. To examine this impact, the model described in Section 4.2.1.3 and Appendix C illustrates the predicted geographic shifts in fishing patterns. This is combined with a qualitative discussion addressing possible impacts of geographic shifts in fishing activity and the implications of the area management provision.

The change in the condition of the groundfish, halibut, or other fish resource is not expected to differ substantially among the action alternatives, but is expected to differ comparing the action alternatives to status quo (Alternative 1). Therefore, the change in condition of the fish resource will be evaluated through a comparison of the condition under status quo management versus the condition under the action alternatives.

4.17.2 Direct and Indirect Effects of the Alternatives on Fish Stocks

4.17.2.1 Increase in the Amount of Target Species Catch

Groundfish stocks are expected to be primarily, but not substantially, affected by changes in the amount of target species that are harvested under the action alternatives. Currently, harvest of many target species is lower than the allowable harvest amount because the harvest limit of associated bycatch species constrains access to those target species. For example, many more tons of Dover sole could be caught in the current bottom trawl fishery, if the harvest of associated canary and darkblotched rockfish could be reduced or avoided. Under the action alternatives, catch of overfished species can be more directly limited through IFQs or allocations to co-ops for overfished species. These catch control tools are expected impose fewer indirect constraints on harvesting the potential yield of target species. Thus, trawl rationalization is expected to allow fishermen the time and incentive to avoid the take of constraining stocks such as canary and darkblotched rockfish, thereby allowing more time and opportunity to harvest larger amounts of target species.

It is difficult to predict the increased amount of target catch that could be realized under IFQ/co-op management, because it depends on the collective behavior of a sector. Therefore, in order to analyze the effects of action alternatives versus the status quo fishery (Alternative 1), three different levels of catch were examined against the status quo catch amounts.[114] Under status quo (Alternative 1) target species catch is constrained by management measures (cumulative trip limits, RCAs) intended to limit the catch of overfished groundfish species. The catch scenarios representing impacts under the action alternatives are based on different assumptions about how effective harvesters will be in avoiding bycatch and, therefore, accessing higher levels of target species catch. Table 4-80 shows the total mortality under each of these catch scenarios. Information from current stock assessments was then used to estimate long-run biomass trajectories expressed as current spawning stock biomass (SB) as a fraction of unfished spawning stock biomass. For groundfish, 40 percent SB/Sunfishes is used as a proxy target reference point for management.

[114] As described under Section 4.2 and Appendix C (Section C.2) and used in Section 4.6.2, describing possible changes in harvester profitability (which is partly determined by catch levels), empirical information is available from the Washington Arrowtooth EFP fishery that indicates the potential reduction in bycatch of constraining overfished species when harvesters are given incentives similar to those expected under the action alternatives.

Table 4-80. Predicted mortality scenarios expected in a rationalized fishery.

	Status Quo (Alternative 1)	Catch scenario 1 (low)		Catch scenario 2 (medium)		Catch scenario 3 (high)	
	Total mortality (mt)	Total mortality (mt)	Relative change	Total mortality (mt)	Relative change	Total mortality (mt)	Relative change
Sablefish	5,933.8	5,933.8	0.00%	5,933.8	0.00%	5,933.8	0.00%
Chilipepper	127.5	127.5	0.00%	2,000.0	1468.63%	2,000.0	1468.63%
Longspine	838.0	2250.5	168.56%	2,250.5	168.56%	2,250.5	168.56%
Shortspine	904.0	1841.3	103.69%	1,841.3	103.69%	1,841.3	103.69%
Dover sole	6,500.0	12,032.47	85.11%	12,032.5	85.11%	16,500.0	153.85%
Arrowtooth	2,913.3	4,942.9	69.67%	4,942.9	69.67%	4,942.9	69.67%
Petrale	2,440.0	2,440.0	0.00%	2,440.0	0.00%	2,440.0	0.00%
Other flatfish	1,562.0	3,170.0	102.94%	4,970.0	218.18%	4,970.0	218.18%
Yellowtail	618.0	618.0	0.00%	618.0	0.00%	1,000.0	61.81%
Slope rockfish	382.0	731.2	91.41%	1,200.0	214.14%	1,200.0	214.14%
Dogfish shark	450.0	450.0	0.00%	450.0	0.00%	450.0	0.00%
Pacific cod	400.0	723.4	80.85%	1,200.0	200.00%	1,200.0	200.00%
Lingcod	671.0	671.0	0.00%	815.0	21.46%	1,000.0	49.03%
Pacific whiting	242,950.0	242,950.0	0.00%	242,950.0	0.00%	242,950.0	0.00%

Catch of several stocks are not anticipated to change substantially from status quo levels, including sablefish, Petrale sole, dogfish shark, and Pacific whiting, were, therefore, not analyzed further. Some stocks with anticipated increased catch (other flatfish, slope rockfish, and Pacific cod) did not have a prior stock assessment; therefore, the catch predictions and the effect on stock biomass could not be analyzed. Lingcod and yellowtail rockfish stock assessment models could not effectively incorporate the mortality predictions, as provided, and could not be analyzed for the effects of the three catch scenarios. However, the OYs (ACLs) for lingcod and yellowtail rockfish were not exceeded in any of the catch scenarios. Four species managed under rebuilding plans—Pacific ocean perch, darkblotched rockfish, widow rockfish, and bocaccio—had anticipated catch increases under the catch scenarios, but no catch levels would exceed the mortality allowed in the respective rebuilding plans.

Under the action alternatives, the levels of mortality of several stocks—chilipepper rockfish, arrowtooth flounder, Dover sole, longspine thornyhead, shortspine thornyhead, yellowtail rockfish, and lingcod—are expected to increase. Therefore, the biomass of those stocks is anticipated to change. For those species, the three catch scenarios were applied to the stock assessment models to show how increased mortality levels may impact those spawning stock biomasses. None of the catch scenarios, when applied to the stock assessment model, resulted in a fishing mortality rate that reduces the spawning stock biomass below the proxy target reference point of 40 percent SB/SBunfished.

For methodological reasons, the analysis simulates the various catch scenarios within the assessments as if the proposed action were implemented in 2008, although the expected implementation date is 2011. Nonetheless, the dates covered in the simulations are still representative of what would occur with changes in the mortality of the various species.

Figure 4-63 through Figure 4-67 show long-run biomass trajectories for the modeled stocks. Outputs are summarized below.

- Chilipepper rockfish: At the highest catch scenario, the stock biomass remains above the target of $SB_{40\%}$. None of the catch scenarios allows the fishing mortality rate to increase much beyond $F_{60\%}$, which is above the management threshold of $F_{40\%}$.[115]
- Longspine thornyhead: Even at the highest catch scenario, SB/SBunfished remains above 60 percent throughout the analysis period. As with chilipepper, the fishing mortality rate would not increase much above $F_{60\%}$, which is below the management threshold of $F_{40\%}$.
- Shortspine thornyhead: Under the catch scenarios, SB/SBunfished declines substantially compared to status quo (Alternative 1) to about 54 percent in 2030. However, the decrease is gradual over 20 years, and the fishing mortality rate remains below $F_{50\%}$. The trajectory does not differ among the three catch scenarios.
- Dover sole: Under the highest catch scenario, SB increases during the first five years of the simulation and then declines slowly to a ratio of about 60 percent at the end of the period, lower than under status quo. The fishing mortality rate remains below $F_{50\%}$.
- Arrowtooth flounder: Under the highest catch scenario, the ratio declines to about 50 percent over the analysis period, versus about 70 percent under status quo. Under all three catch scenarios, the fishing mortality rate is below $F_{50\%}$.

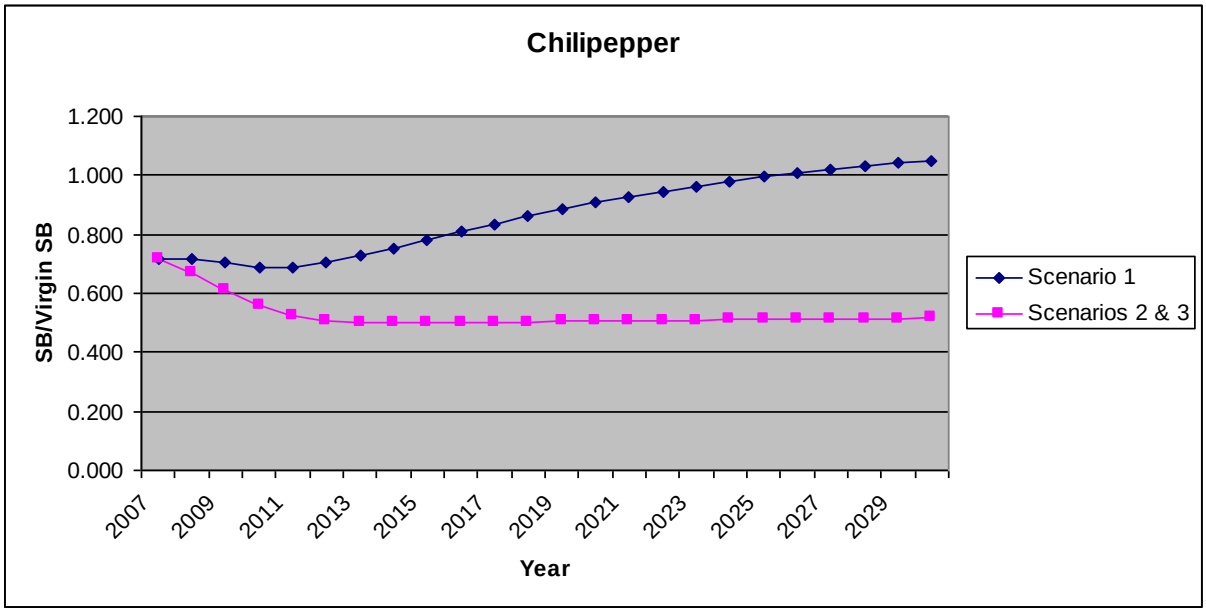


Figure 4-63. Percent of unfished spawning biomass predicted—chilipepper.

[115] $F_{xx\%}$ expresses the fishing mortality rate expected to produce spawning biomass at xx percent of unfished biomass. Thus, $F_{40\%}$ is a higher rate than $F_{60\%}$.

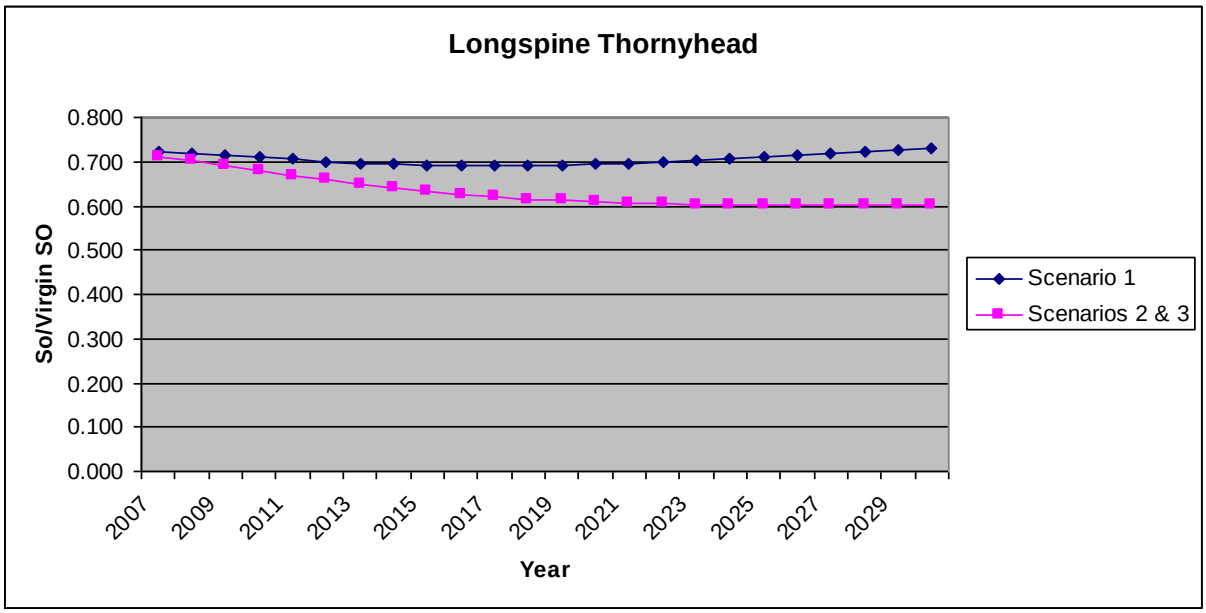


Figure 4-64. Percent of unfished spawning biomass predicted—longspine thornyhead.

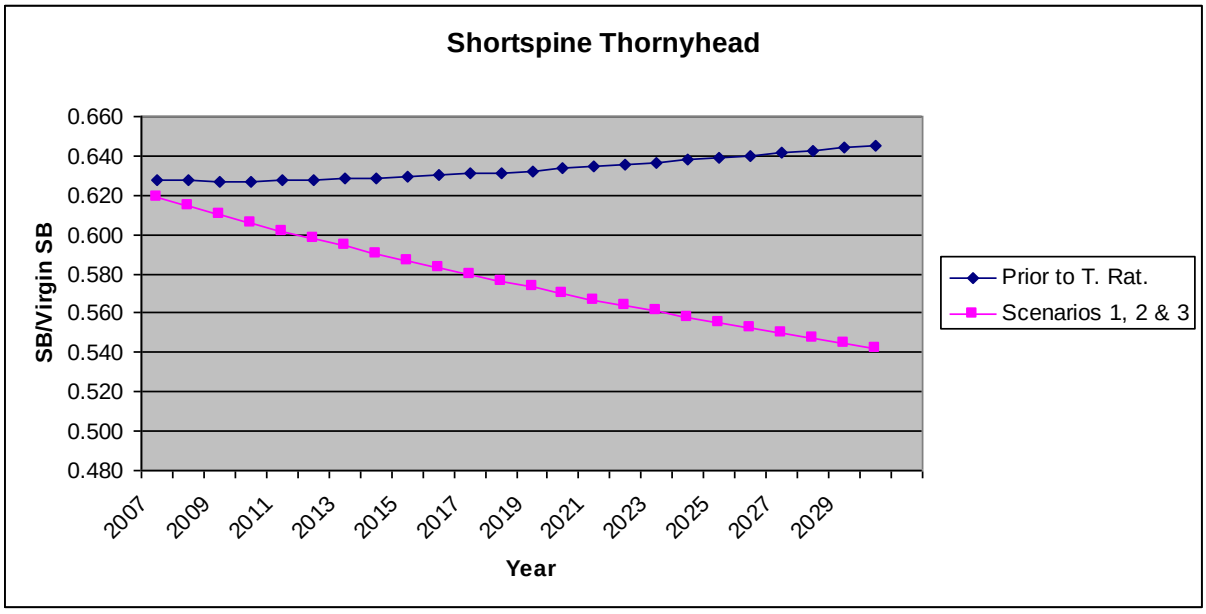


Figure 4-65. Percent of unfished spawning biomass predicted—shortspine thornyhead.

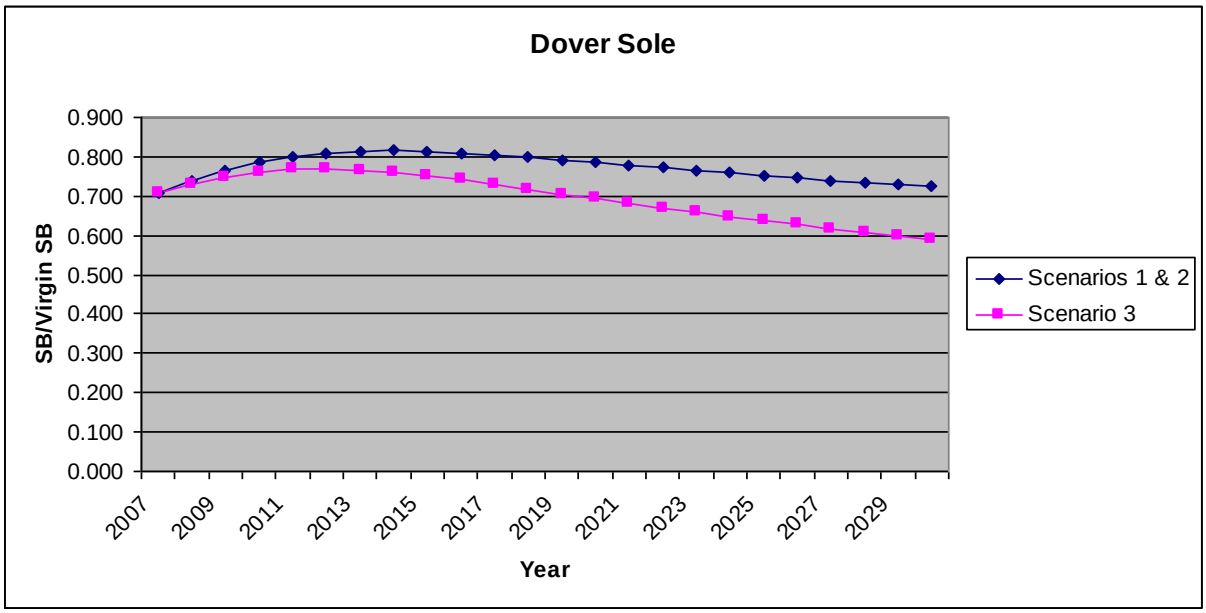


Figure 4-66. Percent of unfished spawning biomass predicted—Dover sole.

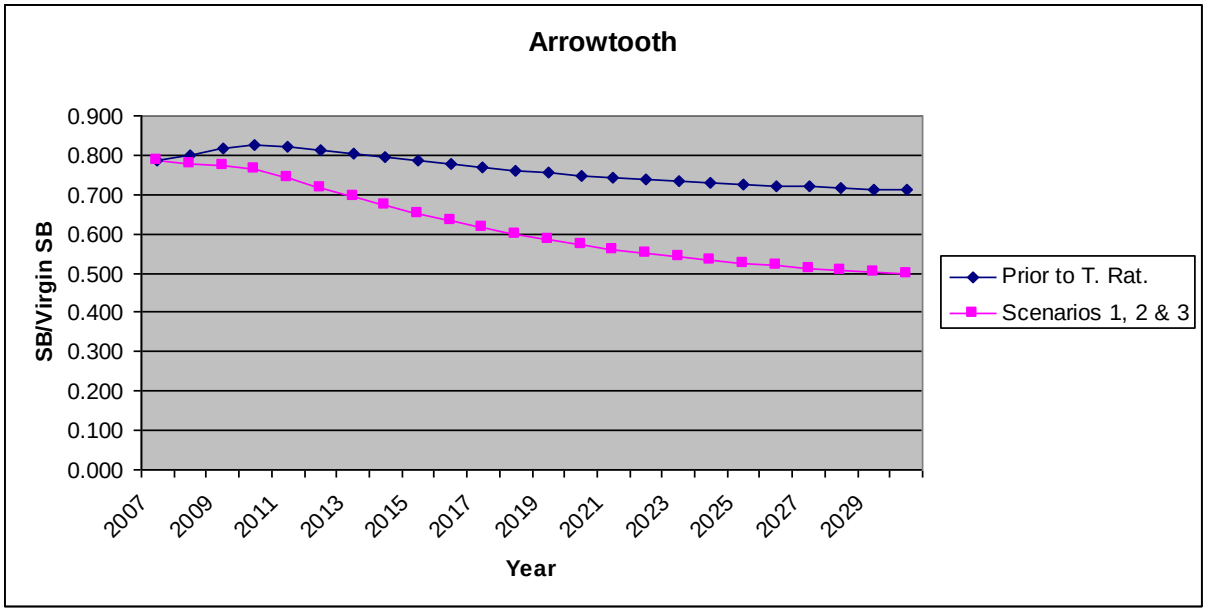


Figure 4-67. Percent of unfished spawning biomass predicted—Arrowtooth flounder.

4.17.2.2 Decrease in the Bycatch of Overfished Species

Under status quo (Alternative 1), catch of overfished species in the nonwhiting portion of the trawl fishery is indirectly managed, for example, by prohibiting retention or setting low trip limits for overfished species (to prevent targeting) and reducing cumulative trip limits for target species that co-occur with overfished species. Trip limits apply to landing amounts, not total catch. As a result, regulatory discarding of overfished species occurs as harvesters seek to achieve target species trip limits. Under this system, there is no individual incentive to reduce overfished species catch rates. Harvesters do not incur direct penalties for discarding overfished species, nor are they rewarded for

avoiding overfished species. Using the MSA definition, this management approach also increases bycatch because fish must be discarded for regulatory reasons (since they have market value they might otherwise be retained).

Under status quo, the observer coverage level in the nonwhiting fishery (about 20 percent) is intended to produce statistically accurate estimates of bycatch, although there is a time lag between data acquisition and its availability for management. Therefore, the fishery sector as a whole is indirectly accountable through any feedback from the management system (for example, inseason action to reduce trip limits or expand RCA boundaries), and that feedback may occur long after catch events have occurred due to the time lag between catch events and data availability to management.

Management of overfished species in the whiting fisheries is dealt with differently. Management in these fisheries imposes hard caps on the take of overfished species that are feasible due to the high level of monitoring in the fishery and the speed at which catch data are made available to management. However, the whiting fisheries are structured in a manner that encourages race for fish conditions, providing little opportunity for harvesters to adjust harvest timing in ways that may decrease bycatch. The exception is the catcher-processor fishery where a voluntary cooperative was formed, and participants operate as if they are in a rationalized fishery.

Under all the action alternatives, 100 percent observer coverage would be used in all sectors of the fishery (this coverage may come in the form of electronic video monitoring). Furthermore, the speed at which catch data would be available to management would be enhanced for the nonwhiting portion of the fishery. Such enhanced monitoring, the implementation of individual accountability, and incentives that eliminate race-for-fish conditions can be expected to reduce the bycatch rate (as is expected in the nonwhiting trawl fishery) and lead to reductions in the total amount of bycatch (as is the expectation in the whiting fisheries).

The reduction in the bycatch rate in the nonwhiting fishery is a direct result of imposing a form of reward through access to under-utilized target species, if harvesters can successfully avoid overfished stocks. It also comes in the form of a potential cost for encountering such species and needing to pay the cost of QPs to cover that catch event. The cost of this quota is likely to be expensive since these species restrict access to other, target species. The reduction in the amount of bycatch in the whiting fishery is a result of several motivations. One motivation is cost incentives that may come in the form of having to purchase quota (or catch history as may be the case in cooperative programs) if harvesters encounter these species, leading harvesters to change harvest activity in a way that reduces the potential for encountering overfished species, and thereby reducing the potential for incurring such costs. Expected reductions in overfished species bycatch amounts in the whiting fisheries also come from incentives to slow the pace of harvesting and/or a decrease in the need to fish as intensively over short periods. The incentives to slow the pace of harvesting come from research demonstrating that whiting become more valuable later in the year (Larkin and Sylvia, 1999), and also due to the incentives to reduce fishing capital to save costs, which means the fishery would have to occur over a longer period out of necessity. As demonstrated by a time-series analysis of bycatch in the whiting fishery, bycatch events and bycatch rates tend to decrease later in the year. Since more of the whiting fishery would occur later in the year, it is reasonable to expect that the amount of bycatch of overfished species would decline.

4.17.2.3 Changes in Nongroundfish Mortality

A variety of nongroundfish species are caught incidentally by the groundfish LE trawl fleet. The 2008 Groundfish SAFE document (PFMC 2008c) describes the various nongroundfish species caught by trawl gear and Section 3.17 summarizes observer data on catch by species. Arguably, the most

important incidentally caught species—because of the amount caught and its commercial importance—is Pacific halibut.

Pacific Halibut

As discussed in Section 4.8.2.2, Pacific halibut bycatch could increase as trawlers find more efficient ways to avoid overfished stocks and access target species, especially flatfish species that co-occur with halibut. However, a Pacific halibut IBQ is a feature of Alternatives 2a, 2b, 2c, and Alternative 4b (the preferred alternative); under these alternatives, this would cap the amount of Pacific halibut caught in the nonwhiting trawl fishery. This would work similarly to IFQ except that retention would be prohibited. Like the IFQ system, IBQ would impose individual accountability and allow for more precise monitoring of halibut bycatch. The accountability feature could motivate harvesters to reduce their halibut bycatch rates. Under these alternatives, IBQ would cover legal and sublegal size Pacific halibut bycatch mortality in the area north of 40°10 N. latitude and bycatch mortality would be estimated on an individual vessel basis. The actual amount allocated or credited to the groundfish trawl fishery to account for Pacific halibut bycatch was determined under the Amendment 21 intersector allocation process. This is further discussed under cumulative effects since it is an exogenous action. In general, a reduction in Pacific halibut bycatch in the trawl fishery is expected under Alternatives 2 and 4b, which include IBQ. As noted in Section 4.8.2.2, implementation of an IFQ program in the B.C. groundfish trawl fishery that included vessel limits on Pacific halibut bycatch was followed by a reduction in bycatch.

Other Fish

Previous environmental impact evaluations of groundfish biennial harvest specifications (PFMC 2004a) have indicated that the groundfish LE trawl fishery has a negligible impact on nongroundfish species because catches are small and are accounted for in the assessment of those stocks and the management of relevant nongroundfish target fisheries.

4.17.2.4 Improved Catch Monitoring

It is expected that there will be improvement in the fishery-dependent data used in many species stock assessments due to the increase in observer coverage, from status quo (20 to 30 percent observer coverage on bottom trawl vessels) to rationalized management (100 percent observer coverage or as close to 100 percent as is reasonable). More data would decrease one source of uncertainty in stock assessment models that arises from not fully accounted for catches. By decreasing uncertainty, decisionmakers can put greater confidence in stock assessment modeling, make more informed risk assessments, and formulate better management decisions. The mere presence of complete observer coverage may also influence vessel and crew behavior by discouraging high grading or unreported/unestimated discard, discouraging fishing in restricted areas, and encouraging avoidance of sensitive species and habitats.

Under Alternative 4b (the preferred alternative), several species infrequently encountered by trawl vessels will not be covered with IFQ/co-op shares, but total catch would still be accounted for through monitoring. The shoreside trawl sector encounters the nearshore stocks not managed with IFQ (longspine thornyhead south of 34°27’ N. latitude, nearshore rockfish and others) relatively infrequently because they are restricted from fishing in state waters off California and Washington, and landings of nearshore species are subject to state regulations off Oregon and California. Furthermore, the ocean bottom structure south of 34°27’ N. latitude is not conducive to trawling, limiting the catch of longspine thornyhead in that area. Shortbelly rockfish and spiny dogfish are frequently caught by trawl vessels; however, when the trawl mortality is viewed as a portion of the OY, that sector’s catch is considered

relatively small. Catch of both shortbelly and spiny dogfish are limited in the trawl sector largely because of market conditions. Similarly, the whiting fishery catches a variety of other species, but in comparatively low amounts. Under Alternative 2, all fishery sectors would be managed with IFQ, and an initial allocation based on catch history would cover incidentally caught species. Whiting sectors would be managed with co-ops under Alternative 3 (all whiting sectors) and Alternative 4 (at-sea sectors) with co-op shares for whiting only (with bycatch limits for overfished widow, darkblotched, and canary rockfish). Other incidentally caught species, such as spiny dogfish, yellowtail rockfish, and slope rockfish, would be managed under status quo (alternative 1) with trip limits.[116] As noted above, current full retention requirements (shoreside fishery, mothership catcher vessels) and full observer coverage (mothership vessels, catcher-processors) would continue under the action alternatives. Therefore, all catch would be fully monitored no matter what catch control tool is used.

4.17.2.5 Regional Shifts in Fishing Effort and Catch

The groundfish and halibut resource may be regionally affected by the action alternatives due to shifts in harvest location compared to status quo. Such shifts may be due to changes in the vessel homeport and processor delivery locations. Potential geographic shifts were explored through the comparative advantage analysis described in Appendix C (Section C.1) and used to evaluate impacts to communities (Section 4.14). That analysis concluded that the following areas would likely be less intensively trawled under the action alternatives compared to status quo (Alternative 1):

- Northern Washington shoreward of the RCA
- Northern and North/Central Oregon seaward of the RCA
- Central Oregon shoreward of the RCA
- Central California shoreward of the RCA

Broadly speaking, ports off northern California and Oregon appear to have the greatest advantage in a rationalized fishery, meaning that fishing effort will tend to become more concentrated in those areas. Harvesters may also alter their fishing strategy and gear in areas with higher abundance of overfished species. This implies that the mortality of stocks may be higher off these ocean/coastal areas compared to other areas. Quantitative prediction of the effects of differences in fishing mortality at a regional level is not possible since stock assessments are not spatially explicit at that fine a scale, and modeling of geographic shifts does not include estimates of the changes in fishing mortality at a regional scale.

The spatial concentration of fishing effort in certain locations has the potential for causing localized depletion. Localized depletion is usually assumed to have little impact on the health of a coastwide stock, depending on life history characteristics. Because stock assessments and management are on a large spatial scale (typically defined by stock distribution), localized depletion is neither accounted for, nor necessarily seen as a concern with respect to stock status (however, it may be a socioeconomic issue in terms of impacts to communities). The influence localized depletion has on stock health depends on stock structure, life history, and distribution. Additionally, at a coastwide scale, spatial differences in fishing mortality can lead to altered perceptions of stock status depending on the spatial scale at which a given stock is assessed. For example, sensitivity analysis of different stock boundaries for the shortspine thornyhead stock assessment in 2006 demonstrated that overall depletion and status was much less of a concern with a coastwide assessment relative to an assessment that only included the four INPFC areas north of Cape Mendocino.

[116] A portion of the trawl sector allocation would have to be set aside for this expected catch in order to determine the amount of QPs available to the IFQ managed fishery.

In 2006 the Pacific Marine Conservation Council convened a "Cape to Cape Meeting," composed of scientists, fishermen, and fisheries-policy experts, to explore the issue of spatial (area-based) management of west coast groundfish (Huhtala 2007). In a consensus statement, participants concluded that management of west coast fisheries would benefit by matching the spatial scales of interest for coastal communities with those scales naturally found within marine ecosystems. The evidence reviewed in that statement suggests that while nearshore ecosystems exhibit marked regional differences in their species composition, dynamics and productivity, and specialization of associated fisheries, offshore ecosystems (particularly the slope ecosystem and slope species) tend to have more population connectivity and more homogenous distribution and life history characteristics. Yet even at a coastwide scale, spatial differences in fishing mortality can lead to altered perceptions of stock status depending on the spatial scale at which a given stock is assessed. As noted above as an example, the 2006 shortspine thornyhead stock assessment demonstrated that a coastwide view resulted in a more optimistic outlook compared to a more localized view.

Alternative 3 contains an area management provision where QSs/QPs would be denominated north and south of 40°10' N. latitude, and catch in those areas would have to be covered by correspondingly denominated QPs. Although this provision is intended to limit geographic fleet consolidation (given the comparative advantage of northern ports), this measure could have implications in terms of localized depletion. Since QP represents a fraction of the catch rather than a quantity, the distribution of shares among permit holders would have no direct or indirect effect on harvest levels (put another way, the QSs denominated for a given area would add up to 100 percent). The potential for localized depletion would depend on the allocation of yield between the two areas. Since this is externally determined (through an allocation process and/or harvest specifications), this will be discussed further under cumulative effects.

Like most target species, the Pacific halibut TAC is set for the coastwide area 2A region by the IPHC, and the potential for localized depletion at smaller scales is not considered a stock status issue. As discussed above, Alternatives 2 and 4b include the use of halibut IBQ for nonwhiting fisheries north of 40°10' N. latitude (halibut bycatch is very minor in whiting fisheries). The region south of 40°10' N. latitude represents the southern extent of the stock's distribution, and Pacific halibut is not abundant in the area. For that reason, trawl bycatch mortality in this area is accounted for through deduction from the TAC for target fisheries as under status quo. Under Alternatives 2 and 4b, IBQ bycatch would be capped substantially lower than current levels, suggesting a reduced potential for localized depletion.

4.17.3 Cumulative Effects on Fish Resources

Past, present and RFFAs that apply to the fish resource are as follows:

- Current overfished status of seven groundfish species and resulting rebuilding plans
- Bycatch reduction and monitoring efforts
- Biennial specification of harvest levels for groundfish stocks, including target and overfished species and related management measures such as RCAs
- Allocation of harvest opportunity to the trawl sector under Amendment 21
- New retention and monitoring requirements for the shoreside vessels targeting whiting fishery (potentially as part of a single shoreside sector) will be implemented through Amendment 15
- Catch monitoring and harvest specifications for nongroundfish stocks, particularly Pacific halibut;
- Designation of EFH and related closed areas to mitigate the impacts of fishing
- Other marine protected areas

Trends that apply to the fish resource now and into the future include changes in the use of ocean areas, increased demand for protein, increased consumer awareness, continued rebuilding of overfished species, cyclical and continuing climate change, and ocean acidification.

For target species, the principal exogenous action is the biennial specification of harvest levels (OYs/ACLs). Major target stocks are regularly assessed. Most incidentally caught species remain unassessed, but management policies are precautionary; for example, the OY is set as a reduction from historical catch levels. The groundfish harvest policy framework is currently being revised to address changes to National Standard 1 guidelines, and new mechanisms to account for scientific uncertainty and adjust harvest limits accordingly may be adopted. Biennial harvest specifications would continue with implementation of the proposed action. Under status quo (Alternative 1), harvest limits for target species have been reduced because potential catch was constrained by management measures to limit overfished species bycatch. The catch control tools under the action alternatives allow catch at the species/stock/management unit level to be directly limited. As a result, harvest limits (QPs) could be set at levels potentially resulting in higher catches of healthy and currently underutilized species relative to status quo. In any case, however, the harvest policy framework has the primary objective of preventing overfishing and, as necessary, returning stock biomass to target levels. Under all the action alternatives, this objective would continue.

Overfished species are managed under rebuilding plans that provide a framework for returning stock biomass to the target level according to the constraints identified in §304(e) of the MSA, which may be paraphrased as rebuilding in a period that is as short as possible, taking into account the needs of fishing communities and the interaction of the overfished stock with the marine ecosystem. The policy framework and current rebuilding strategies—rebuilding in a timeframe consistent with §304(e)—would continue to drive harvest specifications. These rebuilding strategies, combined with periodic stock assessments and related rebuilding analyses, are used to set harvest limits (OYs/ACLs) in the biennial process. Catch control tools under the action alternatives are expected to provide incentives for avoiding overfished species catch (individual accountability, QS/QP cost). Because there is likely some minimum technically feasible bycatch rate, however, it is expected that harvest limits (sector allocations) will, for the most part, be fully utilized for these species. However, rebuilding strategies are predicated on the assumption that fishing mortality always corresponds to catch at the OY/ACL level. Improved monitoring will provide greater assurance that these harvest limits are not exceeded.

The trawl fishery under rationalized management will also continue to be constrained by rebuilding species, but, depending on individual behavior of harvesters, constraints on the fishery could be alleviated, resulting in greater access to underutilized stocks and a reduction in the encounter rate of rebuilding stocks. This behavior comes from incentives created through rationalization that would place pressure on harvesters to be accountable for and to minimize bycatch, as well as fully capturing the OYs of target species. When combined with the expected increase in public awareness and scrutiny of the fishing industry, the incentive to reduce bycatch may be even greater.

Changing ocean uses, such as adding alternative energy arrays, may tend to create de facto MPAs where fish harvesting is restricted or banned. Changing uses, combined with the present protected/conservation areas, will create more localized protection for the fish resources in that particular area, but may do little to alter the catch of groundfish species in the aggregate. However, to the extent that there are sub-populations, or populations of groundfish species that tend to reside outside the closed areas, such reduced fishing grounds will tend to put greater pressure on populations that lie outside of no-trawl areas.

The effect of climate change may be to alter where fish tend to occur, and it would logically follow that harvesters will move to where those fish relocate. When combined with the modifications expected to

occur from changes in the uses of ocean areas, changes in where trawling occurs may result. It is not clear what impacts this will have other than those noted previously.

Overall, the groundfish resource under rationalized fishery management is anticipated to be harvested closer to the OY/ACL for many of the species than it would be under status quo. That effect is expected to reduce the biomass levels of several groundfish species, though, according to available stock assessment models, not to levels that are below $SB_{40\%}$ (the proxy reflecting target biomass levels for groundfish). When these increased harvest levels are combined with climate change, anticipated regional shifts in catch, and closed areas, the resulting effect of rationalization on these resources in general is mixed. However, as indicated in the section below (California Current Ecosystem) the effect of climate change combined with the potentially increased harvest levels of some groundfish species may mean adverse impacts to some groundfish species. This is a twofold impact where climate change may reduce the availability of key prey species for some groundfish, while the trawl fishery subsequently increases the catch of those groundfish species that have experienced a reduction in prey availability. The result appears to be a decline in stock status for some species that is more dramatic than predicted from single species stock assessment models. To the extent that future harvest specifications setting considers this potential dynamic, the decline in stock status for these species may be avoided.

Finally, the increased catch accounting and bycatch accountability associated with the rationalization program would tend to reduce uncertainty in catch estimates, thereby improving information within stock assessments. This has a twofold impact in that the relative certainty management has in regard to meeting management targets is improved, and information in stock assessments is also improved, leading to more accurate estimates of stock status. Presumably, better information would allow for more accurate management of the groundfish resource and more accurate measurement of the resource status, making the resource better off in general.

4.17.4 Summary of the Impacts of the Alternatives on Fish Resources

The action alternatives are expected to affect fish resources differently compared to the no action alternative (Alternative 1), but the action alternatives are expected to be generally similar in terms of the types and intensity of impacts. Features of the alternatives expected to affect fish resources are measures that result in fleet consolidation, and any resulting secondary effect on the spatial distribution of effort, the inclusion of IBQ, which could result in reduced Pacific halibut bycatch, improved catch monitoring, and potential reduction in overfished species bycatch.

Catch of target species under the action alternatives is expected increase in comparison to Alternative 1 (no action). Modeled biomass trajectories indicate that spawning biomass and fishing mortality reference points would not be exceeded, so in this respect stock status would be unaffected. Harvest limits (OYs/ACLs) are set externally through the biennial harvest specifications process and ultimately determine total removals and effect on stock status. Improved catch monitoring under the action alternatives could, however, result in more accurate stock assessments.

The action alternatives are expected to result in a reduction of overfished species bycatch because of individual accountability. Improved monitoring is likely to contribute to this bycatch reduction. To the degree that actual total fishing mortality is reduced in comparison to the no action alternative (Alternative 1), these measures could lead to faster rebuilding of stocks. Any actual reduction in fishing mortality, beyond the amounts represented by the OY/ACL would be occur if there is some amount of unaccounted for bycatch under status quo or if total catch of these species was reduced. Such a reduction could result from lowering the OY/ACL compared to what it would be if set under status quo,

because harvesters demonstrate successful bycatch avoidance. Such a reduction would be an external policy decision (setting the ACL under the harvest specifications process) rather than a direct effect of the proposed action.

Spatial concentration of fishing effort could result in localized depletion. Generally, this is not an issue in terms of stock status, but may have socioeconomic effects at the community level. Alternative 3 creates separate QSs/QPs north and south of 40°10' N. latitude; although proposed to mitigate socioeconomic impacts of consolidation, it could also affect localized depletion.

Alternatives 2 and 4b (the preferred alternative) include IBQ for Pacific halibut. Compared to the other alternatives, including the no action alternative (Alternative 1), this could result in a substantial reduction in the bycatch of this commercial important species. The actual allocation for IBQ is set externally as part of the Amendment 21 intersector allocation action.

4.18 ESA-listed Salmon

4.18.1 Methods for Assessing Impacts

Table 4-81 shows the impacts, mechanisms, and indicators used to evaluate impacts to ESA-listed salmon. A qualitative assessment of changes in bycatch and bycatch monitoring is presented, because quantitative models to predict changes in salmon bycatch in the groundfish trawl fishery are not available.

Table 4-81. Overview of analytical approach used to compare baseline and future conditions of ESA-listed Chinook salmon under the alternatives.

Potential Impacts	Impact Mechanisms	Measurement Criteria or Indicators	Data and Models
Changes stock abundance	• Increase/decrease in Chinook salmon incidental take • Improved bycatch monitoring	• Bycatch rates • Accuracy of catch estimates	Qualitative assessment

4.18.2 Direct and Indirect Effects of the Alternatives on ESA-listed Salmon

The 2009-10 groundfish harvest specifications EIS (PFMC 2008b) evaluates bycatch of salmon under status quo management (Alternative 1). That analysis used information from a 2006 biological opinion (NMFS 2006b) prepared pursuant to reinitiation of consultation under ESA section 7, because an existing standard triggering reinitiation, 11,000 Chinook salmon caught in a given year by the whiting fisheries, was exceeded in 2005. These documents are incorporated by reference. A summary is provided in Section 3.18.

Management measures have been implemented in the whiting sectors to reduce bycatch of ESA-listed Chinook salmon. Season start dates are set to avoid higher bycatch rates occurring earlier in the year. As discussed in Section 3.6.1.1, in 2005, NMFS implemented a Salmon Conservation Zone prohibiting whiting vessels from fishing shoreward of a line approximating the 100-fathom isobath. Beginning in 2007, this was authorized as an inseason management measure for greater flexibility to respond to salmon bycatch conditions, which are highly variable from year to year. These management measures would continue under all of the action alternatives. In terms of impact of the nontribal whiting sectors, using 1998-to-2007 observer data, the mothership sector had the highest salmon bycatch rate (0.0465 Chinook salmon/mt), but the shore-based sector had the highest overall catch, accounting for

31 percent of the total catch from all sectors (including tribal harvesters, who are not subject to the proposed action). The action alternatives do not include any new measures to address Chinook salmon bycatch in the whiting fishery. Under the catch control tools proposed in the action alternatives, IFQs or co-ops, there may be changes in the spatiotemporal pattern of the whiting fishery. Under status quo (Alternative 1), the mothership and shore-based sectors operate under Olympic fishery conditions, where a premium is placed on harvesting fish quickly to maximize each individual's share of the sector's whiting quota allocation. However, the correlation between a potentially slower-paced and longer-lasting whiting fishery and salmon bycatch rates is unknown, especially since the action alternatives do not include any new incentives to avoid Chinook salmon bycatch (since this is not within the scope of the proposed action). Given that bycatch rates vary highly from year to year for reasons that are probably not controlled by the operational characteristics of the fishery (e.g., salmon abundance, overlap in the spatiotemporal distribution of salmon and whiting), there is no reason to suppose that Chinook salmon bycatch under the action alternatives would differ from that under status quo.

Analysis of 2002-to-2006 observer data presented in the 2006 biological opinion showed that salmon bycatch in the nonwhiting trawl fishery is a relatively rare event with a few tows accounting for a disproportionate share of the estimates of catch.[117] Thus, in terms of salmon bycatch, the distribution of effects is highly skewed. In terms of reporting strata, bycatch rates are generally greater in depths less than 250 fathoms and between Cape Falcon (northern Oregon) and Cape Mendocino (northern California). The stratum with the highest bycatch rate in the 2002-to-2006 period was Cape Falcon to Cape Blanco (central Oregon coast) at less than 125 fathoms. As discussed elsewhere (Section 4.14, Section 4.17.2.5), fleet consolidation resulting from implementation of IFQs for the nonwhiting fishery (proposed in all action alternatives) and the comparative advantage of different coastal regions could lead to changes in the distribution of fishing effort compared to status quo. Central Oregon shoreward of the RCA is one area identified as likely to be trawled less intensively (see Appendix C, page C-17). If such a change in the distribution of nonwhiting trawl fishing effort bears out, it could result in reduced bycatch of Chinook salmon.

As with the whiting fishery, the action alternatives do not contain any new measures intended to mitigate Chinook salmon bycatch in nonwhiting fishery. Thus, except for the effect of potential changes in the distribution of fishing effort, discussed above, there is no reason to expect that bycatch would change (increase or decrease) under the action alternatives.

All the action alternatives contain a provision that would allow gear switching (use of any legal groundfish gear) by vessels managed with IFQs (either a single shoreside sector under Alternatives 2 and 4, or the nonwhiting sector under Alternative 3). The 2006 biological opinion concluded that salmon bycatch in fixed gear fisheries is negligible. Therefore, gear switching by trawl permitted vessels is not likely to increase salmon bycatch, and could decrease it.

Impacts to ESA-listed species may be more directly addressed under ESA mandates. As already noted, past consultations have established a Chinook salmon catch threshold for reinitiation. This standard applies only to whiting fisheries, in part because those sectors are subject to full observer coverage so total Chinook salmon bycatch can be accurately determined. As noted elsewhere, under all the action alternatives, all trawl sectors, including nonwhiting bottom trawl, would be subject to 100 percent at-sea observer coverage, allowing accurate and timely determination of Chinook salmon bycatch as occurs in the whiting sectors under status quo (Alternative 1). If Chinook salmon catch were to increase, section 7 consultation could be reinitiated. Under the consultation process, NMFS Protected Resources

[117] A subsequent analysis of WCGOP data (Heery, *et al.* 2009) reports salmon bycatch rates in 2007. Although the magnitude of bycatch is lower in 2007 compared to earlier years, the spatiotemporal distribution is broadly similar.

Division (as the consulting agency) can propose discretionary and nondiscretionary measures to address such circumstances.

4.18.3 Cumulative Effects on ESA-list Salmon

The 2009-10 groundfish harvest specifications EIS (PFMC 2008b) describes exogenous ongoing and future actions and trends affecting Chinook salmon. That information is incorporated by reference and summarized below.

Groundfish biennial harvest specifications: This process sets overall harvest levels for groundfish fisheries and allocations to particular sectors. The setting of OYs (ACLs) indirectly affects the amount of fishing effort that will occur. Combined with the bycatch rate, this can affect the resulting catch of Chinook salmon.

Nongroundfish fisheries: Salmon are subject to target fisheries and caught incidentally in other nongroundfish fisheries. Target fisheries are managed to avoid take of ESA-listed salmon stocks, but a certain level of take is unavoidable when accessing nonlisted stocks.

Nonfishing actions: Salmon are vulnerable to a wide variety of actions and trends not related to fishing. Because salmon are anadromous, degradation of freshwater habitat from a wide variety of sources is an important contributor to stock decline. Cyclical changes in ocean conditions (broadly due to climate forcing) have been demonstrated to influence stock productivity substantially during juvenile and adult phases of the life cycle.

These exogenous factors would impact Chinook salmon to the same degree across all the alternatives.

4.18.4 Summary of the Impact of the Alternatives on ESA-listed Salmon

There are no features of the action alternatives that directly affect Chinook salmon take, so there is little basis for distinguishing between the action alternatives in terms of impacts. Fleet consolidation could result in redistribution of fishing effort. As discussed above, an analysis of factors motivating redistribution of fishing effort suggests that it may decline in nearshore areas of the central Oregon coast where observer data indicate salmon bycatch rates are higher. Greater consolidation may occur under Alternative 2 while, among the other action alternatives, Alternative 3 may result in the least consolidation (Alternative 1, no action, would have the least consolidation). Alternative 4 may result in intermediate levels of consolidation. Gear switching is a provision of all the action alternatives for IFQ managed fisheries. According to the 2006 biological opinion (NMFS 2006b), this gear type has a negligible bycatch rate for salmon. Any gear switching may, therefore, contribute marginally to a reduction in Chinook salmon bycatch. With these features of the alternatives in mind, but considering exogenous factors contributing to cumulative impacts, it is not possible to determine whether impacts to ESA-listed salmon would differ under any of the action alternatives (Alternatives 2 to 4) compared to no action (Alternative 1).

4.19 Other Protected Species (Marine Mammals and Seabirds)

Section 3.19 describes other species protected under the ESA and the MMPA that occur in the action area. Six marine mammal species are known to have interacted with groundfish trawl gear: California sea lion, harbor seal, harbor porpoise, pacific white-sided dolphin, northern elephant seal, and Stellar sea lion (unidentified sea lions are also recorded, which could be either California or Stellar). Various seabird species have been observed taken in the groundfish trawl fishery; none is ESA-listed.

4.19.1 Methods for Assessing Impacts

Table 4-82 shows the impacts, mechanisms, and indicators used to evaluate impacts to other protected species. A qualitative assessment of changes in bycatch and bycatch monitoring is presented, because quantitative models to predict changes in protected species bycatch in the groundfish trawl fishery are not available.

Table 4-82. Overview of analytical approach used to compare baseline and future conditions of marine mammals and seabirds under the alternatives.

Potential Impacts	Impact Mechanisms	Measurement Criteria or Indicators	Data and Models
Changes stock abundance	• Increase/decrease in protected species incidental take • Improved bycatch monitoring	• Bycatch rates • Accuracy of catch estimates	Qualitative assessment

4.19.2 Direct and Indirect Effects of the Alternatives on Marine Mammals and Seabirds

As with ESA-listed salmon discussed in the previous section, the principal impact to marine mammals under the alternatives would be due to take mortality from interaction with trawl gear. Take is a function of the abundance and distribution of the animal and characteristics of the fishing gear and fishery operations, which contribute to overall vulnerability to take in the fishery. Changes in the level and distribution of fishing effort under the action alternatives can be only be assessed qualitatively, and information on the distribution of affected marine mammal species pertains to broad regions and habitat types. Therefore, it is difficult to forecast whether the action alternatives would affect protected species differently than they are affected under status quo. Information on incidental takes under status quo can be presented, and certain features of the action alternatives, which may affect bycatch rates, can be discussed.

Table 4-83 reproduces indicators of marine mammal stock status from 2009 SARs (Allen and Angliss 2009; Carretta, *et al.* 2009). Except for the Eastern U.S. Stellar sea lion stock, which is reported in the Alaska SAR, the stocks are reported in the Pacific SAR. One stock is classified as strategic, the Eastern U.S. Stellar sea lion stock. Table 4-84 and Table 4-85 report marine mammal bycatch (incidental take) estimates from the At-sea Hake Observer Program and WCGOP for the 2002-to-2006 and 2002-to-2005 periods, respectively (NMFS SHOP & WCGOP 2008). Taking the point estimates from the tables below and averaging them over the time period suggests that the whiting fishery takes 0.98 California sea lions, 1.86 Steller sea lions, 0.86 northern elephant seals, and 0.5 harbor seals on average per year. A similar calculation can be made for the nonwhiting fishery. This indicates an average of 58.47 California sea lions, 3.36 Stellar sea lions, 0.62 harbor porpoise, and 1.5 white-sided dolphins taken annually by this fishery sector.[118] Compared to the overall estimate of fisheries injury/mortality for the stocks, the values suggest the groundfish trawl fisheries are a modest contributor to impacts to these stocks.

[118] Since the report includes unidentified sea lion take, that take is distributed proportionately between the two species to arrive at the estimate.

Table 4-83. Stock indicators reported in 2009 Stock Assessment Reports.

Stock	N Estimate	N min	PBR	Fisheries Injury/Mortality	Strategic ?	SAR Last Revised
California Sea Lion (U.S.)	238,000	141,842	8,511	≥159	N	2007
Stellar Sea Lion (E. U.S.)	45,095-55,832	44,404	1,998	1.4	Y	2009
Northern Elephant Seal (CA breeding)	124,000	74,913	4,382	≥8.8	N	2007
Harbor Seal (CA)	34,233	31,600	1,896	389	N	2005
Harbor Seal (OR/WA)	24,732	22,380	1,343	≥13	N	2007
Harbor Porpoise (N. OR/S. CA)	39,581	28,833	114	≥0.8	N	2009
Harbor Porpoise (N. OR/WA coast)	15,674	11,383	114	≥0.8	N	2009
Pacific White-sided Dolphin (CA/OR/WA)	20,719	17,201	155	1.4	N	2008

Table 4-84. Bycatch estimates of marine mammals in the whiting fishery.

	2002	2003	2004	2005	2006
California Sea Lion	0	0	2.1 (1.5-3.0)	0	2.5 (1.4-4.6)
Stellar Sea Lion	1.2 (0.6-2.3)	1.1 (0.7-1.8)	0	2.4 (1.4-4.3)	3.6 (2.3-5.7)
Northern Elephant Seal	0	0	3.4 (2.3-4.9)	0	0
Harbor Seal	0	0	0	1.2 (0.6-2.7)	1.3 (0.6-2.9)

Table 4-85. Bycatch estimates of marine mammals in the nonwhiting fishery.

	2002	2003	2004	2005
California Sea Lion	34.8 (17.9-67.5)	163.1 (103.0-258.4)	10.0 (4.6-21.4)	19.7 (9.7-39.9)
Stellar Sea Lion	11.5 (4.4-30.3)	0	0	0
Unidentified Sea Lion	7.8 (2.1-28.8)	0	0	0
Harbor Porpoise	0	0	3.1 (0.9-10.0)	0
Pacific White-sided Dolphin	0	7.5 (2.0-27.4)	0	0

The SHOP/WCGOP report also presents information on seabird take. In the whiting fishery, the following species were observed, and bycatch estimates were made: black-footed albatross (2-3/year, 2003 to 2006), common murre (<2/year), northern fulmar (~6/year), and sooty shearwater (<1/year). In addition, unidentified auklets or murrelets and other unidentified seabirds were taken in low numbers (<2/year). In the nonwhiting fishery Brandts cormorants, common murres, Leachs storm petrels, and northern fulmars were observed taken, 2002 to 2006. In addition unidentified cormorants, gulls and storm petrels were observed taken. The total number of seabirds estimated taken during the period was 575, 50 percent of which were common murres. However, the bycatch estimate was driven by one observation of 33 murres taken in a single tow in 2003.

As noted previously, there is no information to indicate definitively how changes in management would affect marine mammal and seabird take. In the absence of information, it may be assumed that the level of take reported above for status quo management of fisheries would continue under any of the action alternatives. However, several factors could alter the level of take. Although it is difficult to predict what the effect would be, the following changes could occur under the action alternatives.

Fleet consolidation could lead to an increase in target species CPUE. As a result, the amount of overall fishing effort could decline, remain stable, or increase, and the number of vessels is expected to decline. Effort would decline if overall catch remains constant relative to status quo; however, harvesters may be able to access greater amounts of target species yield, resulting in stable or increasing levels of effort. A combination of fewer vessels expending the same or diminished level of fishing effort could result in fewer interactions with protected species.

Individual accountability (control of QSs or co-op shares) is expected to reduce Olympic or race-for-fish conditions in the fishery. This would give harvesters the opportunity to make more efforts to avoid protected species bycatch, if technically or operationally feasible. However, the program does not include individual incentives for protected species bycatch reduction, so it would be matter of individual harvesters' recognizance.

As discussed above (Sections 4.18 and 4.14), consolidation could also lead to changes in the distribution of fishing effort. This could affect the bycatch of protected species. Looking at the observer data referenced above, the Monterey INPFC area (Cape Mendocino to Point Sur) showed the highest number of marine mammal takes (11 out of 17). This is also the area with the highest number of observed seabird takes. Central California shoreward of the RCA is an area where trawl fishing may decline according to the comparative advantage analysis (Appendix C, Section C.1). To the degree that trawl fishing declines in this area, this may reduce incidental takes of marine mammals, given that the species observed taken are more likely to occur closer to the coast (i.e., shoreward of the RCA).

The program feature with the greatest implications for protected species bycatch is the gear switching provision. This principally applies to vessels managed with IFQ that have sufficient QSs for species that can be efficiently targeted with fixed gear (e.g., sablefish, Pacific cod). They can harvest species against their QSs/QPs using any legal groundfish gear, and fixed gear (pot, bottom longline) would be the most likely choice. The SHOP/WCGOP report (NMFS SHOP & WCGOP 2008) also includes estimates of marine mammal and seabird bycatch in the LE fixed gear fishery. The only marine mammal observed taken, 2002 to 2005, was the California sea lion. Black footed albatross, western gulls, brown pelican, unidentified cormorants and unidentified birds were observed, and bycatch estimates were derived. As noted in Section 3.19, the brown pelican is listed as endangered under the ESA.

For 2009, the sablefish pot fishery was uplisted from a Category III fishery to a Category II fishery under the MMPA, because of interactions with the endangered humpback whale (2009 List of Fisheries, 73 FR 73032; December 1, 2008). Humpback whale interactions with pot and trap gear fisheries off the west coast (including the commercial sablefish pot gear fisheries) were documented in data available from the NMFS Large Whale Disentanglement Network. Based on analysis of these data, NMFS estimated that three humpback whales were seriously injured or killed between 2002 and 2006 due to entanglements with pot or trap gear, one of which was with sablefish pot gear in September 2006. A single serious injury or mortality of a humpback whale results in a level of take of 0.2 animals per year, or 8 percent of the PBR. In addition to data from the Large Whale Disentanglement Network, NMFS also considered other factors prior to its listing of the pot or trap gear fisheries as Category II, including the type of gear being used, stranding records, and the distribution of marine mammals in the area of the fishery. Gear switching by trawl vessels under the action alternatives could increase the risk of such takes (and other marine mammals as discussed above), especially since analysis elsewhere in this chapter suggests that gear switching is more likely to occur among trawl vessels operating in the Central California region.

4.19.3 Cumulative Effects on Other Protected Species (Marine Mammals and Seabirds)

Both marine mammals and seabirds are subject to various sources of human-induced and natural mortality, and other factors affecting population viability. These are catalogued in the SARs (Allen and Angliss 2009; Carretta, *et al.* 2009)and incorporated by reference. Exogenous factors include the following:

- Take of marine mammals and seabirds in other fisheries (fishery mortality/injury estimates in the SARs capture all these sources)
- Nonfishing sources of direct mortality (e.g., ship strikes, oil spills), also discussed in the SARs
- Degradation of nesting habitat for seabirds and disturbance of haul out areas for marine mammals
- Climate forcing affecting food chain dynamics, producing more or less prey (further discussed in Section 4.20)

These exogenous factors have an equal effect under all of the alternatives; therefore, while they would increase the overall magnitude of impacts under each alternative they do not change the relative impact when comparing the alternatives.

4.19.4 Summary of the Impact of the Alternatives on Other Protected Species (Marine Mammals and Seabirds)

Three factors were identified that could affect incidental take of marine mammals: fleet consolidation affecting the distribution of fishing effort, reduction in Olympic (race-for-fish) fishery conditions leading to greater ability to avoid takes, and trawl vessels managed under IFQs switching to fixed gear, which may have different impacts on these protected species compared to trawl gear. Alternative 2 would likely lead to the greatest level of consolidation, while Alternatives 1 (no action) and 3 would result in the least consolidation, and Alternative 4 would result in an intermediate level (see discussion in previous sections for rationale for this conclusion). Consolidation could lead to fishing areas where observed take of marine mammals and seabirds is relatively higher (i.e., Central California shoreward of the RCA). In Alternative 1 (no action), Olympic fishery conditions are more pervasive in the whiting fishery, since it is under season/quota management compared to trip limit management for the nonwhiting sector. All the action alternatives implement catch control tools for the whiting sectors (either IFQs or co-ops) that would reduce Olympic conditions in the whiting sectors. However, the action alternatives do not contain any individual incentives for harvesters to avoid protected species take, so any such change in fishery conditions may not have any effects compared to no action. Finally, the gear switching provision, which is part of all the action alternatives for IFQ managed fisheries, could increase the risk of takes of some protected species over the no action alternative (Alternative 1). In particular, it was noted that the current sablefish pot fishery has been recategorized as a Category II fishery under the MMPA because of interactions with humpback whales. A Category II fishery is one where annual mortality and serious injury of a stock in a given fishery is greater than 1 percent and less than 50 percent of the PBR level.

4.20 Habitat and Ecosystem

A description of the California Current large marine ecosystem can be found in Section 3.20. Below is a brief description of the California Current ecosystem model used to further the understanding of complex interactions off the west coast.

The California Current ecosystem model, dubbed "Atlantis," was constructed by the Northwest Fishery Science Center scientists and included dynamics of species and functional groups of ecologically similar species, predator/prey interactions, oceanographic/climatic features (daily hydrodynamic flows, salinity, temperature), and fishery removals (Brand, *et al.* 2007). Examples of functional groups include habitat-forming species (kelp, corals, and sponges), benthic invertebrates, zooplankton, phytoplankton, and vertebrates. The California Current model extends from the U.S./Canada border to Point Conception, California, and out to the 1,200-m isobaths. In the model, this area is divided into 62 spatial zones, including depth layers. This three-dimensional aspect of the model allows for input and modeling of fish migrations and movement behavior, fleet dynamics, and spatial management. The full parameterization for the California Current is described in Brand et al. (2007), although some modifications and additions have been made since, including the addition of canary rockfish and English sole groups, minor updates to stock abundance, and updated diet data.

The Atlantis model was used to assess the ecosystem impacts of trawl rationalization. These effects are measured through the indirect effects fishing will have on other species based on known relationships in the food web. The results shown here serve only as an indication of the type of effect that may occur.

4.20.1 Broad-Level Effects of Rationalization on the California Current Ecosystem

The California Current large marine ecosystem is not predicted to be substantially impacted by rationalization, although it is difficult to make predictions about a complicated system that has many inputs to productivity. Changes in catch induced by moving from status quo management to share-based management, may result in changes to the ecosystem's food web that are perceptible. Changes in location of catch and changes in the type of gear utilized may result in changes to the amount and kind of EFH impacted. Such changes in habitat impacts may have an effect on the ecosystem; however, that link, while logical, is difficult to demonstrate, as noted in the EFH EIS (PFMC 2004c). Direct effects of fishing are most accurately captured in projections from single species stock assessments, which are evaluated in Section 4.16.

Indirect effects that could occur include keystone predation (a predator indirectly increases the abundance of competitors of its prey via consumption of the prey); tri-trophic interactions (increase in plant/algal abundance caused by the control of herbivores by prey); exploitation completion (a reduction in a consumer or producer resulting from the reduction of its prey or resources by another consumer species); apparent competition (reduction of a species resulting from increase in a second species that enhances predation by a shared enemy); indirect mutualism (positively correlated changes in two species resulting from predation by each on the competition of the other's main prey); indirect commensalism (similar to indirect mutualism, but one potential indirect mutualist is more generalized in diet and also feeds on the main prey of the other indirect mutualist); habitat facilitation (one organism indirectly improves the habitat of a second by altering the abundance of a third interactor); apparent predation (an indirect decrease in a nonprey produced by a predator or herbivore, e.g., a predator removes a prey species, and the decline of the prey results in the decline of a third species); and indirect defense (the indirect reduction of a predator or herbivore by a nonprey; e.g., competition by a nonprey can reduce the abundance of a prey and this its predator) (Menge 1997). The Atlantis model predicted minor indirect effects on prey species.

While not captured in the Atlantis model, rationalization is expected to result in fleet consolidation. A broad-level effect of consolidation is that some fishing vessels are expected to become inactive and may fall into disrepair. This was seen after the buyback program consolidated the trawl fleet, and several of those vessels have become public health, safety, and environmental health problems that harbor masters and port authorities are forced to address. There are no mitigating measures in the trawl rationalization

program to help vessel owners, harbors, and communities deal with potential derelict vessels that may result from trawl rationalization consolidation.

4.20.2 Potential Impacts, Mechanisms, and Metrics

Change in condition of the ecosystem (as indicated by minor indirect effects on prey species) was not substantially different under any of the program's proposed analytical scenarios. Therefore, the change in condition of the ecosystem will be evaluated by comparing conditions under status quo management to conditions under a rationalized management program.

Several catch scenarios were developed that could occur in a rationalized fishery. The following metrics were utilized to examine the potential impacts of the catch scenarios under rationalization on the California Current ecosystem in comparison to the status quo management catch scenario.

Table 4-86 provides an overview of the analytical approach used to compare baseline and future conditions of the California Current large marine ecosystem under the alternatives, including EFH. The analytical approach includes 1) potential impacts, 2) mechanisms that relate the proposed action to the impacts; 3) measurement criteria or indicators used in assessing each type of impact, and 4) models and data sets used in the analysis.

Table 4-86. Overview of analytical approach used to compare baseline and future conditions of the ecosystem under the alternatives.

Potential Impacts	Impact Mechanisms	Measurement Criteria or Indicators	Data and Models
Changes species abundance	Changes in catch that can be traced through the food web	Changes in predator and prey abundance and trophic relationships	Atlantis ecosystem model
Changes in fishing effects (and area management) on EFH	Shifts in location of catch and gear switching	Description of changes in area and duration of bottom contact of groundfishing gears	Geographic shift model and qualitative assessment

Change in the Catch Amount of Target Species and Key Predator/Prey Species: Trawl rationalization is anticipated to result in an increased amount of target species catch. Other species are expected to have variable levels of utilization, including maximum utilization (taking the full allocation or OY) of some species. This high utilization of target and other species could have an impact on the California Current ecosystem, especially if those species are important predators or prey in the food web. This potential impact was evaluated by applying several catch scenarios to the Atlantis model. Direct effects of fishing (catch and fishing mortality) were modeled with the intent of detecting indirect effects, primarily through predator/prey tradeoffs under each catch scenario. Outputs of this model are primarily a qualitative assessment of changes in dominant trophic relationships resulting from the four catch scenarios.

Four scenarios for future catch (landings and discards) under a rationalized trawl fishery were developed for input to the Atlantis model. The scenarios were based on the idea that the behavior of harvesters would change under a rationalized fishery and that change would allow them to access more target species than had been accessed under status quo management.

Constraining overfished species include canary rockfish (*Sebastes pinniger*), yelloweye rockfish (*S. ruberrimus*), darkblotched rockfish (*S. crameri*), Pacific ocean perch (*S. alutus*), bocaccio rockfish

(*S. paucispinis*), and cowcod (*S. levis*)**.** Underutilized species include arrowtooth flounder (*Atheresthes stomias*), Dover sole (*Microstomus pacificus*), shortspine (*Sebastolobus alascanus*) and longspine thornyheads (*S. altivelis*), slope rockfish, chilipepper rockfish (*Sebastes goodie*), yellowtail rockfish (*S. flavidus*), lingcod (*Ophiodon elongatus*), and various flatfish species that make up the "other flatfish" complex.

The catch scenarios were as follows:

- Status Quo = catch roughly the same as those that occurred from 2003 to 2006.
- Scenario 1 (low-catch amount scenario) = minimal increases in catch of underutilized species compared to the status quo scenario. Bycatch rates are assumed to be 55 percent of status quo.
- Scenario 2 (moderate or medium-catch amount scenario) = moderate increases in catch of some underutilized species. Bycatch rates are assumed to be 30 percent of status quo.
- Scenario 3 (high-catch amount scenario) = substantial increase in catch of underutilized species. Bycatch rates are assumed to be 15 percent of status quo.

In all the Atlantis model catch scenarios, total catch of constraining species (e.g., canary rockfish) remained constant or increased only slightly. An assumption in the model was that harvesters have the highest preference for flatfish stocks and thornyheads due to the ability to catch these stocks with low bycatch rates, and other target species have a lower harvester preference.

The Effect of Shifts in Fishing Locations on EFH: Trawl rationalization is anticipated to result in geographic changes in harvest patterns, and consequently, the potential for changes in impacts to EFH. Trawling occurs over hard or soft substrates, and general shifts in fishing location would translate to either an increase or decrease of trawling in certain areas. No change in trawled substrate type would occur in areas that are currently closed to trawling, because no changes are anticipated to RCAs or other EFH conservation measures. To examine this impact, the model described in Section 4.2.1.3 is used to illustrate the predicted geographic shifts in fishing patterns. This is paired with either a hard or soft bottom substrate type, which was obtained from the 2004 EFH EIS (PFMC 2004c). A qualitative discussion follows, indicating whether that area may see an increase, decrease or no change to fishing effort.

The Effect of Shifts in Gear Types on EFH: Trawl rationalization is also anticipated to result in opportunity to switch from trawl gear to fixed-gear, which is thought to be less destructive to bottom habitat. One specific provision of Amendment 20, Adaptive Management, could provide an incentive to switch from bottom trawl to fixed-gear, which could have implications on EFH conservation.

4.20.3 Direct and Indirect Impacts of the Alternatives

4.20.3.1 Change in the Catch Amount of Target Species and Key Predator/ Prey Species

The potential change in catch volumes as a result of trawl rationalization was run through the Atlantis model. The results illustrated several findings:

- Miscellaneous nearshore species and small, shallow-water rockfish showed the most noticeable change in abundance in the model through indirect effects. This is driven by higher fishing-induced lingcod mortality than under status quo, which subsequently reduced lingcod predation on such species.
- Differences in groundfish mortality as a result of rationalization were not predicted by the model to have strong impacts on the food web, beyond the direct effects on harvested species.

- Strong indirect effects appear to be limited only to forage species such as nearshore fish, and were not seen on target species.

Tradeoffs were observed between large demersal predators (lingcod) and two principal prey items: miscellaneous nearshore fish and shallow small rockfish. The high catch amount scenarios led to the highest levels of depletion of target species, including large flatfish (e.g., arrowtooth flounder), large demersal predators (lingcod), deep small rockfish (e.g., longspine thornyhead), midwater rockfish (e.g., yellowtail and chilipepper rockfish), deep large rockfish (e.g., shortspine thornyhead), and small flatfish (e.g., Dover sole). Those high catch amount scenarios resulted in reduced predation on those species' prey. Prey species that showed increases in the model include sculpin (Cottidae) and white croaker (*Genyonemus lineatus*), particularly in response to the reduced abundance of lingcod. Twenty percent of lingcod diet is composed of nearshore fish species. Minor increases (2 percent) in abundance of shallow small rockfish (such as shortbelly rockfish *Sebastes jordani*) also showed in the model. Twenty-one percent of lingcod diet consists of shallow small rockfish.

4.20.3.2 The Effect of Shifts in Fishing Locations on EFH

In order to determine what impacts would occur to habitat from changing to rationalized fishery management from status quo, the areas fished were examined (before and after rationalization), as well as which habitat types occurred in those areas. The following table shows the delineated bycatch areas (GeoHab Areas) and the amount and percentage of each polygon associated with either a hard or soft substrate.

Table 4-87. Induration composition of bycatch polygons (areas in hectares).

GeoHab Area	blank	hard	soft	Grand Total	blank	hard	soft
34d 25' to EEZ-S, in	2,299.2	1,075.9	32,335.6	35,710.8	6.44%	3.01%	90.55%
34d 25' to EEZ-S, out	3,835.2	29,239.7	397,093.6	430,168.6	0.89%	6.80%	92.31%
36d 08' to 34d 25', out	448.8	20,598.4	87,574.6	108,621.8	0.41%	18.96%	80.62%
38d 25' to 36d 08', in	15.1	6,602.4	94,296.3	100,913.8	0.01%	6.54%	93.44%
38d 25' to 36d 08', out		1,173.4	46,749.1	47,922.6	0.00%	2.45%	97.55%
40d 10' to 38d 25', in	2.6	313.3	33,576.3	33,892.2	0.01%	0.92%	99.07%
40d 10' to 38d 25', out		0.4	43,328.4	43,328.7	0.00%	0.00%	100.00%
42d 30' to 40d 10', in	7.8	936.6	46,729.3	47,673.6	0.02%	1.96%	98.02%
42d 30' to 40d 10', out		3,608.3	71,790.0	75,398.3	0.00%	4.79%	95.21%
43d 55' to 42d 30', in	2.6	3,509.9	25,919.8	29,432.3	0.01%	11.93%	88.07%
43d 55' to 42d 30', out		2,522.6	31,957.3	34,479.8	0.00%	7.32%	92.68%
45d 35' to 43d 55', in	0.8	8,592.8	50,657.3	59,250.9	0.00%	14.50%	85.50%
45d 35' to 43d 55', out		2,083.2	49,890.0	51,973.2	0.00%	4.01%	95.99%
47d 40' to 45d 35', in	0.5	528.4	80,676.3	81,205.2	0.00%	0.65%	99.35%
47d 40' to 45d 35', out		1,910.9	54,552.3	56,463.2	0.00%	3.38%	96.62%
EEZ-N to 47d 40', in	6.0	356.3	28,610.5	28,972.8	0.02%	1.23%	98.75%
EEZ-N to 47d 40', out			19,169.2	19,169.2	0.00%	0.00%	100.00%
Grand Total	6,618.7	83,052.6	1,194,905.8	1,284,577.1	0.52%	6.47%	93.02%

The polygons highlighted in grey are those areas that are predicted to experience a decrease in fishing effort (see Section 4.2.1.3 and Appendix C for the geographical shift model description), and, therefore, a decrease in trawl gear contact with the bottom. In four areas (grey rows in Table 4-87), the majority (88 percent to 98.7 percent) of the substrate is soft bottom.

All other polygons (white rows in Table 4-39) may or may not have a complementary increase in trawl fishing effort after the implementation of trawl rationalization. It is difficult to determine which areas may have an increase in trawl effort. Impacts to EFH from trawl gear have been mitigated by past and ongoing Council actions.

4.20.3.3 The Effect of Shifts in Gear Types on EFH

Gear switching may reduce the impacts to habitat that is currently trawled; however, since many types of habitat are not accessed by trawl gear because of footrope restrictions (such as rocky reef habitat), gear switching may result in more fishing effort being exerted on untrawlable habitat. Use of fixed gear could have modest adverse impacts on untrawlable habitat. The EFH EIS (evaluating Amendment 18) (NMFS 2005) describes impacts to bottom habitat from pot and longline gear (Sections 3.5.8.5 and 3.5.9.4), and that information is incorporated by reference. Shifting of pots and lines during retrieval, entanglement of lines with biogenic habitat, and lost gear can adversely affect untrawlable habitat, particularly areas with complex biogenic features (corals, sponges, etc.). The specific effects on any gear switching cannot be predicted, because it is unknown whether this would result in an increase in fishing in sensitive habitats compared to status quo, and the intensity of effects depends on the way the gear is deployed.

4.20.4 Cumulative Effects of on Habitat and Ecosystem

A discussion of cumulative effects on the California Current ecosystem includes trends and actions that are occurring, have occurred, or would be expected to occur exogenous to rationalization, as well as effects that could likely occur under a rationalized management program. The Atlantis model was able to produce a simple simulation of the California Current ecosystem with some, but not all, RFFAs and trends. Therefore, Atlantis is useful in evaluating some cumulative effects related to these actions and trends. Furthermore, as discussed above, there are no discernable differences in terms of the effects of the action alternatives compared to one another; the analysis focuses on the contrast between status quo (Alternative 1) and the general effects of trawl rationalization (action alternatives) on habitat and ecosystem.

Sections 3.3 and 3.4 describe historic fishery management decisions, the RFFAs, and the identifiable trends and Section 3.20 describes baseline conditions of the ecosystem. Past, present, and RFFAs that apply to the ecosystem include the overfished status of seven groundfish species and related rebuilding efforts; bycatch reduction; designation of EFH; and MPAs and RCA closured areas applicable to groundfish trawl gear. Trends that apply to the ecosystem include changes in the use of ocean areas (such as additional wave energy sites and MPAs), changes in land use, continued rebuilding of overfished species, and cyclical and continuing climate change.

Regardless of the fishery management program, the effort to rebuild species and reduce bycatch will continue to influence the amount and type of fish removed by the trawl fishery and will, therefore, affect ecosystem function to some degree. There would be much more individual accountability for fishery removals under the action alternatives (rationalized fishery management program), supported by higher levels of observer coverage (at or near 100 percent). Status quo (Alternative 1) management has shown that closed areas have contributed to the reduction of bycatch of overfished rockfish species, and the benefits of those closed areas would be expected to continue under rationalization.

Changing ocean uses, such as adding alternative energy arrays, create de facto MPAs where fish harvesting is restricted or banned. Changing uses, combined with the present protected/conservation areas, will create more localized protection for groundfish in that particular area, but may do little to

further decrease bycatch of key constraining species or bolster overall integrity of the large marine ecosystem. Climate change may alter the areas where groundfish species occur and can be harvested, but the effect of this on the ecosystem under status quo or rationalization is unknown.

The Atlantis model was used to simulate possible outcomes as a result of climate change. These outcomes were combined with possible catch scenarios under rationalization to estimate the cumulative effect of both rationalization and fishing under an environment altered as a result of climate change. The model was "forced" to account for climate change by depleting shelled benthos, such as bivalves, snails, corals, and sea urchins. A reduction in the populations of these types of species is expected as a result of ocean acidification that is linked to climate change. The noteworthy changes in results that stemmed from food web connections were declines in English sole and dogfish. Compared to a case without ocean acidification where the populations of English sole doubles, under the ocean acidification condition, the population of English sole fell to 6 to 40 percent of initial levels (depending on fishing mortality). Dogfish were not affected to the same degree: without acidification, they increase in abundance to levels that are approximately double initial levels; with ocean acidification, they increase to 1.9 times initial levels (or a 10 percent difference).

Other possibilities stemming from ocean acidification were run through the model. These possibilities resulted in a decline in skates and rays and an increase in miscellaneous nearshore fish species such as croakers and sculpins. The decline in skates was linked to a simulated extinction of sea urchins, while miscellaneous nearshore species increased as a result of a decline in their predator, dogfish.

Overall, the groundfish resource under rationalized fishery management is anticipated to be harvested closer to the OY for many of the species than it would be under status quo. The effect of rationalization on the marine ecosystem is predicted to be minor, but, when combined with possibilities under a more acidic ocean, some species may see reductions in biomass levels. To the extent that these potential effects are known ahead of time, managers have the possibility of adjusting harvest specifications to be more in line with what the resource can sustain under those more acidic conditions.

Current and future MPAs, as well as trawl gear improvements/modifications, could reduce the effect trawling has on the ecosystem. Increased catch accounting and bycatch accountability associated with the rationalization program would reduce uncertainty in stock assessments, as well as providing more accurate catch information, additional information on seabird and marine mammal takes in groundfish trawl fisheries, and better tools for dealing with fish stock range changes due to climate change compared to status quo.

4.20.5 Summary of the Impact of the Alternatives on Habitat and Ecosystem

As discussed above, the features of the alternatives that would have potential effects on habitat and ecosystem are common to all of the action alternatives. For that reason, it is only possible to contrast the effects of the action alternatives collectively with ongoing effects under the no action alternative (Alternative 1). Nearshore species and small, shallow-water rockfish may see increased abundance due to higher lingcod fishing mortality, a predator on these stocks. Expected increases in fishing mortality on target stocks are not expected to have strong impacts on the food web. High-relief bottom habitat, especially areas with substantial biogenic presence, is more sensitive to the adverse effects of fishing, with groundfish trawl gear having greater effects than other types of groundfish gear. Past actions limiting the use of certain types of gear (e.g., large footropes) and EFH closed areas have mitigated the impacts of trawling. Fleet consolidation and related factors under the action alternatives could change the spatial distribution of fishing effort, having differential impacts on EFH compared to no action (Alternative 1). An examination of the areas where fishing effort may decrease, according to the

geographic shift model described in Appendix C, shows that 6.9 percent of the area is classified as hard substrate compared to 6.47 percent of the mapped area of the west coast EEZ (Table 4-87). Although this indicates that these areas have a slightly higher proportion of hard substrate than the total area, there is considerable variation within particular areas, and any redistribution of effort into these areas cannot be predicted. Gear switching, a feature of all the action alternatives, could result in an increase in deployment of fixed gear in some untrawlable areas compared to the no action alternative (Alternative 1). Although fixed gear results in fewer impacts compared to trawl gear, an overall increase in the use of this gear in high relief, untrawlable areas could have an adverse effect compared to no action.

CHAPTER 5 SUMMARY OF OTHER ENVIRONMENTAL MANAGEMENT ISSUES

Federal regulations at 40 CFR 1502.16 require an EIS to compare the environmental impact of the alternatives considered in the analysis. Chapter 4 comprehensively assesses these impacts. However, the regulations identify classes of impacts that, while inherent in the analysis, are not explicitly discussed in Chapter 4. For that reason, these types of impacts are briefly discussed here, based on the information provided in Chapter 4.

Short-term uses versus long-term productivity. The proposed action does not directly affect the tradeoff between short-term use and long-term productivity of fish stocks since this is a function of setting harvest limits (OYs/ACLs), done under a separate periodic process. By requiring individual accountability and requiring comprehensive catch monitoring, the proposed action should make short-term use (catches) consistent with sustaining long-term productivity. However, this relationship ultimately depends on the correct specification of harvest levels.

Irreversible resource commitments. An irreversible commitment represents some permanent loss of an environmental attribute or service. The proposed action is likely to result in an irreversible commitment of some economic resources. Under rationalization, the groundfish trawl fleet is likely to consolidate, resulting in a smaller fleet size. Similarly, there is likely to be some consolidation of at-sea and shore-based processing facilities. The resulting impact of consolidation on communities is treated in detail in Section 4.14. Some of the surplus physical capital (e.g., vessels) may be put to other uses, for example in nongroundfish fisheries (Section 4.8). Other, less-mobile assets, such as shore-based processing plants, may not be redeployed.

Irretrievable resource commitments. A resource is irretrievably committed if its use is lost for time, but is not actually or practically lost permanently. The proposed action does not involve any direct irretrievable resource commitment, except for the fish that are harvested in the groundfish fishery.

Energy requirements and conservation potential of the alternatives. The proposed action may indirectly affect energy use through fleet consolidation. A smaller fleet, assuming that CPUE increases, would result in an overall reduction in vessel fuel use. However, there are various other factors that likely have a greater effect on overall energy use and efficient utilization. Changes in fuel prices, for example, could affect the level of fishing vessel operations independent of fleet consolidation.

Urban quality, historic resources, and the design of the built environment. The proposed action has no direct effect on these resources. However, impacts to communities related to consolidation could cumulatively affect private and public investment in coastal communities, including marine-related businesses and port-related infrastructure. These changes could also affect cultural and historic resources as fishing and fishing-dependent activities are supplanted, or simply disappear, changing the character of a coastal community. This concern is particularly true for those communities identified as vulnerable. See Section 4.14.

Possible conflicts between the proposed action and other plans and policies for the affected area. The proposed action is unlikely to substantially conflict with other plans and policies. The Council's other FMPs (salmon, CPS, and HMS) are most relevant to the proposed action in terms of the geographic area and resources covered. Section 4.8, nontrawl commercial harvesters, and Section 4.17.2.3, other fish resources, discuss the effects of the proposed action on other fisheries, which may be managed under Council FMPs.

Unavoidable adverse impacts. Impacts of the alternatives on the human environment are identified and evaluated in Chapter 4 of this EIS. The Executive Summary summarizes these impacts.

Mitigation. An EIS must discuss "means to mitigate the adverse environmental impacts" stemming from the proposed action (40 CFR 1502.16(h)), even if the adverse impacts are not by themselves significant. The mitigation measure incorporated into the proposed action and included in the preferred alternative (Alternative 4b) is the adaptive management provision, which annually sets aside up to 10 percent of the QPs in the shore-based IFQ fishery and up to 10 percent of the available aggregate harvest pounds for the Pacific whiting cooperative program. This harvest opportunity would then be allocated by the Council to meet specified objectives, including unforeseen impacts, such as geographic shifts in catch or landings, previously unidentified impacts to participants (e.g., processors), or unexpected barriers to new entry into the fishery.

CHAPTER 6 CONSISTENCY WITH THE WEST COAST GROUNDFISH FMP AND MSA NATIONAL STANDARDS AND REQUIREMENTS

6.1 FMP Goals and Objectives

The Groundfish FMP contains three broad goals and 17 objectives intended to achieve those goals. Many of these are similar to the MSA's National Standards described in Section 6.2.

Management Goals

Goal 1 – Conservation. Prevent overfishing and rebuild overfished stocks by managing for appropriate harvest levels and prevent, to the extent practicable, any net loss of the habitat of living marine resources.

Goal 2 – Economics. Maximize the value of the groundfish resource as a whole.

Goal 3 – Utilization. Within the constraints of overfished species rebuilding requirements, achieve the maximum biological yield of the overall groundfish fishery, promote year-round availability of quality seafood to the consumer, and promote recreational fishing opportunities.

Objectives.

To accomplish these management goals, a number of objectives will be considered and followed as closely as practicable:

Conservation

Objective 1. Maintain an information flow on the status of the fishery and the fishery resource which allows for informed management decisions as the fishery occurs.

Objective 2. Adopt harvest specifications and management measures consistent with resource stewardship responsibilities for each groundfish species or species group. Achieve a level of harvest capacity in the fishery that is appropriate for a sustainable harvest and low discard rates,

and which results in a fishery that is diverse, stable, and profitable. This reduced capacity should lead to more effective management for many other fishery problems.

Objective 3. For species or species groups that are overfished, develop a plan to rebuild the stock as soon as possible, taking into account the status and biology of the stock, the needs of fishing communities, recommendations by international organizations in which the United States participates, and the interaction of the overfished stock within the marine ecosystem.

Objective 4. Where conservation problems have been identified for nongroundfish species and the best scientific information shows that the groundfish fishery has a direct impact on the ability of that species to maintain its long-term reproductive health, the Council may consider establishing management measures to control the impacts of groundfish fishing on those species. Management measures may be imposed on the groundfish fishery to reduce fishing mortality of a nongroundfish species for documented conservation reasons. The action will be designed to minimize disruption of the groundfish fishery, in so far as consistent with the goal to minimize the bycatch of nongroundfish species, and will not preclude achievement of a quota, harvest guideline, or allocation of groundfish, if any, unless such action is required by other applicable law.

Objective 5. Describe and identify EFH, adverse impacts on EFH, and other actions to conserve and enhance EFH, and adopt management measures that minimize, to the extent practicable, adverse impacts from fishing on EFH.

Economics

Objective 6. Within the constraints of the conservation goals and objectives of the FMP, attempt to achieve the greatest possible net economic benefit to the nation from the managed fisheries.

Objective 7. Identify those sectors of the groundfish fishery for which it is beneficial to promote year-round marketing opportunities and establish management policies that extend those sectors fishing and marketing opportunities as long as practicable during the fishing year.

Objective 8. Gear restrictions to minimize the necessity for other management measures will be used whenever practicable. Encourage development of practicable gear restrictions intended to reduce regulatory and/or economic discards through gear research regulated by EFP.

Utilization

Objective 9. Develop management measures and policies that foster and encourage full utilization (harvesting and processing), in accordance with conservation goals, of the Pacific Coast groundfish resources by domestic fisheries.

Objective 10. Recognizing the multispecies nature of the fishery, establish a concept of managing by species and gear or by groups of interrelated species.

Objective 11. Develop management programs that reduce regulations-induced discard and/or which reduce economic incentives to discard fish. Develop management measures that minimize bycatch to the extent practicable and, to the extent that bycatch cannot be avoided, minimize the mortality of such bycatch. Promote and support monitoring programs to improve estimates of total fishing-related mortality and bycatch, as well as those to improve other information necessary to determine the extent to which it is practicable to reduce bycatch and bycatch mortality.

Social Factors

Objective 12. When conservation actions are necessary to protect a stock or stock assemblage, attempt to develop management measures that will affect users equitably.

Objective 13. Minimize gear conflicts among resource users.

Objective 14. When considering alternative management measures to resolve an issue, choose the measure that best accomplishes the change with the least disruption of current domestic fishing practices, marketing procedures, and the environment.

Objective 15. Avoid unnecessary adverse impacts on small entities.

Objective 16. Consider the importance of groundfish resources to fishing communities, provide for the sustained participation of fishing communities, and minimize adverse economic impacts on fishing communities to the extent practicable.

Objective 17. Promote the safety of human life at sea.

The trawl rationalization program is consistent with the management goals (Goals 1, 2, and 3) outlined in the groundfish FMP. The program is designed to improve conservation, in part, through total catch accounting (i.e., retained catch and discards) with 100 percent monitoring. The program is designed to improve the economics of the groundfish resource by increasing the profitability of participants in the fishery and increasing opportunities to harvest target species. The program is also designed to fully utilize the healthy groundfish stocks while remaining within harvest constraints of overfished species.

The trawl rationalization program is consistent with the objectives within the Groundfish FMP. The program is consistent with conservation objectives 1, 2, 4, and 5. The program is consistent with objective 1 because it continues to maintain an information flow on the status of the fishery and the fishery resource, which allows for informed management decisions as the fishery occurs. One hundred percent monitoring should provide for more informed management decisions as the fishery occurs. In addition, for the shoreside IFQ fishery, it strives to make catch (retained and discarded) information available to participants much sooner via electronic reporting. The program addresses conservation objective 2 by creating a market system where harvest capacity can be better matched with the available resource. In addition, the program may lower discard rates through increased accountability and total catch accounting. The trawl rationalization program is intended to increase stability and profitability of the fishery. The program is consistent with objective 4 because it is intended to reduce the incidental take of Pacific halibut, a nongroundfish species, which will be managed under the trawl rationalization program with halibut IBQ. The program is consistent with objective 5. Fishing in different areas and using different gear (e.g., switching to fixed-gear or modifying trawl gear) would change how much and what kind of EFH would be affected by fishing. However, the RCAs, areas closed to fishing with trawl and nontrawl gear, and EFH conservation areas will remain in place under the trawl rationalization program. Section 6.3 below describes the EFH assessment of the proposed action.

The program is consistent with economic objectives 6, 7, and 8. The program attempts to achieve the greatest possible net economic benefit to the nation from the managed fisheries (objective 6) by transitioning the trawl fishery to catch shares. The program is consistent with objective 7 by continuing to support year-round fishing and marketing opportunities and decreasing the risk of early season closures. The program is consistent with objective 8 by providing an opportunity for gear switching as an option for reducing regulatory or economic discards.

The program is consistent with utilization objectives 9, 10, and 11. The trawl rationalization program is intended to increase utilization of the groundfish resource by increasing opportunities to harvest healthy groundfish species while remaining within the constraints of overfished species (objective 9). The program continues to recognize the multispecies nature of the fishery and manage the fishery according to the species and groupings listed in the ABC/OY tables from 50 CFR 660, subpart G (objective 10). The program is consistent with objective 11, minimizing bycatch, as described in section 6.2 under MSA National Standard 9. It is also consistent with objective 11 by creating a program with 100 percent monitoring (i.e., total catch accounting) to improve estimates of total fishing-related mortality.

The program is consistent with the social factors described in objectives 14 through 17. The program is consistent with objective 14, accomplishes the change with the least disruption, because most current participants in the fishery would be eligible to receive harvest privileges. In addition, it continues year-round fishing opportunities. The program is consistent with objective 15 by creating a program where most recent participants in the fishery (many of which are small entities) would be eligible to continue participating in the fishery. Those small entities that choose to exit the fishery should receive financial compensation from selling their permit or share of the resource. In addition, for the shoreside IFQ fishery, an AMP would be allocated an amount of harvest privileges that could be used to mitigate any adverse impacts, including impacts on small entities, that might result from the trawl rationalization program. The program is consistent with objective 16, minimizing adverse economic impacts on fishing communities, as described in section 6.2 under MSA National Standard 8. The program is consistent with objective 17, safety at sea, as described in section 6.2 under MSA National Standard 10.

For Groundfish FMP objectives not discussed above, the trawl rationalization program is still consistent with those objectives. However, those objectives are not specifically addressed through the trawl rationalization program.

6.2 National Standards

An FMP or plan amendment and any pursuant regulations must be consistent with ten national standards contained in the MSA (§301).

National Standard 1 states that conservation and management measures shall prevent overfishing while achieving, on a continuing basis, the optimum yield from each fishery for the United States fishing industry.

> The alternatives for rationalization of the trawl fishery would support efforts to achieve OY and prevent overfishing. Both the co-op and the IFQ alternative would increase individual accountability for total catch, including bycatch, and would give fishermen greater discretion as to when and how to fish. This would be expected to provide greater opportunity to extract the full OY of higher biomass species while avoiding lower biomass species. The 100 percent monitoring and increased accountability should reduce the risk of overfishing. The no action alternative would retain the current management regime which can result in forgone harvest of higher biomass species due to closures caused by harvest of lower biomass species.

National Standard 2 states that conservation and management measures shall be based on the best scientific information available.

> The analyses contained in this document constitute the best available scientific information.

National Standard 3 states that, to the extent practicable, an individual stock of fish shall be managed as a unit throughout its range, and interrelated stocks of fish shall be managed as a unit or in close coordination.

The EIS for the 2009 Groundfish Specifications, describes the management units for Pacific Coast groundfish. None of the alternatives analyzed in this document would modify those management units.

National Standard 4 states that conservation and management measures shall not discriminate between residents of different states. If it becomes necessary to allocate or assign fishing privileges among various United States fishermen, such allocation shall be (A) fair and equitable to all such fishermen; (B) reasonably calculated to promote conservation; and (C) carried out in such manner that no particular individual, corporation, or other entity acquires an excessive share of such privileges.

The trawl rationalization program was developed through the Council process, which facilitates substantial participation by state representatives. Generally, state proposals are brought forward when alternatives are crafted and integrated to the degree practicable. Decisions about catch allocation between different sectors or gear groups are also part of this participatory process, and emphasis is placed on equitable division while ensuring conservation goals. None of the alternatives analyzed would discriminate against residents of different states. However, both the co-op and the IFQ alternative would establish a foundation for making allocations of harvest privileges. These alternatives were structured to provide fair and equitable allocations of both target species and overfished species to participants. The proposed action is intended, in part, to reduce bycatch and improve total catch accounting. Some important components of the trawl rationalization program that will promote conservation are (1) 100 percent observer coverage and dockside monitoring for total catch accounting (landings and discards), (2) increased individual accountability for catch should reduce the risk of OY overages, (3) increased target catches and minimized bycatch, (4) reduced number of active fishing vessels and increased operating efficiency may reduce gear and habitat or protected species interactions, and (5) allowing trawlers to switch to longline or pot gear may reduce some habitat impacts. The alternatives include provisions to guard against accumulation of excessive shares including provisions for accumulation limits and divestiture.

National Standard 5 states that conservation and management measures shall, where practicable, consider efficiency in the utilization of fishery resources; except that no such measure shall have economic allocation as its sole purpose.

None of the alternatives analyzed in this document was designed solely for the purpose of economic allocation. However, NMFS and the Council have been working in this fishery to address the need for reduction in fleet capacity. In addition to meeting the conservation and management needs of the fishery, the alternatives analyzed in this document are expected to economically rationalize the groundfish trawl fishery.

National Standard 6 states that conservation and management measures shall take into account and allow for variations among, and contingencies in, fisheries, fishery resources, and catches.

The approach in the co-op and IFQ alternatives would be to provide greater flexibility to individual fishermen to determine when and how to fish. This flexibility would enhance the ability of fishermen and managers to respond to unexpected circumstances. In addition, the preferred alternative includes an adaptive management reserve of harvest privileges that could be used to address unexpected contingencies.

National Standard 7 states that conservation and management measures shall, where practicable, minimize costs and avoid unnecessary duplication.

Generally, by coordinating management, monitoring, and enforcement activities between NMFS and the three west coast states, duplication, and thus cost, is minimized. Monitoring and enforcement programs, such as the use of fishery observers, are very important to the success of the rationalization alternatives. While these features would increase management costs, they are necessary to effective management. The analysis does consider cost-control mechanisms such as limiting landing hours and landing sites. In addition, fisherman may form co-ops or pool their resources, including sharing quota on a single vessel and sharing observers among vessels, to reduce costs.

National Standard 8 states that conservation and management measures shall, consistent with the conservation requirements of this Act (including the prevention of overfishing and rebuilding of overfished stocks), take into account the importance of fishery resources to fishing communities in order to (A) provide for the sustained participation of such communities, and (B) to the extent practicable, minimize adverse economic impacts on such communities.

This document evaluates the effects of the alternatives on fishing communities (Chapter 4), and these effects have been taken into account in developing the preferred alternative. The preferred alternative represents the Council's judgment of the best way to conserve and rebuild fish stocks as soon as possible while taking into account the trawl industry and coastal fishing communities. The analysis indicates that some side effects of rationalization may include geographic shifts in fishing effort and location of processors. To the extent that these shifts do occur, some communities could experience negative impacts. The preferred alternative would minimize the negative impacts to the extent possible by limiting the amount of quota that can be consolidated. In addition, the preferred alternative includes an AMP that would be allocated an amount of harvest privileges that could be used to mitigate any adverse impacts, including community impacts, that might result from the trawl rationalization program.

National Standard 9 states that conservation and management measures shall, to the extent practicable, (A) minimize bycatch and (B) to the extent bycatch cannot be avoided, minimize the mortality of such bycatch.

The rationalization alternatives are designed to improve total catch accounting and to reduce bycatch. The alternatives should reduce regulatory discards, increase target catches, and promote greater individual responsibility for avoiding bycatch. They would also provide for greater flexibility for fishermen to decide how, when, and where to fish, including allowing trawlers to switch to longline or pot gear that may reduce some habitat impacts or minimize bycatch of certain species. In addition, closed areas that keep fishing away from areas where overfished species are most abundant would remain in place and would, therefore, reduce bycatch.

National Standard 10 states that conservation and management measures shall, to the extent practicable, promote the safety of human life at sea.

The preferred alternative would provide fishermen with increased flexibility in determining when, where, and how to fish. This is expected to reduce incentives to fish in unsafe conditions.

6.3 Other Applicable MSA Provisions

The preferred alternatives are intended to facilitate harvest of OY while allowing for rebuilding of overfished stocks in compliance with section 304(e) of the MSA.

Chapter 4.20 in this EIS constitutes an EFH assessment of the proposed action's impacts, as required by 50 CFR 600.920 (e)(3).

6.4 Goals and Objectives of This Proposed Action

Over the past 20 years, fishery management programs—from limited license entry to IFQs to fishing cooperatives—have evolved. In 1999, the NRC produced a study of share-based fishery management programs around the country called *Sharing the Fish* (NRC 1999), which helped refine the national discussion of the pros and cons of this type of natural resource management. Since then, Congress has allowed IFQ programs to be developed, and several such programs have been implemented around the country. The MSA was reauthorized in 2007, with specific sections added to set the national standards and requirements of LAPP—a catch-all phrase that includes ITQ, IFQ, and cooperative fishery management programs. In addition to the requirements laid out in the MSA, the Council has region-specific goals and objectives for the west coast groundfish fishery in the groundfish FMP and in Amendment 20 of the FMP.

Table 6-1 summarizes guidelines, objectives, and goals identified for this action (Section 1.2.3), in the groundfish FMP (Chapter 2.0 in the FMP), and in the MSA (including Section 301(a), National Standards for fishery conservation and management, and Section 303A, LAPPs). The guidance is organized into 11 topic areas: conservation; net benefits and efficiency; disruption; excessive shares; fairness and equity, sector health; labor (captains, crew, and processing plant workers); communities; small vessels, small entities, and new entrants; auctions and cost recovery; and program performance monitoring and modification. This guidance was used to develop the alternatives and to evaluate the effects of the alternatives.

Table 6-1. Policy guidance from MSA, Groundfish FMP, and Amendment 20 (A-20) goals and objectives.

Guidance	Reference
Conservation	
Allocations Reasonably Calculated to **Promote Conservation**	MSA - National Standard 4(b)
LAPPs shall **assist in rebuilding** overfished species	MSA - 303A(c)(1)(A)
LAPPs shall **promote fishery conservation** and management	MSA - 303A(c)(1)(C)(ii)
Maintain an **information flow** on the status of the fishery… as the fishery occurs	GF FMP Objective 1
Reduce **nongroundfish mortality**	GF FMP Objective 4
Minimize adverse impacts on **EFH**	GF FMP - Objective 5
Total catch accounting; Reduce bycatch, discard mortality, and ecological impacts	A-20 Objective 1 and 3
Consider biological stock structure, not exceeding the OY/ABC, minimizing localized concentrations of fishing effort, and accounting for total mortality	A-20 Constraints 1, 2, 3, and 4
Net Benefits and Efficiency	
Consider Efficiency	MSA - National Standard 5
Contribute to **reducing capacity**	MSA - 303A(c)(1)(B)
Attempt to achieve the greatest net economic **benefit to the nation**	GF FMP Objective 6
Maximize the value of the groundfish resource as a whole	GF FMP Goal 2
Provide for a[n] … efficient groundfish fishery	A-20 Objective 2
Promote measurable economic benefits	A-20 Objective 6
Disruption	
Accomplish change with the least disruption of current domestic fishing practices, marketing procedures, and the environment	GF FMP Objective 14

Guidance	Reference
Excessive Shares	
No particular individual, corporation, or other entity [shall] acquire an **excessive share** of privileges	MSA - National Standard 4(c)
Address concerns over **excessive geographic or other consolidation** in the harvesting or processing sectors of the fishery	MSA - 303A(c)(5)(B)(ii)
Ensure that LAPP holders do not acquire an excessive share by (i) establishing a **maximum share** to hold, acquire or use, and (ii) establishing other measures to prevent inequitable concentration	MSA - 303A(c)(5)(D)
Avoid excessive quota concentration	A-20 Constraint 6
Establish a review process to determine whether any illegal antitrust acts have occurred.	MSA - 303A(c)(1)(J)
Fairness and Equity The excessive share objectives also relate to fairness and equity considerations.	
Allocation shall be fair and equitable to all such fishermen	MSA - National Standard 4(a)
Establish procedures to ensure **fair and equitable** initial allocations, including consideration of (i) **current and historical** harvests; (ii) **employment** in the harvesting and processing sectors; (iii) **investments** in, and dependence upon, the fishery; and (iv) the **current and historical participation** of fishing communities;	MSA - 303A(c)(5)(A)
Issue privileges to persons who **substantially participate** in the fishery (as specified by the Council)	MSA - 303A(c)(5)(E)
Provide an administrative **appeals process** regarding initial allocation decisions	MSA - 303A(c)(1)(I)
Environmental Justice: **Identify and address**, as appropriate, **disproportionately high and adverse** human health and environmental effects of its programs...**on minority populations and low income populations.**	EO 12898
Avoid provisions where the primary intent is a **change in marketing power balance** between harvesting and processing sectors	A-20 Constraint 5
Sector Health	
Provide for a **viable, profitable** . . . groundfish fishery	A-20 Objective 2
Promote **measurable economic . . . benefits** through the seafood catching, processing, distribution elements, and support sectors of the industry	A-20 Objective 6
Maximize the value of the groundfish resource as a whole	GF FMP Goal 2
Promote **year-round marketing opportunities** and extend those opportunities as long as practicable during the fishing year	GF FMP Objective 7
Avoid unnecessary **adverse impacts on small entities**	GF FMP Objective 15
Labor: Captains, Crew, and Processing Plant Workers	
Include measures to **assist… entry-level and small vessel owner-operators, captains, crew… through set-asides** of allocations… or economic assistance in the purchase of quota	MSA - 303A(c)(5)(C)
Promote measurable… **employment benefits** through the seafood catching, processing, distribution elements, and support sectors of the industry	A-20 Objective 6
Promote the **safety of human life at sea**	MSA - National Standard 10 GF FMP - Objective 17
Communities	
Consider importance of fishing to communities in order to provide sustained participation and to **minimize adverse impacts**	MSA - National Standard 8 GF FMP Objective 16 A-20 Objective 5
Consider basic cultural and social framework of the fishery through (i) the development of **policies to promote sustained participation** of… fishing communities that depend on the fisheries, including regional or port-specific landing and delivery requirement; (ii) procedures to **address concerns over excessive geographic** or other **consolidation** in the harvesting or processing sectors of the fishery	MSA - 303A(c)(5)(B)
Include measures to **assist**, when necessary and appropriate… fishing communities through **set-asides of harvesting allocations**… or economic assistance in the purchase of quota	MSA - 303A(c)(5)(C)

Guidance	Reference
If a program is created in which fishing communities are given a special standing (e.g., a direct allocation to qualified fishing communities), the Council is required to consider the following criteria: (i) Traditional fishing or processing practices in, and dependency on, the fishery; (ii) The cultural and social framework relevant to the fishery; (iii) Economic barriers to access the fishery; (iv) Existence and severity of projected economic and social impacts associated with implementation…; (v) Expected effectiveness, transparency and equitability; and (vi) Potential for improving economic conditions in remote coastal communities…	MSA - 303A(c)(3)(B)
Minimize negative impacts resulting from **localized concentrations** of fishing effort (this constraint is also listed under "Conservation")	A-20 Constraint 3
Small Vessels, Small Entities, and New Entrants	
Promote sustained participation of small owner-operated fishing vessels	MSA - 303A(c)(5)(B)(i)
Include measures to **assist**, when necessary and appropriate, entry level and small vessel owner-operators . . . through **set-asides of harvesting allocations**… or economic assistance in the purchase of quota [119]	MSA - 303A(c)(5)(C)
Avoid unnecessary **adverse impacts** on small entities	GF FMP Objective 15
Auctions and Cost Recovery	
Auctions, or other **systems to collect royalties**, shall be considered for initial or any subsequent allocation	MSA - 303A(d)
Assess and provide a program of **fees paid by the quota holders** that will cover the costs of management, data collection and analysis, and enforcement activities	MSA - 303A(e)
Program Performance Monitoring and Modification	
Take into account the **management and administrative costs** of implementing and overseeing the IFQ or co-op program and complementary catch monitoring programs, and the limited state and federal resources available.	A-20 Constraint 9
Regular **review and monitoring of the program** for progress in meeting the goals, 5 year formal review	MSA - 303A(c)(1)(G)
Privileges may be revoked, limited or modified at anytime. Provide for revocation	MSA - 303A(b)(2) MSA - 303A(c)(1)(K)

[119] An Assisted Purchase Program may be developed to aid in financing quota purchase by small vessel fishermen and first time purchase by entry-level fishermen (MSA - 303A(g)(1)).

CHAPTER 7 CROSS-CUTTING MANDATES

7.1 Other Federal Laws

7.1.1 Coastal Zone Management Act

Section 307(c)(1) of the Federal Coastal Zone Management Act (CZMA) of 1972 requires that all Federal activities that directly affect the coastal zone be consistent with approved state coastal zone management programs to the maximum extent practicable. The Council's preliminary preferred alternative would be implemented in a manner that is consistent, to the maximum extent practicable, with the enforceable policies of the approved coastal zone management programs of Washington, Oregon, and California. This determination will be submitted to the responsible state agencies for review under Section 307(c)(1) of the CZMA. The relationship of the groundfish FMP with the CZMA is discussed in Section 11.7.3 of the Groundfish FMP. The Groundfish FMP has been found to be consistent with the Washington, Oregon, and California coastal zone management programs. The recommended action is consistent and within the scope of the actions contemplated under the framework FMP.

7.1.2 Endangered Species Act

As described in Section 3.10, a variety of ESA-listed threatened and endangered species occur within the action area. These include salmon, marine mammals, turtles, and seabirds. While some of the alternatives may alter the timing, intensity, and location of fishing activities, these changes are not expected to significantly affect interactions of the fishery with protected species. With respect to ESA-listed salmon, only Chinook are expected to interact with the fishery. NMFS manages the trawl fishery to comply with incidental take levels of Chinook set forth in ESA section 7 consultations.

7.1.3 Marine Mammal Protection Act

The MMPA of 1972 is the principle Federal legislation that guides marine mammal species protection and conservation policy in the United States. Under the MMPA, NMFS is responsible for the management and conservation of 153 stocks of whales, dolphins, porpoise, as well as seals, sea lions, and fur seals; while the USFWS is responsible for walrus, sea otters, and the West Indian manatee.

Off the west coast, the Steller sea lion (*Eumetopias jubatus*) eastern stock, Guadalupe fur seal (*Arctocephalus townsendi*), and Southern sea otter (*Enhydra lutris*) California stock are listed as

threatened under the ESA. The sperm whale (*Physeter macrocephalus*) Washington, Oregon, and California stock, humpback whale (*Megaptera novaeangliae*) Washington, Oregon, and California - Mexico Stock, blue whale (*Balaenoptera musculus*) eastern north Pacific stock, and Fin whale (*Balaenoptera physalus*) Washington, Oregon, and California stock are listed as depleted under the MMPA. Any species listed as endangered or threatened under the ESA is automatically considered depleted under the MMPA.

West coast groundfish fisheries are considered Category III fisheries, indicating a remote likelihood of or no known serious injuries or mortalities to marine mammals, in the annual list of fisheries published in the FR. Based on its Category III status, the incidental take of marine mammals in the west coast groundfish fisheries does not significantly impact marine mammal stocks. However, recent west coast fixed-gear fisheries, including sablefish pot fisheries, have demonstrated a take of humpback whales, which may result in a recategorization of these fisheries to Category II. Consultation under the MMPA would then be needed to implement Category II fisheries in the next biennium. The proposed action could affect the intensity, duration, and location of groundfish fisheries through processes such as fleet consolidation and gear conversion. Impacts to marine mammals are discussed in Chapter 4.

7.1.4 Paperwork Reduction Act

The purposes of the Paperwork Reduction Act (PRA) are to minimize the burden of information collection by the Federal Government on the public; maximize the utility of any information thus collected; improve the quality of information used in Federal decisionmaking, minimize the cost of collection, use, and dissemination of such information; and improve accountability. The PRA requires Federal agencies to obtain clearance from the Office of Management and Budget before collecting information. This clearance requirement is triggered if certain conditions are met. "Collection of information" is defined broadly. In summary, it means obtaining information from third parties or the public by or for an agency through a standardized method imposed on 10 or more persons. Collection of information need not be mandatory to meet the trigger definition. Even information collected by a third party, if at the behest of a Federal agency, may trigger the clearance requirement. Within NMFS, the Office of the Chief Information Officer is responsible for PRA compliance. Obtaining clearance can take up to 9 months and is one aspect of NMFS's review and approval of Council decisions.

The proposed action, as implemented by any of the alternatives considered in this EIS, may require collection of information subject to the PRA.

7.1.5 Regulatory Flexibility Act

The purpose of the RFA is to relieve small businesses, small organizations, and small governmental entities of burdensome regulations and recordkeeping requirements. Major goals of the RFA are (1) to increase agency awareness and understanding of the impact of their regulations on small business, (2) to require agencies communicate and explain their findings to the public, and (3) to encourage agencies to use flexibility and to provide regulatory relief to small entities. The RFA emphasizes predicting impacts on small entities as a group distinct from other entities and the consideration of alternatives that may minimize the impacts while still achieving the stated objective of the action. An IRFA is conducted unless it is determined that an action will not have a "significant economic impact on a substantial number of small entities." The RFA requires that an IRFA include elements that are similar to those required by EO 12866 and NEPA. Therefore, the IRFA has been combined with the RIR, and both are substantially based on the analyses contained in this EIS document. Appendix H contains analytical conclusions specific to the RFA and EO 12866.

7.2 Executive Orders

7.2.1 EO 12866 (Regulatory Impact Review)

EO 12866, Regulatory Planning and Review, was signed on September 30, 1993, and established guidelines for promulgating new regulations and reviewing existing regulations. The EO covers a variety of regulatory policy considerations and establishes procedural requirements for analysis of the benefits and costs of regulatory actions. Section 1 of the EO deals with the regulatory philosophy and principles that are to guide agency development of regulations. It stresses that, in deciding whether and how to regulate, agencies should assess all of the costs and benefits across all regulatory alternatives. Based on this analysis, NMFS should choose those approaches that maximize net benefits to society, unless a statute requires another regulatory approach.

The RIR and IRFA determinations are part of the combined summary analysis presented in preliminary draft form in Appendix H of this document.

7.2.2 EO 12898 (Environmental Justice)

EO 12898 obligates Federal agencies to identify and address disproportionately high adverse human health or environmental effects of their programs, policies, and activities on minority and low-income populations in the United States as part of any overall environmental impact analysis associated with an action. NOAA guidance (NOAA Administrative Order [NAO] 216-6, at §7.02, states that "consideration of EO 12898 should be specifically included in the NEPA documentation for decision-making purposes."

Section 8.5 in Appendix A to the 2005-06 groundfish harvest specifications EIS (PFMC 2004a) describes a methodology, using 2000 U.S. Census data, to identify potential "communities of concern" because their populations have a lower income or a higher proportion of minorities than comparable communities in their region. Based on this information, but focusing on more isolated, rural coastal communities, Section 4.14 of this document discusses the potential effects of the proposed action on communities. Fishery participants make up a small proportion of the total population in these communities, and their demographic characteristics may be different from the community as a whole. However, information specific to fishery participants is not available. Furthermore, various segments of the fishery-involved population may differ demographically. For example, workers in fish processing plants may more often be from a minority population, while deckhands may be more frequently low income in comparison to vessel owners.

Participation in decisions about the proposed action by communities that could experience disproportionately high and adverse impacts is another important principle of the EO. The Council offers a range of opportunities for participation by those affected by its actions and disseminates information to affected communities about its proposals and their effects through several channels. In addition to Council membership, which includes representatives from the fishing industries affected by Council action, the GAP, a Council advisory body, draws membership from fishing communities affected by the proposed action. While no special provisions are made for membership to include representatives from low-income and minority populations, concerns about disproportionate effects on minority and low-income populations could be voiced through this body or to the Council directly. Although Council meetings are not held in isolated coastal communities for logistical reasons, they are held in different places up and down the west coast to increase accessibility.

The Council disseminates information about issues and actions through several media. Although not specifically targeted at low-income and minority populations, these materials are intended for

consumption by affected populations. Materials include a newsletter, describing business conducted at Council meetings, notices for meetings of all Council bodies, and fact sheets intended for the general reader. The Council maintains a postal and electronic mailing list to disseminate this information. The Council also maintains a website (www.pcouncil.org) providing information about the Council, its meetings, and decisions taken. Most of the documents produced by the Council, including NEPA documents, can be downloaded from the website.

7.2.3 EO 13132 (Federalism)

EO 13132, which revoked EO 12612, an earlier federalism EO, enumerates eight fundamental federalism principles. The first of these principles states Federalism is rooted in the belief that issues that are not national in scope or significance are most appropriately addressed by the level of government closest to the people. In this spirit, the EO directs agencies to consider the implications of policies that may limit the scope of or preempt states' legal authority. Preemptive action having such federalism implications is subject to a consultation process with the states; such actions should not create unfunded mandates for the states; and any final rule published must be accompanied by a federalism summary impact statement.

The Council process offers many opportunities for states (through their agencies, Council appointees, consultations, and meetings) to participate in the formulation of management measures. This process encourages states to institute complementary measures to manage fisheries under their jurisdiction that may affect federally managed stocks.

7.2.4 EO 13175 (Consultation and Coordination with Indian Tribal Government)

EO 13175 is intended to ensure regular and meaningful consultation and collaboration with tribal officials in the development of Federal policies that have tribal implications, to strengthen the United States government-to-government relationships with Indian tribes, and to reduce the imposition of unfunded mandates upon Indian tribes.

The Secretary recognizes the sovereign status and co-manager role of Indian tribes over shared Federal and tribal fishery resources. At Section 302(b)(5), the MSA reserves a seat on the Council for a representative of an Indian tribe with Federally recognized fishing rights from California, Oregon, Washington, or Idaho.

The U.S. government formally recognizes that the four Washington coastal tribes (Makah, Quileute, Hoh, and Quinault) have treaty rights to fish for groundfish. In general terms, the quantification of those rights is 50 percent of the harvestable surplus of groundfish available in the tribes U&A fishing areas (described at 50 CFR 660.324). Each of the treaty tribes has the discretion to administer its fisheries and to establish its own policies to achieve program objectives.

Section 4.15 describes the effects of the proposed action on tribal fisheries. The proposed action does not affect the tribes' treaty rights. Through the Council process the proposed action has been developed in consultation with the affected tribes through their representative on the Council.

CHAPTER 8 LIST OF PREPARERS

Council Staff

Name	Primary Contribution
Merrick Burden	Analytical design; model development; impact analysis (harvesters, captain and crew, nontrawl commercial harvesters, processors, communities), Appendix A contributor, Appendix B, Appendix C
Heather Brandon	Impact analysis (management agencies, groundfish, protected species, ecosystem), Appendix A contributor
John Coon	Project management
Christopher "Kit" Dahl	Analytical design; document management; Executive Summary, Chapter 1, Chapter 2, impact analysis (labor, input suppliers, tribal harvesters)
Jennifer Gilden	Impact analysis (communities)
Jim Seger	Project management, model development, Chapter 2, Appendix A, Appendix E

Other Contributors

Name	Affiliation	Participation
Stephen Freese	NMFS Northwest Region	Appendix A contributor (tracking, monitoring and enforcement; NMFS impacts)
Jamie Goen	NMFS Northwest Region	NMFS Project manager, Chapter 2
Michael Taylor	Consultant	Impact analysis, processors; model development
Ed Waters	Consultant	Data analysis, model development, income impact estimates
Kevin C. Duffy	NMFS Northwest Region	Document management for completion of EIS

CHAPTER 9 ACRONYMS AND GLOSSARY

Acronym	Definition
ABC	allowable biological catch. The ABC is a scientific calculation of the sustainable harvest level of a fishery and is used to set the upper limit of the annual TAC. It is calculated by applying the estimated (or proxy) harvest rate that produces maximum sustainable yield to the estimated exploitable stock biomass (the portion of the fish population that can be harvested).
ACL	annual catch limit
AFA	1998 American Fisheries Act
AMP	Adaptive Management Program
BCC	Bird of Conservation Concern
B_{MSY}	the biomass that allows maximum sustainable yield to be taken
BRD	bycatch reduction device
BSAI	Bering Sea/Aleutian Islands
Bycatch EIS	The Pacific Coast Groundfish Fishery Management Plan Bycatch Mitigation Program Final Environmental Impact Statement
CCA	Cowcod Conservation Area(s)
CDFG	California Department of Fish and Game
CDQ	community development quotas
CEQ	Council on Environmental Quality
CFA	Community Fishing Association
CFGC	California Fish and Game Commission
CFR	Code of Federal Regulations
Council	Pacific Fishery Management Council
CPS	coastal pelagic species
CPUE	catch per unit of effort
CV	coefficient of variation

Acronym	Definition
CZMA	Federal Coastal Zone Management Act
DAP	dedicated access privilege
DEIS	draft environmental impact statement
DSL	Division of State Lands
DTS	Dover sole, thornyhead, and trawl-caught sablefish complex
EA	environmental assessment
EBFM	ecosystem-based fishery management
EC	Enforcement Consultants
EEZ	Exclusive Economic Zone
EFH	essential fish habitat
EFHRC	Essential Fish Habitat Review Committee
EFP	exempted fishing permit
EIS	environmental impact statement
EMS	electronic monitoring system
ENSO	*El Niño* Southern Oscillation
EO	Executive Order
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
F	The instantaneous rate of fishing mortality. The term "fishing mortality rate" is a technical fishery science term that is often misunderstood. It refers to the rate at which animals are removed from the stock by fishing. The fishing mortality rate can be confusing because it is an "instantaneous" rate that is useful in mathematical calculations, but is not easily translated into the more easily understood concept of "percent annual removal."
FCZ	Fisheries Conservation Zone
FEAM	Fishery Economic Assessment Model
FEIS	final environmental impact statement
FEP	Fishery Ecosystem Plan
FERC	Federal Energy Regulatory Commission
FMA	Fishermen's Marketin g Association
FMP	fishery management plan
F_{MSY}	the fishing mortality rate that maximizes catch biomass in the long term
FMU	fishery management unit
FR	Federal Register

Acronym	Definition
GAC	Groundfish Allocation Committee
GAO	Government Accountability Office
GAP	Groundfish Advisory Subpanel
GCA	groundfish conservation area
GMT	Groundfish Management Team
GOA	Gulf of Alaska
GPS	global positioning system
HAPC	habitat areas of particular concern
HG	harvest guideline(s)
HMS	highly migratory species
IBQ	Individual bycatch quota
IEP	Independent Experts Panel
IFQ	individual fishing quota
IMPLAN	Impact Analysis for Planning - a regional economic impact model
INPFC	International North Pacific Fishery Commission
IPHC	International Pacific Halibut Commission
IRFA	initial regulatory flexibility analysis
LAP	limited access privilege
LAPP	limited access privilege program
LE	LE fishery
LEP	Limited Entry Permits
LO	lack of objection
M	instantaneous rate of natural mortality (as opposed to F, fishing mortality)
MAFMC	Mid-Atlantic Fishery Management Council
MBNMS	Monterey Bay National Marine Sanctuary
MBTA	Migratory Bird Treaty Act
MFMT	maximum fishing mortality threshold
MLPA	Marine Life Protection Act
MMPA	Marine Mammal Protection Act
MPA	marine protected areas
MSA	Magnuson-Stevens Fishery Conservation and Management Act
MSC	Marine Stewardship Council

Acronym	Definition
MSST	minimum stock size threshold
MSY	maximum sustainable yield
mt	metric ton
NAO	NOAA Administrative Order
NEPA	National Environmental Policy Act
NIST	National Institute of Standards and Technology
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration – the parent agency of National Marine Fisheries Service
NOI	notice of intent
NPFMC	North Pacific Fishery Management Council
NPOA	National Plan of Action
NRC	National Research Council
NTEP	National Type Evaluation Program
NWFSC	Northwest Fisheries Science Center
NWR	National Marine Fisheries Service, Northwest Region
OAR	Oregon Administrative Rules
ODFW	Oregon Department of Fish and Wildlife
OFWC	Oregon Fish and Wildlife Commission
OLE	Office of Law Enforcement
OPAC	Ocean Policy Advisory Council
OSCZ	Ocean Salmon Conservation Zone
OSHUA	Optimum Species Harvesting Unified Allocation
OTC	Oregon Trawl Commission
OY	optimum yield
PacFIN	Pacific Coast Fisheries Information Network. Provides commercial fishery information for Washington, Oregon, and California. Maintained by the Pacific States Marine Fisheries Commission.
PBR	potential biological removal
PDO	Pacific decadal oscillation
POP	Pacific ocean perch – a rockfish species that was declared overfished in 1999
PRA	Paperwork Reduction Act
PSMFC	Pacific States Marine Fisheries Commission

Acronym	Definition
QP	quota pound
QS	quota share
QSM	quota species monitoring
RCA	Rockfish Conservation Area
RCW	Revised Code of Washington
RFA	Regulatory Flexibility Analysis, or Regulatory Flexibility Act
RFFA	reasonably foreseeable future action
RIR	Regulatory Impact Review
ROD	Record of Decision
RPC	raw product costs
SAC	Sanctuary Advisory Council
SAFE	stock assessment and fishery evaluation
SAFMC	South Atlantic Fishery Management Council
SAR	stock assessment reports
SFA	Sustainable Fisheries Act of 1996 – amended the MSFCMA
SFT	selective flatfish trawl
SHOP	Shoreside Hake Observation Program
SPR	spawning potential ratio
SRP	Scientific Research Permits
SSC	Scientific and Statistical Committee
TAC	total allowable catch
TIQC	Trawl Individual Quota Committee
TISEC	tital in-stream energy conversion
T_{MAX}	the maximum time to rebuild an overfished stock, according to National Standard Guidelines. Depends on biological, environmental, and legal/policy factors
T_{MEDIAN}	median year
T_{MIN}	The minimum time to rebuild an overfished stock, according to National Standard Guidelines. Technically, this is the minimum amount of time in which a fish stock will have a 50 percent chance of rebuilding if no fishing occurs (depends on biological and environmental factors).
T_{TARGET}	the target year, set by policy, for a fish stock to be completely rebuilt
U&A	usual and accustomed (usually used when referring to tribal fishing, hunting or gathering areas)

Acronym	Definition
USFWS	U.S. Fish and Wildlife Service – a representative of USFWS is a nonvoting member of the Council
VMS	vessel monitoring system
WCGOP	West Coast Groundfish Observer Program
WCN	World Conservation Union
WDFW	Washington Department of Fish and Wildlife – a representative of WDFW sits on the Council
WFWC	Washington Fish and Wildlife Commission
WPFMC	Western Pacific Fishery Management Council
YRCA	Yelloweye Rockfish Conservation Area

CHAPTER 10 COMMENTS ON THE DEIS AND RESPONSES

10.1 The Proposed Action

10.1.1 Program Costs

Commenters: Fishermen's Marketing Association; Fort Bragg fishery participants; Environmental Defense Fund et al.; Oregon Trawl Commission; Pacific Coast Federation of Fishermen's Association; The Nature Conservancy; Tommy's Marine Service

Seven commenters directly addressed program costs. Those comments are summarized as follows along with our response. Other commenters addressed program costs as a justification for modifying elements of the tracking and monitoring program. These comments are summarized and responded to under the section on tracking and monitoring.

Comment 1: Costs are not fully divulged or analyzed. The range of cost estimates varies greatly. Industry-born costs and fee structures are not specified. Incremental costs have to be specified, as well as areas of cost savings. Only costs directly necessary for the management of the trawl rationalization program should be included (costs related to the collection and processing of data not needed for the catch shares program should not be included). The lack of well-developed cost information violates NEPA.

Response: The DEIS covered a range of potential costs. The economic information provided was sufficient for NEPA purposes and adequate for a reasoned choice among the alternatives.

Additional economic information is provided in RIR/IRFA in this FEIS (see Appendix H). This additional information describes costs along with estimates of the distribution of these costs between the Federal government and the private sector.

Comment 2: Costs are more than industry can bear and the amount industry pays should be limited to the 3 percent specified in the MSA. Catch monitoring should not impose a disproportionate cost on small vessels.

Response: Analyses indicate that the program benefits will outweigh the program costs. One commenter mentioned that program compliance costs in combination with the costs of acquiring QS would be too much of a burden. In response, it should be noted that the amounts that industry must pay to support program costs should reduce the value of the QS. For those participants who feel the costs are too much of a burden, they have the option of selling or leasing their QS.

The MSA states that fees charged for LAPPs are in addition to other fees charged under the MSA. Congress explicitly allows the Secretary to require use of specified gear, require that observers be carried on vessels, and collect royalties. Requiring that industry make arrangements for the presence of a trained observer as a condition for participating in the program does not violate the 3 percent limit on cost recovery, which is specified in the statute to collect agency costs of implementing the LAPP programs. Industry payments for observers go directly to private companies and will vary based on labor markets and private contractual arrangements rather than any fee established by the government.

Since arrangements to pay for observers will be among private parties, the government has little control over the payment structures and the relative costs imposed on small vessels. As noted at the April 2010 Council meeting (http://www.pcouncil.org/wp-content/uploads/I1b_SUP_PSMFC_RPT_APRIL_2010_BB.pdf), the agency intends to cover part of the observer costs, subject to the availability of Federal funding, during the first three years of the program.. In addition, as stated at Council meetings, vessels can and are encouraged to coordinate with each other and with the observer providers to reduce costs and provide more efficiency.

Comment 3: Intent to have industry directly pay for some costs (in excess of 3 percent) should have been disclosed in the EIS.

Response: The analysis in Section A-2.2.3 of the EIS indicates that it is likely that industry would have to pay for the observer and shoreside monitoring costs as a payment in addition to the 3 percent. Direct payment for observers is also mentioned at the bottom of page 293 and page 297 of the DEIS. Adjustments will be made to the sections on impacts on harvesters so that it will be easier for the public to find this information. It is also highlighted in the RIR/IRFA attached to this FEIS. The public will have additional opportunity to comment on the Council recommendations during the comment period on the Amendments and on the proposed rules to implement the Amendments.

Comment 4: Benefits will lag costs. Industry will not be able to cover increased costs, particularly for observers, in the interim or the long-term.

Response: As noted at the April Council meeting, the agency intends to cover part of the observer costs, subject to the availability of Federal funding, during the first three years of the program (see document on website provided above). This is intended, in part, to address the transition period.

In specific response to this comment, the EIS recognizes that not all benefits from the program will occur at inception (page 295). The EIS anticipates that the value of the fishery will increase through a variety of mechanisms, including increased efficiency of operations of existing vessels, the transfer of effort to the most efficient vessels, and increased retention of target species. For the nonwhiting trawl fleet alone, it is anticipated that the first two of these mechanisms may yield benefits of around $14 million. With respect to transfer of quota to more efficient vessels, while QS transfers will be prohibited in the first two years, there would be an opportunity for QP to be transferred annually to the most efficient producers. The more difficult it is for vessels to cover their costs, the more likely and rapidly transfer of QP to most efficient operators will occur. The EIS discusses the possibility that it may take more time for markets to develop to absorb increases in the retention of target species.

However, it is expected that the initial benefits from increased efficiency should compensate for the increased compliance costs.

In general, within the limits of the available data and the models that can be constructed using that data, the analysis projects impacts. The Council and the agency recognize there is uncertainty about the eventual impacts; the program contains many opportunities for adaptive response if actual impacts vary from those projected in a substantially negative fashion.

The Council and the MSA are both very clear that the LAPP systems provide revocable non-compensable privileges, subject to modification. The MSA and the Council's FMP allow the Council to modify the program at any time, after going through the appropriate public process. Additionally, the Council specifically set aside 10 percent of quota for adaptive management, included a program review after five years, and a review of accumulation limits after two years. Also, there will be additional opportunity for review and modification during the specification process through which the Council establishes its biennial regulations.

10.1.2 Monitoring, Compliance, and Control Systems

Commenters: Arctic Storm Management Group, Environmental Defense Fund, Oregon Trawl Commission, The Nature Conservancy, Tommy's Marine Service, United Catcher Boats

Comment 5: In order to reduce costs, the catch monitoring program should be a simple, "bare minimum" program sufficient to verify catch and make the IFQ/co-op programs work.

Response: NMFS will implement a monitoring program sufficient to make the trawl rationalization program work while minimizing cost where possible. As the commenter states, full catch accounting is crucial to the program's success. This will be accomplished through at-sea observers to monitor discards, shoreside monitors to document landings, and the requisite reporting, data processing, and data storage systems. Harvesters will face costs from several sources, including costs specifically for at-sea observers and cost recovery fees intended to recover the agency's actual costs directly related to the management, data collection, and enforcement of the LAPP program.

While NMFS will establish observer duties and priorities, as well as specify harvesters' obligations through regulation, the amount charged for observers will be determined by third party providers and is also governed by applicable maritime wage laws. Observer work duties would prioritize catch monitoring over other duties as long as any other statutory requirements can be fulfilled (e.g., documenting protected species interactions consistent with the ESA). Since vessels are typically assessed at a flat daily rate based on time on board the vessel, there is likely little or no incremental cost of additional duties (e.g., biological sampling) as long as these tasks can be accomplished in a normal work day in addition to all duties related to catch monitoring.

Shoreside monitors also will be contracted through third party providers, with any costs for their services negotiated between the provider and first receiver (the responsible party for landings) with NMFS establishing basic requirements including job qualifications. In that respect the discussion above is relevant, MSA §303A(e) states that cost recovery under LAPPs shall be for programs "directly related to and in support of" the LAPP. NMFS must implement an adequate monitoring program to make the trawl rationalization program work effectively. These types of costs would be covered through a cost recovery fee (up to 3 percent of ex-vessel revenues), rather than third party contractual arrangements. The cost recovery rulemaking will be done as a trailing action after the Council has developed the mechanism, per the statutory requirements.

Comment 6: Fishery observers should not be placed on catcher vessels in the whiting mothership sector, because monitoring of the small amount of discards likely to occur could be accomplished just as effectively and at less cost with EMS, including cameras. A similar comment was made with respect to shoreside whiting catcher vessels.

Response: The preferred alternative specifies observers on whiting catcher vessels. NMFS has stated that it intends to work with the Council in the future to determine whether EMS might be an appropriate type of monitoring for both mothership and shoreside whiting catcher vessels.

Although neither whiting mothership catcher vessels nor shoreside whiting catcher vessels engage in sorting of catch at sea, they vary somewhat in operational characteristics. Mothership catcher vessels detach the codend from the trawl net and deliver it to the processor. Shoreside catcher vessels dump unsorted catch into the fish hold for delivery to the processing plant. In both cases, the intention is that all of the catch is retained for delivery with monitoring occurring at the processing location. Compliance with this requirement may be relatively straightforward, but accurate estimation of discards, whether unintentional or due to exigent circumstances (e.g., equipment failure, emergency) may not be possible with current EMS technology. Although discards may be low in most cases, there may be situations where large volumes of fish are discarded (because of problems with the trawl net, for example).

Similarly, even small amounts of bycatch species discard need to be identified by species if constraining sector allocations apply. Current technology may not allow accurate species identification in these situations. Commenters note that EMS with cameras has been tried in the shoreside whiting fishery under EFPs. The Council Enforcement Committee has stated that human observation will be necessary because currently this fishery is subject to a "maximized retention" requirement that allows some level of self-reported discards, while under IFQ management this will change to a full retention requirement (see Agenda Item E.10b, Supplemental EC Report, June 2009). Furthermore, incentives will change under IFQs, which make harvesters fully accountable to cover all catch with QP and increase the motivation to misreport or under-report discards (especially of highly constraining bycatch species). Harvesters are likely to be more motivated to evade detection so the greater scope for vigilance offered by a human observer is necessary.

Comment 7: Shoreside monitoring provisions could be streamlined, which would lower costs. Recommendations are to allow substantial flexibility in the deployment of observers to various tasks (e.g., shoreside compliance monitors, redeployment among vessels as part of a single contract); eliminate processor production reports because compliance monitors will be gathering the same information; ensure that compliance requirements (landing declarations, site licensing) do not reduce vessels' flexibility in determining landing locations; use observer and shoreside compliance monitor supplied information to track catch against IFQ, rather than the official record of landed catch; and do not require electronic logbooks unless cost savings can be demonstrated.

Response: As supported in the attached RIR/IRFA (Appendix H), the DEIS found that harvesters are likely to experience revenues greater than costs (see also Appendix A, pp 409-418). The monitoring and compliance program will be specified through rulemaking (the program components rule). With respect to measures to allow greater flexibility in deploying observers and shoreside compliance monitors, NMFS intends to streamline regulatory requirements through the public Council process to achieve flexibility.

Comment 8: Develop EMS for fixed gear used under the IFQ program, because use of fixed gear provides economic and environmental benefits. However, because of lower catch volume and associated revenue, observer costs would be a disincentive to switch from trawl gear to fixed gear.

Response: As stated in other responses, the monitoring program must accurately account for total catch. If the efficacy of an EMS can be demonstrated (either through the EFP as discussed by the commenter, through the adaptive management program implemented in year 3 of the program, or other means) future Council decision-making could lead to program modifications to allow EMS to substitute for observers. The Council, in developing their preferred alternative, intended to provide fishermen with the flexibility to use fixed gear under the IFQ program. Overall, IFQs are intended to give fishermen greater flexibility to discover profitable fishing strategies based on costs and opportunities. This might prompt innovation by harvesters to find ways to profitably use fixed gear even with the additional cost of paying for observers. At the same time, the Council and NMFS support continued trials to test EMS for this use.

Comment 9: Baseline socioeconomic data should be collected prior to implementation as well as post-implementation to better understand program effects, but the DEIS does not explain why such baseline data are not being collected.

Response: The Council's preferred alternative (element A-2.3.2) includes a mandatory data collection program for socioeconomic data (costs, revenues, ownership, and employment), which would be implemented as part of the proposed action, and notes that collection before program implementation would be beneficial (see Appendix D, p. D-17, D22-23). The DEIS does specify that baseline socioeconomic data should be collected both before and after program implementation. These regulations will be proposed in the program components rule.

In addition to the mandatory data collection program, NMFS Northwest Fisheries Science Center is developing a voluntary data collection program regarding social impacts. The collection is designed to provide a baseline description of the industry, as well as allow for analysis of changes the program may create for individuals and communities in the fishery. The study includes both pre-implementation information and post-implementation information (see 75 Federal Register 26197, May 11, 2010).

Comment 10: The EIS should explain what protections would be applied to confidential business information that might be collected. In particular, information on sale and lease prices for IFQs and co-op shares may be collected in a "central registry" and this information should not be made public, especially in unaggregated form.

Response: Release of information is controlled by the Freedom of Information Act and the data confidentiality provisions in MSA §402(b) (and pursuant regulations at 50 CFR 660 Subpart E). Generally speaking, unaggregated data cannot be released.

Comment 11: Because violations can be detected through catch monitoring data systems, additional enforcement presence seems unnecessary under the program.

Response: The Council has an ongoing role in the design of the enforcement program through its Enforcement Consultants (EC) committee. The EC represents both state and Federal enforcement agencies. Preliminary estimates of changes in enforcement staff necessary for the trawl rationalization program are found on page 577 of the DEIS. The RIR/IRFA in this document includes enforcement cost estimates based on a plan adopted by the Council at the April 2010 meeting. As the commenter notes, "enforcement is a critical piece of management," but the assertion that the catch monitoring system alone will be a sufficient enforcement tool is incorrect. Many types of violations by their very

nature will not be detected through catch monitoring, because their intent is to frustrate the monitoring system.

Catch shares (IFQs, co-op shares) fundamentally change the incentive system. While individual accountability is expected to result in positive behavioral changes, such as the discovery of bycatch reduction methods, the incentive to evade catch accounting can increase. Enforcement is thus a critical piece of the program's integrity; if participants are not confident that others are playing by the rules, or will be prosecuted if cheating, each person's willingness to abide by the rules is degraded. In addition, given the likelihood that the violations most likely to threaten the integrity of the program are those where catch monitoring is evaded, enforcement is more than just detection. It also involves developing cases by bringing forward admissible evidence and pursuing prosecutions. To the degree that changed incentives increase the likelihood of catch accounting evasion, more enforcement presence will be necessary.

10.1.3 Initial Allocation of Catch Shares, IFQ

Commenters: Arctic Storm Management Group; Coos Bay Trawlers Association; Crab Boat Owners Association; Deronden-Pos, Henry; Hawley, Keith; Fishermen's Marketing Association; Fort Bragg fishery participants; Natural Resource Consultants (Pacific Dawn Fisheries); The Nature Conservancy; Ocean Gold Seafoods, Inc.; Oregon Trawl Commission; Starbound LLC; United Catcher Boats; and Yeck, Fred Seadawn Fisheries

10.1.3.1 General Comments on Allocation of Catch Shares

Comment 12: Creating a fishing business is capital intensive. The next generation won't be able to afford to fish. Fishing has always been a "work your way up from the bottom" business. We need a forward-looking management plan that provides a transition to a rationalized fishery, without the burdens of significant additional investment the average fisherman cannot afford and will likely not make. It will require the redirection of limited capital, badly needed for infrastructure and vessel improvement to acquisition of needed quota.

Response: This is a forward-looking management program. It is expected to improve the economics of the overall trawl fishery. Economic analysis of the fishery indicates that the average nonwhiting shoreside fisherman is either breaking even or losing money (not fully covering its capital costs). Fishing businesses that don't receive an initial allocation may participate either by acquiring QP each year from quota shareholders or acquiring long-term security through the purchase of QS. Those fishing businesses that do not choose to acquire QS will have to compete each year in the market for QP. Their ability to purchase QP will depend on their ability to be more efficient than other fishing businesses, and thereby more able to offer a higher price for the QP. Fishing businesses that choose to do so will be able to increase the security of their investments by acquiring QS.

The Council recognizes that for new entrants, the cost of acquiring individual quota will add to the expense of entering the fishery. An increase in profits (before taking into account the cost of the quota and normal profits after taking into account the cost of the quota) and stability is expected to compensate for the increase in costs. Under status quo management, the value of a new entrant's capital investment would be at greater risk because of the potential erosion of fishing opportunity through the increased effort of others. With respect to the capital badly needed for infrastructure and vessel improvements, this is a condition that has occurred under status quo management. There is no reason to believe that continuation of status quo would improve the situation; however, under IFQs, greater

economic stability may facilitate a safer fleet with a stronger infrastructure. Section A-2.2.2.d of Appendix A to the EIS identifies ways in which the Council considered the needs of new entrants.

With respect to new entrants working their way up from the bottom, the QS system provides an opportunity for individuals such as crew members to accumulate capital. For example, crew members might invest in some QS and sell their QP to the vessel each year, creating a stream of income which may be accumulated to allow them to purchase more QS and eventually a vessel.

Comment 13: The initial allocation of harvest privileges to shoreside fish processors is not legal. Specifically, the Council lacks statutory authority for such allocations. Shoreside processors do not "substantially participate" in the fishery. Even if shoreside processors could receive direct allocations to harvest fish, the allocations are based on processing history and are in effect shoreside processing privileges, which are not authorized under the MSA. In addition, the allocations will reduce competition and have anticompetitive effects. Finally, the allocation to processors are not "fair and equitable" as required by National Standard 4: 20 percent of the available harvest is taken off the top and allocated to processors, and harvesters' bargaining power is decreased while processors' power is increased.

Response: The Council's preferred alternative designated that 20 percent of the shoreside harvest allocation of whiting would be initially allocated to shoreside processors, based on those processors' history. The Council concluded that this initial allocation was fair and equitable, thus consistent with section 303A(c)(5) of the MSA, which requires the Council to "ensure fair and equitable allocations, including consideration of (i) current and historical harvests; (ii) employment in the harvesting and processing sectors; (iii)investments in, and dependence upon, the fishery; and (iv) the current and historical participation of fishing communities ." As explained in Section A-2.1.1.a (Appendix A) of the EIS, the Council took the statutory factors into account and determined that, among the various alternatives under consideration, the initial allocation of whiting harvesting privileges as a 20/80 percent split to processors and current permit holders was fair and equitable.

NOAA does not interpret MSA 303A(c)(5)(E) to prevent shoreside processors from receiving harvesting privileges. Section 303A(c)(5)(E) states that in developing a LAPP to harvest fish, a Council shall "authorize LAP to harvest fish to be held, acquired, used by, or issued under the system to persons who substantially participate in the fishery, including in a specific sector of such fishery, as specified by the Council." The agency's interpretation of that provision is that those who substantially participate in the fishery must be among those eligible to acquire QS, but are not the only entities or persons who can receive QS. In other words, as long as those who substantially participate in the fishery are included as those eligible, the provision of the statute is satisfied. The Council's eligibility criteria provide QS to all owners of existing limited entry permits; hence to those entities that currently substantially participate in the trawl fishery.

As noted above, Section 303A(c)(5)(A) covers initial allocation and requires that the Council consider four factors in determining what would be a fair and equitable initial allocation. Of these four factors, three either implicitly or explicitly require the Council to take into account processing activities: (ii) employment in the harvesting and processing sectors; (iii) investments in, and dependence upon, the fishery; and (iv) the current and historical participation of fishing communities. As explained above, the Council considered a variety of different initial allocation criteria, and concluded that the preferred alternative was fair and equitable, and took into account the required factors.

The commenter also asserts that the allocation of harvesting privileges to processors constitutes the allocation of an opportunity to process a certain share of the catch and is therefore a processing privilege, and as noted by the commenter, such allocation would be inconsistent with past agency legal

opinions. In response, the nature of the primary business activities of those owning the QS does not change the nature of the privilege. The privilege represented by the IFQ is the privilege of catching the fish, nothing else

Finally, the commenter objects to the allocation of QS to processors because such an allocation will reduce competition and have anticompetitive impacts. This issue and the potential for anticompetitive results has been analyzed extensively in the EIS and was discussed and considered carefully by the Council. During development of the trawl rationalization program, the NOAA Office of General Counsel (GC) had informal consultations with the Antitrust Division of the U.S. Department of Justice. Based on those informal consultations and analysis of relevant facts and applicable legal rules, NOAA GC submitted a letter to the Council dated October 11, 2008, in which the antitrust savings clause in Section 303A of the MSA was noted and advised "that any fishery participants that are uncertain about the legality under the antitrust laws of the Unites States of any of their anticipated activities should consult legal counsel prior to commencing those activities." The NOAA GC letter provided citations to guidance or resource documents available on the Federal Trade Commission website. The NOAA GC letter is available on the Pacific Council's website at http://www.pcouncil.org/bb/2008/1108/F3d_SUP_GC_1108.pdf.

Comment 14: As a substantial participant in the fishery, the Nature Conservancy should be allocated quota.

Response: The Nature Conservancy cites as evidence of its status as a fishery participant its ownership of limited entry permits and that it has partnered with fishermen and local communities to continue fishing those permits using more sustainable practices. The EIS assumptions and the policy recommended by the Council both anticipate that the Nature Conservancy would receive an initial allocation of QS based on the permits it owns, i.e., they will qualify for QS just as any other permit holder qualifies for QS.

10.1.3.2 Allocation Formula, General

Comment 15: With respect to the initial allocation of catch history to catcher vessels in the mothership sector, the commenter supports the allocation periods and criteria but states that it is important to recognize that in the original Council motion, the word "worst" was purposefully not included and the motion just stated: "drop 2 years." It was the intent of the PFMC to allow the permit owner the ability to decide which years to drop. Furthermore, there is no requirement for a vessel dually qualified in the MS and SS whiting fisheries to have the same drop years in both sectors.

Response: The word "worst" was used in the write up of the Council motions based on the assumption that no permit holder would choose to drop years that would result in a lesser allocation. Worst was interpreted to mean "worst" after taking into account relative catch history. Nevertheless, the commenter is correct and the language has been adjusted to state only that "two years" will be dropped, so that the permit owners might be allowed to choose to drop years other than their worst years. The commenter is correct that there is no requirement for a vessel dually qualified in the MS and SS whiting fisheries to have the same drop years in both sectors.

Comment 16: With respect to the analysis, one commenter noted that analysis of the impacts relative to the recent fleet activities might be improved.

Response: Some of the information sought by the commenter was available in Appendix A, covering the IFQ program. However, in response to this comment, Appendix B, covering the co-op program, has been augmented with (1) counts of the numbers of vessels participating in recent years and those eligible to participate under Amendment 15; and (2) a graph comparing the allocation of QS to each permit against the permit's recent harvest shares.

Comment 17: One commenter opposes the inclusion of additional qualifying years for determining the initial allocation and/or imposing a recent harvesting requirement, another supports the allocation qualification and catch history requirements for mothership catcher vessels that were adopted, and another voiced general support of the initial allocation formulas.

Response: No additional qualifying years or recent harvesting requirements have been imposed. For the at-sea mothership delivered, estimates of quota allocations have been updated based on new vessel identifier information acquired by PacFIN.

Comment 18: Several commenters addressed the allocation qualification and catch history requirements. Two commenters expressed a belief that MSA recency requirements are not being met because the allocation period of 1994-2003 is too out of date. One commenter suggested extending the history years to include years 2004 up to 2009 or as recent as possible. Another suggested increasing emphasis on recent years by moving the start of the allocation period from 1994 to 1997 and the end from 2003 to 2006 (and using 2003 through 2006 for the allocation period for overfished species), recognizing a new control date of January 1, 2007. The commenter further stated:

- **This plan considers historical participation that will be 17 years old at the time of implementation (including harvest taken leading up to the groundfish disaster) but not 7-year-old history.**
- **It rewards the inefficiencies, inadequate infrastructure and lack of investment that characterized the qualifying year window. Since 2000 we have seen significant changes in the markets and technology in groundfish processing. Active fishermen will be required to buy or lease quota upon implementation of this program just to achieve their status quo fishing levels prior to its implementation.**
- **Approximately 40 percent of the nonwhiting groundfish allocated under this plan go to permits that are not active participants in the fishery. The initial allocation and species mix do not provide enough fish to live on.**
- **The allocation period includes years with inaccurate species composition and discard data that will skew the picture of the true state of nature.**

Several other commenters voiced support for the Council's qualifying years. Those commenters expressed concern that any amendment to the allocation qualification and catch history requirements would result in delay in implementation.

Response: In determining initial allocations, the Council is required to consider several factors including current harvests and historic harvests. See 16 U.S.C. § 1853a(c)(5)(A); see also 16 U.S.C. § 1853(b)(6). Appendix A to the EIS includes a review of the Council's consideration of all of these factors, including a discussion of the rationale for considering a variety of dates for the allocation period, including start dates of 1994 and each year from 1997 through 2001. The allocation dates selected represent a balance between emphasis on more recent history and considering the historic fishing opportunities which may have had a determining effect on the levels of capital investment by individual firms. The start date of 1994 was selected because 1994 was the first year of the license

limitation program. The decision to utilize a long allocation period was deliberate; it is likely that capital investment is based on longer term opportunity and that capital persists after contractions in the fishery such as that reflected by the disaster declaration in 2000. On this basis it is appropriate to give some weight to landings from the 1990s. Because more fish was taken during that time period, the relative pounds approach (measuring catch history as a vessel's share of total catch) reduces the emphasis on a pound of fish caught in the 1990s as compared to a pound of fish caught after 2000. While some argue that fishermen who caught fish in the mid-1990s caused the disaster and should not receive QS for that fish, the catch taken in the mid-1990s was in line with what was allowed under the regulations and believed to be sustainable at the time.

The Council selected the ending year of 2003 because that year corresponds to the previously announced control date for the fishery. The Council adopted and published the control date of November 6, 2003. See 69 Fed. Reg. 1563 (Jan. 9, 2004); 70 Fed. Reg. 29713 (May 24, 2005). The Council believes it very important that the 2003 control date be used in order to prevent future fishery disruptions. The purpose of announcing a control date in advance of developing a LAPP is to discourage speculative entry into a fishery and increased harvest while the Council goes through the process of developing the program details. If the Council develops a pattern of announcing and abandoning control dates, then the announcement of control dates will become a signal to harvesters to intensify their efforts to catch fish in order to increase their odds of qualifying for greater initial allocations. Such a response would be disruptive to fisheries and exacerbate the challenges of meeting conservation objectives. Additionally, abandoning the original control date would reduce the perceived fairness of the program by rewarding those who fished speculatively after the control date (fishing primarily on the chance that the control date would be abandoned and they would acquire more quota as a result of their post control date fishing) at the expense of those who heeded the control date.

Further, the public was given significant notice of the use November 6, 2003, as a potential control date. The notice was originally published in the Federal Register on January 9, 2004, and an additional notice was published on May 24, 2005. Both notices were posted on the Council's website, with an explanation of the possible consequences of the control date. In addition, starting in October 2003, the Council and its Trawl Individual Quota Committee, held numerous public meetings and discussions at Council meetings on the trawl rationalization program, including the use of the control date and the alternative qualifying periods.

The Council disagrees with the commenter's assertion that Amendment 15 to the Groundfish management plan created a new control date of January 1, 2007, that should be controlling here. Nowhere does Amendment 15 address the 2003 control date or purport to change the qualifying period for the Groundfish trawl program. Amendment 15 was a limited interim action for the non-Tribal whiting fishery issued in anticipation of the trawl rationalization that in no way attempted to address matters beyond its limited scope. Moreover, the Council has explicitly stated that vessels that qualified for whiting fishery participation under Amendment 15 were not guaranteed future participation or inclusion in the Pacific whiting fishery under the provisions of Amendment 20 (see http://www.pcouncil.org/groundfish/fishery-management-plan/fmp-amendment-15/)

With regards to "recency" concerns, the Council does take into account recent participation patterns in the fishery by allocating QS to current permit holders rather than to individuals or vessels that originally caught the fish. In this way, during the extensive period required to develop a program of this kind, entry and exit can occur and QS can be allocated in a less disruptive manner than would occur if the allocations went to the individuals who caught the fish historically.

While the overfished species allocation formula includes logbooks for 2003-2006, these records are used to determine the fishing pattern, not the overall level of harvest activity. The Council's

methodology for allocating overfished species is significantly different than the methodology for allocating target catch. The 1994-2003 period is still used to determine the target species allocation, and the harvest patterns from the 2003-2006 logbooks are used to determine the amount of overfished species an entity would need to take its target species. In this fashion, more recent information for the fishery is used without rewarding post control date increases in effort. The 1994-2003 harvest patterns were not used to determine a target species QS recipients need for overfished species QS. This is because of the substantial changes in fishing patterns which were induced by the determination that some species were overfished and the implementation of the RCAs and because the RCAs will remain in place after the trawl rationalization system is put into place. Therefore the Council considered that an estimate of likely patterns of activity should be based on a period of time when the RCAs were in place. The RCAs were not in place for most of the 1994-2003 period but were in place for 2003-2006.

One commenter made the point that the initial allocation, because it is different from the current distribution of harvest, may reward inefficiencies and reverse recent conservation gains, including reductions in bycatch. While it is possible that the initial allocation may not go to the most efficient and innovative harvesters, because of the need to draw a balance between control date and disruption, fairness and equity, recent participation and historic participation issues, it is expected that society will benefit over the long haul as the quota is transferred to use by the most efficient harvesters as the program progresses. Independent of the initial allocation, the QS system is expected to provide substantial incentive for vessels to avoid bycatch. One hundred percent observer coverage will ensure full individual vessel accountability. These individual vessel incentives are expected to preserve gains made in bycatch avoidance in recent years.

The same commenter also made the point that the discard and catch composition data quality from those years is poor and will skew the picture of the true state of nature. The allocation formula does not use discard data from the mid-1990s. With respect to catch composition data, it has been accepted that these data may skew the mix of species any particular permit would receive away from its actual catch, simply because the catch composition data was designed to estimate catch at the fleet level rather than the individual vessel level. Catch composition data has the same problem whether it is from the mid-1990s or early 2000s. While the catch composition data might be of better quality in more recent years, the Council felt that it was more important that the control date and longer allocation period be maintained and worth the tradeoff entailed in relying on older catch composition data.

In summary, the Council did not revisit the qualifying period for initial allocation—no additional qualifying years will be considered. The Council does not anticipate delays in implementation related to the initial allocations.

Comment 19: There are many permit holders who haven't delivered a fish in 20 years that have gotten larger allotments than more active vessels. It is unfair that permits that have not made payments for the buyback program will receive an initial allocation.

Response: The permit system has only been in place since 1994 and only one permit has no shoreside landings during that period of time. All permits will receive an initial allocation of non-overfished species, Petrale sole, and canary rockfish based on the equal division of QS associated with the history of the permits bought back plus an amount of QS related to the actual 1994-2003 deliveries by the permit. The Council was aware that this will include some permits that have not made landings since the inception of the buyback loan payback program (December 2003). The Council has chosen what it believes to be the best balance among a variety of possible allocation approaches.

Comment 20: The Nature Conservancy strongly supports the Council's action to allow entities who qualify for an amount of QS in excess of the accumulation caps a reasonable period of time (four years from the initial allocation of QS under the program) to divest of their excess quota.

Response: This is part of the Council's final recommendations.

10.1.3.3 Allocation of bycatch/overfished species IFQ

Comment 21: Bycatch mortality rates should be applied to all management units to determine catch amounts debited to quota pounds, just as it is for Pacific halibut.

The Council considered whether the IFQ fishery should have mandatory retention of IFQ species or if participants could discard IFQ species. Application of discard mortality rates was not included for IFQ species because most bycatch species expected to constrain target fisheries assume discard mortality rates of 100 percent. For the few IFQ species that may have greater viability, tracking of discard mortality would be impracticable because it would increase the complexity and costs of the program. Complexity would increase because protocols for determination of viability have not been developed for application to voluntary discards of IFQ species. Costs would increase because of the research necessary to develop such protocols, and because of the substantial additional time an observer would need to spend documenting the amount and condition of the fish being discarded.

The situation for Pacific halibut is quite different from that of IFQ species bycatch. Pacific halibut is regulated under an international treaty with specific prohibitions, including the prohibition of retention of halibut by vessels with trawl gear. Trawl vessels are required to discard all halibut immediately. Observers track viability of halibut as part of their sampling duties; unlike other species, observers have established methods for evaluating the survival likelihood of individual halibut in order to report mortality estimates to the International Pacific Halibut Commission. Moreover, the amount of halibut bycatch in any particular tow is quite low; such that observers are able to accommodate viability sampling for Pacific halibut in addition to the observer's other duties.

Comment 22: Fort Bragg fishery participants will be adversely affected by the allocation formula for canary rockfish. Fort Bragg nonwhiting trawl vessels will only receive the minimum allocation of canaries, since they did not get any under the Council's final preferred alternative ("FPA"). In general, the FPA formula for the IC/IFQs gives more fish to permit holders who did not fish for certain species than to those who did. The program has been compromised by a Council decision to not allocate "overfished" species in the same manner as all the other species, but to use a method based on a constrained fleet outside of the time frame which the rest of the program is based. The allocation of overfished species should have been treated the same as all other species instead of using a different date range and methodology.

Response: The Council considered and rejected the option of allocating overfished species for nonwhiting trips using the same method as for other nonwhiting IFQ species as not appropriate under the circumstances. In particular, the relative weighting approach, by which landings for a year are measured as a percent of all landings for the year and species, would have given a particularly high amount of credit for pounds caught during the rebuilding period. Additionally, QS would have been allocated to those who targeted some of the overfished species in the mid-1990s (before they were declared overfished) rather than to those who need such QS to access current target species. Accordingly, the Council rejected the approach of using the same allocation formula for overfished species as for nonwhiting target species based on the desire to not reward bycatch during the rebuilding

period and in order to provide QS to those who would need it to cover incidental catch taken with their target species QS allocation.

In response to the situation of the Fort Bragg vessels, the Council revised its initial FPA so that all permits would receive an allocation of canary rockfish from the equal division of the pool of QS associated with the catch history of the buyback permits. This amounts to the equal division of about 45 percent of all the canary QS.

Comment 23: On page 546 of the DEIS, the Council and NMFS speculate that "Fort Bragg's vessels do not appear to rely on fishing grounds with a relatively high bycatch of constraining overfished stocks. Therefore, covering constraining overfished species with IFQ is not expected to substantially affect Fort Bragg." This is incorrect. Because we will not receive IFQs anywhere near our needs under the FPA for overfished incidental catch species other than canaries, we will be unable to fish for our long-time target species if Amendment 20 is passed as written.

Response: The statement that Fort Bragg vessels do not appear to rely on fishing grounds with relatively high bycatch rates of constraining overfished stocks is based on vessel logbooks from 2003 through 2006 (to determine fishing patterns) and 2003 through 2006 West Coast Groundfish Observer Program observations (to determine fleet bycatch rates). Both of these sources of data were used to analyze the alternative to allocate overfished species based on QS allocations of nonwhiting target species.

After the adoption of its FPA, the Council heard public comment with regard to concerns of the owners of Fort Bragg trawl vessels over the initial allocation of QS for constraining overfished species. The Council considered such testimony and subsequently revised its initial FPA so that all permits would receive an allocation of canary rockfish from the equal division of the pool of QS associated with the catch history of the buyback permits. The Council declined to revise the FPA for constraining overfished species other than canary.

Comment 24: Vessels should not be rewarded with larger initial allocations of QS for exceeding trip limits or being allowed to fish in restricted areas under an exempted fishing permit.

Response: The Council considered whether illegal landings or landings from trips under EFPs should be used as a basis for the calculation of initial allocations of QS. The Council motion disallows use of illegal landings, such as landings in excess of cumulative trip limits, in QS calculations. With regard to landings history from EFPs, the Council considered not only that vessels fishing under EFPs had opportunities that were not available to other vessels, but also that had the vessels not been taking part in these special activities they would have put more effort into other fisheries or groundfish targeting strategies. If vessels fishing under EFPs had put their effort into other available groundfish strategies, they would have more landings history, regulations would have been more constraining on the fleet, and the landings opportunity for other vessels not fishing under EFPs would have been diminished. After considering these issues, the Council determined that landings from trips under EFPs would count as a basis for initial allocations of QS, but landings from nonwhiting EFP trips that are in excess of the cumulative trip limits in place for non-EFP fishery would not count.

10.1.4 Ownership of catch shares, IFQ

Commenters: Environmental Defense Fund; Food and Water Watch; The Nature Conservancy; Pacific Coast Federation of Fishermen's Association

Comment 25: The proposed action should have included an owner-operator provision that limits who can hold quota to those who actually participate in the fishery.

Response: An owner-operator or owner-on-board provision was considered but rejected. In Section A-11 of Appendix A, three reasons are identified for rejection of the provisions: first, the impracticality of such a provision in a multispecies fishery which would rely heavily on quota trading to match quota mix to catch mix; second, the substantial increase in tracking and monitoring costs that such a provision would entail; and third, the owner-operator mode of organization is less dominant in the trawl fleet than in other, smaller boat, fisheries.

Comment 26: Eligibility to own language may be overly broad. This could lead to QS being held by some outside the fishery which could dissipate the economic benefits to fishery participants and fishing dependent communities. Therefore, we propose that the Council (1) identify tracking ownership patterns as a critical data collection need and (2) commit to evaluating the effectiveness of eligibility rules in meeting the objectives of the IFQ program during the 5-year review.

Response: As identified by this commenter, the Council considered this issue several times but decided to retain broad "eligibility to own" rules because of other concerns such as enforceability and tracking issues. NMFS has already published a final rule to collect information needed to track ownership patterns, and the effectiveness of eligibility rules will automatically be reviewed with all other program provisions during the 5-year review. The commenter suggested that participants be put on notice of a potential change in ownership rules. The regulations will specify and participants will be on notice from the start of the program that the quota system constitutes the granting of a fishing privilege, not a right, and any aspect of the program may be changed without compensation. The commenter also proposed that information be collected on the disposition of QP issued to QS holders. Tracking the use of QP was considered at length as part of a use-or-lose provision and it was determined that such a tracking system would be cost prohibitive.

Comment 27: The DEIS should give greater specificity to the need for a clearly defined and enforceable limit on control. Despite Council action to the contrary, given the great complexity of relationships in the fishing industry between and among fishermen and processors, the commenter believes the affiliate test would be a more clear way to determine control. The Council should then establish a "safe harbor" exemption from control limits for certain types of desirable and transparent arrangements that promote community stability, reduce bycatch, and improve monitoring and accountability. The commenter strongly supports Council action to create such a safe harbor through a "Community Fishing Association" program.

Response: The commenter acknowledges the individual and collective rule adopted by the Council, and that types of control other than ownership are still subject to the control limits. The commenter suggests the superiority of an affiliation test under which all of the QS owned by an entity would count against any other entity that owns more than a 10 percent share of the QS owning entity. This is supported as providing a "bright-line rule" for the evaluation of ownership.

In the program adopted by the Council, control is evaluated through relationships that go beyond direct ownership. The commenter suggests nine other control standards based on rules from the Alaskan fishery. These same standards are identified in the DEIS as ones that NMFS might incorporate into its rules in order to implement the general policy guidance provided by the Council (pages A-318 and A-319). The commenter also provides different situations and arrangements that should be considered. Each of these situations is covered in the EIS.

In addition, during the Council "deeming" process on the initial allocation and appeals regulations, the Council requested that NMFS revise the original draft implementing language to make it clear that in certain situations someone could control QS by controlling QP, which would constitute a violation of the control limit. At the April 2010 Council meeting, the Council deemed the revised draft implementing language as necessary or appropriate to implement Amendment 20.

The Council has committed to evaluation of a special control limit ("safe harbor") for community fishing associations as part of a trailing amendment.

Comment 28: Lower accumulation limits should be included in the preferred alternative. Alternative 4b supports QS accumulation limits that are so high as to be meaningless. There are no control limits on quota pounds at all.

Response: The Council adopted accumulation limits that reflect the current level of concentration in the fleet, as reflected by the harvest activity of individual permits. After consideration of a variety of approaches, the Council adopted control at levels more constraining than necessary to address concerns related to the effective functioning of QS markets. This was done in order to achieve certain objectives related to the distribution of QS ownership. The method used to develop the QS control limits is explained in the EIS. The commenter does not provide the standard by which the evaluation is made that the control limits are "meaningless." With respect to limits on the control of QP, the limits on QP control are in place but indirect. As explained in the previous response, the Council adopted revised regulatory language to make it clear that in certain situations someone could control QS by controlling QP, which would constitute a violation of the control limit.

Comment 29: The Council should have considered the needs of smaller ports and fishing communities when setting accumulation limits. One percent is normally considered a prudent accumulation limit in IFQ fisheries. Some of the smaller ports along the West Coast could vanish completely under the scenarios adopted by the Council.

Response: Accumulation limits for IFQ fisheries range widely depending on the needs and circumstances of any particular fishery. The U.S. surf clam and Wreckfish IFQ programs have no limits and rely on antitrust laws to ensure excessive control does not occur. Limits in the New Zealand system range from 10 to 40 percent, and limits in Iceland's IFQ system run from 12 to 35 percent. Nova Scotia has a limit of 2 percent. Limits in the halibut and sablefish IFQ fisheries in Alaska are set at 0.5 and 1.0 percent. The Council has set aggregate limits that will facilitate fleet consolidation and an increase in efficiency. It is recognized that fleet consolidation will have an impact on communities; however, other measures are provided to mitigate impacts on communities (see Section 10.1.5). Under an IFQ program, communities will have opportunities to plan and control their destiny through the acquisition of QS, if they so desire. Furthermore, the Council may use part or all of the 10 percent quota set aside in the AMP to mitigate impacts on communities and will be considering a trailing amendment to allow community fishing associations to acquire quota, potentially in excess of control limits.

10.1.5 Community involvement and Community Fishing Associations

Commenters: Crab Boat Owners Association, Food and Water Watch, Pacific Coast Federation of Fishermen's Associations, The Nature Conservancy

Comment 30: The preferred alternative should include provisions allowing CFAs to be established rather than deferring this program component to a later, trailing action. Fishing community representatives were not adequately consulted, CFAs were not adequately considered

by the Council, and CFAs were not sufficiently analyzed in the EIS as required by the MSA. Without CFAs, the trawl rationalization IFQ will only go to limited entry trawl permit holders and not to offset effects of consolidation on other fishermen and smaller ports. One commenter provided detailed comment on how CFAs should be structured under a trailing action.

Response: The assertion that community representatives were not adequately consulted or involved in the development of the program is incorrect. The community representative on the TIQC engaged in significant outreach efforts that included meetings with community and local environmental group representatives and distribution of information to an extensive contact list. The results of this outreach effort and community concerns thereby raised was summarized in Appendix H to the Council's 2005 scoping report (see pp. 108-112). The TIQC also discussed community-related issues at length; as with all Council committees, their meetings were open to the public and opportunities for public comments from non-committee members were provided.

Another example of community outreach may be found in the 2004 Environmental Defense report submitted to the Council summarizing the results of a survey of community stakeholders and their concerns over the development of the trawl rationalization program.

The Council also distributed information to communities through various channels. First, the Council regularly publishes a newsletter detailing Council activities, including the development of the proposed trawl rationalization program ultimately becoming the preferred alternative detailed in the DEIS. In 2004, the Council also distributed a scoping information pamphlet on the proposal as part of the scoping process, which was widely distributed. An information pamphlet directed at captain and crew members in the groundfish fleet was also distributed in both English and Spanish and was posted in affected ports by Sea Grant extension agents during this scoping period. These information materials described the Council's proposed action, and explained how comments could be submitted to the Council and how to engage in the Council process.

In June 2005, the Council directed the analytical team in consultation with the Council's SSC to draft a range of alternatives for community involvement in the trawl rationalization program. Then in November 2005, the Council devoted substantial time to the consideration of options to address community impacts, including the distribution of QS to communities. DEIS Appendix A, pp. A-41 to A-42, summarizes results of the process, noting the difficulty in identifying an appropriate representative body within the community that would hold QS. As described there, at that time community leaders did not express interest in receiving an initial allocation of QS because of the administrative and political costs of managing such an allocation. Furthermore, communities (through whatever organizational mechanism) have not been precluded from acquiring groundfish limited entry trawl permits, which would make them eligible for the initial allocation of QS associated with a permit. Additionally, the Council's preferred alternative includes a very broad definition of who may own QS so communities are not precluded from acquiring QS once the program is implemented. Appendix A of the 2005 Council's scoping report also contains an analysis of community measures and effects in the context of the use of regional area restrictions.

Although the Council considered incorporating provisions for CFAs into the alternatives early in the development process, no strong recommendation or advocacy was voiced by members of the public or representatives on the TIQC, which was intended to represent a cross section of interests for the development of recommendations on structuring the trawl rationalization program. Proposals for including provisions for CFAs in the program emerged later on, when the Council was at the point of adopting a preferred alternative in November 2008, in part tied to the issue of how to deal with QS holding in excess of accumulation limits. Further refinement of the preferred alternative, which occurred at Council meetings in 2009, included additional consideration of CFA provisions.

Specifically, at the April 2009 Council meeting, Agenda Item F.4 addressed CFAs, and it was at this time that the Council concluded that it would be more appropriate for CFA provisions to be implemented through a trailing action. However, the moratorium on the transfer of QS during the first twp years of the program, combined with provisions to allow divestiture of QS over accumulation limits during years 3 and 4 of the program, were designed to facilitate the transfer of QS to CFAs. The moratorium is in part intended to slow the movement of QS holdings out of communities during a time when the trailing action for CFAs can be developed and implemented in a considered fashion. Recommendations for how to structure the CFA provisions in a trailing action, provided by one commenter, are welcome and should be brought forward as that proposal is developed. The Council is likely to begin developing CFA provisions in 2010 so that they could be in place before the QWS divestiture period begins.

10.1.6 Adaptive Management Program

Commenters: Environmental Defense Fund; Pacific Coast Federation of Fishermen's Associations; Radtke, Hans

Comment 31: The DEIS should better describe the process for designing and implementing the AMP and include a quantitative analysis of the adverse effects on communities stemming from delayed implementation. The AMP should be implemented before the third year of the IFQ program, as proposed in the preferred alternative, in order to better address the adverse effects stemming from the transition from the current management system to IFQ management.

Response: Quantitative analysis of the potential impacts of delayed implementation is hampered by lack of specifics about how the program would function.[120] The AMP would not change the total amount of QP available to cover catch; instead it affects the distribution of the QP reserved for the AMP. The difference in the way QP or resulting landings would be distributed due to the AMP and the distribution based on initial quota allocations would depend on program objectives and the particular distribution formula used. Although the Council considered various approaches to how quota would be distributed under the AMP, no final recommendations for distribution formulas were identified as part of the preferred alternative. Without this information, it is not possible to quantify the differential effects of not implementing the program in the first two years.

One of the uses of the AMP is to react to unanticipated and unintended consequences of the program. By definition, it is not possible to predict associated impacts of unanticipated consequences. Given these impediments to a quantitative prediction, the DEIS presents a qualitative description of the potential range of impacts and their intensity.

With respect to the recommendation that the AMP should be implemented on day 1 of the program, it should be noted that it would still take time for the impacts of IFQ management to emerge and then to craft an appropriate response through the AMP. Thus, implementing the AMP on day 1 of year 3 may not in practice delay very much the application of AMP to emerging impacts compared to having a program framework set up on day 1 but still needing to identify the impacts that need to be addressed with AMP quota. Development of the AMP during the first two years of the program can take into account adverse impacts of the program as they emerge.

[120] These details are to be worked out during the two years before the AMP goes into effect.

10.1.7 Designating the Whiting Sector Co-ops Limited Access Privilege Programs

Commenters: Arctic Storm Management Group, Food and Water Watch, Pacific Whiting Conservation Cooperative, United Catcher Boats

Comment 32: In relation to these provisions, the co-ops for whiting mothership catcher vessels and for catcher-processors do not meet the definition of a LAPP. Furthermore, if they are considered LAPPs, any fees assessed should only be for the applicable costs directly attributable to the two fishery sectors within which the co-ops would be established and not to cross-subsidize the IFQ program for the nonwhiting fishery. One commenter supported defining the catcher-processor sector as a LAPP.

Response: At the time the DEIS was published (November 2009), the Council had taken the position that a permit should not be required for the catcher-processor co-op and that therefore the catcher-processor sectors would be a LAPP. In June 2008, the Council was advised by legal counsel that "if the allocation is issued to the co-op and the co-op is required to have a permit then the program would be a LAP but if the co-op is not required to hold a co-op permit then it would not be a LAP" (minutes of the 194th Pacific Fishery Management Council Meeting, June 6-13, 2008, p. 51). On this basis, the Council voted down a motion to include a requirement for permits for the catcher-processor co-op made by the NMFS representative to the Council (Amendment 3 to Motion 41).

However, during the regulatory deeming process, the Council decided to reconsider the issue of requiring permits for co-ops. After providing advance notice of its intent to reconsider this issue, the Council changed its position by agreeing that a permit should be required for co-ops formed as part of the trawl rationalization program in both the mothership and catcher-processor sectors. NMFS advised the Council of the necessity of permitting co-ops so that they could be effectively tracked and held accountable. By issuing a permit to the co-ops as described in the Council program, the co-ops meet the definition of a LAPP.

As indicated in the comments, the question of whether the co-ops in either sector are determined to be part of a LAPP is of concern because of the provisions in the MSA on cost recovery. Section 304(d)(2)(A) authorizes NMFS to collect fees "to recover the actual costs directly related to the management, data collection, and enforcement" of a LAPP, which "shall not exceed 3 percent of the ex-vessel value of the fish harvested." Issues related to these cost recovery provisions will be taken up as part of a trailing action when the Council develops the cost recovery methodology required by section 303(A)(e) and NMFS during the implementation of the cost recovery program.

10.1.8 Expressions of Support for Program or Program Elements

Commenters: Midwater Trawlers Cooperative; Moore, Steve; Pacific Whiting Conservation Cooperative; United Catcher Boats

Comments 33:

- **The members of United Catcher Boats support the declaration system for participation in mothership co-ops as outlined in the preferred alternative. United Catcher Boats also supports the provision of a 20 percent minimum of catcher vessel permit holders necessary to form a co-op and that co-op membership is voluntary.**

- **The members of United Catcher Boats support the Council's preferred alternative that requires hard cap management at the co-op level of widow, canary, darkblotched rockfish,**

and Pacific Ocean Perch and the allocation methods presented in the final Council analysis and in the DEIS.

- **Pacific Whiting Conservation Cooperative fully supports the final preferred alternative with respect to the catcher-processor sector.**

- **Midwater Trawlers Cooperative fully supports the Pacific Fisheries Management Council,and NMFS' development of Trawl Individual Quota (TIQ) for the Pacific trawl fisheries. Midwater Trawlers Cooperative has been a participant in the TIQ process at both Council and Committee meetings since inception in 2003.**

- **I am in favor of the individual quotas.**

Response: We note these expressions of support for the program.

10.1.9 Mothership Co-op Declaration Date

Comment 34: The FEIS should explicitly identify September 1 as the date for notification of NMFS under the mothership co-op declaration system.

Response: At its April 2010 meeting, after providing public notice of its intent to reconsider its final action on this matter, the Council modified its final motion to specify that by September 1 mothership catcher-vessel permits must notify the mothership of their intent to change their mothership affiliation, and that by December 1 they must notify NMFS of the new mothership to which they are obligated for the coming year.

10.2 Need for Action, Problem Statement

Commenters: Food and Water Watch; Forve, Matt; West Coast Seafood Processors Association

Comment 35: The need for action lacks a clearly articulated vision of desired outcomes or problem statement. Furthermore, "rationalization" is not a clearly defined concept; the commenter concludes that it means "the fishery is being privatized and commoditized at the behest of special interests, and they, to persuade the public and possibly themselves, rationalize their anti-social actions." Instead, the action should focus on an outcome in the best interests of society as a whole, which would require estimates of nonmarket (unpriced) benefits.

Response: The commenter presents a lengthy discussion of possible definitions of the term rationalization, based on a footnote to the description of the proposed action on page 3 of the DEIS that lists a variety of commonly accepted definitions, which are not in any case mutually exclusive. In fact, the term "trawl rationalization" is a shorthand intended to capture social and economic objectives and associated conservation benefits of a proposed management program that includes both IFQs and co-ops. While this term may connote various aspects of all the commonly accepted definitions in the footnote, the commenter's exercise in semantics to derive an alternative rationale does not substitute for the actual, and clearly articulated, rationale laid out in the next two sections of the DEIS. DEIS Section 1.2.3 includes a succinctly stated goal: "Create and implement a capacity *rationalization plan* that increases net economic benefits, creates individual economic stability, provides for full utilization of the trawl sector allocation, considers environmental impacts, and achieves individual accountability of catch and bycatch" (emphasis added), capturing the intended meaning of the term rationalization. The

commenter's exposition of the term mainly serves to support an alternative vision, or rationale, that the commenter believes the Council should have substituted for the rationale that they actually adopted.

Comment 36: The need for action based on the claim that the trawl fishery is currently viewed as economically unsustainable is unsupported by the evidence presented in the DEIS. Second, the claim that the proposed action will reduce bycatch is not supported by the DEIS analysis.

Response: The EIS provides a detailed problem statement developed by the Council early in the process highlighting the interconnected problems of capacity, economic inefficiency, and bycatch management, which together have made it difficult for groundfish trawl sectors, and groundfish fisheries in general, to achieve optimum yield. The actual problem statement does not claim that the purported economic unsustainability of the fishery is the sole basis for the proposed action. It is relevant to note that economic analysis of the fishery indicates that the average nonwhiting shoreside fisherman is either breaking even or losing money

The second claim, that the proposed action will not reduce bycatch, uses a partial citation; the sentence in full reads "By itself an IFQ program may have few direct conservation benefits, *but substantial indirect benefits*" (emphasis added). The commenter then implies that if IFQs (or more generally, management measures making harvesters fully accountable for their catch) have no conservation benefits, then it must be instead that the proposed management program relies on a "stimulation of a conservation ethic" suggesting voluntary compliance based on a perfect alignment of self interest and social objectives in the absence of other institutional constraints. Nowhere in the DEIS is there a claim that a so-called conservation ethic by itself would be sufficient to meet the objectives of the proposed action. However, a study ((Redstone Strategy Group and Environmental Defense 2007) analyzing pre- and post-implementation performance of 10 LAPPs, including all seven U.S. programs, cites interviews with fishery participants and other sources showing that QS value "transformed the mindset of fishermen, who developed a real stake in the outcome of their fishing practices" (p. 7).

The commenter further claims that the bycatch reduction objective is not supported by analysis, and argues that the main piece of empirical evidence used to model possible bycatch reduction scenarios, results from an exempted fishing permit (the "arrowtooth EFP"), is of limited applicability, which is not acknowledged in the DEIS. In fact the uncertainties associated with using the EFP data are disclosed and discussed in Appendix C (on page C-19), containing detailed documentation of the models used in support of the impact analyses. The analysis in the DEIS supporting predictions that trawl rationalization will lead to reductions in the bycatch has a theoretical basis, informed by empirical evidence; in this context the results from the arrowtooth EFP are indicative, not predictive. The arrowtooth EFP was conducted "with requirements nearly identical to what would be expected under a rationalized fishery" (p. 244) and thus a parallel set of incentives. The model is used to show "order of magnitude" estimates of the amount of regulatory discard occurring under status quo regulations and associated loss of revenue and to present a range of increases in fleetwide revenue that could result if bycatch rates were reduced.

Conditions in the west coast groundfish trawl fishery, and characteristics of the proposed action, are in important ways unique. No other IFQ program includes complete monitoring and full accountability for such a wide range of species and is so constrained by the kind of low harvest limits imposed to rebuild overfished stocks. However, the lack of specific empirical evidence does not invalidate the expectation that under the proposed action harvesters have more incentive to avoid overfished species compared to status quo regulations, because of individual accountability and greater access to target species if bycatch rates are reduced. Other studies and reviews support the proposition that individual accountability fostered by IFQs (or the small group collective responsibility of the whiting co-ops) helps to reduce bycatch. *Sharing the Fish* ((NRC 1999), a report on IFQs requested by Congress from the

NRC, includes bycatch reduction as part of the rationale for implementing IFQs, noting that harvesters can more carefully choose their time and area of fishing, which may "reduce bycatch of non-target species since operations can be moved to target more favorable harvesting conditions, or it might allow the opportunity to develop practices that could reduce bycatch" (p. 35). The aforementioned report ((Redstone Strategy Group and Environmental Defense 2007) found that "nearly all the fisheries experienced decreases in their respective discard rates" when the LAPP was implemented.

The commenter references the "rebuilding paradox" where increasing abundance of overfished species is lagged by comparable increases in harvest limits; as bycatch becomes harder to avoid so it becomes harder to keep catches below established limits. Although it is true that bycatch will become harder to avoid as these stocks recover, the underlying incentive structure in the proposed action would still operate. Harvesters would have incentive to engage in both behavioral changes and invest in or discover bycatch reducing technology as long as these investments are less than the imputed cost of the IFQ needed to cover bycatch species.

Comment 37: The proposed action does not meet the stated purposes of increasing net economic benefits, creating individual economic stability, providing full utilization of the trawl sector allocation, mitigating environmental impacts, and achieving individual accountability of catch and bycatch.

Response: We disagree. Chapter 4 of the DEIS extensively evaluates the effects of the preferred alternative and offers evidence on how the action may address the purpose and need. Appendices A and B contain additional detailed analysis of specific program elements.

10.3 Range of Alternatives

Commenters: Daspit, William; Ecotrust; Food and Water Watch

Comment 38: Commenters claim that the Council did not consider a sufficiently broad range of alternatives. One commenter argues that alternatives should have been presented across a range "from the broad public interest at one end, to the interests of a very few at the other." As such, the public and policymakers were not presented with a real set of choices. Commenters proposed alternatives that should have been evaluated in the DEIS but were not:

- **Food and Water Watch proposes a "cap-rent-recycle model of catch share management" using fixed terms for QS ownership coupled with periodic auctions to recover resource rent. Resulting revenues would be used by government to "support eco-friendly community-based cooperative catching and marketing business models." The commenter argues that under this alternative the social (external) cost of resource extraction would be recovered by the public. The commenter cites a statement by the Council's SSC suggesting that fixed-term QS and auctions was not sufficiently analyzed in the DEIS (see Appendix F). A second commenter also advocated including fixed-term QS and auctions in the range of alternatives.**
- **Ecotrust argues for genuine "mitigation" measures to address environmental objectives. The DEIS should have included alternatives with strong incentives to reduce bycatch of overfished species and encourage switching to nontrawl gear. The commenter recommends several mechanisms that could be used to penalize fishermen who catch overfished species, but protect against market distortion and hording of overfished species quota. The commenter argues that the only mechanism included in the alternatives that**

could potentially address these objectives—the AMP—is subject to multiple, competing claims and won't be implemented until year 3 of the program.

- **Ecotrust also advocates for initial allocation of quota shares and pounds to community entities and crew and captains or facilitating such allocation in the future (e.g., by holding back a portion of the quota share to allocate once communities have organized appropriate receiving entities). The commenter argues that the Council did a poor job in outreach to communities, which contributed to lack of inclusion of such alternatives.**
- **Mr. Daspit presents the "Optimum Species-Harvesting Unified Allocation (OSHUA) plan" that proposes a different mechanism to allocate harvest opportunity to individual fishery participants. Under this plan, catch shares would be allocated to groundfish limited entry permits (fixed gear permits, open access, and trawl). The commenter includes a detailed description of the plan in his comment, which he notes was described at Council meetings during public comment periods.**

Response: CEQ regulations at 40 CFR 1502.14 call on agencies to "rigorously explore and objectively evaluate all reasonable alternatives." Case law on this topic links the range of reasonable alternatives to the definition of the proposed action. The DEIS on page 3 describes the proposed action as creating "a management regime under which the owners of Pacific Coast groundfish limited entry permits with trawl endorsements are more individually accountable for catch of target and nontarget species harvest by the vessels that their permits are registered to." This action is intended to address "problems with capacity, economic inefficiency, and bycatch management interconnected with problems related to the ability to achieve optimum yield (OY), the need for a precautionary management approach, the need for a flexible system that allows for variations and contingencies, long-term and short-term concerns for communities, and safety" (DEIS, p. 3, footnote omitted).

Furthermore, the Council engaged in a lengthy scoping process during which they solicited public input on a wide range of issues and proposals not only, in the words of CEQ, "to identify significant environmental issues deserving of study, but also to deemphasize insignificant issues, narrowing the scope of the environmental impact statement process accordingly" (40 CFR 1500.4(g)). Bearing in mind the proposed action, purpose and need, and scoping process, below is a consideration of commenters' proposed alternatives, which either were not considered, or considered but eliminated from further detailed analysis.

The "cap-rent-recycle model" alternative

This alternative would have government capture resource rents to be used for public purposes. The use of fixed-term QS that would be auctioned off periodically is one method to achieve such "rent capture." The Council considered fixed terms and auctions but rejected this mechanism from further detailed study. In doing so, the Council considered the analysis contained in Appendix F of the EIS and the critique of the analysis presented by their SSC. The Council rejected inclusion of fixed-term QS and auctions in the range of alternatives, because (1) auctioning quota at the outset of the program could make it more difficult for the groundfish trawl fleet to successfully transition to IFQ/co-op management, and (2) exclusion of auctions from the range of alternative does not imply that access privileges have been irrevocably distributed.

The Council intends to give further consideration of auctioning harvest privileges during the 5-year program review required in the program adopted by the Council.

Ecotrust's environmental "mitigation alternative"

These proposals focus on using environmental performance standards and other means to encourage trawlers to switch to fixed gear, which they assert has fewer adverse impacts on benthic habitat, to reduce and/or avoid bycatch, and to achieve other environmental benefits. In response, we note that such measures may be proposed if not already a part of the proposed action (40 CFR 1502.14(f)) but such separate measures do not have to be implemented. (Broadly, the alternatives include measures to mitigate various adverse effects to harvesters and other stakeholders and resources described in the DEIS.) Consistent with 40 CFR 1502.14(f), no additional mitigation measures have been identified. The commenter's mitigation proposals are viewed in this context. While considering and possibly mitigating new adverse habitat impacts is an MSA provision—indeed, in 2006, the Council and NMFS implemented Groundfish FMP Amendment 19 to comprehensively address fishing-related impacts to essential fish habitat—this action is not expected to result in new habitat impacts for which mitigation could be proposed. The preferred alternative would allow IFQ holders to use fixed gear, if they choose to pursue such a strategy. While there are no incentives to encourage gear switching, the existing provision alone may have a mitigating effect compared to status quo, since trawl-endorsed permits are currently prohibited from using other gear types to fish against their bimonthly limits. Any vessel switching gear types with less habitat impacts would represent a reduction in impacts compared to existing, ongoing habitat impacts due to trawl fishing under status quo.

The commenter also recommends environmental performance standards tied to preferential allocation of quota. Such proposals may go beyond the scope of the proposed action, which focuses on creating new incentives based on individual accountability for catch, and certainly goes beyond mitigating any effects associated with the proposed action. The commenter's bycatch reduction proposals tend to focus more on the claimed market distorting effects that quota scarcity may engender (note that the DEIS impact analysis includes an evaluation of "thin market conditions" resulting from quota scarcity).[121] As stated in their comment letter, the commenter's proposals would "punish less responsible fishermen and safeguard against malicious market manipulation." Such proposals would add additional complexity to the program by introducing "market distortions" linked to particular policy objectives. The purported adverse effects to be so mitigated, although identified in the DEIS, cannot be precisely specified or fully predicted, making it impractical to specify such measures in advance. In this regard, the Council included the AMP in its proposal as another mitigation measure. The commenter suggests this is the only means to mitigate bycatch and so its delayed implementation means there are "no mitigation measures in place on day 1 of the Program." However, as explained above, the proposed action as a whole is intended to be mitigative so the AMP is not the only means of mitigating adverse impacts. Also, as discussed elsewhere in these responses (see Section 10.1.6), the initial two-year hiatus in the AMP (when reserved QP are "passed through" pro rata to quota shareholders) may not make a substantial material difference in actual implementation, given that the Council would have needed time to develop methods and procedures to allocate AMP quota in any case. Additionally, since AMP quota is designed to address impacts from the program and unintended consequences, it follows that those impacts must occur before they can be addressed.

[121] Furthermore, reducing bycatch, as it defined in the MSA as discards, does not by itself necessarily reduce fishing mortality—the ultimate environmental objective—if discards are converted into retained catch (in other words, the same fishing mortality rate applies). The program will result in more accurate monitoring and accounting of total catch, which will yield environmental benefits when coupled with the fact that the sum of quota pound holdings (and co-op catch history assignments) cannot exceed the trawl sector's allocated portion of the OY/ACL. However, as discussed in Chapter 1 of the DEIS, these catch limits are specified external to this proposed action.

Initial allocation of QS to communities and to captain and crew was considered in the development of the alternatives but rejected from further consideration. The 2005 Scoping Results Document reflects preliminary consideration of these allocations. Appendix A (Section A-2.1.1) discusses the reasons why allocation proposals of this type were rejected from further consideration. In addition, response to comments on community involvement (see Section 10.1.5) discusses Council efforts to solicit input from communities during the development of the trawl rationalization proposal.

The OSHUA Plan

The OSHUA plan is beyond the scope of the proposed action, given that it considers the application of a catch privilege system to all groundfish fishery sectors. The Council discussed the OSHUA plan. Some components of the plan were part of the alternatives while other aspects were rejected. However, the Council concluded that OSHUA measures addressing the groundfish trawl fishery alone were so complicated and contentious that any expansion of scope to other sectors would have likely paralyzed the decision-making process. In the FEIS, Chapter 2 has been augmented to provide a more complete explanation of the challenges presented by the OSHUA plan.

10.4 Resources and Stakeholder Profiles (Chapter 3) and Effects of the Alternatives (Chapter 4)

10.4.1 Harvesters, Harvesting, and Bycatch

Commenters: Food and Water Watch, Tommy's Marine Service, West Coast Seafood Processors Association

Comment 39: The claim that the proposed action will increase ex-vessel revenue and profits is not supported. There is no comparison of revenue under the alternatives compared to no action (Section 4.6.2). The DEIS asserts that it is likely that buyers will be able to find new markets, yet offers no analysis or evidence. Given the impacts of increased aquaculture and imports, combined with lower per capita consumption rates, we find it impossible to understand how the DEIS can reach this conclusion.

Response: We disagree. The analysis looks at the profitability of the nonwhiting shoreside fishery before and after ITQs; it indicates that profits will increase even if revenues do not. However, the expectation is that revenues will increase as a result of more efficient use of the bycatch being allocated to them. Figure 4-7 compares ex-vessel revenue under status quo to the action alternatives. Table 4-13 provides the estimated change in efficiency as a result of consolidation. Additional program costs are taken into account in the Lian et al. (2008) analysis cited in the footnote on page 297 of the DEIS.

The commenter cites a declining per capita consumption rate and increased aquaculture production among the reasons not to expect new markets to develop. The commenter is correct that aquaculture production has increased substantially over the last 10 years (U.S. Fisheries Statistics 2008), and is correct that there has been a slight dip in the US per capita consumption (comparing 2007 and 2008 to 2006). Overall per capita seafood consumption is up by roughly just over one pound relative to the mid-1990s (from about 15 pounds to just above 16 pounds). At the same time, the price index for groundfish was at 100 in 1997 and at 165 in 2008 (a 65 percent increase). Over that same period, the gross domestic product implicit price deflator has increased by only 28 percent (U.S. Fisheries Statistics 2003; 2008). Given these changes since the 1990s and given that West Coast nonwhiting landings are approximately one half of what they were in the mid-1990s (Table 3-17), it seems reasonable to expect that there is some opportunity to redevelop markets for West Coast groundfish that were lost only due to

constraints to protect overfished species. With respect to future allocations under status quo or the alternatives, the analysis demonstrates performance of the different alternatives using a baseline.

This commenter also noted that in order to properly assess impacts on profits, the analysis needs to use monitoring and implementation costs that were produced by NMFS at the same time the DEIS was finalized (November 2009). The cost estimates used in the DEIS were those available at the time the document was drafted. Updated monitoring costs based on the Council's adopted plan are provided in the RIR/IRFA .

Comment 40: Economic benefits will accrue to the fishery only with access to larger volumes of target species which, in turn, occurs only if bycatch is reduced. The claim that bycatch reduction will occur is not well supported. Bycatch reduction and resulting revenue increases that drive the "success" of the rationalization alternatives are not well analyzed or supported and demonstrate a major weakness in the DEIS (Subsection 4.2.1.3, Section 4.4.4, Section 4.6.2.1).

Response: Economic benefits are expected even without an increase in the volume of target species landed. The bycatch reduction expectations are supported by substantial empirical experiences and models based on behavior theory and substantial empirical evidence. See Section 10.2 of response to comments for additional response.

Comment 41: On a technical matter, Figures 4-4 and 4-5 are both blank on the compact disc provided to the public and on the DEIS posted on the Council web site.

Response: This has been corrected.

Comment 42: The buyback program and the QS associated with buyback history should be discussed. The public should be informed as to why this buyback catch history is being reallocated, including why the QS effectively purchased by taxpayers (noting that it is a public resource to begin with) is being given to private entities. Also, it is not clear if any of this allocation is going to the crab and shrimp sectors that were part of the original buyback agreement.

Response: The buyback program is described in Section 3.3.3.3 of the DEIS. The buyback program bought back Federal groundfish permits and state shrimp and crab permits. The buyback program is part of the baseline from which impacts are assessed. While for simplicity of reference and establishing a standard there are references to the QS associated with the buyback permits, there is in fact no such association until one is created (i.e., there is no prior claim that these permits had some QS which is now being reallocated to others). For example, the Council considered an option that would have allocated all the QS based on landing history of current permits and none based on the landing history of the buyback permits (i.e., no equal allocation element). The designation of an equal allocation amount based on the history of the buyback permits was viewed as an equitable way to help resolve the initial allocation issue, ensuring that the smaller producing harvesters were more likely to receive an initial allocation adequate to cover their needs while the larger producing harvesters, more likely to be better financed, might have to purchase more QS to maintain their recent harvest levels.

Nevertheless, in response to the commenter we note that the industry is actively paying landings taxes to pay back the public loan that was made to support the buyback program. The schedule calls for that loan to be paid back over about 20 years. The amount that was directly paid for by the Federal government ($10 million) was based on an estimate of the tax revenue that the Federal government would receive from those who reported a capital gain as a result of selling their permits and vessels. With respect to allocations to those in the crab and shrimp sectors, such vessels will receive allocations

in proportion to their participation in the groundfish trawl fishery. The crab and shrimp vessels receive other benefits from the buyback program (the reduction in the number of vessels and permits participating in their respective fisheries).

10.4.2 Quota Allocation, Ownership, and Transfer, Including Auctions

Commenters: Ecotrust, Food & Water Watch, Pacific Whiting Conservation Cooperative, West Coast Seafood Processors Association

Comment 43: The analysis underlying the dismissal of fixed terms and auctions is unsatisfactory and too qualitative to warrant the strong conclusions, as recognized by the Council's own SSC.

Response: The SSC's report was part of the public record. The Council was aware of the concerns expressed by its SSC when it made its decision to defer consideration of an auction until the 5-year program review. The EIS has been revised to explicitly acknowledge the SSC's concerns about the analysis contained in Appendix F of the EIS. One concern about using an auction for initial allocation was its potentially disruptive effects, particularly with respect to smaller, less well-financed harvesting operations. This issue is discussed further in Section 10.5.1.

Comment 44: All information about the proposed IFQ market should be disclosed in the EIS. This includes the identity of all limited entry trawl permit holders and/or all participants; all QS and QP holders; all transfers and amounts, dates, and prices; all landing locations and landing and discard information; all infringements; and all other relevant business information required to ascertain control, eligibility, accumulation, and other matters of public interest including the operations of cooperatives.

All information that is not subject to state and Federal confidentiality laws has been released. Similarly, all information that is collected in the future will be released except to the extent that state and Federal laws prohibit its release.

Comment 45: The Council fails to comprehensively analyze the environmental effects of its allocation formula for overfished species. There are several problems with the Council's approach. First, the equal division and fleet-wide bycatch rate approaches are positively related to past bycatch landings during times when overfishing was occurring in the fishery. This perpetuates the root cause for the overfished status of several species—that is, the fact that historically too many of them were caught. Second, the allocation rules as designed also have the rather counter intuitive effect of penalizing fishermen who have historically been more successful at avoiding bycatch.

Response: The QS initial allocation formulas attempt to balance a number of issues including fairness and equity and trying to put the QS into the hands of those most likely to need it. The fishery is complex and constantly changing, and "perfect" information is not always available. Any initial allocation formula is controversial and because any formula represents balancing a number of different objectives, it will not be optimal with respect to any particular objective or all participants. However, the performance of the IFQ program with respect to bycatch control and reduction is not dependent on the initial allocation. The program includes individual vessel accountability for all bycatch and 100 percent observer coverage. On this basis, it is expected that catch limits will not be exceeded and over time quota will be transferred to those vessels able to make most effective use of it.

The commenter is incorrect in stating that any part of the formula is based on a particular permit's past catch of an overfished bycatch species. The allocation of overfished species is based on the depths and latitudinal strata in which the permit was fished during the rebuilding period (2003-2006), fleet-wide average bycatch rates for those strata that were observed by the WCGOP, and the amount of target species QS allocated to the permit. The equal allocation component of the program was included for equity reasons and benefits small vessels, as described in Section 10.4.1 in the response on the rationale for the treatment of the buyback permits.

Comment 46: The lack of provisions facilitating the buying, selling and leasing of QS or QP has environmental and economic implications omitted from the analysis. Search costs and asymmetric information will interfere with the negotiation process, and brokers will absorb most of the economic rents that are supposed to make the fleet more viable.

Response: It is incorrect that provisions are not included pertaining to the QS and QP markets. The Council's proposal calls for the publication of transfer prices and lists will be available indicating who owns the QS (as is currently the case with respect to information about who owns limited entry permits). Public release of all information will be consistent with the confidentiality provisions of the MSA and other relevant statutes; in general, NMFS intends to provide aggregate price information and the names of QS owners. Availability of appropriate information will reduce information asymmetry, reduce fishermen's search costs, and allow fishermen (or other QS buyers) to know whether the prices they are offering or being asked to pay are within a reasonable range.

The economic rents that are absorbed in the QS and asscociated transaction costs are not what make the fleet more viable over the long-term. Over the long-term new entrants will have had to purchase their QS, and the price paid for the QS, including transaction costs sometimes paid as brokerage fees, should represent the above normal profits that otherwise would have been available in the fishery. The long-term benefit of the program for industry is more stability at a normal profit level. To stay in business, brokers must provide a service that reduces the costs of transactions enough to pay for their fees.

Comment 47: There is a complete failure to account for the effects of permanently consigning 90 percent or more of all groundfish to the bottom trawl sector. The claim that "trawl gear is the only gear that can viably harvest much of the groundfish" (DEIS p. 52) has not been validated, and in any case, it does not apply to several species in question, including lingcod, thornyhead rockfish, and sablefish that are viably harvested by fixed gear, including longlines and pots.

Response: It is incorrect that there is a permanent consignment of 90 percent of the groundfish to the bottom trawl sector. First, no allocations are permanent; they may be changed by appropriate Council or agency action. In addition, Amendment 20 only pertains to the method used to manage the trawl allocation, regardless of the amount of fish allocated to the trawl fishery. Recent harvest levels were used for purpose of the analysis but such harvest levels are not necessary to maintain the program or justify program costs. The commenter is correct that not all species can only be harvested primarily by trawl gear and we note that for the species cited the allocation to trawl gear in Amendment 21 will be less than 90 percent. For other species where trawl gear is dominant (in many cases harvesting 99+ percent) to-date there have been no allocations in place that would have prevented other gear from harvesting those species if it were economically viable for them to do so. Nevertheless, in Amendment 21, if approved, the Council will be constraining trawl shares to somewhat lower levels to provide an opportunity for alternative fisheries to develop. If such fisheries do begin to develop, there would be an opportunity in the future to consider reallocations away from the trawl fishery.

Comment 48: Section 4.1.3 does not include in the reasonably foreseeable future action bullet points any reference to increased tribal allocations for Pacific whiting. Since tribal allocations are

taken "off the top" of available harvest, increases will have a direct impact on the amount of whiting available to both harvesters and processors. A reasonable range of increases needs to be analyzed under all alternatives.

Response: This is not a reasonably foreseeable future action. It is acknowledged that this negotiation process is underway, but resolution is at least two to three years out and the outcome is uncertain at this time. The action has not reached a proposal stage, the criterion listed in Section 4.1.3 for including a future event as in the list of reasonably foreseeable future actions. See previous comment regarding change in the trawl allocation.

Comment 49: The notes following Table 4-2 need clarification. Note #2 states the Council's preferred alternative does not apply accumulation limits to QP. While this is correct, it should make clear that vessel limits still apply to QP.

Response: This clarification will be made. However, it should be noted that certain usage of QP may be used as evidence of the control of the underlying QS, as reflected in the Council's discussion at the April meeting.

Comment 50: A commenter recommends that the EIS be expanded to evaluate the redistribution of quota from present to past participants in the Pacific whiting mothership sector under Amendment 20. Specifically, it was suggested that the EIS compare and contrast the number of vessels qualifying for the cooperative with the number of vessels qualifying under Amendment 15 and with the number of vessels actively participating in the fishery since 2000 until the present. Data should also be provided that shows the actual harvest of the vessels actively participating in the fishery since 2000 (status quo).

Response: The FEIS has been augmented to take this comment into account.

Comment 51: Chapter 4 refers to four CP companies, which was true when Chapter 4 was originally drafted, but, subsequently, there are now three companies with vessels licensed to participate in the CP sector. We recommend the DEIS be reviewed to ensure the CP sector is characterized accurately.

Response: We acknowledge that ownership in the CP sector has changed. Ownership in the fishery is frequently changing and it is not feasible or practical to keep the EIS completely up to date with these constantly changing conditions. In general, the standard that is followed is to use information on conditions in the fishery as it was available when the NOI to develop an EIS is published.

10.4.3 Participation by and Effect on Nontrawl Fisheries

Commenters: Ecotrust, Food and Water Watch, Pacific Coast Federation of Fishermen's Associations

Comment 52: The analysis is predicated on the assumption that the only economical way to extract groundfish biomass from the ocean is through a small fleet of large trawlers. The economic analysis in the DEIS should have examined whether the fishery could be prosecuted using smaller vessels with different gear types.

Response: The analysis does not assume that the only way to economically extract groundfish is through a small fleet of large trawlers but rather includes that as a predicted outcome. With respect to the assumption that it is the trawl fleet that will access most of the fish, this assumption is based on

observations that, for most species and species groups (particularly flatfish species and whiting), no other fleet or gear type has developed to harvest the quantities of groundfish accessed by the trawl fleet, despite the absence of regulations which would prevent that from occurring under status quo. With respect to the analytical treatment of the policy options considered, the analysis does take into account that vessels may switch gears and that nontrawl vessels may acquire a trawl permit and quota.

The issue of whether other options should have been considered, such as providing nontrawl vessels greater opportunity to access the trawl allocation, is discussed in Section 10.1.8.

Comment 53: The DEIS fails to identify and evaluate impacts associated with the portfolio role of groundfish in many ports and fishing communities and the reduced flexibility for participating that would occur as a result of the trawl rationalization program.

Response: The commenter is incorrect regarding the impacts on flexibility. The DEIS identifies that trawl rationalization increases regulatory flexibility rather than decreases such flexibility. This conclusion applies to vessels using a variety of fishing strategies, including portfolio strategies (generally one vessel fishing in a number of different fisheries) used by both trawl and nontrawl gear, used within and across years, and used by communities. The issue of whether an option should have been considered to increase such flexibility even further by not requiring that a vessel hold a trawl permit in order to fish in the trawl fishery is addressed in Section 10.1.8.

Whether a vessel is using trawl or nontrawl gear in its portfolio approach, the portfolio approach would be more viable under trawl rationalization because permit operators will have the option to use different gears. Under the IFQ program, nontrawl vessels can acquire a trawl permit and QS and fish trawl QS using nontrawl gears. If an alternative gear type makes more sense financially, the permit operator has the option of fishing that gear.

The trawl rationalization program also provides vessels with more flexibility with respect to the timing of the groundfish harvest, making it easier to work the groundfish in around other fishing opportunities. Flexibility is provided by the trawl rationalization program whether a vessel rotates through its portfolio of fisheries on an annual basis or across many years, taking advantage of the opportunities present for a particular year. Vessels for which the portfolio pattern crosses many years can either acquire QP through leasing in years they participate or buy QS and lease their QP out in years they don't participate themselves.

For portfolio vessels using nontrawl gear, the IFQ program itself presents a new participation opportunity not present under status quo. Status quo provides no opportunity for these vessels to access the trawl allocation except through the acquisition of a trawl permit and use of trawl gears.

Under the trawl rationalization program, some communities will benefit while others won't. If the program results in fleet consolidation and the departure of trawl vessels from a particular port, there is concern that infrastructure may collapse and other fisheries will be forced out of the community. This possibility is one that is identified in the EIS, albeit not specifically labeled as a portfolio issue. The EIS identifies numerous ways in which impacts on communities are considered and all communities are provided some opportunity to have more control of the future of their own fishing industry through the trawl rationalization program. Options for communities include the direct purchase and control of QS to use as incentives to maintain fleet deliveries in the communities.

While the DEIS does not specifically name portfolio strategies and break out the impacts of the IFQ program on portfolio strategies, there is substantial discussion of the flexibility the IFQ program provides to vessels for determining their optimum mode of participation. The nature of the expected

effect is that rather than a vessel having to be "all in" or "all out," as under status quo, the trawl rationalization program facilitates vessel participation at a variety of levels of production. While the model used to predict potential benefits predicts the benefits will be achieved through specialization, a portfolio approach will persist and may increase to the degree that it is competitive with or superior to the specialized approach.

Comment 54: There is insufficient analysis of the cumulative and secondary impacts with respect to spillover into other fisheries. The buyback program carefully took into account spillover effects and the trawl rationalization program the Council has not, instead relying on state-managed limited access systems to control spillover. In this context it is surprising, and inconsistent with its own previous mitigation measures, that the Council has made no efforts to avoid such negative spillover effects of Amendment 20.

Response: The analysis identifies spillover as a potential effect of the trawl IFQ program, the conditions for spillover and the fisheries into which spillover is likely to occur (Section 4.8.2).

The buyback program and mitigation measures were a Congressional program that was not implemented under Council authority. The Council does not have authority to implement complementary adjustments that might be appropriate for the state limited entry programs that control the fisheries into which spillover is likely to occur. The scope of action available to Congress in designing the buyback program was much greater than that available to the Councils.

There is also a key difference between the buyback and trawl rationalization programs. The buyback program provided a direct and immediate infusion of cash into the fishery, through the purchases of vessels and permits. This left active fishermen who sold out with an opportunity to use that cash to reenter and expand their effort into other fisheries, to the degree that permits in those other fisheries were available. The buyback program reduced the number of permits in other fisheries in order to limit this spillover effect. The trawl rationalization program does not provide a direct infusion of cash. An asset is created, the IFQ or mothership catcher vessel permit and history. Fishermen will receive cash only through the sales of these assets; however, such sales are more likely to represent transfer payments among members of industry

The Council took spillover factors into account when it rejected the option of providing "sideboards" to limit groundfish trawl vessels from expanding into other fisheries. Such provisions would have added to program complexity and inhibited flexibility. For example, see Section 4.8.2.

Comment 55: There is insufficient analysis of the cumulative and secondary impacts because of the omission of the impacts of a prior trawl rationalization program, the 2003 vessel buyback. The buyback was supposed to permanently retire the 40 percent of catch history associated with these vessels, and resulted in higher trip limits in the second half of the decade. These higher limits were not considered in the initial allocation calculation of the preferred alternative; instead, the Council chose to allocate based on the sum of the buyback history and the individual qualifying amounts. This may be a nuance, since arguably the total TAC remains the same, but the effect nonetheless is one of diluting the environmental benefits of the buyback program.

Response: We disagree. The purpose of the buyback program was to reduce the number of vessels that participate in the fishery. It was not intended to "bank" or remove the catch history of buyback vessels and preclude the use of that history by other vessels. It is not clear why the commenter believes that a different distribution of the allocation of trawl QS among trawl permits (one that takes the history of the buyback permits into account in a different way) changes the environmental effects of the program. The IFQ program is the means used to manage the trawl allocation. If the point of the comment is that there

should be a reduction in the trawl allocation, this issue is more directly addressed through intersector allocation (Amendment 21). Such a reallocation would reduce the higher trip limits cited by the commenter as a benefit recently received by the trawl fishery. See Section 10.1.8 for additional response on the issue of the amount allocated to the trawl sector.

Comment 56: There is insufficient analysis of the cumulative and secondary impacts because there is no analysis of Amendment 22, which contemplates the conversion of the open access fishery to limited entry.

Response: Under Amendment 22, the Council did not adopt a limited entry system for the open access fishery.

Comment 57: The DEIS is devoid of a meaningful discussion of the interlinked harvest strategies that fishermen employ to reach their livelihood goals. A more meaningful characterization of the interlinked harvest strategies would have shown earnings from groundfish as a percentage of overall revenues, whether by port, permit holder, or—with only a little more analytical effort—harvest portfolios. The picture that would then emerge is that the trawl rationalization program with the limitations it places on some of the LE fixed gear and OA groups significantly reduces those fishermen's flexibility to respond to a variety of contingencies.

Response: We disagree. The DEIS addressed flexibility and a variety approaches (see above discussion on portfolios). The trawl IFQ program provides more access opportunities for non-trawl vessels rather than less.

Comment 58: The description of the natural environment in Chapter 3 is inadequate because it does not adequately address the considerable impacts the RCAs have had on consolidation of the open access and fixed gear ground fish fleets.

Response: The health of the open access and limited entry fixed gear fleets has been affected by many factors including the RCAs, increasing fuel prices, increasing insurance costs, etc. The RCAs do not cause the relative impacts of the alternatives to vary. The effects of the trawl rationalization program on the nontrawl fleets are analyzed.

Comment 59: Under the Council's proposal, trawlers can switch to fixed gear and thereby compete with this other harvesting sector. In fact, this measure "could depress the price of fixed-gear-caught sablefish slightly if IFQ holders are more efficient producers" (p. 574). By contrast, fixed gear vessels cannot buy or lease trawl quota without purchasing a limited entry trawl permit.

Response: The commenter objects to fixed gear vessels having to buy a trawl permit to access trawl quota. Those trawlers who have entered the fishery since 1994 have had to buy trawl permits to access the trawl quota, thus in this respect other vessels would be on an even footing with trawl vessels. The reasons for requiring a trawl permit to participate in the IFQ program (as opposed to allowing anyone to acquire trawl IFQ) are discussed in the response to comment 62. Additionally, there seems to be a concern that if trawlers use fixed gear to catch trawl quota that fixed gear prices will be depressed, yet the commenter wants to increase fixed gear vessels' ability to access trawl quota, not to use trawl gear but in order to use fixed gear. This would have a similar effect on prices, adversely impacting those fixed gear vessels that chose not to supplement their harvest by acquiring trawl IFQ.

Comment 60: The IFQ program protects the trawl fleet, a fleet with a number of undesirable characteristics. The DEIS is cognizant of the market trends that put a "premium for products

and services that can be produced with demonstrably lower environmental impacts" (p. 100), yet the permanent allocation of the lion's share of groundfish to the trawl sector undercuts those other gear sectors that have a demonstrably lower impact on the environment. Gear types should be allowed to compete for access to the groundfish resource based on their ability to minimize bycatch and habitat damage.

Response: We disagree with the commenter's characterization of the trawl fleet. That said, the DEIS identifies and discloses the potential adverse impacts of trawl gear cited by this commenter. To the degree that these impacts may exist, they are not increased under trawl rationalization and may be reduced because it allows more opportunities for use of fixed gear to harvest the trawl allocation. The Council actions under Amendment 20 provide an opportunity for the transition of harvest away from the trawl sector and its action under Amendment 21 limits the trawl fleet allocation to the lower end of its recent harvest share. Furthermore, the allocations provided to trawlers in Amendment 21 are not permanent and may be changed in the future as it is determined to be appropriate. Additionally, trawl rationalization is expected to decrease total trawling hours required to take a given amount of harvest. Amendment 20 allows some movement of harvest toward the nontrawl gear through gear switching and the transfer of IFQ to the nontrawl fleet. For the time being, that movement is constrained by the number of trawl permits available and the dictates of the market place, combined with any incentives or subsidies that may be created, which are discussed further below.

Comment 61: Trawl vessels would have a tough time competing in the free market with other gears in avoiding overfished species. Gear types should be allowed to compete for access to the groundfish resource based on their ability to minimize bycatch and habitat damage.

Response: The program as developed allows gear switching and the transfer of QS to nontrawl vessels that acquire trawl permits. If there is a competitive advantage in the use of nontrawl gear, there will be opportunity for that advantage to show itself in how the trawl IFQ is used. If it becomes apparent on that basis that the transfer of IFQ to nontrawl gear is being constrained by the IFQ programs, and that it is a problem, adjustments to the program can be made in the future.

Comment 62: The number of limited entry permits issued is arbitrary and has no impact or good rationale in a fishery regime making allocations to individual entities Possession of a groundfish limited entry trawl permit should not be required to fish with IFQ using other gear types. This will allow the trawl allocation to support the most appropriate number of participants using the best mix of harvest strategies and gear. An IFQ system is supposed to be a "free market" solution to avoiding overfished species and rewarding the most efficient vessels, yet the market for which vessels can fish the QS is strictly limited to those who own a trawl permit. Thus, while the Council created a supposedly free market system, they also artificially restricted the market for QS down to the 150 or so permit holders.

Response: Under the Council's FPA, the program would start off requiring possession of a limited entry trawl permit for a number of reasons. First, the scope of the action pertains to how the trawl allocation will be managed, the allocation for which a vessel is required to have a trawl permit. Those permits were issued as part of the Amendment 6 license limitation program. There is nothing in the program that would prevent a follow-on action with a broader scope. Second, the trawl permit requirement limits the maximum number of vessels which may participate in the fishery and therefore assists in the initial planning for the tracking and monitoring program and keeps program costs down. Third, there is an equity perception that it would be unfair to allow one gear group to acquire the allocation given to another but not the other way around, for example, the trawlers would not be given the opportunity to buy limited entry fixed gear sablefish quota for use with trawl gear.

Even though a trawl permit will be required, it is not required that the vessel with which the permit is registered use trawl gear or even be capable of using trawl gear. Moreover, on average there are about 120 trawl vessels that participate in the fishery each year. There are about 168 permits. This indicates some opportunity for nontrawl vessels to acquire trawl permits and use trawl IFQ. Further, it is expected that there will be consolidation in the trawl fleet, increasing the number of trawl permits potentially available for use by nontrawl vessels. Thus, despite the limited scope the IFQ system will allow for some use of trawl IFQ by nontrawl vessels.

Comment 63: Fixed gear vessels are unfairly disadvantaged while allowing trawl-permitted vessels to use fixed gear. The gear switching provision in Amendment 20, which allows trawl vessels to switch to limited entry gear (longlines or pots), effectively gives trawl vessels a fixed gear endorsement. Fixed gear vessels are not given trawl permits. So while trawl vessels get to have it both ways, open access boats and fixed gear limited entry boats are prevented from acquiring quota.

Response: Under the license limitation program, trawl vessels are already allowed to use fixed gear to take the trawl allocation, albeit they must do so under the open access regulations, which have much lower limits. Fixed gear endorsements give a vessel access to the fixed gear allocation. Allowing trawl vessels to gear switch (or other vessels to acquire a trawl permit and IFQ) does not give trawl permitted vessels access to the fixed gear quota; it merely allows the vessel to use nontrawl gear to take the trawl IFQ. Therefore, the IFQ program does not effectively give trawl vessels a fixed gear endorsement. On the other hand, a fixed gear vessel could acquire a trawl permit and trawl quota and would not have to use trawl gear to take that quota, it could use fixed gear. This allows nontrawl vessels to access the trawl IFQ allocation.

10.4.4 Processors

Commenters: Pacific Seafood Group, West Coast Seafood Processors Association

Comment 64: In Chapter 3, Table 3-1 on page 64 is inaccurate in that it assumes there is no effect on shoreside processors of trawl groundfish from bycatch reduction, sector allocations, habitat/ecosystem protection, or wind energy.

Response: With regard to Table 3-1, the accompanying narrative states that the table "shows which environmental components these categories of actions are most likely to affect." There is no assertion that environmental components may not be affected in some way by the various categories of ongoing actions listed in the table, but analysts concluded that any such effects do not contribute in a substantial way to the types of cumulative effects disclosed and evaluated in Chapter 4. Acknowledging that there is the possibility of some kind of effect from these actions, the table key will be modified to state the blank cells indicate "minimal effect expected" rather than "no effect expected."

Comment 65: Chapter 3 of the DEIS provides no basis for the claim that increased protein demand is likely to lead to an increase in real prices for wild-caught fish.

Response: The discussion of protein demand affecting prices is part of an enumeration of trends that may contribute to the cumulative effects of the proposed action. The commenter notes that the DEIS uses 2006 data to show that seafood consumption has been modestly increasing in the U.S. while more recent data show a decline in consumption between 2006 and 2008. The report cited by the commenter ((NMFS 2009a) shows that over a longer time horizon per capita seafood consumption is variable but increasing. For example, per capita seafood consumption was 12.5 pounds in 1980 and had increased to

16 pounds in 2008 with some oscillation in between, including the decline between 2006 and 2008 noted by the commenter. The DEIS more generally explains that increases in global population and living standards are likely to increase demand. Given that the supply of wild-caught fish is fixed by generalized maximum sustainable yield it is reasonable to assert that price increases could be an outcome. However, this discussion is qualified by acknowledging that increasing prices may be offset by other factors such as lower cost production and availability of substitute products.

Comment 66: In Chapter 3, the statement in Section 3.9 that many of the businesses that process west coast harvests are also involved in Alaska and foreign fisheries is not supported with any evidence.

Response: The statement about west coast processors being involved in Alaskan and foreign fisheries is part of a general introductory description of the west coast processing sector. A cursory search of the Web indicates that some west coast processing companies are also involved in Alaskan fisheries. However, we acknowledge that the number of processors involved in such activities is not enumerated. For that reason the statement will be revised to indicate that while there is anecdotal evidence of such involvement, it is not quantified in the description.

Comment 67: The commenter also had several recommended technical corrections to Chapter 3, including correcting references to whiting processors that should be to nonwhiting processors in Section 3.9.2 and reporting a firm no longer in business in Table 3-59.

Response: The text of the DEIS will be revised to ensure references to whiting and nonwhiting fisheries are correct. The caption for Table 3-59 will be revised to indicate the year for which the inventory of seafood processing companies is applicable rather than deleting the company the commenter notes has gone out of business. Because baseline conditions are continually changing (as reflected in the discussion of ongoing trends in Chapter 3), a time period needs to be chosen for data that is used to represent the baseline in the analysis. As discussed in Section 4.1.2, the baseline uses data from the 2004-2008 period (see Table 4-1). For that reason, indicating the time period in the table caption is deemed a better solution since there may be other changes in the status of listed companies since the information was compiled.

Comment 68: Section 4.5.4 in Chapter 4 makes a number of claims for benefits to consumers, which the commenters argue are unsupported or incorrect. They argue that "consumers will receive no benefits and perhaps will even suffer losses as a result of rationalization."

Response: Section 4.5.4 concludes that "trawl rationalization is expected to have a modest beneficial impact to consumers" after enumerating several possible benefits. The commenter argues that claimed benefits are incorrect: greater product availability depends on bycatch reduction, which is unlikely to occur; groundfish is already available throughout the year and fleet consolidation is more likely to reduce year-round availability; and there is no evidence that new product forms will be developed. To respond, we believe our statements about potential benefits are valid, and we reiterate the qualified nature in which they are presented in the DEIS. First, based on review of other quota programs, it is reasonable to expect that trawl rationalization will lead to bycatch avoidance and greater product availability as discussed in comment response Section 10.2. Second, we do not expect that fleet consolidation will lead to reduced seasonal availability of product; consolidation better matches physical capacity to resource availability and will not restrict the ability to harvest throughout the year, subject to other constraints such as market demand and weather. Third, as discussed in the DEIS, the whiting fishery currently operates under derby conditions; trawl rationalization is expected to eliminate these conditions and allow a more measured pace of harvest. Although nonwhiting groundfish are generally available year-round under trip limit management, rationalization will give harvesters more flexibility

over the timing of harvests. Fourth, we recognize that the development of new products is not a given; however, trawl rationalization is expected to allow harvesters and processors to pursue different market opportunities, which may include new product forms, because the management system is structured to give harvesters much greater flexibility in making decisions about when and how to harvest.

Comment 69: Decreased production costs, increased utilization, more even timing of deliveries to processing plants, and market development are claimed as benefits (in Section 4.9), contrary to the commenter's perspective.

Response: With respect to Section 4.9 (impacts to shoreside processors), first, the commenter asserts that the DEIS uses old and limited data and presents conflicting claims with respect to the potential for per-unit production costs to fall for harvesters. The FEIS in Section 4.9 has been revised to state clearly that the data used in the 2000 EA are the best available; they are the only data the agency has on this issue. As explained in that section, the information presented in Table 4-57 is useful to show that excess capacity existed for shoreside processors in 1997 and in 2000 after regulations that restricted fishing were implemented. This information supports the generally accepted view that there is excess capacity in the shoreside processing industry.

The commenter asserts that a statement made in the discussion of cumulative effects to communities (Section 4.14.6.1) that "changes in production costs have made it more expensive to harvest and process fish, and are likely to continue doing so" conflicts with the claim in Section 4.9 of reduced costs. The statement in Section 4.14.6.1 describes general trends applicable to both harvesting and processing. The discussion in Section 4.9 presents information suggesting that there may continue to be excess processing capacity. If the volume of fish landed increases, which the DEIS analysis finds likely, this spare capacity could be more efficiently used, a countervailing effect. In other words, overall costs may increase, but the availability of spare processing capacity could curb the rate of increase in costs, at least over the short-term.

In addition, the commenter asserts that the effects of cost increases on invested capital value and employment are not addressed in the DEIS. In response, the potential for stranded capital is discussed on pp. 425-426, and Section 4.12 discusses impacts to processing and other labor.

Next, the commenter disputes a claim that current regulatory discards of rockfish would be landed under trawl rationalization, increasing utilization and benefitting processors, noting that "many of these discards are due small size or the fact that the species is overfished." In response, the DEIS specifically references regulatory discards, which are required to be discarded, while "economic discards," which include small fish, are discarded for economic reasons (i.e., they are unmarketable). Overfished species are currently regulatory discards: very low trip limits or retention prohibitions are set for these species. Under trawl rationalization, these species could be retained with the only constraint being the requirement to match catch with QP. Increased landings of marketable species, especially of higher value rockfish, should benefit processors by increasing revenues and normal profits.

In addition, the commenter asserts that due to consolidation the "year-round fishery is likely to disappear" preventing the benefit of better matching deliveries to plant capacity. As discussed above, we disagree that consolidation will necessarily eliminate a year-round fishery; consolidation is expected to result in a better match between harvesting capacity and resource availability; although there may be substantially fewer vessels, they would have the capacity to deliver fish in response to any seasonal demand for product by processors (as reflected by processor willingness to pay for year round deliveries).

Finally, the commenter argues that "if the projected impacts of allocating all quota shares to harvesters (i.e., close to zero profits for processors) are correct, there is no money available to develop … new markets." Under the Council's preferred alternative, 20 percent of whiting QS will be allocated to eligible processors (based on processing history). It is unclear what the commenter means by saying there will be "no money available" to processors for this purpose. Generally, market development is a financial decision made by the firm based on the expectation that resulting revenues will exceed the costs entailed and we expect that the program will enhance these expectations. If markets are not available, ex-vessel prices are likely to drop enough to allow the development of needed markets.

Comment 70: Aquaculture as an exogenous factor adversely affecting processors (by increasing price competition for groundfish products) is not mentioned in Section 4.9.4.2.

Response: On page 99, the DEIS identifies aquaculture as part of the "increased demand for protein affecting real prices" reasonably foreseeable future trend, stating "price increases may be mitigated by lower cost production methods in aquaculture and agriculture." Section 4.9.4.2 does identify increased protein demand as an exogenous trend affecting processors. However, the discussion will be supplemented to note the qualification made in Chapter 3 that aquaculture could have a mitigating effect on this trend.

Comment 71: Monitoring costs are not identified as a cost to processors.

Response: The commenter points out that processors will be required to have plant monitors present for every groundfish offload. At the time the DEIS was drafted, it was unclear who would be responsible for covering the costs for shoreside compliance monitors to be on hand for deliveries will devolve to harvesters under the trawl rationalization program. However, in the development of proposed regulations, NMFS has determined that processors will be obligated to pay for shoreside catch monitors; the agency has announced its intent to cover in the first year 90 percent of the cost of hiring the monitor, subject to the availability of Federal funding (and phasing out the government portion by 2014). In practice, who actually pays the cost for shoreside catch monitors (as well as at-sea observers) could be subject to negotiation between processors and harvesters with outcome partly dependent on relative bargaining power. There are also other, associated costs that could devolve to processors. These costs may relate to accommodation of shoreside compliance monitors (e.g., designating a workspace, purchase of approved scales) and any agreed upon cost sharing that may be a part of ex-vessel price negotiations. The DEIS does acknowledge on page 433 that shoreside tracking and monitoring requirements, including the use of shoreside compliance monitors, could add to processor operating costs.

Comment 72: The conclusion in Section 4.6.3.4 (Table 4-28, DEIS pp 339-349) that a 25 percent allocation of nonwhiting groundfish to processors would allow them to capture the entire market for certain species is unsupported by the analysis.

Response: Table 4-28 simply illustrates a reasonable premise: that an allocation to processors is likely to give them an advantage in ex-vessel price negotiations, which may be substantial for species where market demand can be met with comparatively smaller quantities. This supports the conclusion that harvesters would be relatively worse off compared to alternatives where harvesters receive a larger proportion of the initial allocation (either 100 percent, 90 percent under the adaptive management provision, or 80 percent of the shoreside whiting allocation and 90 percent of the nonwhiting allocation, once the AMP is implemented, under the preferred alternative).

10.4.5 Communities, Income, and Employment

Commenters: Crab Boat Owners Association; Vince Doyle and Others; Ecotrust; Food and Water Watch; Radtke, Hans; Tommy's Marine Service; West Coast Seafood Processors Association

Comment 73: Use more recent employment/unemployment data in Table 3-74 and include nontrawl fisheries in the description of the Brookings port group as part of a reanalysis of port vulnerability rankings.

Response: Census data and other information used to characterize west coast ports were incorporated from other sources. Employment/unemployment information was drawn from a detailed compilation of 2000 decennial census data conducted as part of the environmental justice analysis contained in the 2005-2006 groundfish harvest specifications EIS (PFMC 2004a 916 /id /ft; Appendix A). (Detailed demographic information is generally not available for years between decennial censuses for the geographic scale of small coastal communities.) This information is included in the DEIS as part of the baseline description of west coast fishing communities. Updating the cited analyses was not part of the preparation of this FEIS. The time frame of the 2006 vulnerability analysis falls within the analytical time period identified for the baseline description as discussed in Section 4.1.2 (also see Table 4-1).

Comment 74: The socioeconomic impact analysis is deficient because it lacks net economic value modeling and relates fleet efficiency to vessel size, which is not supported by historical evidence.

Response: With respect to net economic value modeling, the DEIS uses a modeling exercise that suggests possible increases in harvesting vessel efficiency, which was published in a peer reviewed journal subsequent to publication of the DEIS ((Lian, *et al.* 2009a).

The commenter also states that vessel size, which is an important factor in the Lian et al. analysis, "is not a major indication of total ex-vessel revenue within a fishery" and presents several examples to suggest many factors that "make a length predictor unreliable." First, ex-vessel revenue is different from vessel efficiency, which affects the cost of harvesting. Second, the commenter's examples of factors affecting fleet size misconstrue the Lian et al. analysis and its use in the DEIS.

Comment 75: The socioeconomic impact analysis is deficient because the regional economic impact analysis is qualitative and not specifically associated with the impacts of the alternatives.

Response: The DEIS contains estimated region-wide income impacts presented for three scenarios positing different levels of bycatch reduction under trawl rationalization. The income impact estimates were derived using the modeling method found in other Council/NMFS environmental analyses and documented in the 2005-2006 Groundfish Harvest Specifications EIS (PFMC 2004a 916 /id /ft; Appendix D) The commenter asserts that there is enough information to make such estimates at the community level. We disagree. Given the uncertainties surrounding the regional distribution of effects of trawl rationalization, presenting income impacts estimates at a finer scale would lead to a false sense of precision. Presenting numerical estimates at the community level could be more misleading than informative, because of the specific assumptions that would have to be made about factors affecting the distribution of income at this scale. Information presented in Section 3.14 (see for example Tables 3-70 and 3-71) is used to indicate the historical distribution of fishery-related income among west coast ports, which can be compared to the regional estimates to get a sense of the relative effects among communities.

It is also important to make the more general point that the analytical framework in the DEIS uses qualitative methods. This framework and approach is described in Section 4.1. The EIS discusses the

uncertainty in predicting outcomes (Section 4.1.6), and for that reason the analysts chose to disclose and discuss the range of potential impacts but could not specify the potential intensity of a given impact. Within this framework, several quantitative models were developed to explore and illustrate potential effects. Section 4.2 describes these models and how they are used in the analysis. Appendix C documents these models.

Comment 76: The socioeconomic impact analysis is deficient because the discussion of ex-vessel price negotiation (Section 4.4.3) cites an unpublished paper by Lian et al. that relies on outdated cost estimates. The commenter argues that the paper relies on 2004 cost estimates while more recent data cited in the DEIS shows that nonwhiting trawl revenue has subsequently increased.

Response: As noted above, the Lian et al. paper has been published in a peer-reviewed journal ((Lian, *et al.* 2009b). While gross revenues have increased, costs have also increased. The Lian et. al. paper illustrates the magnitude of the substantial benefits that might be expected from trawl rationalization under trawl rationalization, both with and without an accompanying expansion of harvest. For these reasons the general conclusions of the Lian et al. paper are still relevant.

Comment 77: The socioeconomic impact analysis is deficient because the DEIS does not contain a proper social impact assessment that would disclose the social costs of the loss to the general public of the asset value of QS. Generalizations about benefits should be removed from the analysis.

Response: The EIS analysis is intended to disclose both environmental and socioeconomic impacts of the proposed action. As noted in response to comment 75, a qualitative analytical framework was used, with certain potential impacts illustrated through the use of quantitative modeling. This qualitative analytical approach acknowledges data and predictive limitations.

Comment 78: The way in which the composition of the industry will change should be presented, especially the emergence of a rentier class of quota shareholders and brokers and fewer captain and crew. The EIS should discuss how this rentier class will derive unearned extra-competitive profits.

Response: The DEIS discusses capture of rents, which would otherwise be dissipated, by quota shareholders. These quota shareholders could be fishery participants or others who then lease quota to fishery participants. Appendix E contains a detailed analysis of the impacts on the allocation of QS on the short- and long-term distribution of rents from the fishery. It discloses that the quota share owner benefits from the stream of rents thus generated and points out that under program rules a wide variety of entities, not just fishery participants, could acquire quota. In terms of change in composition of the industry, the DEIS discusses fleet consolidation and relative bargaining power between harvesters and processors, as well as the possibility that QS might be owned by non-participants. The DEIS also discusses the potential effects of the program on captain and crew, acknowledging the program is likely to result in fewer such jobs and will likely shift the compensation scheme from one based on a share system to a wage system.

Comment 79: Section 3.14 excludes ports where groundfish fisheries are part of a broader "portfolio strategy," ports with nongroundfish fisheries that are likely to experience spillover effects, and ports historically active in the groundfish fishery. The communities are likely to experience adverse impacts that are not accounted for in the DEIS.

Response: Section 3.14 provides a general view of the characteristics of west coast ports by region. It provides information in tables and narrative that indicates the relative importance of groundfish fisheries

to the overall fishing economy of these regions and ports. Section 3.8.3 provides baseline information on nongroundfish fisheries. Section 4.14 considers impacts to nontrawl communities.

Comment 80: The socioeconomic impact analysis is deficient because the identification of vulnerable communities is outdated; an update would change resilience scores and the designation of some ports from not vulnerable to vulnerable.

Response: The analysis underlying the identification of vulnerable communities was part of the 2007-2008 groundfish harvest specifications EIS ((PFMC 2006). It used 2005 landings data to evaluate ports' engagement in fishing and dependence on groundfish. Census and other socioeconomic data were used to determine community resilience. Because of the time frame during which the EIS has been prepared, the most recent fishery data used comes from 2007 (fishery data is used for measures of dependence and engagement). Census and other data used to determine resiliency is generally not available at the geographic scale of ports for years more recent that the 2000 decennial census.[122] The 2006 vulnerable communities analysis uses data within the baseline time period (2004-2008) used for the analysis. The DEIS incorporates this information by reference; the assessment of community vulnerability was conducted separately from the DEIS analysis. For these reasons, the cited vulnerable communities analysis provides a reasonably accurate assessment of community status consistent with the baseline time frame used in the EIS.

Comment 81: The socioeconomic impact analysis is deficient because Section 3.14.6 does not include information about community-based entities engaged in the acquisition of fishing-related assets.

Response: Information on these community-based entities was not available an,d as noted elsewhere the baseline description of west coast fishing communities, takes a synoptic view. The Council discussed program provisions related to community fishing associations (CFAs; see comment response Section 10.1.5) and decided to implement such provisions through a trailing action. Therefore, inclusion of information about existing entities with similar purposes does not bear directly on the range of alternatives considered in the EIS.

Comment 82: The role processors play in providing critical fishery-related infrastructure in ports is not discussed in Section 3.9.3.

Response: Section 3.9.3 presents information on the flow of groundfish among west coast ports and processing centers. As the commenter acknowledges, the role of processing infrastructure is discussed in other sections of the DEIS. The commenter notes that such a discussion would illuminate shifts in processing center locations and its effect on other fisheries. There is substantial discussion in Section 4.14 of the potential effects of changes in the regional distribution of landings and the effects of fleet consolidation.

Comment 83: Reductions in fishery-related employment related to the proposed action are not considered or quantified in the context of impact on the general public in Section 4.5.5.

[122] Inter-decennial census data, such as the U.S. Census American Community Survey is not available for geographic areas with less than 20,000 population and estimates at this scale are only available as 3-year averages. The first 5-year estimates, which will contain data at sufficiently large scale, will not become available until later in 2010. Most of the ports are too small to obtain demographic characteristics directly.

Response: As explained in the DEIS, the general public environmental component is defined as nonconsumptive users and nonusers of the resource. Fishery-related employment is not relevant in this context. Fishery-related employment is addressed elsewhere (e.g., Sections 4.7, 4.12-4.14).

Comment 84: Amendment 20 will severely impact Fort Bragg fishermen, their families, and suppliers.

Response: The DEIS discloses potential adverse impacts to Fort Bragg and other fishing communities.

10.4.6 Regulatory Impact Review (RIR) and Initial Regulatory Flexibility Analysis (IRFA)

Commenters: Ecotrust, West Coast Seafood Processors Association

Comment 85: The RIR/IRFA analysis (Appendix H in the DEIS) is inadequate. The analysis needs to take into account impacts on the full range of affected entities. Considering effects at the scale of the whole nation for determining whether impacts are significant is not supported by EO 12866 or the Regulatory Flexibility Act. The evaluation of alternatives should include the additional alternatives proposed by the commenter elsewhere in their letter. The RIR/IRFA analysis is inadequate for the same reasons the commenter claims the impact analysis in Chapter 4 of the DEIS is inadequate.

Response: The RIR/IRFA analysis in Appendix H of the DEIS is preliminary. The RIR/IRFA analysis is tied to the regulatory process and its inclusion in the EIS is not required, but the EIS is frequently used as a way of disseminating this information to the public. Furthermore, the contents of the DEIS overlap with many, but not all, of the required elements of the RIR/IRFA analysis. However, the RIR/IRFA analysis has specific analytical requirements, such as cost-benefit analysis, that is not required in an EIS (40 CFR 1502.23). At the time the DEIS was published, the development of implementing regulations for Amendment 20 had not proceeded to a point where the RIR/IRFA analysis could be fully developed. A revised RIR/IRFA analysis has been prepared as part of Federal rulemaking and is included in this FEIS.

10.5 Policies, Legal Standards, and Requirements

10.5.1 Public Trust and Privatization

Comment 86: The commenter favors status quo and opposes Alternative 4b (the Council recommended alternative) citing concerns that Alternative 4b does not collect any resource rent and is chiefly concerned with putting anti-competitive measures in place so that the "winners" can extract extra-competitive profit. Alternative 4b provides access privileges with most of the attributes private property rights, exclusivity, tradability, and effective perpetuity. The Pacific coast limited entry trawl fishery, as with all other U.S. fisheries, should be maintained as a valuable public trust asset and not be doled out to private interests for free and forever.

Response: The policy recommended by the Council is one that balances several objectives. Imposition of the collection of resource rents without a phase-in process would be highly disruptive and likely result in the acquisition of harvest privileges by large well-funded entities with "deep pockets." The Council considered a provision that would phase in the collection of additional resource rents through an auction. While the Council deferred further deliberation on this provision until the first 5-year review, it put the public on notice that such provisions would be considered. Congress and the Council

have both been clear and explicit that what is being granted is a privilege that is modifiable and revocable at any time without compensation to the privilege holder (see Section A-2.3.4 of the EIS).

Under status quo, the fishery resource is held in the public trust until sometime after it is captured and brought on board a vessel, at which point it becomes the private property of the vessel. Under the proposed alternative, the situation will be no different. What changes is how the harvest is controlled. Under status quo, those with trawl permits compete with one another on the fishing grounds to harvest the trawl allocation. Under trawl rationalization, those with trawl permits will compete with each other, crew, communities, processors and others in the private market place to determine who is willing and able to pay the most for the harvest privileges. This process is expected to result in an efficient outcome and convert currently wasted resources into profits. It is not clear why the commenter believes these measures to be anticompetitive. The profits will be captured by the holders of the harvest privileges who: will pay taxes on any capital gains (benefiting the public), will pay directly or indirectly for the costs of the program, and may at a later time be asked to pay additional rents or royalties. The public trust nature of the resources will not change; the harvest privileges are not given out completely freely; and the nature of what is being given out is not necessarily fixed even over the next several years, much less so "forever."

Comment 87: The commenter voiced concern that the gifting of a valuable public asset worth many hundreds of millions of dollars is not accounted for and specifically asks: How much is this asset worth? Who is getting this asset? Is the public even aware that its asset is being given away for free and essentially forever? Has the PFMC made any effort to assess public sentiment over this giveaway of public wealth? How much annual resource rent (that could be used for better management and habitat restoration) is being forgone?

Response: The asset worth is assessed in Section A-2.1.1.a of the DEIS. The trawl permit holders would receive 90 percent of the nonwhiting QS, 80 percent of the whiting QS, and all of the mothership whiting and catcher processor allocations. The identities of these permit holders are a matter of public record available from the NMFS Northwest Region Limited Enter Permit Office. The 20 percent of the whiting QS going to first receivers is expected to be distributed among 11 companies listed on the Council website. The Council's policy deliberations are a matter of public record, noticed in the Federal register, announced through the Council web site and mailing lists, and reported on frequently by the press. The issue of whether these assets are being given away free forever is discussed in the previous response. With respect to assessment of public sentiment, the Council has received considerable public comment and is considering policies authorized by Congress, one of the main authorities for determining public interest. The amount of annual resource rent is directly related to the value of the long-term harvest privilege, discussed in Section A-2.1.1.a.

Comment 88: Anti-competitive protections for the catcher processor whiting, and other whiting and nonwhiting sectors should be removed from the preferred alternative. The catcher processor sector is a LAPP and should be subject to LAPP requirements.

Response: The measures this commenter terms "anti-competitive" are part of the status quo program (under Amendment 6 and Amendment 15, participation in the trawl sectors of the fishery was limited). The Council reconsidered its policy at its April 2010 meeting and recommended to NMFS that co-op permits be required for mothership catcher vessel and catcher-processor co-ops, with the understanding that this modification would clearly subject these sectors to LAPP requirements.

10.5.2 Magnuson-Stevens Act, Including National Standards

Commenters: Crab Boat Owners Association, Ecotrust, West Coast Seafood Processors Association

Comment 89: We believe that the action alternatives do not successfully meet the national standards for fisheries management in Section 301(a) of the MSA. We also believe that the action alternatives do not successfully meet the national standards for fisheries management in Section 301(a) of the MSA.

Response: Specific issues are addressed below. During Secretarial review, NMFS will review the Council's recommended alternative to determine whether it complies with the MSA's National Standards.

Comment 90: National Standard 2 requires the use of the best scientific information available. The DEIS makes the assertion that the analyses contained within constitute that information. Given the flaws discussed at length above, we disagree.

Response: As explained in responses above, in response to public comment, descriptions of some of the information presented in the EIS have been revised. NMFS will review the entire record supporting the Council's recommended action to determine compliance with National Standard 2 and all National Standards.

Comment 91: National Standard 5 prohibits management measures that have economic allocation as their sole purpose. Note the discussion on Section 1.3.1 above (Analysis of need for action).

Response: National Standard 5 does prohibit measures that have economic allocation as their sole purpose. The trawl rationalization program is not such a prohibited measure. The need for trawl rationalization arises from a complex set of challenges relating to biological, social, and economic concerns. This action addresses the challenge of addressing bycatch in a complex multi-species fishery in which management requirements for several overfished stocks are constraining the ability of the fishery to achieve OY on other stocks. By giving individual participants more flexibility, accompanied by greater individual accountability, the action is expected to better allow for achieving OY while rebuilding overfished stocks.

The stated purpose for the action reflects the range of biological, social, and economic concerns:

> Create and implement a capacity rationalization plan that increases net economic benefits, creates individual economic stability, provides for full utilization of the trawl sector allocation, considers environmental impacts, and achieves individual accountability of catch and bycatch.

NMFS notes that Sections 303(b)(b) and 303A of the MSA specifically authorize the establishment of limited entry and LAPP programs.

NMFS will review the proposed action to determine its consistency with National Standard 5 prior to making a final decision.

Comment 92: Individual quota programs are economic programs and they do not work without allocation when different sectors compete for the same fish but only one of those sectors is proposed to be rationalized.

Response: Section 2.6 of the analysis explains the Council's rationale for recommending the IFQ program. As stated in Section 2.6, the purposes of Amendment 20 are not merely economic but pertain to bycatch reduction and catch accounting as well. While allocations play an important role in implementation of an IFQ program, such allocations could be made through the biennial specification process under the current status quo without formalizing them in the FMP. The Council explores these alternatives in the context of Amendment 21.

Comment 93: National Standard 7 speaks to minimizing costs and duplication. Since the DEIS contains no real analysis of the monitoring program and its effects, we will base our comments on reports provided to the Council by enforcement bodies.

Response: The DEIS evaluates the potential impacts of the proposed action and its alternatives on the quality of the human environmental. In this context, it includes a broad level discussion of anticipated program costs. A more precise cost assessment is contained in the RIR/IRFA accompanying this FEIS. NMFS will evaluate compliance with National Standard 7 prior to making a decision.

Comment 94: The monitoring program contemplates the use of observers, rather than the existing electronic monitoring, on whiting trawl vessels – at a much higher cost. Fish in both the whiting and nonwhiting fishery will be observed by a federally-trained observer as it is hauled aboard a vessel and again when it is landed on shore in a processing facility, this time by a different federally-trained monitor. Specifics of the fish (weight, species, etc.) will be recorded on a fish ticket and in a production report, both of which will be made available to state and federal enforcement entities. Duplication and costs will run rampant.

Response: National Standard 7 states that "[c]onservation and management measures shall, where practicable, minimize costs and avoid unnecessary duplication." The monitoring requirements in the proposed trawl rationalization program are necessary for the effectiveness of the program. Under the IFQ program, the nature of fishing activities will not change, but *incentives* will. There generally will be enhanced incentive to avoid detection of overfished species due to the level of individual accountability. Current electronic monitoring may not be sufficient to detect throwing overboard of infrequently caught constraining bycatch. For catcher vessels in the mothership sector it may be important to have observers on board in case there are any situations in which codends must be bled for fish is otherwise spilled before it is transferred to the mothership. Moreover, it is important for the integrity of the program that fishermen believe that everyone is complying.

At-sea observers would perform different functions from shoreside monitors. The primary role of at-sea observers includes recording fishing effort and estimate total, and discarded catch weight by species. The function of the shoreside monitors includes verifying all shoreside deliveries of catch share species, ensuring that species are sorted to Federal species or species groups, and recording and submitting catch/landing data daily.

With respect to the requirements for both fish tickets and production reports, NMFS acknowledges that there may some duplication at the beginning of the program. This is due to the need for both the state and the Federal government to have access to the information and the different formats currently in use. However, it is possible that this situation can be improved during the initial phases of the rationalization program in a manner similar to how reporting in the Oregon whiting fishery has been resolved. In the Oregon whiting example, both the state and Federal government required access to information, and through cooperation they were able to develop one reporting instrument that met both needs. Thus, while there may be some duplication at the start of the program, the hope is that this will be reduced as the program develops.

NMFS, the states, and the Council intend to continue working collaboratively on data collection programs to meet both state and Federal purposes without duplication and in the most efficient manner.

NMFS will review the proposed action for compliance with National Standard 7 prior to making a final decision.

Comment 95: National Standard 8 requires minimizing effects on communities. The action alternatives will potentially increase unemployment, remove fishing facilities (vessels and processors) from "at risk" communities, and reduce income from local taxes and purchase of goods and services.

Response: National Standard 8 requires consideration of impacts on communities, but recognizes the higher priority of National Standard 1. Specifically, National Standard 8 states that "Conservation and management measures shall, consistent with the conservation requirements of the Magnuson-Stevens Act (including the prevention of overfishing and rebuilding of overfished stocks), take into account the importance of fishery resources to fishing communities in order to: (1) Provide for the sustained participation of such communities; and (2) To the extent practicable, minimize adverse economic impacts on such communities."

Chapter 4.14 of the analysis describes anticipated impacts on communities and acknowledges a possibly profound impact on communities that depend on trawling. This is due to the nature of rationalization which results in fewer fishery participants and likely geographic shifts. The goal of attaining a sustainable fishery as a whole requires some impacts to individual communities. However, the Council also recommended measures that should mitigate these impacts.

For example, the program would allow communities to purchase quota or permits to keep some of the fishery in the community. In addition, the AMP is intended for use in ameliorating impacts on communities.

NMFS will review the proposed action for compliance with National Standard 8 prior to making a final decision. See also response to comment 105 below.

Comment 96: National Standard 9, reduction in bycatch, can be met equally well by the status quo alternative as by the action alternative.

Response: Chapter 4.17.2.2 provides information indicating that the proposed trawl rationalization program would be expected to be more effective at reducing bycatch than maintaining the status quo. See also responses to comments on the need for action, and responses to comments in Section 10.2 on the need for action 35.

NMFS will review the proposed action for compliance with National Standard 9 prior to making a final decision.

Comment 97: The proposed Program would elevate fishing efficiency and economic objectives over objectives dealing with environmental stewardship. This approach inverts the priority of the standards adopted by Congress to guide management plans. Under Congress' scheme, it is the standard on fishing efficiency that must be considered (National Standard 5), while the standard on fisheries conservation (National Standard 1) has primacy.

Response: NMFS does not agree that the order of the wording in the stated goal of the proposed program is intended to elevate any parts of the stated goal above others. NMFS notes that the MSA uses

a similar ordering of issues in defining OY as MSY as reduced by any relevant economic, social, or ecological factors. NMFS concurs with the statement that National Standard 1 takes primacy over certain other considerations in the MSA. The analysis contained in Chapter 6 indicates that the proposed program would comply with National Standard 1 by improving the ability of the fishery to achieve OY while preventing overfishing and achieving rebuilding. The MSA also mandates the consideration of economic efficiency, allows allocations to the extent that they are not the sole purpose of a management measure, and specifically authorizes the establishment of limited entry programs and LAPPs.

As discussed in Section 1.2.2 of the EIS, since the initiation of scoping for action, the Council has identified the interrelated issues of bycatch and fleet stability as key problems, and the Council has been committed to increasing accountability for bycatch. Amendment 18, which focused on bycatch, identified IFQ as an appropriate approach for bycatch reduction (pp. 3-4 of EIS).

NMFS will review the proposed action for compliance with the National Standards prior to making a final decision.

Comment 98: The Program's only concrete contribution to fishery conservation is the proposed full observer and camera coverage at sea and dockside and related reporting.

Response: Amendment 20 is expected to promote achievement of OY, reduce bycatch, and improve information available for use in managing the fishery. The analysis identifies numerous potential benefits, as well as potential adverse impacts, from the proposed action. The Council considered these impacts and concluded that the benefits outweigh potential adverse effects. Section 2.6 of the EIS explains the Council's rationale for recommending the actions in Amendment 20. NMFS will review the proposed action for compliance with applicable laws prior to making a final decision.

Comment 99: If implemented as planned, this aspect of the Program should yield information useful for improving fisheries management.

Response: The observer coverage and monitoring requirements are intended to yield useful information.

Comment 100: This potential gain is overshadowed, however, by the considerable negative impacts of the Program. The DEIS does not give an adequate accounting of these impacts. Additionally, it contains significant errors in the information and analysis that are provided.

Response: The DEIS evaluates the potential impacts of the proposed action and its alternatives on the quality of the human environmental. In this context, it includes a broad level discussion of anticipated program costs. As noted above, in some cases the EIS has been revised to provide a better description of the some of the information and its limits.

After considering potential positive and negative impacts of the proposed program and its alternatives, the Council determined that the proposed approach is the best way to achieve the stated goals as described in Section 2.6 of the analysis.

Additional economic information is provided in RIR/IRFA in this FEIS (see Appendix H). This additional information describes costs along with estimates of the distribution of these costs between the Federal government and the private sector NMFS will evaluate compliance with National Standard 7 prior to making a decision.

Comment 101: The program lacks the incentives needed to encourage harvesting the full optimum yield of higher biomass species while avoiding lower biomass species, thereby not meeting National Standard 1.

Response: Section 4.17.2.2 provides information indicating that the proposed trawl rationalization program would be expected to be more effective at reducing bycatch than would be maintaining the status quo. Section 2.6 explains the Council's rationale for recommending Amendment 20. See also response to comments in Section 10.2, the need for action.

NMFS will review the proposed action for compliance with National Standards 1 and 9 prior to making a final decision.

Comment 102: The program's allowance of non-fishing ownership and QS leasing will diminish fishers' incentive for stewardship, undercutting the ability to meet National Standard 1.

Response: Appendix A-2.2.2.3.b (p.A-225-230) describes alternatives the Council considered, but rejected, that would have modified the eligibility to own requirements. This section of the analysis sets forth costs and benefits of different eligibility requirements. For example, the council considered restricting eligibility to "stakeholders" or limited entry permit holders, but identified concerns about cost and administration of such restrictions. The council also identified benefits of allowing broader eligibility such as encouraging the highest value use of the resource. See also response to comments 25 and 28.

Comment 103: The allocation of 90 percent of the groundfish quota to a nonselective gear with high levels of habitat destruction and bycatch makes the action inconsistent with National Standard 1.

Response: National Standard 1 states that "Conservation and management measures shall prevent overfishing while achieving, on a continuing basis, the optimum yield (OY) from each fishery for the U.S. fishing industry." The MSA defines OY as "the amount of fish which (A) will provide the greatest overall benefit to the Nation, particularly with respect to food production and recreational opportunities, and taking into account the protection of marine ecosystems; (B) is prescribed as such on the basis of the maximum sustainable yield from the fishery, as reduced by any relevant economic, social, or ecological factor; and (C) in the case of an overfished fishery, provides for rebuilding to a level consistent with producing the maximum sustainable yield in such fishery."

Thus, National Standard 1 pertains to an amount of fish rather than to a gear type's impact on habitat. The analysis does discuss the rationale for focusing management measures on trawl gear in Section 2.6.1. Currently, for a number of species (especially flatfish and slope species) trawl gear is the only gear capable of commercially viable harvest in the amounts in which the species are available—see the response above under comment 47 in Section 10.4.2 for more discussion. The fishery is already subject to rebuilding plans that comply with the mandates of National Standard 1.

In addition, it is important to recognize the ongoing nature of fishery management under the MSA. As management needs arise, the Council and NMFS respond to them. Recently, Amendment 19 addressed habitat issues in the fishery, and established extensive habitat protections. Amendment 20 maintains those protections while specifically addressing a separate management need for rationalization as described in the purpose and needs statement. While FMP amendments must comply with the broad array of policy objectives in the MSA's National Standards and within the FMP, not every FMP amendment will thoroughly address every management need in the fishery simultaneously. NMFS and

the Council will continue to review the best available information regarding habitat needs and develop additional management measures if necessary and appropriate.

The goal of Amendment 20 is to "[c]reate and implement a capacity rationalization plan that increases net economic benefits, creates individual economic stability, provides for full utilization of the trawl sector allocation, considers environmental impacts, and achieves individual accountability of catch and bycatch." Within the context of achieving this goal, the EIS acknowledges impacts caused by trawl gear. For example, the impacts of trawl gear are discussed in a section on eco-labeling in Chapter 3 (p.100). While Amendment 20 is not focused on habitat remediation, as discussed in responses to comments in Section 10.4.3, Amendment 20 may allow for an increase from the status quo in the use of nontrawl gear in the trawl fishery. See also Section 2.6.1 of the EIS. Also, as noted in response to comment 47,, the allocations in Amendment 21 would limit the trawl share of harvest to a slightly lower level than status quo. NMFS will review the proposed action's compliance with all National Standards prior to making a final decision.

Comment 104: Although the intersector allocation process has been deferred to Amendment 21 (improperly, as discussed in our comments above on segmentation), the intended allocation to the trawl sector is clear on the record of Amendment 20. The preferred alternative has ignored available studies and reports showing the adverse effects of trawl gear on bottom habitat and overfished stocks, thus not addressing National Standard 2.

Response: The commenter's position regarding segmentation of Amendment 21 and 20 are addressed below. And, as noted in response to other comments, no allocation or management scheme is "permanent." the MSA requires periodic review of actions and the Council recommends modifications frequently. To the extent that the comments address the allocation scheme of Amendment 21, those comments are beyond the scope of this action.

The focus of Amendment 20 is rationalizing the trawl fishery and reducing bycatch. As discussed in responses above to comments addressing habitat concerns, especially the response to comment [5.2.4], Amendment 19 developed a suite of habitat protections that would continue under the Amendment 20 regime. The DEIS for Amendment 20 recognizes the impacts of trawl gear (for example, see page 100) and incorporates by reference information from the Amendment 19 EIS (see Section 4.20.3.3, p. 603). Amendment 20 would not modify the protections implemented pursuant to Amendment 19. We do not agree that relevant information has been ignored.

NMFS will review the proposed action for compliance with National Standard 2 prior to making a final decision.

Comment 105: The proposed Program fails to meet the National Standard 4 standards for allocation fairness and equitability in several ways. The Program's failure to provide for fishing community participation is especially troubling in light of the statutory provisions for inclusion of communities in initial allocations and a record of Congressional concern over this issue. Senate Report 109-229 on Senator Stevens' original limited access privilege bill, S 2012 in 2006 which, with changes not relevant here, was enacted into law. The report specified that allocation of harvesting privileges to fishing communities was to be allowed and that small vessel and entry-level participants as well as communities were to be included in any plan to rationalize a fishery.

Response: The cited legislation does not require initial allocations to communities or any other community specific provisions but does require that effects on communities be considered and taken into account. As stated in Section 2.5 of the EIS, the Council considered initial allocation alternatives,

including to communities but heard from local governments that they were not interested in the cost and burdens of administering a community quota program.

Appendix A provides additional discussion of the Council's consideration of communities at Section A-2.1.1.a, and lists alternative means by which Amendment 20 addresses community needs, including:

- Maintenance of a split between the at-sea and shoreside trawl sectors.
- Broad eligibility for ownership.
- A temporary moratorium on the transfer of QS to ease the adjustment period and allow for adaptive response.
- Specification of vessel and control limits to spread QS among more owners and potentially more communities.
- Inclusion of a community advisory committee as a formal part of the program performance review process.
- The Adaptive Management set-aside.

While initial allocations of quota would be limited based on qualifying criteria, after the first two years, the proposed program would allow both ownership of privileges by communities and acquisition by entry level participants. In addition, parties, including communities, desiring to receive initial issuance would be able to purchase limited entry permits such as The Nature Conservancy has done and receive initial issuance. Appendix A Sections A-2.2.2.d and A-2.2.3 describe entry level opportunities and transfer provisions.

NMFS will review the proposed action for compliance with National Standard 4 prior to making a final decision. See, in addition, response to comment below.

Comment 106: Given evidence that QS programs result in consolidation of fishing power in relatively large operations, the NS 4 (C) prohibition on acquisition of excessive shares under National Standard 4 may be violated along with National Standard requirements.

Response: National Standard 4 requires that allocations be "reasonably calculated to promote conservation," and that they be "carried out in such a way that no particular individual, corporation or other entity acquires an excessive share."

Chapter 4, particularly 4.17, describes the anticipated effects of the proposed program, and the expected conservation benefits for fish stocks, including increased speed of management information, elimination of the race for the fish, and reduction in bycatch and rate of bycatch. Section 2.6 sets forth the Council's rationale for recommending Amendment 20.

Limitations on accumulation and use are included in the program to prevent accumulation of excessive shares or excessive consolidation. These protections would include potential divestiture at the initial issuance stage.

Additional information on accumulation and use limits is provided in the response to comments 28 and 29.

NMFS will review the proposed action for compliance with National Standard 4 prior to making a final decision.

Comment 107: Congress intended that communities and small vessels be allocated harvest privileges (see, for example, Senate Report 109-229 on Senator Stevens' original limited access privilege bill).

Response: While initial allocations of quota would be limited based on qualifying criteria, after the first two years, the proposed program would allow both ownership of privileges by communities and acquisition by entry level participants. See response in Section 10.1.5.

Comment 108: The proposal runs counter to decisions of Congress in 1996 to strengthen laws promoting sustainable fishing and weaken National Standard 5 by replacing "shall promote" with the present "shall consider" efficiency.

Response: As stated above in response to comment 91 above, National Standard 5 does prohibit measures that have economic allocation as their sole purpose. The trawl rationalization program is not such a prohibited measure. The need for trawl rationalization arises from a complex set of challenges relating to biological, social, and economic concerns. This action addresses the challenge of addressing bycatch in a complex multi-species fishery in which management requirements for several overfished stocks are constraining the ability of the fishery to achieve OY on other stocks. By giving individual participants more flexibility, accompanied by greater individual accountability, the action is expected to better allow for achieving OY while rebuilding overfished stocks.

The stated purpose for the action reflects the range of biological, social, and economic concerns:

> Create and implement a capacity rationalization plan that increases net economic benefits, creates individual economic stability, provides for full utilization of the trawl sector allocation, considers environmental impacts, and achieves individual accountability of catch and bycatch.

NMFS notes that Sections 303(b)(b) and 303A of the MSA specifically authorize the establishment of limited entry and LAPPs.

NMFS will review the proposed action to determine its consistency with National Standard 5 prior to making a final decision.

Comment 109: In elevating economic objectives over statutory standards that provide for the sustained participation of fishing communities, the DEIS misconstrues the relationships among the standards and fails to exhibit consistency with NS 8.

Response: We reiterate the multi-purpose goal of Amendment 20 which is to "[c]reate and implement a capacity rationalization plan that increases net economic benefits, creates individual economic stability, provides for full utilization of the trawl sector allocation, considers environmental impacts, and achieves individual accountability of catch and bycatch."

Economic considerations are an important component of a rationalization program and redistributive impacts are unavoidable. As discussed in the responses in Sections 10.1.5 and 10.4.5, the DEIS fully considers impacts on communities and Amendment 20 includes provisions to mitigate these impacts to the extent practicable.

NMFS will review the proposed action for compliance with the MSA and its National Standards prior to making a final decision.

Comment 110: Nothing in the DEIS indicates that the Program will actually minimize bycatch to the extent practicable, as called for by NS 9.

Response: Section 4.17.2.2 provides information indicating that the proposed trawl rationalization program would be expected to be more effective at reducing bycatch than would be maintaining the status quo. See also comment responses in Section 10.2, especially the response to the first comment.

As discussed above in response to comment 114, Amendment 20 does not allocate between the trawl and nontrawl fleets. The decision on that allocation will be made pursuant to Amendment 21. See response to comment 101.

NMFS will review the proposed action for compliance with all National Standards prior to making a final decision.

Comment 111: The claim of increased safety is unsubstantiated and contrary to reported results from other IFQ fisheries.

Response: This comment relies on one example and refers back to the leasing argument as the driver for that impact. The proposed Pacific program is structured differently than the BC program. The degree of quota divisibility in the Pacific program alters the effect of leasing by allowing new entrants to purchase small amounts over time while also serving as crew. This is a different mechanical structure than BC where huge chunks of quota must be purchased to "enter," so the new entrant has leasing as the only viable option.

Second, Pacific trawl vessels are currently in a relatively poor state as a result of the economics of the fishery. They also currently have a large incentive to fish in the winter due to the fishing opportunities present there via the trip limit regime. The proposed rationalization program would eliminate or reduce that structure and that corresponding incentive to fish in the winter.

Third, with regard to the whiting fishery, this program replaces the interim Amendment 15 provisions that restricted participation in the shoreside and at-sea sectors to vessels that met the specific eligibility criteria. Amendment 15, which was approved by the agency in 2008 and implemented in 2009 (see the final rule published March 10, 2009, 74 Federal Register 10139), contained no provisions for replacement vessels. Under the rationalization program, participation is no longer tied to a vessel but to a permit with a whiting endorsement. Permits can be transferred to different vessels, with some restrictions. This increases safety significantly over the Amendment 15 vessel limitation where aging vessels could not be replaced.

Last, most fisheries under IQs have shown an improvement in safety at sea. This is supported by the findings of the NRC.

NMFS will review the proposed action for compliance with the MSA and its National Standards prior to making a final decision.

Comment 112: Can you say, "Who's your Banker?" Catch shares also allowed investors who've never been in the business to control large quantities of our nation's fish resource. Some people would rather worship fish than eat them.

Response: Under Amendment 20, entities who are not currently fishermen would be able to acquire QS. The Council's rationale for this recommendation is set forth in Appendix A-2.2.3.a. See also response to comment above.

With respect to large quantities of quota, there would be accumulation limits in place.

The Council considered adding a use-or-lose requirement, but the tracking and monitoring requirements would have been untenable. The Council did add measures to try and ensure that quota is transferred to fishermen, including the requirement that all QP be transferred to quota account within a year, and the requirement that QP can only be transferred to a vessel. The 5-year review will allow NMFS and the Council to revisit this issue and determine whether additional management action is warranted.

10.5.3 Groundfish FMP Goals and Objectives

Commenters: Ecotrust, West Coast Seafood Processors Association

Comment 113: We believe the action alternatives are flawed and, in fact, do not meet the Groundfish FMP goals and objectives and specifically Goal 2, maximize the value of the groundfish resource as a whole, and Goal 3, promote the year-round availability of seafood to the consumer among other things.

Response: It is important to note that none of the FMP goals and objectives, nor any of the MSA National Standards, should be viewed in isolation. Both the FMP and the MSA contain a variety of competing policy objectives which must be considered and balanced whenever developing fishery management measures. In both the FMP and the MSA, some of the policies take priority over the others, such as the National Standard 1 mandate to achieve OY while preventing overfishing. As discussed in Chapter 6, the FMP contains three broad goals and 17 objectives to promote achievement of the goals. The three goals are enumerated in order of priority and the FMP specifies that they must be considered in conjunction with the MSA's National Standards. The first goal, and first priority, for the FMP is to "[p]revent Overfishing and rebuild overfished stocks by managing for appropriate harvest levels and prevent, to the extent practicable, any net loss of the habitat of living marine resources."

Thus goals 2 and 3 are secondary to the FMP's primary management goal.

Goal 2 of the FMP is to "[m]aximize the value of the groundfish resource as a whole." The concept of maximizing value does not pertain to bestowing value on any particular group or groups, but rather on maximizing value as a whole consistent with National Standard 1. Nevertheless, the analysis does extensively consider potential effects on processors and harvesters. See, for example, Chapter 4.6, describing impacts on harvesters, 4.9 addressing impacts on processors, and 4.14 addressing impacts on communities. The analysis identifies a variety of potential impacts on processors that would include both positive and negative potential impacts. Chapter 2.6 of the EIS explains the reasons for and considerations underlying the Council's recommendation. In addition, Appendix A contains detailed information on these considerations.

With respect to goal number 3, the FMP states that:

> Within the constraints of overfished species rebuilding requirements, achieve the maximum biological yield of the overall groundfish fishery, promote year-round availability of quality seafood to the consumer, and promote recreational fishing opportunities.

As stated in the EIS, the goal of trawl rationalization is to:

> Create and implement a capacity rationalization plan that increases net economic benefits, creates individual economic stability, provides for full utilization of the trawl sector allocation, considers environmental impacts, and achieves individual accountability of catch and bycatch.

Underlying this goal is the need to address management of bycatch in a complex multi-species fishery in which management requirements for several overfished stocks are constraining the ability of the fishery to achieve OY on other stocks. By giving individual participants more flexibility, accompanied by greater individual accountability, the action is expected to better allow for achieving OY while rebuilding overfished stocks. The Council and NMFS analyzed alternative approaches for meeting this management objective in context of the FMP's broader goals and objectives as well as the MSA's National standards.

In this context, the FMP's objective of a year-round fishing season is of lower priority than preventing overfishing, rebuilding, allowing for appropriate harvest levels, and preventing to the extent practicable, any net loss of habitat. The proposed measures in Amendment 20 would affect both whiting and nonwhiting fisheries. While the shoreside nonwhiting sector currently operates on a year-round basis, the whiting sectors do not. The reference in the analysis to extending the fishing season pertains to eliminating the "race for the fish" in the whiting sectors. By replacing regulatory seasons with greater individual catch accountability, the different sectors of the fishery will be able to operate according to the schedule that makes the most sense to them. For example, one reason for maintaining year-round fishery for groundfish is that it holds the fishery together between seasons for other species, such as crab. It provides flexibility to keep operations going/provides year-round fishing activity in coastal communities and for processing plants. The IFQ system will provide greater flexibility to maintain year-round operations. Thus a key reason for this objective is to maintain year-round "fishing" activity, not just year-round "groundfish" activity. There is an underlying concern for stable employment in the fishing community.

Comment 114: The Program with its 90 percent allocation to the habitat—damaging trawl sector would undermine FMP goal 1, net loss of marine habitat is to be prevented to the extent practicable.

Response: Amendment 20 would not allocate between the trawl and nontrawl fleets; the decision on that allocation will be made pursuant to Amendment 21. The allocations in Amendment 20 pertain only to allocating within the Limited Entry trawl fishery. With respect to the shoreside IFQ sector, the proposed program would initially allocate the shoreside whiting trawl quota as follows: 80 percent to limited entry trawl permits and 20 percent to processors. It would initially allocate the nonwhiting shoreside trawl species covered by the program as follows: 90 percent to limited entry trawl permits and 10 percent to an adaptive management program.

While Amendment 20 is not focused on habitat remediation, as discussed in responses to comments 1.8.1, 1.8.2, and 4.2.5, Amendment 20 may allow for an increase from the status quo in the use of nontrawl gear in the trawl fishery. See also Chapter 2.6.1 of the EIS. Also, as noted in response to comment 4.2.5, the allocations in Amendment 21 would constrain trawl harvests to a slightly lower level than status quo.

It is important to recognize the ongoing nature of fishery management under the MSA and that not every amendment will address every management need in the fishery simultaneously. As management

needs arise, the Council and NMFS respond to them. Amendment 19 established extensive protections for habitat. Amendment 20 maintains those protections while specifically addressing a separate management need for rationalization as described in the purpose and needs statement. While FMP amendments must comply with the broad array of policy objectives in the MSA's National Standards and within the FMP, not every FMP amendment will thoroughly address every management need in the fishery simultaneously. NMFS and the Council will continue to review the best available information regarding habitat needs and develop additional management measures if necessary and appropriate.

Comment 115: The Program does not comply with FMP objectives 14 through 17 with respect to impacts on small entities. The AMP cannot be relied upon in evaluating the impacts of the preferred alternative.

Response: As stated in response to the first comment in this section, the FMP's goals and objectives should not be considered in isolation, but as components of a complex framework of competing considerations.

Objectives 14 – 16 read as follows:

> Objective 14. When considering alternative management measures to resolve an issue, choose the measure that best accomplishes the change with the least disruption of current domestic fishing practices, marketing procedures, and the environment.
>
> Objective 15. Avoid unnecessary adverse impacts on small entities.
>
> Objective 16. Consider the importance of groundfish resources to fishing communities, provide for the sustained participation of fishing communities, and minimize adverse economic impacts on fishing communities to the extent practicable.

Chapter 2.6 of the EIS explains the reasons for and considerations underlying the Council's recommendation. In addition, Appendix A contains detailed information on the Council's rationale for each of the alternatives recommended. Factors considered include degree of disruption, impacts on small entities, and impacts to communities. The analysis does recognize potential negative impacts on harvesters not receiving sufficient initial allocations of quota. See for example Table A-12 setting forth considerations for allocating to processors. See also, Table A-15 describing potential impacts on harvesting and processing sectors, Section A-2.1.3.a setting forth considerations for allocation formulas, Section A-2.1.1.a discussing the initial split of QS and particularly the discussion of impacts on communities, and Section A-2.2.3.b describing considerations on transferability and eligibility to own.

With respect to FMP objective of considering communities, the analysis documents the Council's consideration of communities and efforts to minimize economic impacts to the extent practicable. Due to the nature of the allocation program, it is not possible to control how participants will consolidate or what geographic shifts may take place. See response to comment 5.2.1 above as well as additional responses to comments regarding communities throughout this chapter for more discussion of measures recommended to address impacts on communities.

Amendment 20 contains a 10 percent set-aside of the nonwhiting shoreside trawl quota for AMP, to begin in the third year of the program. Prior to that time, the Council will develop the infrastructure and

program components for use with the AMP through adaptive management, NMFS and the Council will be able to develop appropriate response measures as the program is implemented and actual impacts begin to be manifested.

10.5.4 Segmentation of a Major Federal Action

Commenters: Crab Boat Owners Association; Daspit, William; Ecotrust, Food and Water Watch; West Coast Seafood Processors Association

Comment 116: As acknowledged in the DEIS, this action (Groundfish Amendment 20) and Groundfish FMP Amendment 21, which establishes under the FMP allocations between the groundfish trawl sector and other sectors of the groundfish fishery, are closely related actions. Commenters argue that NMFS and the Council impermissibly segmented what they claim is in fact a single major Federal action by producing separate EISs for Amendment 20 and Amendment 21. Two commenters additionally argue that Groundfish FMP Amendment 22 should also be considered part of this action. Amendment 22 establishes a new vessel registration requirement for vessels targeting groundfish but not registered to a Federal groundfish limited access permit.

Response: CEQ regulations at 40 CFR 1508.25(a)(1) describe connected actions, which "are closely related and therefore should be discussed in the same impact statement. Actions are connected if they:

(i) Automatically trigger other actions which may require environmental impact statements.
(ii) Cannot or will not proceed unless other actions are taken previously or simultaneously.
(iii) Are interdependent parts of a larger action and depend on the larger action for their justification."

Furthermore "[p]roposals or parts of proposals which are related to each other closely enough to be, in effect, a single course of action shall be evaluated in a single impact statement" (40 CFR 1502.4(a)).

We do not agree with the commenters' view that these actions are connected such that they should have been evaluated in one EIS. As described below, the Council made reasonable judgments about what should be analyzed separately.

Does either amendment "automatically trigger" implementation of the other amendment? Nowhere in either proposal is there a mechanism that triggers implementation of the other action.

Would it be impossible to implement either amendment if the other were not implemented (one cannot proceed without the other)? If Amendment 21 were not implemented, the trawl fishery could still be managed with IFQs and co-ops under Amendment 20. While an allocation is required to determine the conversion of QS to QP, such allocations could be determined and implemented through the Council's biennial groundfish harvest specification process. Although pre-established allocations such as the trawl allocation in Amendment 21 could simplify the biennial process, it is not accurate that Amendment 20 cannot be implemented without them. Likewise, Amendment 21 can be implemented without implementing Amendment 20. If that were the case, the Council would continue to manage the groundfish trawl fishery with status quo measures (cumulative trip limits and whiting quotas/seasons). Furthermore, as mentioned previously, the biennial harvest specifications process benefits in any event from the allocations established in Amendment 21, because the amount of decision-making required is reduced.

Are the two actions so interdependent as to rely on each other for their justification? The rationale for Amendment 20 does not flow from the fact that allocations are established and similarly trawl rationalization is not justified by the allocations adopted under Amendment 21. Conversely, Amendment 21 is justified independent of Amendment 20, because, as stated above, it will help to simplify the biennial harvest specifications process no matter what measures are used to manage the groundfish trawl fishery. The Council has made allocation decisions in the past that are not tied to trawl rationalization and Amendment 21 is another step in establishing allocations under the Groundfish FMP. The Groundfish FMP Section 6.3 lays out a framework for establishing allocations in reference to criteria described in Section 6.2.3 and FMP goals and objectives. The purpose and need for Amendment 21, as described in that EIS, identifies support of trawl rationalization as one of three purposes for establishing the allocation scheme, the other two being to streamline the biennial harvest specifications process and to address bycatch of Pacific halibut. These purposes are consistent with the Groundfish FMP.

Commenters assert that segmenting these two actions into separate EISs masks the adverse habitat impacts stemming from continuing to allow a large proportion of the catch to be made by trawl vessels and prevents the public from fully understanding that a large proportion of fishing opportunity will be directed to the groundfish trawl sector in the form of harvest privileges. The goal of Amendment 20 is to "[c]reate and implement a capacity rationalization plan that increases net economic benefits, creates individual economic stability, provides for full utilization of the trawl sector allocation, considers environmental impacts, and achieves individual accountability of catch and bycatch." Within the context of achieving this goal, the EIS acknowledges impacts caused by trawl gear in Section 4.20. As discussed in responses to comments in Section 10.3 and comment 114, the proposed trawl rationalization program may allow for an increase from the status quo in the use of nontrawl gear in the trawl fishery. Also, as noted in response to comment 114, the allocations in Amendment 21 would constrain trawl harvests to a slightly lower level than status quo. Not every amendment will address every management need in the fishery simultaneously. The Council recently addressed habitat issues in Amendment 19, and will continue to review relevant information and recommend additional management measures if necessary and appropriate.

Commenters further assert that segmenting the action "deprived some people and communities of their ability to participate in a process of importance to them" and masked the extent of a plan that the public would have otherwise found "very unappealing to a public weary of both industrial-scale trawl fishing and corporate welfare." However, as the commenters themselves point out, the DEIS discloses the linkages between these two actions and in the impact analysis Amendment 21 is considered an external action contributing to the cumulative effects of trawl rationalization. Both of these actions were developed in the same decision-making forum—the Pacific Council—allowing the public to track the development of both in a fairly straightforward way and comment on them in the same venue. Given the common setting for the two actions, it is not the case that nontrawl groundfish fishery participants were burdened (noting their participation in the Council process through the Groundfish Advisory Subpanel, for example), nor did it "thwart public comprehension."

The original proposal upon which Amendment 22 was based outlined various options for creating a limited access framework for the "open access" (i.e., not Federal license limited) fishery targeting groundfish. However, the Council action only established a vessel registration requirement. The Council has not submitted the Amendment to NMFS for consideration and possible implementation. Commenters imply a linkage between the two actions, because of the effects of trawl rationalization on nontrawl fishery participants in the open access fishery. However, the fact that the open access fishery may be affected (as disclosed and discussed in the DEIS) does not create a necessary connection between the two actions. As noted elsewhere, the trawl rationalization proposed action focuses squarely on the groundfish trawl fishery and the Amendment 22 proposed action is well outside its scope.

Comment 117: Amendments 20 and 21 should be reconsidered as a single amendment and a 90-day comment period should be allowed for the related DEIS, because 45 days offers insufficient time to obtain the documents, read through them, and draft comments.

Response: For the reasons discussed above, the Council and NMFS did not combine Amendment 20 and 21 into a single action. The DEIS was available on the Council's website when completed (and somewhat in advance of publication of the NOA initiating the 45-day public comment period). Furthermore, because of the nature of the Council process, earlier drafts of the document were made available to the public for review. For example, a "decision document," substantially similar to the DEIS in form and content, was made available in October 2008 in support of the Council's choice of a preferred alternative in November 2008. CEQ Regulations require a 45-day comment period on a DEIS (40 CFR 1506.1(c)). The comment period on the DEIS was consistent with the CEQ regulations.

10.5.5 Commitment of Financial and Staff Resources by NMFS

Comment 118: For the last several years, NMFS has provided substantial financial and staff resources to the Council for the sole purpose of developing a trawl individual quota plan. It is clear that NMFS has committed those resources with a particular intent in mind, which calls into question the validity of the comment process in which we are engaged. The commenter notes that regulations at 40 CFR 1502.2(f) prohibit an agency from committing resources prejudicing selection of alternatives before making a final decision.

Response: NMFS has committed staff to the analysis of the development of a trawl rationalization program and to the drafting of the proposed regulations to implement the program. These are statutory requirements of the MSA. However, NMFS has not selected or implemented a final alternative. In addition, per 40 CFR 1503.2(f), NMFS has not committed resources that would prejudice the selection of alternatives prior to making a final decision on implementation of the trawl rationalization program.

10.6 Other Comments

Commenters: Bean, Brandon; Campbell, Bruce; Jensen, Charlie

Comment 119: Three comments not related to the proposed action were received. They discussed issues related to commercial whaling, collapse of the ocean food chain in the Pacific, and use of materials containing toxic materials.

Response: These comments do not relate to the proposed action or its effects.

10.7 Implementation Recommendations

Commenters: Department of Interior, Environmental Defense Fund, Tommy's Marine Service

Comment 120: The following comments were made related to implementation of the trawl rationalization program:

- **Prioritize available funds for program implementation according to recommendations made by Environmental Defense Fund and others in a joint comment letter.**
- **Provide funds for transition assistance at the outset of the program.**
- **Develop an electronic, web-based IFQ transfer and tracking tool based on the principle that this automated tool should result in cost savings.**
- **The Department of Interior recommends that the U.S. Fish and Wildlife Service's trust anadromous species be reported to the Service if they are caught as bycatch.**

Response: The comments do not relate directly to the description of the proposed action and the evaluation of impacts contained in the EIS. NMFS has taken these comments into consideration as part of the rulemaking and program implementation process.

Comment 121: One commenter cannot support moving forward toward the January 1, 2011, implementation date.

Response: The Council and NMFS note the commenter's recommendation but have decided that implementing the program at the earliest practicable date best serves the public interest. The commenter states that "problems [cannot] be solved through 'trailing amendments' or on the fly after the program starts." We disagree that delay is necessary. Although a broad range of issues have been anticipated and addressed in program design, inevitably there will be unforeseen effects and the program may not perform as expected. Beyond the future implementation of the AMP, which will allow the allocation of 10 percent of QP per year to address unforeseen and unintended effects, the Council and NMFS recognize that the program as a whole may need to be adapted to changing circumstances over time; for this reason, a 5-year review is part of the program. Modifications will be accomplished through future Council actions, related FMP amendments, and regulatory adjustments.

10.8 Environmental Protection Agency Comments

EPA assigned a rating of "LO" (Lack of Objection) to the Pacific Coast Groundfish DEIS, Amendment 20. They did, however, offer some suggestions for the FEIS.

Suggestion: EPA recommends a comprehensive monitoring and mitigation program that incorporates adaptive management to the extent possible in order to address community impacts, impacts on tribes, and potential increases in bycatch of protected and overfished species. These actions should be identified in advance of the implementation of the action, and preferably be identified in the FEIS.

Response: NMFS appreciates the suggestions brought forward by EPA. Regarding an AMP, as suggested by EPA, the DEIS describes the Council designed AMP that sets aside 10 percent of the shoreside nonwhiting individual fishing quota two years after initial program implementation. This quota set aside will be used to address unforeseen impacts on coastal communities, consistent with EPA recommendations. During the first two years of the program, the Council, working with NMFS and the states, will develop the infrastructure and program components necessary to effectively administer this mitigation program in the future.

Regarding bycatch of protected and overfished species, the DEIS describes one of the most important components of this IFQ program. The IFQ program will implement a 100 percent observer requirement as a prerequisite to participation in the program, which means all catch will be observed. The responsibilities of the observers include catch monitoring and enumeration of target as well as overfished species. NMFS fully expects this IFQ program to facilitate the rebuilding of overfished

species in the west coast groundfish fisheries. A secondary responsibility of these onboard observers is to identify and record incidental interactions with protected species. NMFS fully expects that potential impacts or interactions with protected species, which is currently minimal, will decrease under the new IFQ program.

Suggestion: Tribes may be represented on the Council, but DEIS is unclear if NOAA has actually consulted in accordance with the requirements of *Executive Order 13175, Consultation and Coordination with Indian Tribal Governments.* If consultation has taken place, describe in EIS. If not, NOAA should initiate consultation and include information as appropriate in the final EIS.

Response: Tribal participation in the development of this rationalization program for west coast groundfish fisheries through the Council process has been significant, and will continue to be a priority of the agency. For *EO 13175*, NOAA is currently developing internal procedures and requirements to be followed nationwide, thereby ensuring compliance. Although not specifically related to the trawl rationalization program, NMFS has recently restated their offer of government to government consultation on fishery management issues, including groundfish, on the west coast.

CHAPTER 11 AGENCIES, ORGANIZATIONS, AND PERSONS TO WHOM COPIES OF THIS STATEMENT WERE SENT

The Council makes both the DEIS and FEIS available on its website, so anyone with computer access may download an electronic copy. Electronic copies on CD-ROM and paper copies are made available upon request. The Council distributes a notice of availability for the DEIS and FEIS through its electronic mailing list, which include state and Federal agencies, tribes, and individuals. Copies of the FEIS are sent to anyone who comments on the DEIS. In addition, NMFS distributes copies of the FEIS to the following agencies:

Willie R. Taylor
Office of Environmental Affairs
Department of Interior
1849 "C" Street, N.W.
Washington, D.C. 20520
(1 hardcopy and 11 CDs)

U.S. Coast Guard, Commander Pacific Area
(1 CD)

William Gibbons-Fly, Director
Office of Marine Conservation
Department of State
2201 "C" Street, N.W.
Washington, D.C. 20520
(1 CD)

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ANALYSIS OF COMPONENTS, ELEMENTS, AND OPTIONS FOR THE INDIVIDUAL FISHING QUOTA ALTERNATIVE TRAWL INDIVIDUAL QUOTA COMPONENTS

Appendix A

TO THE
RATIONALIZATION OF THE PACIFIC COAST
GROUNDFISH LIMITED ENTRY TRAWL FISHERY
FINAL ENVIRONMENTAL IMPACT STATEMENT

PREPARED BY
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Acronyms and Abbreviations

Acronym	Definition
ABC	allowable biological catch. The ABC is a scientific calculation of the sustainable harvest level of a fishery and is used to set the upper limit of the annual TAC. It is calculated by applying the estimated (or proxy) harvest rate that produces maximum sustainable yield to the estimated exploitable stock biomass (the portion of the fish population that can be harvested).
ACL	annual catch limit
ACT	annual catch targets
AMP	Adaptive Management Program
ARID	allocations to permits using area identifiers
Bycatch EIS	The Pacific Coast Groundfish Fishery Management Plan Bycatch Mitigation Program Final Environmental Impact Statement
CFA	Community Fishing Association
Council	Pacific Fishery Management Council
CPS	coastal pelagic species
DEIS	draft environmental impact statement
DMR	discard mortality rate
DTS	Dover sole, thornyhead, and trawl-caught sablefish complex
EFH	essential fish habitat
EFP	exempted fishing permit
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
FEIS	final environmental impact statement
FERC	Federal Energy Regulatory Commission
FMP	fishery management plan
GAC	Groundfish Allocation Committee
GDA	Groundfish Development Authority
GDQ	groundfish development quota
H	halibut [bycatch]
HMS	highly migratory species
IFQ	individual fishing quota
IPHC	International Pacific Halibut Commission
ISA	Intersector Allocation
IVQ	individual vessel quota
LAP	limited access privilege

Acronym	Definition
LAPP	limited access privilege program
LE	limited entry
LEP	Limited Entry Permits
MSA	Magnuson-Stevens Fishery Conservation and Management Act
mt	metric ton
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration – the parent agency of National Marine Fisheries Service
NPFMC	North Pacific Fishery Management Council
NRC	National Research Council
NWFSC	Northwest Fisheries Science Center
OFL	overfishing levels
OFS	overfished species
OY	optimum yield
PacFIN	Pacific Coast Fisheries Information Network. Provides commercial fishery information for Washington, Oregon, and California. Maintained by the Pacific States Marine Fisheries Commission.
PCID	Allocations to permits using Port-based identifiers
PPA	preliminary preferred alternative
PSMFC	Pacific States Marine Fisheries Commission
QP	quota pound
QS	quota share
TAC	total allowable catch
TCEY	total constant exploitation yield
TIQ	trawl individual fishing quota
TIQC	Trawl Individual Quota Committee
VMS	vessel monitoring system
WCGOP	West Coast Groundfish Observer Program

Organization of Appendix A

Each section starts with a restatement if the provision and option being analyzed. A rationale is then provided, followed by an explanation of the interlinked elements and an analysis of the provision.

In the provisions a "►" indicates an option that is part of the Pacific Fishery Management Council's (Council's) preliminary preferred alternative (PPA).

Interlinked elements include the following measures:

- Directly dependent on one another (e.g., if quota pounds [QP] did not have to be placed into a vessel account in order to be used, we would have to change the way the use-or-lose provision is specified)
- Those that, if changed, would substantially alter the impact or decisions made on other provisions (for example, if only vessel owners are allowed to own quota shares [QS]/QP, we would have to rethink many of the provisions and rationales related to how we are addressing the needs of communities and crewmembers).

The following text outlines the individual fishing quota (IFQ) program. Table A-1 provides an overview of the organization of the sections of the program.

Table A-1. Organization of the IFQ alternative program elements and options from Appendix A.

A-1	***Trawl Sector Management Under IFQs***
A-1.1	Scope for IFQ Management (includes gear switching) **(Also see Section A-5)**
A-1.2	IFQ Management Units (includes latitudinal area management)
A-1.3	General Management and Trawl Sectors"
A-1.4	Management of Nonwhiting Trips
A-1.5	Management of Whiting Trips
A-1.6	Groundfish Permit Length Endorsements
A-2	***IFQ System Details***
A-2.1	Initial Allocation and Direct Reallocation
A-2.2	Permit/IFQ Holding Requirements and Acquisition (Includes Annual Issuance and Transfer Rules)
A-2.3	Program Administration (Includes tracking, data collection, costs, duration)
A-2.4	Additional Measures for Processors
A-3	***Adaptive Management (Option)***
A-4	***Pacific Halibut Individual Bycatch Quota (IBQ)— nonretention (Option)***
A-5	***Alternative Scope for IFQ Management (Option)***
A-6	***Alternative Duration: Fixed Term (and Auctions) (Option)***
A-7	***Gear Conversion (Option)***
A-8	***Regional Landing Zones (Option)***

In the detailed description below, where the Council chose an option as part of the preferred alternative, the choice is indicated by a "►" symbol. Program elements without options are adopted as described unless otherwise noted. Elements and options that are not relevant under the preferred alternative are so noted and provided in boxed text. For example, program elements relating to IFQs for the at-sea sector are not relevant under the preferred alternative. Appendix D is a detailed, stand-alone description of the entire program adopted by the Council.

A-1 TRAWL SECTOR MANAGEMENT UNDER IFQS

A-1.1 Scope for IFQ Management, Including Gear Switching

❖ *Provisions and Options*

QP will be required to cover catch of all groundfish (including all discards) by limited entry (LE) trawl vessels with certain gear and gear exceptions.

Gear Exceptions: For trips delivered **shoreside**

Option 1: QP is required for LE trawl vessels using any directed commercial groundfish gear0F[1] EXCEPT

LE fixed gear when the vessel also has an LE permit endorsed for fixed gear (longline or fish pot) AND has declared that they are fishing in the LE fixed-gear fishery.

► Option 2: QP is required for LE trawl vessels using any gears EXCEPT

exempted trawl,1F[2]	salmon troll
gear types defined in the coastal pelagic species (CPS) fishery management plan (FMP)	crab pot
gear types defined in the highly migratory species (HMS) FMP	LE fixed gear when the vessel also has an LE permit endorsed for fixed-gear (longline or fish pot) AND has declared that they are fishing in the LE fixed-gear fishery.

Species Exceptions:

For trips delivered **shoreside** QP is not required for

Option 1: No species exceptions.

► Option 2: For trips delivered shoreside QP is not required for

Longspine South of 34°27'	California Scorpionfish
Minor Nearshore Rockfish N	Cabezon
Minor Nearshore Rockfish S	Kelp Greenling
Black Rockfish (WA)	Shortbelly
Black Rockfish (OR-CA)	Other Rockfish
	Other Fish

[1] For the purpose of the trawl rationalization alternatives, "directed commercial groundfish gear" is defined as all legal commercial groundfish gear including limited entry gear and commercial vertical hook and line, troll, and dinglebar gear.

[2] California halibut gear of 7.5" or greater used in state waters would be exempted.

Option 3: Same as Option 2 but provide an exception for spiny dogfish and not for "Other Fish"

For trips delivered **at-sea** QP is not required for

Option 1 (similar to status quo):	any species other than whiting and widow, darkblotched, and canary rockfish
Option 2 (extended List)	same as Option 1 plus add slope rockfish, yellowtail rockfish shelf rockfish, lingcod, POP, and sablefish to the list of covered species.
Option 3 (all bycatch exception)	any species other than whiting.

See Section A-5 for an alternative specification of scope for whiting trips that would not require QP for any bycatch species (i.e., QP would be required only for whiting).

This definition of the scope allows a LE trawl vessel to switch between trawl and nontrawl groundfish gears, including fixed gear, for the purpose of catching their QP ("gear switching"). It also allows a nontrawl vessel to acquire a trawl permit, and thereby use trawl QP to catch the LE trawl allocation using nontrawl gear.

An option was added to allow "gear conversion" (the permanent switch from trawl to some other legal groundfish gear). **This option is described in Section A-7**.

❖ *Rationale and Policy Issues*

Coverage of Landings and Discards

Coverage of landings and discard is expected to be consistent with several aspects of the Magnuson-Stevens Fishery Conservation and Management Act (MSA), the Groundfish FMP, and the Council's goals and objectives for Amendment 20. Accountability for landings and discard is expected to increase the certainty managers have regarding fishing mortality, and this in turn is expected to foster the rebuilding of overfished species (consistent with MSA – 303A(c)(1)(A). Furthermore, the increased observation necessary to monitor landings and discard is expected to increase the information flow on the status of the fishery as the fishery occurs (consistent with the Groundfish FMP objective 1). Finally, responsibility of landings and discard – and the monitoring necessary for that type of management – is expected to increase accounting ability and result in changes to fishing behavior, which include a reduction in the bycatch rate of constraining stocks and an elimination, or reduction, in the need for regulatory discarding. These changes are expected meet Council objectives 1 and 3 of Amendment 20, which speak to total catch accounting, reducing bycatch, and reducing discard mortality. Coverage of total catch is also consistent with the bycatch mitigation program (Amendment 18).

The reduction in bycatch rates for constraining overfished species will allow harvesters to increase their harvest of currently underutilized target species and thereby increase the value of the groundfish fishery. Such an increase in value is consistent with the Groundfish FMP objective 6 (attempt to achieve the greatest net economic benefit to the nation), with Groundfish FMP objective 2 (maximize the value of the groundfish resources as a whole).

Species Coverage

The coverage of species with quota is intended to act as a catch control tool to ensure that management targets are adhered to, that other sectors are not affected by higher than expected catch levels in the trawl fishery, or both. One rationale is that the lack of IFQ coverage (or some other management tool) of some species may lead to a case where trawl vessels target uncovered species in unchecked quantities. However, this is not necessarily the case, especially for those species that may be inaccessible to groundfish gear, or for those species that are constrained by the catch of other species. Implicit in this concept is that not every species in the Pacific Ocean that may be encountered by commercial groundfish vessels has to have catch managed through a catch control tool in order to stay within management targets. Many species may be encountered in such small volumes that their management through IFQ could be unnecessary and lead to administrative costs that are not necessary for successful management of fishing mortality. Species where it may not be necessary to cover catch with quota include infrequently encountered nongroundfish species such as sardines, Ocean Sunfish, and Albacore tuna. However, it may also be unnecessary to cover many groundfish species with quota because the amount of those species encountered by trawl vessels is small relative to management targets.

In addition to the idea of whether it is necessary to cover such species with quota in order to stay within management targets is the idea that for some species, their coverage with quota may lead to a case where the market does not act in an efficient manner. This could be due to relatively infrequent encounters of such species and the relatively infrequent trades that occur on the market (often called thin market conditions). Infrequent trades make it difficult to effectively price transactions on the market because there is relatively little historic information on the trading price of those species. This means that prices may be determined more by negotiation skill than market conditions and the implications are an over-inflated, or deflated, price of the quota.

The species covered with IFQ (shown in the table above) would be different for the shoreside whiting sector depending on whether three versus four trawl sectors are established. If three sectors are established, the shoreside whiting and nonwhiting sectors would be combined, whereas if 4 sectors are established, the shoreside whiting sector would be responsible for the same species as found in the at-sea portion of the table. This is due to the fact that, if a three-sector option is established then shoreside whiting and nonwhiting would be able to trade quota with one another. In order for this to occur, both sectors would need to hold quota for the same species. If four sectors are established, the shoreside whiting and nonwhiting sectors would be separated, and it would not be necessary for them to hold quota of the same species. The four-sector option may make the shoreside whiting fishery responsible for the same species as the at sea sectors because the mix of species caught by shoreside whiting vessels is similar to that of vessels in the at sea fishery.

For the shoreside sector, the Council considered whether to include "other fish" within the IFQ program. There has been some substantial trawl harvest of some species within the "other fish" category in recent years, unlike most of the other species that are excluded from the IFQ program in Species Exceptions Option 3, however, some of these species are not targeted and historical catch data for them is sparse. As the Council is transitioning from its traditional method of setting harvest specifications (i.e., allowable biological catch [ABC] and optimum yield [OY]) to the new federal program using overfishing levels (OFL), annual catch limits (ACL) and, potentially, annual catch targets (ACT), it seemed appropriate to delay consideration of adding the "other fish" category to the IFQ program until after that process is complete. In addition, the Council explicitly excluded dogfish from the IFQ program, which is a component of the "other fish" category. Because dogfish are not assessed and are typically not retained in the fishery, it is difficult to determine the amount of dogfish to break out of the larger "other fish" category. Therefore, given that the other species in that category are taken

in relatively small quantities, the Council chose to treat the entire category based on its concerns with respect to dogfish. With respect to dogfish, the council was concerned that it is taken in practically every fishery—groundfish and nongroundfish—across all sectors, including recreational fisheries. While there is currently no assessment for this species, one is anticipated in the next assessment cycle (2011). This assessment will provide the Council with a better understanding of the status of the stock. Additionally, the Council also did not feel it had a good understanding of the amount of bycatch of dogfish in the trawl fishery or other fisheries. This makes it difficult to assess what the trawl fishery needs would be for the IFQ program and the potential effects to other fisheries if the trawl catch were accommodated. The Council's intent would be to collect that information through the IQ program with 100 percent observer coverage.

Gears and Fisheries Covered and Gear Switching

The IFQ program allows gear switching, meaning that vessels with a LE trawl permit can use gear other than trawl gear to prosecute their IFQ. Some complexities arise when a LE trawl endorsed vessel is participating in another fishery. In the current groundfish fishery, when trawl vessels use a nontrawl gear, their groundfish catch is attributed to the trawl sector. This does not constrain the harvest activity of vessels engaging in nongroundfish fisheries as those vessels can simply discard groundfish caught incidentally that may be in excess of trip limits and continue fishing in that nongroundfish fishery. Under an IFQ program where discards and landings are counted against IFQ, groundfish catch in nongroundfish activity could have the potential of constraining nongroundfish activity for LE trawl licensed vessels if that groundfish continues to count against the trawl sector. In light of this possibility, several gears were considered for exclusion from the trawl IFQ program, meaning that if a trawl licensed vessel were using one of these excluded gears, they would not be required to cover their incidental groundfish catch with IFQ. The reason for excluding certain gears from the IFQ program is that some gears are almost exclusively used in nongroundfish activity and the amount of groundfish catch occurring with these nongroundfish gears is minor.

The proposed scope implicitly allows gear switching and would not prevent a vessel from converting[3] to a nontrawl gear; however the vessel could reverse the gear switch or transfer IFQ back to a trawl vessel if conditions warranted it. There is also an option for permanent gear conversion (Section A-7.0). Under the gear conversion option, in certain circumstances, IFQ would be permanently converted away from trawl gear and restricted from switching back. In addition to resolving the management complexities mentioned in the previous paragraph, a scope that allows gear switching may generate some conservation benefits if the gears to which harvest is switched generate smaller habitat impacts or have selectivity that increases stock productivity (e.g., disproportionately remove from the biomass fish that are of a less productive age or size class). Gear switching also provides vessels with an increased amount of flexibility in determining the most efficient mix of harvest strategies (as compared to a scope that includes only catch taken with groundfish trawl gear).

Gears that are excluded under the program include exempted trawl (such as pink shrimp, ridgeback prawn, and California halibut gear in certain areas), gears defined in the CPS FMP, gears defined in the HMS FMP, salmon troll gear, crab pot gear, and LE fixed gear when the vessel also has a LE permit endorsed for fixed gear (longline or fish pot) and has declared that they are fishing in the LE fixed-gear fishery. These gears were excluded from the program because catch of groundfish in these fisheries and gears is small. Therefore, requiring that trawl licensed vessels using these gears fish under the requirements of the IFQ program (such as carrying observers) is unnecessary

[3] Converting means permanently switching harvest to a nontrawl gear. In contrast, gear switching implies the ability to switch back.

❖ *Interlinked Elements*

Alternative Scope – Section A.5 provides an alternative scope that allows QS for whiting only and no QS for bycatch species in the shoreside whiting sector. While this alternative scope would effectively change the species for which whiting vessels are individually responsible, and is, therefore, a replacement to much of the analysis in this section rather than an interlinked element, it is useful to consider this alternative program scope while considering the analysis in this section.

Gear switching/gear conversion – Based on the logic that the risk of yelloweye rockfish encounters should be minimized, and that hook and line gear encounters yelloweye much more frequently than trawl gear: "for trawl vessels fishing IFQ with longline gear, Rockfish Conservation Areas (RCAs) may need to be more conservative."

Gear conversion – In addition to gear switching, which is part of the scope of Amendment 20, a gear conversion provision (A-7) was added as an option for Council consideration. The gear conversion option would add to the scope of the trawl rationalization program, if adopted as part of the preferred alternative, and there may have to be some alteration of the gear-switching portion of the scope.

Fishing restriction while in deficit – The scope of Amendment 20 defines which gears and fisheries are participating in trawl rationalization, but Section A-2.2.1, lists which fisheries trawlers may or may not have access to when in violation (e.g., IFQ overage). This provision would further refine the scope of the program.

Tracking and Monitoring Program – Observer coverage is a necessary element for the trawl rationalization program, and Amendment 20 could not be implemented without the tracking and monitoring provision.

Although not a provision of Amendment 20, the inter-sector allocation process is necessary to define the trawl sector allocation, which in turn is necessary for issuance of individual and cooperative shares.

❖ *Analysis*

In general, imposing a rationalization program on the LE trawl sector is expected to result in some substantial changes to the fishery. Much of the expected effect of a rationalization program is discussed in Chapter 4 and is, therefore, only briefly summarized here where appropriate. The general effects of rationalization on the west coast trawl fleet include a variety of effects such as fleet consolidation; elimination of derby-style fishing in the whiting sectors; and increased landings of currently underutilized species, among others. The reader is referred to Chapter 4 for a more detailed description of generalized effects of rationalization.

Coverage of Landings and Discards

Requiring that vessels be held individually responsible for both catch and discard is a departure from the status quo approach of holding vessels individually accountable for landings but the fleet accountable for landings and discards. Holding vessels responsible for both landings and discard is expected to result in some substantial changes in behavior, especially in the case of overfished species encounters. Under status quo conditions, managers attempt to craft regulations that limit the amount of fishing effort occurring in areas where overfished species are relatively abundant. This is necessary because discard mortality is 100 percent in many cases, so holding vessels accountable for landings is not sufficient alone to control total mortality. Holding vessels accountable for both landings and discard shifts the

burden of catch control to those engaged in the harvesting of groundfish resources, and the expected outcome is one where vessel operators engage in techniques that avoid depleted species and/or fish in areas where they are less abundant.

Conservation

Key to the IFQ program is holding vessels accountable for their landings and discards. Because of the incentives to under-report and discard IFQ species in order conserve QP, 100 percent at-sea monitoring is required. A side benefit of the monitoring program will be the increased certainty that managers have about total fishing mortality. This will improve their control of total mortality as well as improve the information used in stock assessments. The improved information will help to sustainably manage all stocks and, in particular, assist in the successful implementation of rebuilding plans.

Individual vessel responsibility for total mortality is expected to encourage fishermen to reduce their incidental catch rates (and decrease their incentive to discard incidental catch). Empirical information suggests that the outcome of imposing responsibility for both landings and discard on vessels can result in substantial changes in the amount of bycatch of depleted species. As illustrated in Chapter 4, the Washington Arrowtooth Flounder Exempted Fishing Permit (EFP) was conducted in a manner that held vessels responsible for both landings and discard and the result was one where bycatch rates of constraining overfished species decreased substantially relative to status quo management. It is likely that the same result would occur in a rationalized trawl fishery.

The implication of reducing bycatch rates of constraining overfished species means that there is likely to be increased access to currently underutilized target species. In other words, many species are not accessed fully under status quo conditions because managers limit access to those stocks in order to rebuild depleted stocks. If harvesters reduce the encounter rate of such constraining species under rationalized fishery conditions, they will in turn be able to leverage more target species that were not being fully accessed under status quo. From a biological perspective, increased removals may mean a lower biomass level for those species that experience higher mortality levels. However, as shown in Chapter 4, the estimated increase in mortality levels is not expected to result in any species falling within the precautionary zone within the 20-year time period analyzed.

Economic Effects

A fishery rationalization program that holds individuals accountable for their discards will induce reductions in the bycatch rate of constraining overfished species. Since fishermen are then accountable for bycatch mortality, managers no longer have to impose regulatory constraints to control bycatch. For example, if an IFQ system were developed that covered landings only, managers would have to reduce the amount of QP issued for target species in anticipation of the average incidental catch rates for overfished species. As covered in the section on conservation, making fishermen responsible for their discards gives them the incentive to reduce unwanted incidental bycatch in order to increase the harvest of currently underutilized target species, thus increasing the value of the groundfish fishery. The result is an increase in economic activity associated with fishing through higher landings, higher ex-vessel revenues, and increased processing among other things. These impacts have positive effects on objectives related to net benefits, efficiency, sector health, labor, and communities.

Program Costs and Effectives

One of the main implications of the decision to require QP to cover discards is the need for 100 percent at-sea monitoring. The costs of this monitoring program are covered in Section A-3.1.

Species Covered

Three options exist for species coverage with IFQ. Option 1 would cover all species in the Council's ABC/OY table, while the second and third options would cover a sub-set of those, leaving a number of species that are rarely encountered by trawl vessels out of the program. Options 2 and 3 differ only in that Option 3 also excludes the "Other Fish" category of groundfish.

Requiring that all species be covered with IFQ introduces a factor of risk to harvesters engaged in IFQ activities with minimal conservation benefit. For those species that are rarely encountered, it is likely that there will be a small allocation made to the trawl sector. Two sources of risk exist from a species that is rarely encountered and with a small allocation. A rarely encountered species is likely to have IFQ that is "thinly" traded, meaning that IFQ for these species will be traded infrequently. The implication of infrequent trading is the lack of a clear price signal to both the buyer and the seller and the end result is a traded price that is often based more on personal relationships and negotiation skill than supply/demand conditions. Depending on the skill of the buyer, the buyer may end up paying a large cost for acquiring shares of these species. This potential means there is a possibility that harvesters in the trawl sector that need to acquire shares of those species will pay a large cost.

A second source of risk is derived from the small sector allocation. In many markets, supply will rise to meet demand. However, in a trawl IFQ program, the QP of each species are fixed, but it is entirely possible that harvesters could catch more than the total amount of QP available to the fishery. In cases where allocations made to the sector are relatively small and catch events are highly uncertain and variable, it is not unreasonable to expect that a single trawler could take a substantial portion of the sector allocation on one trip. If that amount is enough to put the total sector catch over the allocation, then that harvester will not be able to acquire additional QP, requiring that vessel be tied up for a period of time (the actual period of time, and the factors determining that time period, is to be determined, see Section A-2.2.1). This tie-up provision imposes risk to that harvester because he must forego some future fishing opportunity. However, the potential of exceeding the sector's allocation means that there is also a collective risk to the entire sector. If the sector allocation is exceeded, NMFS may respond by closing areas of the west coast where that species is found, and this is likely to prevent harvest of certain target species found in the same areas. This effectively eliminates future harvest opportunity for some target species for all harvesters, creating a risk that is collective to the entire sector. If the risk of this event occurring is great enough, and harvesters in the fishery know that risk is relatively great, then a gradual tendency toward a derby fishery may begin to develop as harvesters effectively "race for bycatch."

From an empirical basis, the trawl sector currently harvests relatively small amounts of some rarely encountered species (such as cabezon, kelp greenling, and nearshore rockfish). In 2005 and 2006, the trawl fishery harvested 1 mt and 5 mt of black rockfish respectively, relative to a 2008 OY of 1,262 mt. If, hypothetically, the trawl sector had been allocated 3 metric tons of black rockfish in 2006, the sector would have exceeded its allocation by 2 metric tons. If that occurred in an IFQ fishery, the economic implications to harvesters in the trawl sector could be fairly large, but the implications to the stock (and by extension, to other recreational and commercial fisheries) would be essentially unnoticeable. Instances like this suggest that the cost of covering rarely encountered species that are not overfished with IFQ may be large to the trawl sector, but with little or no benefit to management, to other fishery sectors, or to the status of the stock.

Table A-2. Catches of selected nearshore species by trawl sectors, 2005–06.

	2006		2005		2008 OY
	Nonwhiting Trawl	Whiting Trawl	Nonwhiting Trawl	Whiting Trawl	
Black rockfish	5	0	1	0	1,262
Other Nearshore rockfish N	3	0.1	1	0	142
Other Nearshore rockfish S	0	0	0	0	564
Cabezon	0	0	0	0	69
Kelp greenling	0	0	0	0	NA

The Councils final preferred alternative excludes: longspine south of 34°27', minor nearshore rockfish north and south, black rockfish, California scorpionfish, cabezon, kelp greenling, shortbelly, "other rockfish" and other fish. Many of these species are found in nearshore areas where trawlers do not, or cannot, operate and for the most part are managed through state-based regulations. Species affected by the state management described above include the following: cabezon, black rockfish, kelp greenling, California scorpionfish, and the various species making up the nearshore rockfish group (including deeper and shallow nearshore). Gear switching should be considered alongside the types of species covered in the program. While trawl vessels do not harvest many types of species under status quo measures, the ability for those vessels to switch gears may provide for some opportunities to harvest different species. As illustrated in Chapter 4, some species are not caught with trawl gear, but are caught with nontrawl gear. In particular, longspine 34 degrees 27 minutes North latitude are caught with nontrawl gear. However, based on information from industry representatives, fixed gear vessels do not actively target longspine thornyheads because the price is too low to justify targeting on that stock (Richter, 2008. Personal communication). Therefore, the fixed gear landings of these species are almost certainly incidental to efforts spent catching shortspine, sablefish, slope rockfish, or another deep water species. Longspine south of 34 degrees 27 minutes North latitude are found in areas not accessible to trawl gear. When combined with the fact that fixed gear vessels do not target longspine thornyheads, it may be reasonable to exclude longspine south of 34 degrees 27 minutes North latitude from the IQ program because the catch of that species is likely to be small. Shortbelly is similar in that markets are not available for this species and the OY is large relative to the amount of incidental catch. "Other rockfish" and other fish are somewhat different. The catch of "other rockfish" is small and is constrained by catch limits on other species. "Other fish" are also constrained to some degree by the catch of other species, though targeting does occur on species making up this complex such as skates and dogfish.

The "other fish" stock complex contains all the unassessed Groundfish FMP species that are neither rockfish (family *Scorpaenidae*) nor flatfish. It includes dogfish (Table A-3). While there have been proposals in the past to remove dogfish from the "other fish" category it remains part of that category. Dogfish is a major component of the "other fish" catch (Table A-4). Landings in the "other fish" category and landings of dogfish have been relatively stable across sectors with the exception of a recent increase in tribal fisheries (Table A-5 and Table A-6).

Table A-3. Groundfish species included under "Other Fish."

Big skate, California skate, Leopard shark, Soupfin shark, Spiny dogfish, Finescale codling,	Pacific rattail, Ratfish, Cabezon (north of the California-Oregon border at 42° N latitude), and Kelp greenling

Table A-4. "Other Fish" ABCs, OYs, and catch by sector for 2007.

	2007	
	MT	**% of OY**
ABC	14,600	200%
OY	7,300	100%
Total Estimated Catch (mt)	4,516	62%
Shoreside Trawl		
Kelp Greenling	-	0%
Dogfish	703	10%
Skates (including longnose)157F[i]	1,940	27%
Other	584	8%
Total	3,227	44%
All Other Commercial and Tribal		
Kelp Greenling	20	0%
Dogfish	782	11%
Skates (including longnose)	246	3%
Other	109	1%
Total	1,157	16%
Recreational		
Kelp Greenling	32	0%
Dogfish	5	0%
Skates (including longnose)	2	0%
Other	31	0%
Total	70	1%
Totals Including Research		
Kelp Greenling	52	1%
Dogfish	1,503	21%
Skates (including longnose)	2,194	30%
Other	765	10%
Total	**4,514**	**62%**

Table A-5. "Other Fish" groundfish landings in metric tons (including Spiny dogfish and longnose skate).

	2001	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**
WA	579	860	439	398	473	382	412	557
OR	237	261	254	119	104	110	94	142
CA	471	405	439	348	311	288	228	222
Total	**1,288**	**1,526**	**1,131**	**865**	**887**	**780**	**734**	**922**
LE Trawl	581	650	425	266	321	215	201	195
LE Fixed Gear	293	480	246	159	261	213	221	209
Other Gear	216	226	232	274	163	122	110	134
Recreational*	197	168	224	125	136	154	82	81
Tribal	0	1	4	40	6	77	119	302

* Recreational Fishery Information Network (RecFIN) type "A" landings only.

Table A-6. Spiny dogfish landings in metric tons.

	2001	2002	2003	2004	2005	2006	2007	2008
WA	544	850	429	386	457	370	404	551
OR	21	15	10	5	4	9	9	42
CA	12	25	29	30	12	18	15	47
Total	**578**	**890**	**469**	**421**	**473**	**398**	**428**	**640**
LE Trawl	346	466	201	155	222	119	108	128
LE Fixed Gear	216	404	193	131	230	191	195	180
Other Gear	4	5	53	91	11	7	2	27
Recreational	11	14	18	2	4	4	3	2
Tribal	0	1	4	40	6	77	119	302

* RecFIN type "A" landings only.

The choice of whether or not to include "other fish" under the IFQ program has a number of impacts. With respect to conservation objectives, protection for any species within the complex is somewhat limited because the "Other Fish" OY is under harvested and there is substantial potential to shift targeting among species within the category. If it is determined that an undesirable amount of shifting within the category is occurring, it might be possible to impose cumulative limits on the species experiencing excess targeting. This is true whether the group is managed with IFQs or under status quo. Currently, the Council's ability to impose trip limits requires identification of a conservation concern for a species for which there is an OY. The justification for the current landing limits that are in place for dogfish is based on the need to control incidental catch of overfished species, which occurs when dogfish are targeted. Ultimately, whether managed with IFQs or under status quo, with 100 percent monitoring on trawl vessels the fleet will be held fully accountable for its catch and conservation objectives will be achieved.

One or all species in this group could be brought under the IFQ program later. The possibility for this to occur could create a competition for harvest history if the group is left outside the IFQ program. The potential for that competition might be a conservation concern. To address this possibility the Council indicated that for this group it would likely use 1994-2003 permit landings history as the basis for its initial QS allocation should it become necessary. See Section A-2.1.6 for additional discussion and analysis of this provision.

Inclusion of "other fish" under the IFQ program could impose a major constraint on the fishery if the correct amount of dogfish is not allocated to the fishery. Because of the ubiquitous and variable nature of the occurrence of dogfish in bycatch, the Council was particularly concerned about the difficulty of setting the trawl allocation amount properly. Improper setting of the trawl allocation for this species could seriously constrain harvest, reduce net benefits, and adversely impact the harvesting and processing sectors, labor, and communities. Leaving the group under status quo management allows the Council more latitude for adjusting management measures to account for the needs of both trawl and nontrawl sectors.

The main disadvantage of leaving the "other fish" out of the IFQ program is that if markets do begin to develop and constraints have to be imposed, these constraints (two-month limits) could substantially reduce benefits from a developing fishery, as compared to the management options available under IFQ management. To address this possible negative impact, "other fish," or dogfish as a separate category, could be brought under the IFQ program later.

Coverage of species with IFQ is expected to be consistent with several aspects of the MSA, the Groundfish FMP, and the Council's goals and objectives for Amendment 20. Covering species with IFQ means that harvesters are responsible for the catch of those species. When combined with monitoring requirements envisioned to be necessary to support a total catch IFQ program, the coverage of overfished species with IFQ is expected to help foster the rebuilding of those stocks, which is consistent with MSA – 303A(c)(1)(A). This consistency exists because of increased catch certainty associated with IFQ coverage of those species. This increased catch certainty exists because of the type of monitoring associated with a total catch IFQ program (monitoring is expected to be more timely than status quo conditions) and the fact that vessels must stop fishing when reaching their quota. For these same reasons, the coverage of species with total catch IFQ promotes conservation of those stocks, which is consistent with MSA – 303A(c)(1)(C)(ii).

For some species that may be infrequently encountered, the conservation benefit associated with covering those stocks with quota may be minimal. However, the cost and risks associated with covering those stocks with quota could be quite large. When considering this effect next to MSA standards, FMP and Amendment 20 objectives, the coverage of infrequently encountered species with quota may be contrary to the Groundfish FMP objective 15, which states "avoid unnecessary adverse impacts on small entities." This could occur if a vessel falling under the definition of a small entity catches an unexpected quantity of a relatively infrequently encountered species. The cost of covering that catch with quota could be high because of the limited amount of quota available on the market. Additionally, that vessel may incur an enforcement action (if unable to cover that catch with quota) which could be costly. Relative to the OY of infrequently encountered nearshore stocks, the catch occurring in the trawl sector is small. This means that the possible cost to a vessel encountering an unexpected amount of catch of one of these species may be "unnecessary" for the successful management and conservation of the stock while also having an "adverse impact" on that vessel. Furthermore, for reasons outlined in paragraphs above, a catch event could be large enough to affect the entire trawl sector and trawl dependent communities while having little to no effect on the status of the stock or other fishery sectors.

Alternative Scope (A-5)

One option exists that would require whiting vessels to be individually responsible for whiting, but not be individually responsible for the catch of other species. Under this form of management, it is envisioned that bycatch limits would continue to be used for the three whiting sectors (either collectively or at a sector level). The effect of this type of management was discussed in Chapter 4, Section 4.6.2.4, therefore, the reader is referred to that section for additional discussion that may not be contained here.

This alternative scope has two principal effects. One effect deals with risk management by quota holders in an IFQ program. The other effect is related to management complexity. Under status quo measures, bycatch limits are used to manage the bycatch of select species in the whiting fishery. Beginning in 2009-2010, bycatch limit management is applied on a sector-specific basis. It is envisioned that this type of management would continue under the alternative scope, meaning that managing the bycatch of the three whiting sectors would not change from status quo if one or more sectors of the fishery were managed with IFQ. This means that management of bycatch in the whiting fishery is not likely to add to administrative complexity of the program of this alternative scope is adopted.

Harvesters under an IFQ program face a degree of risk based on the species for which those harvesters are responsible, and whether they are responsible for those species collectively or individually. As stated in Chapter 4, holding harvesters individually responsible for bycatch species may create a relatively high amount of risk to individuals, but a relatively low amount of collective risk. Individual

risk is defined as one where individuals face a relatively high cost of some form if they catch greater than expected amounts of bycatch species and are responsible for covering that catch with quota individually. This is a relatively high individual risk because, if a harvester incurs a "disaster tow," that harvester would be responsible for purchasing enough quota to cover that catch event by themselves and this may prove quite costly. A collective risk is one where the actions of one harvester can affect the opportunities to another harvester, potentially leading to a break down in rational fishing behavior and race for fish conditions via a race for bycatch even though the fishery may be "rationalized." Such an outcome could occur if a bycatch limit is applied at a sector or fishery level and participants in that sector or fishery do not believe that they can successfully manage that bycatch collectively. When participants stop believing that successful bycatch management is a possibility, the likely outcome is one where they begin to race to catch their target species before the bycatch limit is reached.

The alternative scope described in this section would effectively trade some individual responsibility for some collective responsibility, and decrease individual risk while potentially increasing collective risk. The degree to which individual risk is traded for collective risk depends on the level of bycatch management and whether bycatch is managed at a fishery level or a sector level.

Gears and Fisheries Covered and Gear Switching

Gears and Fisheries Covered

The Council's motion on gears and fisheries covered states the following:

> If a vessel has an LE trawl permit and groundfish is caught by any gear, IFQ must be used, with the following exceptions: exempted trawl, California halibut trawl (in California state waters), CPS gear, HMS gear, salmon troll, and crab pot.

The Council's decision to eliminate these gears from the program is based on the notion that such gears do not encounter volumes of groundfish that would justify the measures necessary to fold their use into the IFQ program. To help illustrate this point, the following information was developed. This information shows landings of groundfish by fishery, and this information is useful for illustrating the potential amount of groundfish catch that occurs in each of the fisheries. Based on this information, the California halibut, pink shrimp, fish pot, Pacific halibut, salmon and set net fisheries take the most groundfish (Table A-7.). However, the catch of groundfish in the pink shrimp fishery has declined dramatically since the introduction of fish excluder devices and that fishery now takes some of the smallest amount of groundfish relative to other nongroundfish fisheries. Of the previously listed fisheries it is primarily the California trawl and pink shrimp fisheries that have substantial crossover with the groundfish trawl fishery, and some participation in the California halibut fishery is considered part of the overall fishing strategy by vessels participating in the LE trawl fishery off Central California. Outside of the California halibut, fish pot and Pacific halibut fisheries, the ex-vessel revenue from groundfish contributed less than 3 percent of the value of the total catch in these open access fisheries (Table A-8).

Of these listed fisheries, California halibut trawl and sea cucumber trawl use gear defined as "legal groundfish gear." Pacific halibut uses anchored longline, fish pot uses anchored fish pot gear, and set net and California halibut hook and line use gear often described as groundfish gear. Gears used for pink shrimp, ridgeback prawn, spot prawn, CPS, crab pot, HMS, salmon, and sea urchin are not typically considered gears that are used to prosecute groundfish.

Table A-7. Federal groundfish landings in incidental fisheries, 1998-2006, including averages.

Fishery	1998	1999	2000	2001	2002	2003	2004	2005	2006	AVG
Nongroundfish trawl										
California halibut	56.6	47.3	22.5	21.7	14.3	10.6	28.1	31.6	22.7	28.4
Pink shrimp	186.5	220.8	153.0	94.2	47.0	1.3	1.8	0.1	0.0	78.3
Ridgeback prawn	1.9	4.1	8.0	9.1	3.8	3.4	0.9	1.2	3.4	4.0
Sea cucumber	3.1	1.6	1.2	1.4	0.9	1.1	0.3	0.1	0.0	1.1
Spot prawn 1/	28.8	16.0	6.0	3.4	2.0	0.2	0.0	0.0	0.0	6.3
subtotal	276.9	289.8	190.7	129.8	68.0	16.6	31.1	33.0	26.1	118.0
California halibut HL 2/	4.7	5.8	5.2	3.7	2.3	3.4	3.0	1.2	1.1	3.4
CPS	6.2	3.6	2.5	2.8	2.0	4.3	2.9	0.8	1.9	3.0
Crabpot	1.5	1.0	1.2	0.7	0.6	0.9	1.2	4.3	6.1	1.9
Fish pot 2/	3.7	3.1	6.8	9.0	3.1	3.9	4.5	2.3	1.2	4.2
HMS	3.8	2.7	2.9	3.4	4.1	1.9	2.1	1.7	1.7	2.7
Pacific halibut LL 2/	2.0	4.6	3.7	5.6	4.1	10.9	15.9	20.3	20.3	9.7
Salmon	37.8	22.5	18.0	13.4	9.3	8.7	13.1	11.5	4.1	15.4
Sea urchin	0.0	0.1	0.5	0.1	0.3	0.3	0.0	0.0	0.0	0.1
Set net 2/	31.9	57.7	46.3	38.8	29.2	25.8	16.8	22.3	14.4	31.5
subtotal	91.6	100.9	87.1	77.5	54.9	60.1	59.6	64.4	50.8	71.9
TOTAL	368.5	390.7	277.8	207.3	122.9	76.7	90.7	97.4	76.9	189.9
Fishery unknown	96.2	58.4	63.1	81.2	6.9	2.7	3.6	5.4	3.6	35.7
TOTAL (2)	464.7	449.1	340.9	288.5	129.8	79.4	94.3	102.8	80.5	225.6

1/ Prohibited in California starting April 2003. Incidental landings are allowed with ridgeback prawn landings

Table A-8. Summary of open access incidental fishery landings of federal groundfish, 1998-2006 annual averages.

	Target Species		Federal Groundfish		Federal Groundfish % based on	
Fishery	mt	K$$	mt	K$$	mt	K$$
Nongroundfish trawl						
California halibut	111.2	759.4	28.4	66.1	25.5%	8.7%
Pink shrimp	8,244.7	6,254.2	78.3	90.9	0.9%	1.5%
Ridgeback prawn	219.6	625.5	4.0	7.6	1.8%	1.2%
Sea cucumber	91.5	162.4	1.1	2.7	1.2%	1.6%
Spot prawn 1/	57.5	929.7	6.3	11.3	10.9%	1.2%
subtotal	8,724.6	8,731.1	118.0	178.5	1.4%	2.0%
California halibut HL 2/	66.1	467.6	3.4	15.3	5.1%	3.3%
CPS	149,012.7	31,799.8	3.0	5.3	0.0%	0.0%
Crabpot	15,428.1	60,653.2	1.9	7.2	0.0%	0.0%
Fish pot 2/	288.8	542.0	4.2	41.7	1.4%	7.7%
HMS	12,194.8	22,361.4	2.7	4.9	0.0%	0.0%
Pacific halibut LL 2/	62.0	308.3	9.7	31.8	15.6%	10.3%
Salmon	3,196.3	13,655.2	15.4	24.1	0.5%	0.2%
Sea urchin	5,618.8	9,336.6	0.1	1.0	0.0%	0.0%
Set net 2/	351.5	1,356.7	31.5	37.8	9.0%	2.8%
subtotal	186,219.0	140,480.8	71.9	169.1	0.0%	0.1%
TOTAL	194,943.6	149,212.0	189.9	347.6	0.1%	0.2%
Unknown	NA	NA	35.7	NA	NA	NA
Total (2)	194,943.5	149,211.9	225.6	NA	NA	NA

1/ spot prawn trawling prohibited in California starting April 2003. Incidental landings allowed with ridgeback prawn landings

Association with the Inter-Sector Allocation Process

Requiring that a vessel with a LE trawl permit cover groundfish catch in nongroundfish fisheries with quota is consistent with existing provisions that applies groundfish landings made by a vessel with a LE permit in a nontrawl sector to that vessel's trawl cumulative limit. This effectively limits groundfish catch by a trawl vessel to its cumulative limit regardless of which fishery that vessel may have harvested groundfish and expands the trawl sector allocation to participation in fisheries other than the trawl fishery. Exceptions do exist however, such as when a trawl vessel with a LE fixed gear permit participates in the sablefish tier fishery. Under this circumstance, the catch of a vessel with a trawl permit associated with it in the sablefish tier fishery is not applied to the trawl cumulative limit.

If groundfish catch made by LE trawl licensed vessels that are participating in a nontrawl fishery are not included under the scope of the trawl rationalization program, then the inter-sector allocation process may have to consider that decision. One method of dealing with this issue is to attribute groundfish catch in fisheries not covered under the scope of the rationalization program toward the nontrawl sector. This could be done by developing estimates of groundfish catch made by licensed trawl vessels participating in fisheries not covered under the scope of the program and applying that estimated catch to the allocation made to the nontrawl sectors. Another approach for some legal gears that take a very small amount of groundfish quota would be to estimate the expected mortality preseason and deduct it from the trawl allocation before allocating out the QP. Adjustments would be made from year to year if the actual take were greater or smaller than the estimates but given the low harvest levels, deviations from the estimates would be unlikely to have a significant conservation impact.

Gear Switching

Gear switching is an implied result of the definition of the program scope. Gear switching may be used to balance catch accounts (because different gears have relatively different catch rates), take advantage of differing market opportunities, or to respond to public relations issues. Although difficult to predict, some information suggests that there are harvesters located in different sections of the west coast that are more likely to engage in gear switching on a permanent basis. Harvesters located in the central and southern-central California coast have expressed a desire to switch from trawl gear to groundfish fixed gear (longline and pots) in recent years because of public relations issues and because consumers in central and southern California appear to prefer nontrawl caught fish. In addition, harvesters that have typically relied on areas with relatively high rates of constraining species bycatch may be more likely to switch to a nontrawl gear to avoid those constraining stocks since many types of fixed gear have lower bycatch rates of overfished stocks than trawl gear (though not always as is evidenced by the comparative bycatch rates of yelloweye rockfish). This may encompass harvesters located in northern Washington and some harvesters in southern Oregon ports. Other factors may cause harvesters temporarily to use nontrawl gear to prosecute fishing activities during certain times of the year. This may be due to market conditions where there is a noticeable differential in the prices paid for groundfish species caught with one gear versus another. This is particularly the case for sablefish. The figure below shows that there is a substantial price differential between fixed-gear-caught sablefish and trawl-caught sablefish. If the trawl sector harvests 10 percent of the trawl allocation with fixed gear, this would increase ex-vessel revenues by approximately $600,000. If 20 percent of the trawl allocation was caught with fixed gear, ex-vessel revenues may increase by $1.2 million.

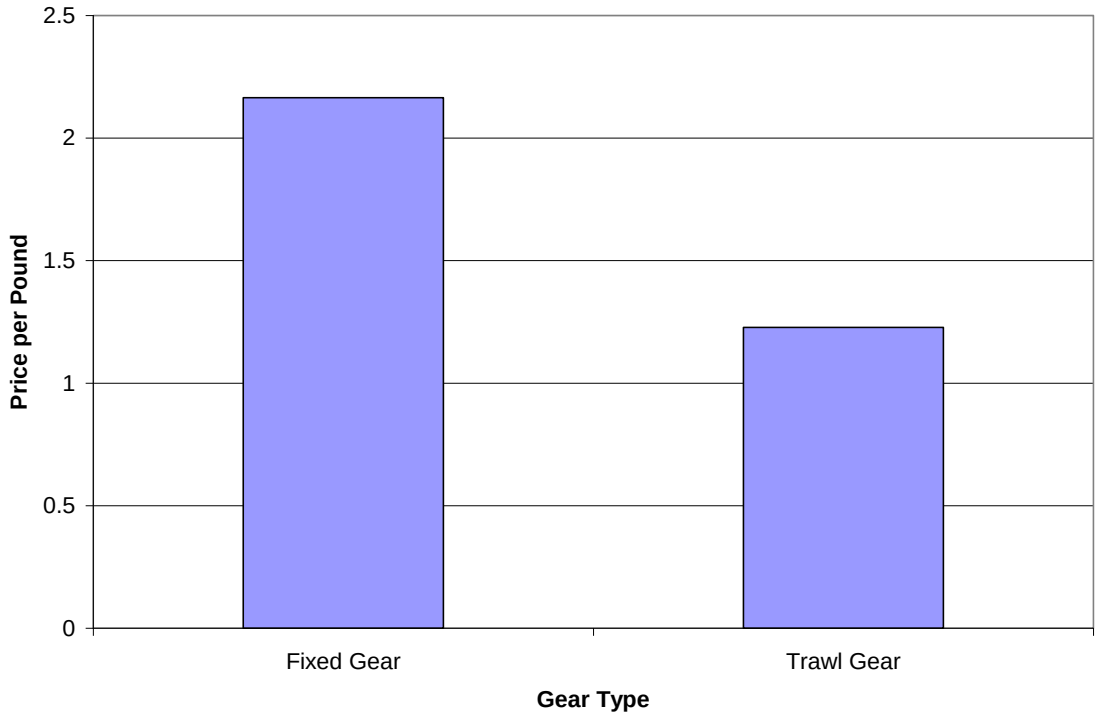


Figure A-1. Average price per pound for sablefish by gear type (2004 to 2007).

Another factor influencing gear switching, aside from the price differential, is the ability to harvest some types of groundfish with trawl gear that cannot be caught with nontrawl gear. Harvesters in many areas are not likely to abandon trawl gear completely because doing so would mean giving up the catch of many species of flatfish, which are not easily caught with nontrawl gears. In other words, in many areas of the coast, harvesters may use nontrawl gear to target species such as sablefish during certain times of the year and use trawl gear to prosecute Petrale sole, Dover sole, and other flatfish during other times of the year. The relative catch rate—under status quo conditions—for bottom trawl and fixed gear is shown in Table A-5. This information shows that fixed gear is successful at catching sablefish, shortspine thornyhead, and arrowtooth to some degree, but is not productive for catching many types of flatfish. Trawl gear on the other hand is capable of catching all of the species listed in the table. One reason these flatfish are not successfully caught with hook-and-line gear is because of their feeding patterns. While many longline fishermen may use herring with large hooks for example, several of the flatfish shown below feed on small prey, like worms, and have mouths too small to be caught with many of the hook sizes currently used. This information implies that large-scale gear switching may result in several species of flatfish being left unharvested.

Table A-9. Catch of select groundfish by gear type, mt (2006).

Species	Nonwhiting trawl	Fixed Gear
Sablefish	2,654.3	3,119.3
Shortspine	648.7	178.1
Longspine	821.3	21.2
Dover sole	7,475.5	4.6
Petrale sole	2,690.1	4.1
English sole	1,291.4	0.0
Arrowtooth flounder	2,817.6	78.8
Other Flatfish	1,854.9	4.1

Gear switching in an IFQ program addresses several aspects of guidance related to rationalization. Gear switching is related to conservation, net benefits, and sector health. The MSA at 303A(c)(1)(C)(ii) states that limited access privilege programs (LAPPs) shall promote fishery conservation and management, while the Groundfish FMP objective 5 specifies the objective of minimizing adverse impacts on essential fish habitat (EFH). Gear switching is expected to result in a wider use of gear types some of which may have a smaller impact on habitat than bottom trawl gear. However, this is not necessarily always the case, especially in cases where fixed gear can access high relief substrate and trawl gear cannot. If gear switching results in increased fishing pressure in areas where trawl gear currently cannot access, the result may be a greater impact on habitat than under status quo. In other areas (those that are accessible to trawl gear), the impact may be a reduction in the impact on habitat. A reduction in habitat impacts is expected to have an indirect effect on fish stocks and in this way influence fishery conservation.

[i] Longnose skate has since been moved out of the "Other Fish" category.

A-1.2 IFQ Management Units, Including Latitudinal Area Management

❖ *Provisions and Options*

QS will carry designations for the species/species group, area, and trawl sector to which it applies (see A-1.3 for the list of trawl sectors). The QP will have the same species/species group, area, and sector designations as the QS on the basis of which the QP was issued. QP will not be used in a trawl sector other than that for which it was issued, unless specifically allowed, and will not be used in a nontrawl sector (i.e., by vessels without trawl permits).[4] QP will not be used in a catch area or for a species/species group other than that for which it is designated.

For those species within the scope of the program, the, species groupings and area subdivisions will be those for which OYs are specified in ABC/OY table that is generated through the groundfish biennial specifications process.

Geographic Subdivision **Option 1:** Additionally, for species or species groups for which the OY is not geographically subdivided (i.e., there is only a coast wide OY), the QS will be subdivided geographically at the 40°10' N latitude line. Existing geographic lines for other species will be maintained. [If this option is not adopted, area divisions will be as specified for OYs in the biennial ABC/OY table, unless changed by the Council.]

► Geographic Subdivision **Option 2:** Additionally, there will be area subdivisions for those species for which there is an area specific harvest policy.

OR

See Section A-8 for an alternative approach to addressing concerns about geographic shifts: "regional landing zone restrictions." Regional landing zone restrictions would not alter the IFQ management units.

QS for remaining minor rockfish will be aggregated for the nearshore, shelf, and slope depth strata, as per Table A-82, Control and Vessel Limit Options.

After initial QS allocation the Council may alter the management units by changing the management areas or subdividing species groups. Section A-2.1.6 provides methods for reallocating QS when such changes are made after initial implementation of the program.[5] *Hereafter, all references to species include species and species group, unless otherwise indicated.*

❖ *Rationale and Policy Issues*

The IFQ units would be matched to the ABC/OY table species and species complexes in order to allow managers to control trawl harvest with respect to the annual ABC/OY management targets.

The option to provide a further geographic subdivision of those categories is intended to spread out effort to decrease the likelihood of localized depletion of fish species/populations and to disperse landings to sustain a variety of coastal communities. Managers of both British Columbia groundfish and IPHC halibut employ area management.

[4] Not withstanding this provision, a vessel with a LE trawl permit may catch the trawl QP with a nontrawl gear, as per Section A-1.1.

[5] Such changes in latitudinal area management may occur as a result of changes in the management areas for species/species complexes in the ABC/OY table or as a result of separate Council action to change the trawl QS by area. In either case, specific Council action will be required to change the management areas, and such action will be accompanied by appropriate supporting analysis and public comment opportunity.

The GMT recommended in June 2007 that status quo area management measure be applied as a precautionary measure under both status quo and rationalization management systems.

> As evidenced by the March 2007 groundfish inseason action, increasingly complex spatial management measures may be necessary within the existing management framework. Intersector allocations (ISAs) and the implementation of trawl individual fishing quotas (TIQ) may further increase the need for spatial management, perhaps in a manner different than status quo….
>
> Spatially explicit management has proven to be critical to meeting conflicting management goals and objectives, such as maintaining fishing opportunities on healthy stocks while reducing incidental catches of rebuilding species, and meeting habitat protection requirements. Furthermore, there is a growing appreciation of the significance of heterogeneity in population structure for most marine organisms, as well as for the potential interaction between population structure and fishing behavior, that scientists and managers alike will find increasingly necessary to confront in population models and management measures….
>
> The GMT recommends incorporating current area management tools within the TIQ program, recognizing the limitations, and continuing to pursue research and data that may further inform spatial management. As data become available, area management within the TIQ program is expected to evolve and adapt.

A further explanation of how north-south trawl IFQ allocation would work is provided below.

1. Allocation of QS would be based on landings by area north and south of the 40° 10’ N latitude area management line. The area to the north sums to 100 percent, and the area to the south sums to 100 percent.
2. Division of trawl allocation between north and south areas could be based on average landings over a series of years (1994 to 2003 was suggested by the GMT; 2004 to 2006 is the status quo years used in the analysis). The Council has not selected a period of years.

Currently, and in the past, permits could be sold coast wide. There is a possibility that, if a permit was sold to a different part of the west coast, the permit would not get an initial allocation of QS that match the present-day location of the vessel, but rather match the history of the permit. For example, if someone in California wanted to sell their permit to someone fishing in Washington, that vessel might qualify, based on fishing history, for southern QS, but not northern. That vessel would have to acquire northern QSs to fish by a different means than initial allocation, such as buying or trading.

The goals and objectives addressed by the Area Management provision include the following: promote fishery conservation (MSA 303A(c)(1)(A)); consider biological stock structure and minimize localized concentrations of fishing effort (Amendment 20 Constraint 3); address concerns over excessive geographic consolidation in the harvesting or processing sectors (MSA 303A(c)(5)(B)(ii)); and promote sustained participation of fishing communities and address concerns over excessive geographic consolidation (MSA 303A(c)(5)(B)).

Conservation	Net Benefits	Disruption	Excessive Shares	Fairness and Equity	Sector Health	Labor	Communities	Small Entities and New Entrants	General Public	Program Performance
X			X				X			

A process option to form a group to address area management was considered but rejected. Furthermore, the Council adopted (as part of the PPA) area management and Regional Landing Zones as dual preferred alternatives. Both were not adopted as the Final Preferred Alternative. Some factors leading to the decision not to adopt area management as a Final Preferred Alternative include the fact that little scientific information was available to support the decision on where boundaries might be drawn to support such area subdivisions and whether implementing such measures would be necessary for conservation of groundfish resources given the life history characteristics of groundfish caught in the trawl fishery.

❖ *Interlinked Elements*

General Management and Trawl Sectors –The north-south division of coast wide OYs would not apply to the shoreside whiting fishery if managed by IFQs, as it occurs entirely to the north.

Stock distribution vs. distribution of trawl sector allocation – The north and south distribution of trawl sector allocation, if based on past landings amounts, may not match up with future groundfish locations and centers of abundance. The percentage of the north-south OY split is typically based on biological considerations, is part of the biennial specifications process, and would not necessarily be indicated under Amendment 20. IFQ area management units are related to decisions to be made under the ISA and/or 2011-12 groundfish harvest specifications EISs.

Reallocation with changes in management area – There are specific formulas proposed in the program provision alternatives that describe how reallocation would occur if there were an area subdivision, area recombination, area line movement, or species group subdivision.

❖ *Analysis*

Area management units would have both a biological effect and a socioeconomic effect. Under a rationalized fishery, it is anticipated that harvest privileges will be more fluid than under status quo. Under status quo, permit owners can sell their permit, or lease their permit to another individual that fishes that permit. However, IFQ is anticipated to be more fluid because it is divisible, and one individual's quota can be spread throughout several different active vessels or stacked on one vessel. Because of this envisioned fluidity, fishing effort is likely to be much more concentrated in areas where economic conditions (including catch per unit effort and species mix in the catch) are most favorable (assuming area management restrictions do not exist). This may have the effect of shifting fishing and delivery activity away from some areas and toward others, resulting in an overall shift in location in which fishing activity occurs.

Assuming area management units do not exist, from an economic standpoint, this shift can be viewed as favorable to some as quota owners are best able to capitalize on favorable economic conditions. In the case of coastal communities, the effect is largely distributional. Those communities that lose fishing

activity stand to be adversely affected while those communities that gain fishing activity stand to be positively affected.

From a biological standpoint the issue is somewhat mixed. On one hand, if short-term economic conditions dominate the decision of where fishing effort will be concentrated, then stocks present in areas with an increase in fishing effort may experience more mortality than under status quo. However, if those stocks become less abundant, harvesters may elect to move and fish in areas where stocks are more abundant, allowing stocks in the first area to recover while harvesters fish in the area of more abundant stocks. Even so, if costs are lower in a particular port or region of the coast, or the travel distance to the fishing grounds shorter, QP may tend to flow to vessels in those locations even though the CPUE is lower due to localized depletion.

If area management restrictions exist, this is likely to temper the geographic shift effect. In general, trawling effort has been becoming increasingly concentrated in areas off Oregon and northern California and less concentrated in areas off central and southern California. If an area management boundary is put in place at 40° 10' N latitude (just south of Cape Mendocino), it is expected that the shift in concentration of fishing to the north of that latitude line will be halted/reversed, and more fishing activity will take place to the south compared to a case where no area management restrictions exist. Implementing this area restriction may have the effect of spreading the distribution of fishing activity across a wider number of communities. However, quota owners may be less able to capitalize on favorable economic conditions and the fluidity of QS will be reduced.

In November 2007, the GMT proposed a north-south QS split based on average fleet harvest history in the two areas during the 1994 to 2003 period. In Table A-10 below, trawl caught average percentages north and south for 1994 to 2003 are compared to more recent years (2004 to 2006 averaged) for certain species.

Table A-10. Share of Trawl Landings North and South of 40° 10' N latitude Line averaged for the years 1994 to 2003 and 2004 to 2006.

	1994-2003		
	All Permits	**Nonbuyback**	**2004-2006**
Sablefish			
North of 40-10	82.34%	80.78%	86.96%
South of 40-10	17.66%	19.22%	13.04%
Shortspine Thornyheads			
North of 40-10	72.77%	68.26%	71.39%
South of 40-10	27.23%	31.74%	28.61%
Longspine Thornyheads			
North of 40-10	75.39%	71.10%	54.37%
South of 40-10	24.61%	28.90%	45.63%
Dover Sole			
North of 40-10	71.73%	66.82%	81.92%
South of 40-10	28.27%	33.18%	18.08%
Petrale Sole			
North of 40-10	81.99%	77.26%	86.08%
South of 40-10	18.01%	22.74%	13.92%
Other Flatfish			
North of 40-10	56.25%	44.66%	77.02%
South of 40-10	43.75%	55.34%	22.98%

For some species, such as other flatfish, Petrale sole, and Dover sole, the more recent years show the trawl catch is greater in the north. Using 1994 to 2003 would not reflect the current trawl effort as well as more recent years would, but using the older years would spread the effort out more between northern and southern areas. For other species, such as sablefish, there is less of a discrepancy between using an

older data set and more recent years. The Council may wish to split the north and south QS for shortspine and longspine thornyheads to disperse the trawl effort on those species. However, the provision as it is currently written would have to be changed to include the thornyheads, because the current provision only applies to species that have no OY management division. Thornyheads have a management division at the 34° 27' N latitude line, which has little application to the trawl fishery.

The status quo management of some species' OY currently divides fishing effort to the north and south of 40° 10' N latitude, such as minor nearshore, shelf and slope rockfish. Other species have an OY management division at a different line of latitude, such as shortspine and longspine thornyhead, and 34° 27' N latitude. Most groundfish species, such as whiting, Dover sole, Petrale sole, and widow rockfish, have a coast wide OY with no specified area management. Below is a table (Table A-11) that lists every west coast groundfish stock and stock complex with a specified OY and whether that OY is coast wide or has a division. Those species with no OY division would have the 40° 10' N latitude management line applied to them under rationalization.

Table A-11 furthers the analysis by commenting on the potential biological effect of creating a management division at 40° 10' N latitude. In general, species that are found further off-shore, e.g., on the continental slope, have a life history that involves broadcast spawning, a higher level of adult mobility, and a higher level of genetic mingling than species found on the continental shelf and nearshore. Adult nearshore species tend to have higher site fidelity, are less likely to colonize new habitats, have lower levels of genetic mixing, and, therefore, have higher levels of genetic specialization and diversity. Nearshore species are more vulnerable to intense and localized fishing effort because they tend to be more adapted to a specific area than slope species. If concentrated fishing effort occurred on slope species, there is a lower risk of localized population depletion because other individuals in the population are genetically similar and could migrate to repopulate the depleted area. Localized depletion would have a greater effect on species occurring on the shelf and nearshore, because in general their life history characteristics tend to include low larval dispersal, high geographic loyalty, and high genetic diversity.

In addition to the generalized differences in life characteristics of slope versus shelf species, there are other considerations that bear on whether or not the management division at 40°10'N latitude would apply in a useful way. For example, some species range entirely above or below 40°10'N latitude, are not caught in either the north or the south, and a management line at that location would not help spread out the catch effort (i.e., arrowtooth flounder, Pacific ocean perch, and Pacific cod, which all primarily occur in the northern area). Some species have an unknown distribution, and still other species are so rarely caught by the bottom trawl fishery that an area management line would have little biological implication.

Creation of a line for species that are abundant coast wide but present in relatively small quantities south of Cape Mendocino may risk problems similar to those described in Section A-.1.1 with respect to species that are generally caught in small quantities by the trawl fishery (e.g., cabezon and black rockfish). See Species Covered in Section A-1.1 for a discussion of the implications of requiring IFQ for species that are rarely encountered and for which the available QP is very limited.

Minor effects of the area management provision, would include additional tracking, monitoring, and enforcement of QS harvest location. North and South categories of QS would be created and tracked to make sure that QS are fished and traded/sold in the correct area. Likewise, if adaptive management QS are part of the rationalization program, those QSs would also be designated North and South.

In summary, an OY management division at 40° 10' N latitude would result in a more precautionary management measure for some of the species currently lacking north/south area management divisions, would be more effective for certain species than others depending on life history traits, would help ensure some communities retain some amount of historical fisheries commerce, and would restrict coast wide tradability of QS.

Table A-11. West coast groundfish stocks and stock complexes with harvest specifications (overfished stocks in CAPS.)

Stock	Geographic Extent of Specified Optimum Yields (OYs)	Potential Biological Benefit of Separate OYs N and S of 40°10' N lat. (if current OY is coast wide)?	Comments
Lingcod	Coast wide	Likely	Southern sub-population has different pop. dynamics and is more depleted
Pacific Cod	Coast wide	Unlikely	Rare S of 40°10' N lat.
Pacific Whiting (U.S.)	Coast wide	Unlikely	Highly migratory with majority of fishing pressure in the north
Sablefish	Separate OYs N and S of 36° N lat.	N/A[6]	
PACIFIC OCEAN PERCH	Coast wide	Unlikely	Rare S of 40°10' N lat.
Shortbelly Rockfish	Coast wide	Unlikely	Negligible exploitation
WIDOW ROCKFISH	Coast wide	Unknown	Stock differences along west coast unknown
CANARY ROCKFISH	Coast wide	Unknown	Stock differences along west coast unknown
Chilipepper Rockfish	S of 40°10' N lat.	N/A	Managed under the minor shelf rockfish complex in the north
BOCACCIO	S of 40°10' N lat.	N/A	Managed under the minor shelf rockfish complex in the north
Splitnose Rockfish	Coast wide	Unknown	Stock differences along west coast unknown
Yellowtail Rockfish	N of 40°10' N lat.	N/A	Managed under the minor shelf rockfish complex in the south
Shortspine Thornyhead	Separate OYs N and S of 34º27' N lat.	N/A	
Longspine Thornyhead	Separate OYs N and S of 34º27' N lat.	N/A	
COWCOD	S of 40°30' N lat. (Con. and Mon. areas)	N/A	
DARKBLOTCHED	Coast wide	Unlikely	Slope species: genetic diversity likely low along west coast due to broad larval dispersal
YELLOWEYE	Coast wide	Unknown	Stock differences along west coast unknown; sedentary life history may lead to stock differences
Black Rockfish	Separate OYs N and S of WA-OR border	N/A	
Minor Rockfish North	N of 40°10' N lat.	N/A	
Nearshore Species	N of 40°10' N lat.	N/A	
Shelf Species	N of 40°10' N lat.	N/A	
Slope Species	N of 40°10' N lat.	N/A	
Minor Rockfish South	S of 40°10' N lat.	N/A	
Nearshore Species	S of 40°10' N lat.	N/A	
Shelf Species	S of 40°10' N lat.	N/A	
Slope Species	S of 40°10' N lat.	N/A	
California scorpionfish	Coast wide	No	Ranges S of 37° N lat. and rare N of 34°27' N lat.
Cabezon	OY for CA only	N/A	

[6] Not Applicable (N/A). The 40°10' N lat. management line would not be applied to species with a previously specified management division.

Table A-12 cont. West coast groundfish stocks and stock complexes with harvest specifications (overfished stocks in CAPS.)

Stock	Geographic Extent of Specified Optimum Yields (OYs)	Potential Biological Benefit of Separate OYs N and S of 40°10' N lat. (if current OY is coast wide)?	Comments
Dover Sole	Coast wide	Unlikely	Stock differences along west coast unknown, but long larval period (2 yrs) and offshore larval transport prob. contribute to low genetic diversity
English Sole	Coast wide	Likely	Stock differences along west coast unknown, but inshore larval dispersal may contribute to higher genetic diversity
Petrale Sole	Coast wide	Likely	Stock differences along west coast unknown, but inshore larval dispersal may contribute to higher genetic diversity
Arrowtooth Flounder	Coast wide	Unknown	Stock differences along west coast unknown, but deeper shelf spawning and 4 week larval period may contribute to higher genetic diversity
Starry Flounder	Coast wide	Likely	Stock differences along west coast unknown, but nearshore distribution prob. contributes to higher genetic diversity
Other Flatfish	Coast wide	Likely	Mix of species including nearshore species with probable high genetic diversity
Other Fish	Coast wide	Unknown	Mix of species with disparate life histories; Though stock differences along west coast unknown there may be some trawl-caught species with higher genetic diversity
Kelp Greenling	HG for OR only	N/A	
Longnose Skate	Coast wide	Unlikely	Stock-specific OY specified starting in 2009; Highly migratory with prob. low genetic diversity

A-1.3 General Management and Trawl Sectors

❖ *Provisions and Options*

Unless otherwise specified, status quo regulations, other than trip limits for species within the scope of the IFQ program, will remain in place. If individual vessel overages (catch not covered by QP) make it necessary, area restrictions, season closures or other measures will be used to prevent the trawl sector (in aggregate or the individual trawl sectors listed here) from going over allocations.[7] The IFQ fishery may also be restricted or closed as a result of overages in other sectors. There will be:

►**Option 1:** three trawl sectors: shoreside, mothership, and catcher-processors.
Option 2: four trawl sectors: shoreside nonwhiting, shoreside whiting, mothership, and catcher-processors.

Allocation among trawl sectors to be determined in the intersector allocation process.[8]
Trawl vessels fishing IFQ with nontrawl gear will be required to comply with the RCA lines applicable for that gear. Such restrictions, as necessary, will be determined in a separate process.

❖ *Rationale and Policy Issues*

Within a rationalization program, the more transferability allowed among vessels the more efficient the use of the fishery resource and hence the greater the potential total economic benefits of the program. However, in an attempt to preserve certain characteristics of a fishery that may be considered desirable, limits on IFQ transfers among sectors may be adopted despite being less economically efficient overall.

The Council, at the recommendation of the Trawl Individual Quota Committee (TIQC), eliminated the one trawl sector option from further analysis. By not differentiating between trawl sectors, the single trawl sector option would maximize potential transferability among trawl fisheries. However, with one sector, the market may not fully capture all the important social and economic effects, particularly if some IFQ buyers in the market benefit from both harvesting and processing profits while others only harvest or only process. It is anticipated, therefore, that a single sector would lead to migration of quota to the more vertically integrated catcher-processor sector. Such expected consolidation would likely result in disruption of other sectors in the fishery and a change to its current landscape, including loss of small-boat/owner-operator businesses that could be out-competed in both the shoreside and mothership

[7] The Council authority to establish or modify RCAs will not be changed by this alternative.

[8] The allocation among trawl sectors will be determined as part of the intersector allocation process. The TIQC recommended a number of options for determining the allocation among trawl sectors. One of these would have based the allocation on fleet history, but would not have included in the fleet history the history of any vessel not meeting the recent participation requirement. The Council rejected this application of a recent participation requirement to a determination of fleet history. The remaining TIQC options recommend that the division of allocation among trawl sectors be based on the fleet history over the same time periods used to allocate QS. The TIQC further recommends that if different periods are used for different trawl sectors, either (1) calculate the share for each sector based on its IFQ allocation period, then adjust all percentages proportionately such that they sum to 100 percent; OR (2) use the shortest period common to the allocation formula for all sectors.
If bycatch in the whiting sectors is not managed with IFQs and is pooled at the overall whiting fishery or sector level, allocations of bycatch will be determined through the intersector allocation process. The TIQC recommends allocation among the whiting sectors based on Option 1: pro rata in proportion to the whiting allocation, or Option 2: weighted historical catch formula (for example, in projecting bycatch in the whiting fisheries prior to the start of the season, the GMT uses a four-year weighted average starting with the most recent year: 40 percent, 30 percent, 20 percent, 10 percent).

fleets. Such situations would conflict with the objective to minimize adverse effects on fishing communities to the extent practical and the MSA mandate to consider the basic cultural and social framework of the fishery (303A(c)(5)(B).

While less economically efficient in theory, the options of three sectors or four sectors would better protect communities and regions once the fishery was rationalized. Multiple sectors would allow the Council to make explicit decisions about how to allocate QS between the sectors in order to incorporate some of the socioeconomic values that might not be captured by a market driven allocation.

Four sectors represent the current groundfish fishery and its diversity.

Under a three sector fishery, the shore-based harvesting sector would share one pool of whiting and other groundfish, and this could allow for more flexibility to move harvest opportunity between shoreside whiting and nonwhiting trips to address the fishery's needs. This would relieve some of the Councils allocation tasks and result in more economically optimal distribution, particularly with respect to the consideration of the shoreside whiting and nonwhiting fisheries needs for bycatch, which would be addressed through market-based mechanisms rather than regulatory, administration-based mechanisms.

❖ *Interlinked Elements*

IFQ or cooperatives as the catch control tool: If the nonwhiting sector is managed with IFQ, and the shoreside whiting sector is managed with cooperatives, the fishery must be managed with four trawl sectors.

❖ *Analysis*

Number of Trawl Sectors

It has been hypothesized that if one sector of the fishery has more financial capability of purchasing quota than another sector, then establishing a single shoreside sector may tend to result in a flow of quota from one group of harvesters to another. If overfished species IFQ flows from one sector to another (because one sector has greater purchasing power), the sector that loses the overfished species IFQ may see their ability to access target species reduced (because of the constraining nature of overfished stocks). Alternatively, if there are four sectors, the separation would tend to preserve the amount of species available to each sector. It is important to note that this argument is theoretical. Available information suggests that both shoreside sectors will see profits improve under a well-designed rationalization program. However, having a single shoreside sector will tend to make it easier for trades to occur, while having two shoreside sectors will tend to maintain two fairly distinct sectors (though some vessels may participate in both).

The number of trawl sectors established will likely influence the flexibility that harvesters have in either sector. By creating three trawl sectors and bundling both shoreside sectors into a common allocation, the trading of quota can occur between both sectors in a manner that creates flexibility in harvesting activity because of the ability to acquire and sell quota as needed. The establishment of four trawl sectors imposes risks to harvesters because it reduces the amount of QP available to each sector and creates a firm set of allocations that could cause a sector to close if one or more of those allocations were met. For example, if the incidental catch of Pacific whiting in the nonwhiting sector is higher than anticipated, nonwhiting harvesters could end up being constrained by Pacific whiting and would not be able to purchase whiting quota from shoreside whiting harvesters to alleviate some of that constraint. This division of quota between the shoreside sectors could restrict the ability of nonwhiting harvesters to prosecute fishing activity if some species become unexpectedly constraining, because it establishes

boundaries and restrictions on fishing activity without a mechanism for harvesters to work around those restrictions. Alternatively, the establishment of four trawl sectors implies that a set-aside or allocation of non-target species will be necessary for the whiting fishery. Such a set-aside may be a target species for the nonwhiting fishery. Setting firm allocations for separate trawl shoreside sectors may mean a loss of economic opportunity in years where the whiting fishery does not need that entire set-aside, thus jeopardizing the ability of the trawl sectors to achieve their allocation. Sablefish is one example of a species where catch in the whiting fishery has varied from year to year and for which allocations necessary to establish four sectors may result in lost potential or produce a constraining species. In years where the catch of sablefish is low in the whiting fishery, that catch will reflect a lost economic opportunity to nonwhiting harvesters if that quota cannot be transferred to them. Figure A-2 shows sablefish catch in the whiting fishery over the past several years. This figure shows that the catch of sablefish has varied substantially. Interestingly, the largest source of variation is in the shoreside whiting fishery. In years where sablefish bycatch is low, the inability to transfer that catch to the nonwhiting sector (because of the establishment of four trawl sectors) represents a lost opportunity.

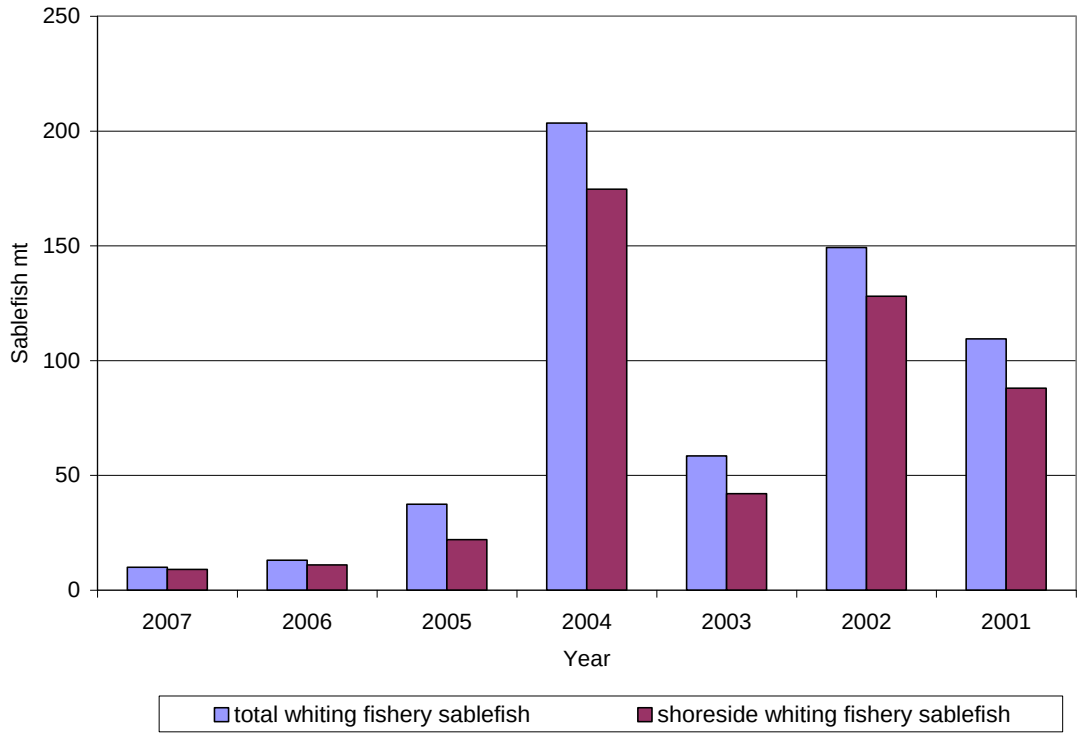


Figure A-2. Bycatch of sablefish in the Pacific whiting fishery (2001–2007).

Measures used to Prevent Exceedance of Allocations

Closing portions of the fishery through area restrictions, season closures, or some other measure to prevent the trawl sector from going over an allocation, or implementing those measures because another sector has exceeded its allocation, is likely to mean the preemption of some fishing opportunities to harvesters in the trawl sector. Many target species are only available in certain areas, such as shelf flatfish. If, hypothetically, an overage of yelloweye rockfish occurs in the trawl sector or another sector that requires depths less than 150 fathoms be closed to trawl activities, several species of flatfish will be inaccessible (such as sand sole, sanddabs, and English sole, among others). This area-based closure would mean that the sector would not be able to harvest these target species, and revenues in the fishery

would be lower than expected. In other cases, some vessels may not have the capacity to fish deeper than 150 fathoms even if target species are available at those deeper depths. However, because of the transferability provisions of a rationalization program, harvesters not able to fish in those other areas can transfer quota to a vessel that does operate in areas remaining open and in this way continue to participate in the fishery.

If measures were not used to prevent overages from the trawl sector or from other sectors, the outcome may mean the exceedance of a management target such as an OY. In the worst-case scenario, the belief that another sector or another harvester can affect the opportunities of trawlers in a rationalized fishery can lead to behavior that resembles race for fish behavior. This is most likely to occur for bycatch species or cases where catch potential is large relative to the management target. Not implementing a restriction, such as an area closure, in a case where a management target is met or exceeded may mean that rebuilding plans are jeopardized or over-fishing occurs. Area closures could also be used to slow the harvest of some species if the Council identifies the need for additional tools to achieve various goals for managing the fishery that are not being achieved by the rationalization program itself. Therefore, while implementing a restriction on the trawl sector to prevent an overage in the trawl sector, or as a result of an overage in a nontrawl sector, may restrict economic opportunity, it is likely to assist in the long-term health of groundfish stocks.

A-1.4 Management of Nonwhiting Trips

❖ *Provisions and Options*

> Nonwhiting trips are those with less than 50 percent whiting. No changes to management measures, other than those identified in Section A-1.3, have been identified at this time.[9]

Nonwhiting trips are those where whiting comprises less than 50 percent of the groundfish catch.

No management measures other than those identified in Section A-1.3 have been identified at this time.

A-1.5 Management of Whiting Trips

❖ *Provisions and Options*

> Whiting seasons will not be changed under the TIQ program, and so the current spring openings will be maintained to control impacts on Endangered Species Act (ESA)-listed salmon.[10]
>
> When the primary whiting season for a sector is closed (see section A-1.3 for options on the number of trawl sectors)
>
> - ► If there are 3 sectors: for shoreside deliveries, cumulative whiting catch limits will apply and shoreside QP will be required to cover whiting incidental catch. Deliveries will be prohibited for at-sea sectors during at-sea closures.
> - If there are 4 sectors: whiting sectors will be prohibited from delivering.

❖ *Rationale and Policy Issues*

Maintaining the existing season structure of the whiting fishery is intended to accomplish several objectives. One objective is to continue to minimize interactions with salmon and in this way continue to meet ESA requirements over salmon management. The reason for continuing to maintain different start dates for the at sea fishery and the shoreside fishery is that many mothership catcher vessels also deliver to shoreside processors. Having the fisheries timed differently is expected to minimize conflicts between the mothership sector and the shoreside sector over catcher vessel participation in both sectors. By maintaining different start dates for this fishery, catcher vessels can participate in the mothership sector in May and early June, and motherships can expect those vessels to deliver catch without concern that catcher vessels would unexpectedly move to the shoreside sector. The inverse is also true. By maintaining a different start date, shoreside processors do not have to have much concern that catcher vessels will unexpectedly move to the mothership sector.

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[9] For the nonwhiting fishery there is a potential that a vessel might make a targeted whiting trip by accumulating whiting QPs provided to cover whiting bycatch in the nonwhiting fishery. This could create a problem if it occurred during a time when the whiting fishery is closed to control for impacts on ESA-listed salmon. Other than that, whiting-targeted trips using whiting QP intended for whiting bycatch in the nonwhiting fishery might not create a problem. Restrictions might be imposed on whiting catch in the nonwhiting fishery as needed to address concerns ESA concerns.

[10] The current process for changing the whiting fishery opening dates involves a regulatory amendment developed under the FMP through a framework process. Implementation of an IFQ program should not change this process.

For a management system in which the various whiting sectors would be managed under separate IFQ systems, the Council considered an option that would allow unused whiting QP to be rolled from one sector to another. This option was rejected early on in favor of maintaining the separation among sectors or allowing the market to handle redistribution of whiting QP by managing the fishery as a single sector under IFQs. Under the final preferred alternative, rollover of QP was not a consideration because the at-sea sector is managed with co-ops.

❖ *Interlinked Elements*

Sector management (three versus four sectors) - Under the four-sector option, the directed whiting sectors would be prohibited from delivering whiting when the fishery is closed. Under the three-sector option, QP and cumulative limits would be used for managing shoreside whiting outside the whiting season.

❖ *Analysis*

The existing start date for the at sea portion of the Pacific whiting fishery was established as a mechanism to minimize the take of salmon. Historical information suggests that salmon bycatch is higher in months prior to May. It can be reasonably inferred that changing the start date of the fishery to an earlier period would, therefore, result in more salmon bycatch than would otherwise be the case.

The effect of the existing start date has economic implications in addition to biological implications. The existing timing of the fishery allows participants in the at sea fishery to engage in fishing opportunities before moving to the Bering Sea Pollock fishery or to the shoreside whiting fishery. This allows participants to engage in multiple fishing opportunities throughout the year and generate greater revenues compared to a case where no differentiation in the timing of fishing opportunities existed. While rationalization may make differential season start dates less necessary for those harvesters that desire to participate in multiple fisheries, it still has the effect of minimizing conflicts that may arise between various processors over catcher vessel deliveries and the timing of those deliveries. Since shoreside processors and motherships use many of the same catcher vessels, maintaining a differential start date minimizes the conflict shoreside processors and mothership may have over when those catcher vessels should engage in at sea activity or shoreside activity.

A-1.6 Groundfish Permit Length Endorsements

❖ *Provisions and Options*

Option 1: Length endorsement restrictions on limited entry permits (LEP) endorsed for groundfish gear will not apply for vessels using LE trawl gear. (This action will not change the application of length endorsement restrictions for vessels using LE longline or pot gear).

- **Option 2:** Length endorsement restrictions on LE permits endorsed for groundfish gear will be retained; however, the provision that requires that the size endorsements on trawl permits transferred to smaller vessels be reduced to the size of that smaller vessel will be eliminated (i.e., length endorsements will not change when a trawl-endorsed permit is transferred to a smaller vessel).

❖ *Rationale and Policy Issues*

Elimination of the groundfish permit length endorsement is being considered because rationalization of the fishery is expected to eliminate the incentives for "capital stuffing" and increasing capacity in the fishery beyond what is necessary to harvest the available catch. In a race for fish fishery where vessels compete with one another for catch, there is a large incentive to increase the capacity and

competitiveness of vessels by increasing speed, hold capacity, equipment capacity, etc., because increasing this type of capacity makes it more likely that a vessel will out-compete other vessels in a fishery and assume a large percentage of the available harvest.

Since rationalization eliminates the need for vessels to compete with one another, it also eliminates the incentive vessel owners and operators have for capital stuffing. The incentives created by rationalization lead toward capital that is able to maximize revenue given the opportunities in the fishery, but this can only be done if the market is able to indicate the correct incentives toward fishery participants. The elimination of the length endorsement is intended to allow fishery participants the ability to optimize their fishing capital relative to their fishing opportunity.

The option of retaining the length endorsement but not requiring that the length endorsement declines if it is transferred to another vessel is intended to accomplish a couple of different factors. Vessels in the trawl fishery are built to specifications that make them consistent with the length endorsement for the permit that is registered to that vessel. Since there are limited numbers of permits that fall under any given size category, the value of many vessels is artificially inflated to some degree. If the length endorsement were to be eliminated, it is possible that vessels that fall under a relatively inefficient size category would become less valuable as vessels of that size category are no longer needed to harvest the resource, and instead the fleet can instead become made up of efficient vessels. Inversely, if the length endorsement is retained, the fleet will continue to be made up of vessels of varying sizes according to the permit length endorsements and, therefore, the fleet must continue to be comprised of some relatively inefficient vessels. The requirement that the fleet continue to be made up of at least some relatively inefficient vessels means that some relatively inefficient vessels will continue to have value.

The option of not requiring that the length endorsement declines if the permit is transferred to a vessel of a smaller size recognizes that a reduction in fleet capacity is accomplished through fleet consolidation in a rationalized fishery rather than through a decline in the size of vessels in the fishery (which may tend to happen if the permit length endorsement declines if traded to a smaller vessel). In other words, the implementation of rationalization allows entities essentially to stack their fishing privileges on to fewer vessels, resulting in fleet consolidation. Under status quo that is not possible.

❖ *Interlinked Elements*

No provisions of Amendment 20 appear to be substantially interlinked with length endorsement.

❖ *Analysis*

Retaining a vessel length endorsement on a LEP is expected to result in some inefficiency. The effect of retaining the length endorsement may very well mean that vessels of an inefficient size category will remain in the fishery, increasing the aggregate cost of harvesting groundfish, and decreasing the economic efficiency of the fleet. If a length endorsement is retained, some permits and associated vessels may have a greater asset value if their associated length endorsement is of the size necessary to prosecute fishing activities efficiently.

However, before drawing conclusions about whether vessels and permits will retain value if the permit length endorsement is relaxed, it is important to view the count of permits in each size category and compare that to the expected amount of fleet consolidation. The following figure illustrates the existing count of LEPs by size category. From this figure it is apparent that nearly 80 permits exist that fall under the "efficient" size category identified by Lian, Weninger, and Singh (2009). When compared to the expected amount of fleet consolidation, it appears that there will be sufficient numbers of permits in the efficient category to handle the number of boats in the fishery. This means that, contrary to some

arguments made for retaining the endorsement, retaining the length endorsement is likely to do very little in terms of retaining the asset value of permits or associated vessels. However, as the number of permits in the efficient category is still somewhat limited, there may still be some small effect of retaining that endorsement. Furthermore, if the efficient vessel size changes over time through technological change, retaining the length endorsement would mean that vessels and permits would retain some additional asset value if the length endorsement is retained.

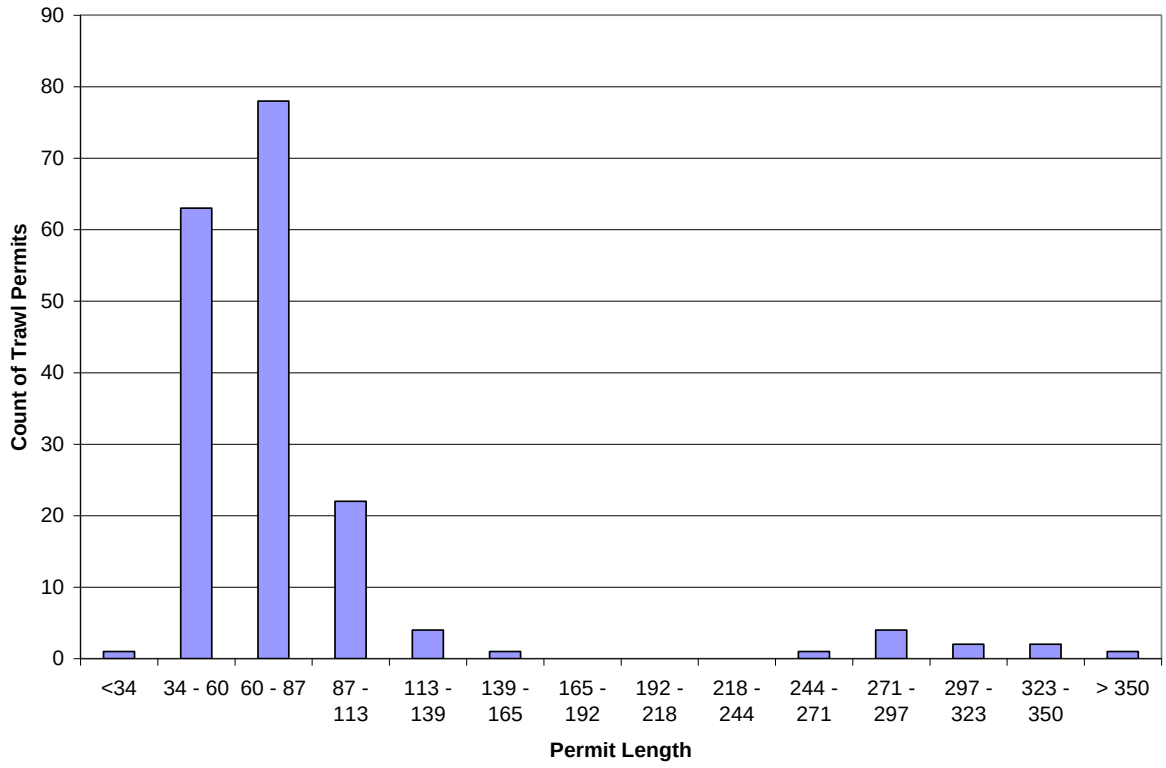


Figure A-3. Count of limited entry trawl permits by size category.

A-2 IFQ SYSTEM DETAILS

A-2.1 Initial Allocation and Direct Reallocation

The Council began its development of the IFQ alternatives under the guidance provided in the MSA as reauthorized by the Sustainable Fishery Act of 1996 and completed the design pursuant to the requirements of the 2006 reauthorization of the MSA. Under the Sustainable Fisheries Act, Councils developing IFQ programs were required to take into account an NRC study (NRC, 1999) on the topic. The NRC recommended that "the councils consider a wide range of initial allocation criteria and allocation mechanisms in designing IFQ program . . . and more broadly consider . . . (1) who should receive initial allocation, including crew, skippers, and other stakeholders (councils should define who are included as stakeholders); (2) how much they should receive; and (3) how much potential recipients should be required to pay for the receipt of initial quota (e.g., auctions, windfall taxes)" (NRC 1999) (pg. 203). Councils should "avoid taking for granted the option of 'gifting' QSs to the present participants in the fishery, just as they should avoid taking for granted that vessel owners should be the only recipients and historical participation the only measure of what each deserves. Councils should consider using auctions, lotteries, or a combination of mechanisms to allocate initial shares of quota" (NRC 1999) (pg. 207). This section covers most of the initial allocation topics raised by the NRC[11] as well as the requirements of the MSA, as reauthorized in 2006 (Table A-12). Specifically, this section covers the following issues related to initial allocation of IFQ as QS:

Eligible Groups

- What groups will be eligible to receive an initial allocation of QS (A-2.1.1.a)?
- How much of the initial allocation will go to each group (A-2.1.1.a)?
- What criteria must be met for membership in each group and how might the attributes that meet those criteria be passed on or accrue to successors in interest (A-2.1.1.b, c, and d)?

Recent Participation

- Should recent activity or membership in the group be required to receive an initial allocation? (A-2.1.2.a, b, and c)

Allocation Formula

- What amounts of QS should be allocated to each of those qualifying for an initial allocation? (A-2.1.3, a, b, c, and d) The following are considered in addressing this allocation question:
    - Should there be an equal allocation element in the allocation formula?
    - Should there be a landing history element in the allocation formula?
    - What time periods should be used for allocation?
    - Should the allocation formula take hardships into account?
    - Should the same credit be received for a given amount of catch, regardless of the year in which it is harvested?

Initial Recipients vs. Eligible to Own

The question "Who should be eligible to receive an initial allocation of IFQ?" is separate from a similar question "Who should be eligible to acquire IFQ after the initial allocation?" The latter question is covered in Section A.2.2.3. The initial allocation does not tell us which groups (permit owners, crew, processors communities or others) will come to hold the quota shares over the long run.

[11] The primary exception is the amount that initial recipients might pay to receive their initial IFQ allocation See Sections A-2.3.2 and A-6 for discussion of issues related to fees and auctions.

- Should overfished species be allocated on basis different from that used for other species?

Exceptional Situations

- With respect to the allocation formulas, how should various exceptional situations be addressed (e.g., credit for EFP landings in excess of trip limits)? (A-2.1.4)

Appeals

- What process should be provided to address disagreements about applications of the provisions and unusual situations that may arise that are not otherwise addressed? (A-2.1.5)

Direct Reallocation and Future Allocation after Initial Issuance

- If after QS is issued direct reallocation appears to be needed to address the redefinition of management units[12] or if there are substantial changes in the status of a species, how would those reallocations be achieved? How would an initial allocation be made for a groundfish species not currently within the scope of the IFQ program? (A-2.1.6)

Policy guidance on allocation actions is provided in the MSA (National Standards and 303A provisions pertaining to LAPPs), the goals and objectives of the Council's groundfish FMP, and those specified for this amendment. Guidance related to initial allocation has been grouped into categories in the summary shown in Table A-12. In the following sections, we will draw on this guidance to focus our evaluation of various initial allocation provisions.

[12] For the IFQ program, a management unit is defined by the species or species group, area, and trawl sector (e.g., shoreside, mothership, or catcher-processor) for which QS is issued.

Table A-13. Policy guidance on allocation decisions from the MSA, as reauthorized in 2007) and Council goals and objectives.

Guidance	Reference
Conservation	MSA - National Standard 4(b)
Allocations reasonably calculated to promote conservation.	
Net Benefits and Efficiency	
Consider efficiency	MSA - National Standard 5
Reduce capacity	MSA - 303A(c)(1)(B)
Attempt to achieve the greatest net economic benefit to the nation	GF FMP Obj 6
Provide for a[n] . . . efficient groundfish fishery.	A-20 Obj 2
Disruption (Efficiency and equity implications). Accomplish change with the least disruption of current domestic fishing practices, marketing procedures, and the environment (NOTE: this objective also has implications for efficiency and net benefits).	GF FMP Obj 15
Excessive Shares (Efficiency and equity implications). Control of excessive shares (including geographic concentration)	MSA - National Standard 4(c) MSA – 303A(c)(5)(B)(ii) MSA – 303A(c)(5)(D) A-20 Constraint 6
Fairness and Equity	MSA - National Standard 4(a) GF FMP Obj 13
Establish procedures to ensure **fair and equitable** initial allocations, including consideration of (i) **current and historical** harvests; (ii) **employment** in the harvesting and processing sectors; (iii) **investments** in, and dependence upon, the fishery; and (iv) the **current and historical participation** of fishing communities;	MSA – 303A(c)(5)(A)
Fishery Participation. Allocate IFQ to persons who **substantially participate** in the fishery	MSA – 303A(c)(5)(E)
Market Power. Avoid provisions where the primary intent is a change in marketing power balance between harvesting and processing sectors.	A-20 Constraint 5
Sector Health	
Provide for a viable, profitable . . . groundfish fishery.	A-20 Obj 2
Promote measurable economic . . . benefits through the seafood catching, processing, distribution elements, and support sectors of the industry.	A-20 Obj 6
Labor: Crew, Processing Plant Workers Etc.	
Include measures to assist, when necessary and appropriate, . . . captains, crew	MSA – 303A(c)(5)(C)
Promote measurable . . . employment benefits through the seafood catching, processing, distribution elements, and support sectors of the industry.	A-20 Obj 6
Communities	
Consider importance to communities (in order to provide sustained participation and to the extent practicable minimize adverse impacts).	MSA - National Standard 8
Consider promotion of sustained participation by fishery dependent communities.	MSA – 303A(c)(5)(B)(i)
Include measures to assist, when necessary and appropriate, entry level and small fishing communities.	MSA – 303A(c)(5)(C)
Consider the importance of groundfish resources to fishing communities, provide for the sustained participation of fishing communities, and minimize adverse economic impacts on fishing communities to the extent practicable.	GF FMP Obj 17
Minimize adverse effects from an IFQ program on fishing communities and other fisheries to the extent practical.	A-20 Obj 5
Small Vessels, Small Entities, and New Entrants	
Consider promotion of sustained participation by small owner operators.	MSA – 303A(c)(5)(B)(i)
Include measures to assist, when necessary and appropriate, entry level and small vessel owner-operators	MSA – 303A(c)(5)(C)
Avoid unnecessary adverse impacts on small entities.	GF FMP Obj 16
General Public: Auctions – must be considered	MSA – 303A(d)

A-2.1.1 Eligible Groups

A-2.1.1.a Groups and Initial Split of QS

Eligible Groups

- What groups will be eligible to receive an initial allocation of QS (A-2.1.1.a)?
- How much of the initial allocation will go to each group (A-2.1.1.a)?

❖ Provisions and Options

Eligible Groups The initial allocation of QS will be made either only to permit owners or to permit owners and processors. *Some QS or QP may be set aside to support adaptive management.*

	Nonwhiting Sector QS		Whiting Sector QS	
	Amount to Permits	**Amount to Processors**	**Amount to Permits**	**Amount to Processors**
Option 1	100%	0%	100%	0%
Option 2	87.5%	12.5%	75%	25%
Option 3	75%	25%	50%	50%
Option 4 (10% ***QP*** for Adaptive Management)	100%	0%	100%	0%
Option 5 (10% ***QP*** for Adaptive Management)	75%	25%	50%	50%
Option 6a (10% ***QP*** for Adaptive Management)	80%	20%	80/20 split of whiting 100/0 split for all other species	
Option 6b (10% ***QP*** for Adaptive Management)	80%	20%	80%	20%
	Nonwhiting QS		**Whiting QS**	
	Amount to Permits	**Amount to Processors**	**Amount to Permits**	**Amount to Processors**
►**Option7** (10% ***QS*** for Adaptive Management)	← 90%	0%	80%	20%

Due to limitations on available documentation, fish "receivers" may be used as a proxy for the "processors" (see A-2.1.1.d). After initial allocation, trading will likely result in changes in the distribution of shares among permit owners and processors. Additionally, entities that are neither permit owners nor processors may acquire quota shares (see below: "IFQ/Permit Holding Requirements and IFQ Acquisition").

Rationale and Options Considered, but not Included

The NRC report on IFQ program design (NRC 1999) contained the following recommendations with respect to groups for which an initial allocation of QS might be considered.

NRC Recommendations for Allocation Groups (Other than Vessel Owners)	
Skippers and Crew Allocations	Consider where appropriate. Lack of detailed catch data are not a reason to forgo this option as equal allocation is an option. It may be less appropriate in industrial fisheries that do not involve crewmembers as co-venturers in the same sense as other fisheries.
Processor Allocation	No compelling reason to include or exclude processors from an initial allocation.
Communities	Consider initial allocations of IFQ to communities. Some communities may be heavily dependent on fishing for social, cultural, and economic values and/or are lacking in alternative economic opportunities.
Public	Consider auctions, lotteries or combinations of mechanisms to allocate initial shares. Avoid taking for granted the option of "gifting" IFQ.

With respect to vessel owners, the NRC report notes that they are usually the recipients of initial allocations. Initial allocation to "permit owners," as a group, was not considered in the NRC report. This may have been because the permit owner was considered analogous to the vessel owner. The permit owner generally tends to be the vessel owner, but not always. Since establishment of the groundfish license limitation system, permit owners (not vessel owners) have been the recipient of new LE allocations (the fixed gear sablefish endorsement and fixed gear tier system). Criteria often mentioned in connection with this issue include compensation for those whose asset values are most adversely affected by the new program and minimizing disruption (PFMC, 1998). During scoping, public comments also recommended consideration of allocations to crew and captains, vessel owners, communities, lottery entrants, and auction. Of these, the TIQC recommended that consideration be given to allocation to current owners of LE permits, vessel owners, processors, or combinations thereof, as well auctions. However, in the final set of program alternatives the TIQC recommended to the Council it included only options for allocating to holders of LE permits and processors.

- Consideration of Vessel Owners

The TIQC recommended against allocation to vessel owners rather than permit owners, because once the LEP system was established, everyone understood that the permit represented the access privileges for the fishery and much of the value of the fishery was capitalized into the value of the permit. Thus, permit values will be more directly affected by a change in the nature of the access rights. At the same time, it is recognized that the fleet consolidation will indirectly diminish the value of a vessel, to the degree alternative uses of surplus vessels generate less net revenue for the vessel owners. Splitting the allocation between vessel and permit owner was discussed but considered overly complex.

- Consideration Individual History as an Owner (Personal History)

The TIQC recommended not considering allocation to the owner of a vessel or permit at time of landing (i.e., personal history) because it could result in allocations going to individuals who no longer participated in the fishery and would inhibit entry and exit during the development of the program. Allocation to the current owner of assets in the fishery is a way in which current participation is taken into account.

- Consideration of Skippers Crew

Direct allocation to skippers and crewmembers was discussed and the costs and complexity of identifying vessel workers and determining whether they participated on vessels while those vessels

were fishing in the groundfish trawl fishery were noted. Complexities include the fact that crewmember-licensing requirements vary between states and in some cases crewmembers are not required to have permits. Multiple alternative sources of information would have to be considered in determining crewmember eligibility for an initial allocation.

With respect to relative impacts of an initial QS allocation on different classes of fishery participants, it was noted that for a crewmember dislocated because of the IFQ program there would likely be a greater number of economic alternatives available, as compared to a fishing permit or vessel. Additionally, since crewmembers move between fishing operations, an allocation to crew could reduce the initial allocation available to a harvester in comparison with its recent operation levels, leaving fixed capital assets without significant production opportunities. While harvesters receiving less than their needs would be able to acquire additional QS through purchase, the need to make such purchases would likely mean a greater disruption during initial implementation of the program.

● Consideration of Communities

In the fall of 2005, the Council received a report on potential measures to address community concerns. Included among the measures considered was direct allocation to communities. Among other issues, it was noted that it would be difficult to determine what body within the community might represent that community and receive the initial allocation. For most of the process, communities expressed little if in any interest in receiving an initial allocation; community leaders voiced concern over the administrative costs and political difficulties that would be entailed in managing an allocation of QS to communities and distributing it within the communities. As the Council reached its final decision, some public interest was expressed in creating criteria for community fishing associations (CFAs) and providing CFAs with an initial allocation. The Council is considering a trailing amendment that might create criteria for CFAs (see Section A-9) and provide them with some degree of an exemption from accumulation limits. However, the Council chose not to consider a direct initial allocation of QS to CFAs but instead to rely on the following:

- The QS set-aside for adaptive management as a potential source of quota to address adverse impacts on communities (Section A-3)
- A number of other provisions that are expected to benefit communities

Other measures in the program intended to address community needs (in addition to the QS set aside for adaptive management) include the following:

1. Maintenance of a split between the at-sea and shoreside trawl sectors (options for a single sector had been considered) (Section A-1.3)
2. Specification of a broad class those eligible to acquire QS, including communities (Section A-2.2.3.a)
3. Inclusion of a temporary moratorium on the transfer of QS to ease the adjustment period and allow for adaptive response (Section A-2.2.3.c)
4. Specification of vessel and control limits to spread QS among more owners and potentially more communities. (Section A-2.2.3.e)
5. Inclusion of a community advisory committee as a formal part of the program performance review process (Section A-2.3.4)

Additionally, any community that owns or acquires a permit prior to the initial allocation would be eligible to receive an initial allocation as a permit owner.

Consideration was also given to area management (Section A-1.2) and a landing zone requirement (Section A-8), both of which would have some effect in maintaining a distribution of landings along the coast, but the latter of which would be most directly targeted to maintaining a distribution of landings among communities. A number of other provisions to address community concerns were considered at the November 2005 Council meeting but rejected. Rejected measures included the right of first refusal before QS is transferred out of a community, an owner on board requirement, a partial prohibition on leasing, and redistribution of QS to new entrants, including nonprofit community organization. These rejected measures are discussed further in Section A-11.

- Consideration of Permits and Processors

Many reasons have been given for allocating to permits and allocating to processors. The following tables list some of the reasons that are contained within the records of the Council deliberations.

Table A-14. Some of the reasons given for allocating to permit holders.

Reasons to Allocate to Permit Holders	Reasons Given for Not Allocating All QS to Permit Holders
The management problem to be resolved with IFQs is the management of harvesting not processing.	The problem of managing the harvest is still resolved if some of the QS is given to processors.
It is the harvesters who have become overcapitalized as a result of the management system.	The processing sector is also overcapitalized either as a result of participating in the race for fish or as a result of reductions in harvest.
Compensation for reduced permit value and compensation to those who are squeezed out in the consolidation process.	Long-term compensation should not be given for a short term problem.
The language of the MSA strongly indicates an emphasis on the allocation to harvesters (e.g., National Standard 4). Permit holders are fishery participants that are invested and dependent on the fishery (303A) and have made contributions to the development of the fishery.	Permit holders may not be operating the harvesting business. They may be leasing to the vessels. Further, they are often owned by corporate entities, not the fishermen themselves.
Harvesters cannot operate without QS or QP to support their harvest.	Harvesters can acquire QS/QP through the market and by partnering with processors.
A harvesting operation not receiving an initial allocation of QS/QP will be in a position of greater financial risk than a processing operation without QS/QP.	Processors may be at financial risk if harvesters get all the QS, gain market power, and reduce processor profits.
The allocation of QS to harvesters will correct a current imbalance in market power between the two sectors.	If processors receive no QS as part of the initial allocation, a market power imbalance will be created in favor of harvesters.
There is a greater conservation benefit if the QS is in the hands of the fishermen, including the reduction of bycatch of overfished species. An allocation to fishermen clearly puts responsibility on them.	Permit holders will not necessarily be the fishermen and may lease the QP to harvesters. If the system allows processors to acquire QS then conservation concerns should not be a reason for not giving it to them as part of the initial allocation. Earlier analysis indicated there was not a difference between allocations to harvesters and processors with respect to conservation effects.
If QS is given to processors they will have less incentive to ensure that it is used optimally than if they have to buy it.	Regardless of how they receive it, they will still lose benefits if the QS/QP is not used optimally.
Processors will benefit in other ways and, therefore, do not need that additional compensation. For example, the total volume of product may increase.	Harvesters will also benefit from the increase in total product volume.
The history of development of this program encompasses the identification of a continued harvester overcapacity problem and conception of the buyback program in 1996, the groundfish strategic plan, and the bycatch reduction amendment. The success of this long-term effort requires protection for those established in the fishery in order to increase the economic stability for all.	For stability, harvesters need a stable processing sector to sell to.

Table A-15. Some of the reasons given for allocating to processors.

Reasons to Allocate to Processors	Reasons Given for Not Allocating to Processors
Compensation for stranded capital	Stranded capital will not occur for processors. Long-term compensation should not be given for a short term problem.
Processors are fishery participants that are invested and dependent on the fishery (303A) and have made contributions to the development of the fishery.	National Standard 4 says allocations, when necessary, should be to "fishermen." No precedence for allocating IFQ to processors
Keep balance of market power and flow of product to existing plants	Will create a market power imbalance.
Facilitate communication and coordination of fishing activity between plants and vessels, including management of total harvest, bycatch, and participation among co-ops.	Such communication and coordination occurs under status quo and processors do not need an initial allocation to continue. If processors do not receive an initial allocation they can still participate in co-ops by acquiring QS in the market place.
There is a conservation benefit whether you give QS to permit holders or processors.	Degrades conservation benefit.
Maintain diversity and competition in the processing sector.	The processing sector will be consolidated and new entry will become more difficult.
Processor buy-in is needed to move the program forward.	
Since processing plants are more tied to communities than vessels are, an allocation to processors will stabilize the distribution of harvest across communities.	The major processing companies are active in multiple ports and may move allocations between ports. It is not clear that an allocation to processors will address concerns about geographic redistribution.
If processors do not receive an initial allocation existing working relationships will be disrupted.	Long established relationships between processors and harvesters will continue to exist, there will not be widespread disintegration and relocation of these relationships.
	Consolidation among permit holders not associated with processors will increase, reducing the number of participants in the fishery that are not linked to processors.
	An allocation to processors does not take into account the permit owner's obligation to repay loans from the buyback program. Those loans bought up permits representing nearly 50% of the fleets landing history.
	There is not a large disadvantage to processors if they do not receive an initial allocation.
	An initial allocation to processors may lead to greater than desirable consolidation, particularly if there is a grandfather clause.
	The processing sector as a whole, will receive some allocation because they hold permits.

An option to allocate nonwhiting groundfish evenly between permit owners and processors (50 percent each) was rejected. The following is the rationale provided by the TIQC and Groundfish Allocation Committee (GAC) in its recommendations for removal of this option.

Rationale for removing the 50/50 option for nonwhiting groundfish:

- TIQC members raised concern that with a 50 percent allocation to processors, the quota initially allocated to a trawl permit may not be enough to allow for fishing. One TIQC member opposed to removal of the 50 percent allocation option noted that analysis of impacts has not been completed and so the suggested impacts are only assumed (2/2007 TIQC meeting).

- The majority of GAC members believed that a 50 percent initial allocation to processors would create an imbalance of power. They cited as examples the lack of power that vessel owners have had in negotiating crab prices and the potential for the number of alternative buyers to be more restricted within smaller geographic regions than it is coast wide. GAC members also noted concern that the initial allocation would only be the starting point with respect to the amount of shares controlled by processors and that they would expect processors to acquire additional shares, subject to accumulation limits. Some processor/permit owners may also receive shares for both their processing activity and permits they own. In general, there was a perception that there is a current imbalance in favor of the processors and that a 100 percent allocation to harvesters would not create an imbalance in favor of harvesters. On that basis, they recommended that the analyzed range be narrowed by reducing the maximum amount that might be allocated to processors while maintaining the option of a 100 percent allocation to permit holders. A minority of GAC members wanted to see the analysis of a 50/50 split before making a decision. It was noted that analysis has not yet been produced to demonstrate that an imbalance would result from a 50/50 initial allocation, though question arose as to the extent that a quantitative analysis could provide insight on this issue (12/2006 GAC meeting).
- During discussion, concern was also expressed that vessels fishing IFQ provided by processors might not have the same incentive to minimize bycatch as it would for its own IFQ. Others countered that the processor and vessel would both have incentive to minimize bycatch in order to maximize their ability to harvest and process target species (12/2006 GAC meeting).

Initial rationale for including a 50/50 option:

- Part of the original rationale for the 50/50 option, when the TIQC developed it, was that it was the closest legal alternative to a two-pie system.

Rationale for the Council's final decision on the allocation split between permit owners and processors:

During Council discussion it was noted that the MSA LAPP provisions in Section 303A(5) require that the Council ensure fair and equitable initial allocations, including consideration of (1) current and historic harvests, (2) employment in the harvesting and processing sectors, (3) investments in and dependence on the fishery, and (4) the current and historical participation of fishing communities. Congress specifically instructed that the Council fully analyze alternative program designs, including the allocation of limited access privileges (LAPs) to harvest fish to fishermen and processors. Much of the Council's discussion about an allocation to processors revolved around the impact of both status quo and trawl rationalization on market power. It was noted that the U.S. economy relies on competition and on individuals and businesses acting in their own self-interest for growth, innovation, price setting, and the allocation of resources. There was a sentiment that government should not interfere in business competition unless it is necessary for the public benefit. It was noted that the Council interferes with harvesting businesses because of problems identified relative to conservation and management both in the nonwhiting and whiting fishery. When the Council intervenes in harvesting, it cannot help but also interfere with the processing businesses by changing the basic bargaining dynamics in the raw fish product market. While ex-vessel price negotiations have to be left to the harvesters and processors, the Council felt it could not ignore how fishery management actions might influence those negotiations. Some Council members opposed any allocation to processors because they believed it would have an adverse effect on market power (increasing market power for processors) and that there were ways to address concerns about community stability, other than by allocating to processors. They noted that even if processors received no QS, after initial allocation processors would likely be in a position to acquire additional shares and achieve the balance of power they want. The real issue of concern in this

regard may be the control limits, to make sure the balance does not get out of hand. Others were concerned about small processors and expressed concern that not to allocate to processors might cause more consolidation and a further decline in the number of buyers, increasing the power of remaining processors. In its PPA, the Council recommended giving processors 20 percent of the shoreside allocation of QS for all species except bycatch taken in the shoreside whiting fishery. Council members noted the difficulty of determining the correct percentage for a possible QS allocation to processors. The option for a 50 percent allocation of whiting QS to processors seemed like far too much. When a 20 percent option was proposed, some Council members felt that when the 20 percent allocation to processors was combined with a 10 percent allocation for adaptive management, and considering that some processors would receive QS for the permits they hold, the amount remaining for harvesters would be insufficient. In selecting its PPA Council members noted that the case for providing QS to whiting processors seemed to be relatively clear but it was less clear for nonwhiting processors. For whiting processors, the switch from a derby fishery would immediately result in some of the processing capacity becoming surplus. The shift from two-month cumulative limits to IFQs would not affect the nonwhiting processors in the same way. However, with respect to nonwhiting processors there was concern for small processors' ability to compete with larger processors. The 20 percent approach chosen for the PPA was believed by some to be a fair middle ground for public review and comment.

In its final preferred alternative, after further review of the analysis and public testimony, the Council recommended giving processors 20 percent of the QS only for shoreside whiting and no QS for shoreside nonwhiting. In taking this action, Council members expressed their concern that an initial allocation of QS to nonwhiting processors would add too much to the market power of shoreside nonwhiting processors. They noted that there was already considerable consolidation among processors, particularly relative to the number of vessels operating in the fishery. Providing processors with an initial allocation would be expected to further increase consolidation and market power. Additionally, the argument that the larger processors also held vessel permits that would provide them with QS held more sway. At the same time, Council members continued to be concerned with the impact of the program on smaller processors. It was noted that if an allocation of nonwhiting QS to processors were to be made, that the appropriate amount might be 10 percent of the QS. Instead, the Council favored providing a 10 percent allocation for adaptive management. The adaptive management program (AMP) could be used not only to provide some amount of certainty and security to the larger processors, but also to provide flexibility to tailor a program that would provide some protection to smaller processors. In making its decision, the Council specified its intent that the AMP be constructed in a manner to ensure that the program accomplishes this as one of its objectives.

With respect to the decision to allocate 20 percent of the whiting QS to processors, differing conditions between the whiting and nonwhiting sectors were noted. In particular it was noted that the size of the shoreside whiting fleet was expected to be very small (only 20 vessels), providing the fleet with greater market power relative to the three major whiting buyers than would be experienced by the nonwhiting fleet relative to the major buyers of nonwhiting species. While the shoreside whiting fleet position would be strong, the analysis predicted that, with the move from a whiting derby fishery to an IFQ program, the amount of processing capital needed in the whiting fishery would decline by 30 to 50 percent,[13] and that competition among whiting processors would tend to increase in order to continue to attract deliveries to their facilities, leading to a decrease in their market power. In contrast to whiting, the nonwhiting trawl fishery is not a derby style system; it is managed with two-month cumulative trip limits. Therefore, the shift to IFQs will not create a sudden increase in the amount of excess processing capacity. Even with a 20 percent allocation of whiting QS to processors, the Council believed it may be uncertain whether the initial allocation of whiting QS to processors will offset whiting harvester gains in

[13] Processors invest in excess capacity to compete with other processors for deliveries by being able to handle peak volumes during the derby fishery. When the derby is over, much of the capital then remains idle. The move to an IFQ program will slow the pace of the fishery resulting in substantial unneeded processor capital.

market power, relative to status quo. An initial allocation of whiting QS to processors functions as a means of guaranteeing supply for processors, granting processors some leverage in bargaining power as they can "hold out" against harvesters, and providing an incentive to make necessary capital investments to increase product recovery yield.

- Option 6a and 7 (FPA) for Whiting

At its June 2008 meeting, the Council added an option that would allocate QS for whiting to processors but not QS for bycatch species in the whiting fishery. This option provides another variation on the initial allocation balance between harvesters and permits and provides a different result with respect to the distribution of wealth and control generated by the initial allocation. Because this variation was added late in the process, it is analyzed separately at the end of the analysis section (page A-107).

- Allocation of QS or QP for the Adaptive Management Program

At its November 2008 meeting, the Council decided that, rather making an allocation of IFQ for adaptive management by setting aside QP, it would set aside an amount of QS, thus creating Option 7 for the eligible groups provision. While QS is set aside for adaptive management, the associated QP for the program may distributed among those holding non-set-aside QS in proportion to their QS holdings (i.e., a pass-through). For at least the first two years of the program, all QP associated with the set-aside for adaptive management will be passed through to those holding non-set-aside QS. Allocating IFQ for adaptive management in the form of QS rather than QP was believed to provide more of an opportunity to make multi-year commitments of adaptive management quo and to increase the assurance that the use of the adaptive management quota will not be usurped for other purposes.

When the Council specified Option 7, it also indicated that the 10 percent set-aside would apply for all nonwhiting species. Since the shoreside nonwhiting and whiting sectors are to be managed as a single shoreside sector, this meant that 10 percent of the nonwhiting species that would otherwise go for bycatch for whiting vessels would be allocated for the AMP that is focused primarily on the nonwhiting fishery. The 10 percent reduction in the initial QS allocation to whiting vessels to cover their bycatch needs would likely be covered by the equal allocation component of the allocation formula (except with respect to overfished species).

❖ *Interlinked Elements*

The following elements of the IFQ program interact with the decision on groups to which an allocation will be made.

- Number of Trawl Sectors (Section A-1.3)

The Council's preferred alternative combines the shoreside whiting and nonwhiting harvest into a single sector. Creating a single shoreside sector has implications for the effects of Option 6a, which would not allocate bycatch species for whiting history to processors. With a single shoreside sector, processors receiving a whiting allocation will have a larger market to go to if they want to acquire QS for the bycatch species needed to harvest whiting.

- Moratorium on Trading (Section A-2.2.3.c)

At the start of the program, the Council's preferred alternative will include a two-year moratorium on QS trading. This moratorium will make it more difficult for processors receiving only whiting (Option 6a) to adjust by either acquiring the needed bycatch species QS or divesting themselves of whiting.

Until they are able to balance their whiting QS holdings with bycatch species, in years when bycatch species limit whiting harvest, they may find themselves with whiting QPs that have little value.

● Grandfather Clause Exemption for Everyone (Section A-2.2.3.e)

There are four options:

- To provide a full grandfather clause exemption, allowing those who would qualify for an initial allocation of QS in excess of the accumulation limits to keep that allocation (Grandfather Clause Option 1).
- To provide an grandfather exemption for up to twice the vessel accumulation limits. Any QS over twice the limit would be redistributed to the remainder of the initial recipients (Grandfather Clause Option 2).
- To provide no grandfather exemption. Any QS over twice the limit would be redistributed to the remainder of the initial recipients (Grandfather Clause Option 3).
- To provide no grandfather exemption but allow those qualifying for an initial allocation of QS in excess of accumulation limits a period to divest themselves of those QS (Grandfather Clause Option 4).

Depending on which of these grandfather clause options is implemented, the initial allocation results may be substantially altered. The balance of allocation between harvesters and processors will not be affected but the distribution between larger and smaller entities will be affected. In general, the amounts of QS allocated to larger producers will likely be less than the shares of harvest the larger producers have taken historically. If larger harvesters have been producing at levels above those facilitated by accumulation limits then their only opportunity to have a chance to stay close to those levels would be through the grandfather clause, such as that provided in Grandfather Clause Options 1 and 2 (and Option 4 on a temporary basis). As the amount of allocation that goes to processors increases, the initial allocations going to harvesters will decline reducing the effectiveness of the grandfather clause in allowing the continuation of larger harvest operations. The degree to which increasing the allocation to processors diminishes the effectiveness of the grandfather clause for harvesters will depend on where accumulation limits are set. For processors, the accumulation limits and initial allocations will not constrain production. Higher accumulation limits would reduce the impact of the presence or absence of a grandfather clause and the interaction with the decision on the initial QS split among groups.

● Additional Measures for Processors (Sections A-2.4 and A-3)

The key decision for eligible groups and initial split (A-2.1.1.a) is whether or not processors will receive an initial allocation of IFQ and if so how much. The following elements are contingent on initial allocation of QS to processors to address concerns about adverse impacts of IFQ program on processors. While addressing this impact, these options would issue QS to processors that differs in character or is for a different duration than the QS issued to LE permit holders.

A-2.4. Additional Measures for Processors. There are options in Section A-2.4, all of which are interlinked with the options of Section A-2.2.1. The options are not mutually exclusive.

Option 1 (Limited Duration QS): QS issued to processors based on buying history will expire after a certain period (to be determined as part of final Council action). When they expire, all remaining QS would be increased proportionally to sum to 100 percent. The rationale for this provision is based on the idea that, if an initial allocation to processors is intended to provide an adjustment period and compensate processors for potential harm, this intent can be fulfilled by issuing QS that has shorter duration than those issued based on harvesting history.

Option 2 (No Grandfather Clause for Processing History): Any QS issued for processing history would not be subject to the accumulation limit grandfather clause (i.e., processors would be

held to the accumulation limits except with respect to landing history issued for any LE permits held by the processor). The rationale for this provision is that processors need not be grandfathered in above accumulation limits in order to receive sufficient compensation for adverse impacts of the IFQ program.

Option 3 (Adaptive Management Program Modification): The AMP will be used to compensate processors for demonstrated harm by providing them witH QP. This provision provides processors relief one year at a time only after harm has been demonstrated.

A-3. Adaptive Management. Under the AMP (without the modification specified in A-2.4 Option 3), 10 percent of the QS would be eligible for use to benefit processor stability, among other objectives.

❖ *Analysis*

The following are the key questions to be covered in this section of the analysis.

1. How does the initial allocation affect who holds the QS over the long term?
2. How does who holds the QS at any point in time affect achievement of goals and objectives, including market power and equity effects related to who receives the initial financial benefit (wealth) from the initial allocation?

The answer to the first question determines the duration and timing of the effects covered under the second question. The sections in which each of the goals and objectives will be discussed are identified in the following table. The section on the effect of the QS allocation on the long-term distribution is extensive and covers topics of relative efficiency, vertical integration, market power, and access to capital. For that reason, a full analysis of that issue is provided in a separate appendix (Appendix E), and a summary is provided here.

		Related Category of Goals and Objectives									
Sections	**Summary (Page Ref)**	**Conservation**	**Net Benefits**	**Disruption**	**Excessive Shares**	**Fairness and Equity**	**Harvester and Processor Sector Health**	**Labor**	**Communities**	**Small Entities and New Entrants**	**General Public**
Impact of QS Allocation on Long Term Distribution	A-48 -A-56	X	X	X	X	X	X	X	X	X	
Impact on Conservation (Resource Stewardship)	A-57	X									
Impact on Sector Health											
Buyers/Processors	A-60			X			X			X	
Harvester Sector—Permits	A-74			X			X				
Harvester Sector—Vessels	A-92			X			X			X	
Labor—Harvester	A-93							X			
Labor—Processors	A-93							X			
Impact on Net Benefits	A-96		X								X
Impact on Equity	A-104				X	X					

Note: The general public is affected by many if not all of these impacts. For example, reduced net benefits have an effect on the general public, but indirectly though the effect on the economy. Here the emphasis is on the direct effect (e.g., paying for administrative costs related to allocation).

Table A-15 provides an explanation of some of the economic terms that are used in this analysis.

Table A-16. Explanation of Terminology: return on investment, profits, and rents.

General Term and Description of the Concept	Economic Term
Return on Investment: Profit that goes to compensation for capital investment (to compensate the owners of capital). For industries that involve greater risk, greater return is required to compensate or attract capital investment. If the industry profit level is not enough to compensate capital, there will not be new investment.	Quasi Rents
Relative Efficiency Profits: Profits earned by firms that are more efficient than others.	Intramarginal Rents
"Reasonable" Profit Level: Income necessary to pay for all labor, supplies, capital, and entrepreneurial expertise used by a firm at going market prices. This includes compensation for capital (quasi rents).	Normal Profits (Zero Economic Rent or Zero Economic Profit)
Extra Profits (Abnormal Profits): Any earnings above normal profits are considered "economic profits" or "economic rents." Economic profits or rents attract new entrants.	Economic Rents (Above Normal Profits)
Value/Cost of the Resource: Amount paid for the use of a raw resource. In open access fisheries management, no one pays for access to the resource; what might otherwise be paid for fishing privileges shows up as extra profit. The extra profit attracts new entrants until efficiency decreases to the point that only normal or less than normal profits are earned. What would have been paid for the resource goes instead to excess capacity.	Resource Rents

Key Findings

1. The initial allocation may have a substantial effect on how the QS is distributed over time (with initial recipients being more likely to accumulate additional QS, up to accumulation limits).
2. Market conditions under rationalization will vary from status quo thus changing the market power dynamics.

Under status quo, the following occur:

- Harvesters and processors negotiate with one another in an attempt to capture the profits that are associated with the resource (resource rents).
- Harvesters, and possibly processors, are overcapitalized, putting them in a position where they are willing to accept unsustainable prices over the shorter term, giving up some of their returns to capital in order to continue operation (operating at a long-term loss).

Under a rationalized system, the following occur:

- Profits that are associated with resource rents will be captured by whoever owns the QS/QP,
- Rationalization will result in more appropriate levels of capitalization and substantially reduce a business' willingness to accept unsustainable prices (operate at less than normal profit levels).
- Under such circumstances and assuming well functioning markets, holding the QS/QP does not give any additional leverage in determining price for the raw product. [If a harvester holds the QS/QP, it would be expected to receive a payment for its fish that reflects a normal profit level and may receive, as part of that transaction, an additional amount reflecting the value of the QS/QP. If a processor holds the QS/QP, the harvester would be expected to receive a payment for its fish that reflects a normal profit level and no more or less.]

However, the result for the rationalized system may change to the degree to which there are other nonrationalized fisheries with surplus capital that is readily adaptable to the West Coast groundfish trawl fishery. Under such circumstances, more of a status quo situation may hold, one in which harvesters (for example) are willing to deliver to a processor witH QP at a price that gives them lower than normal returns, giving up some of their returns to capital. The ability of the competing harvesters to enter depends on the surplus LEPs that are expected to be available after fleet consolidations.

Without such a surplus, there would not be an opportunity for surplus vessels from nonrationalized fisheries to enter the West Coast groundfish fishery.

Before discussing how the initial allocation affects distribution over the long term and the impacts resulting from allocation of QS to different groups, it is useful to have a brief discussion about the entities composing those groups.

● Who: Nature of the Entities and Group Membership

As we consider the groups to which allocations are made, we should take into account that some entities may qualify as members of a variety of groups. For example, when we talk about vessel owners or permit owners, they may also be processors. People have a variety of roles in the harvesting and buying sectors including the following.

- Permit ownerVessel owner
- Vessel operatorCrewmember
- Fish buyerFish buyer/processor
- Fish buyer/processor employee

Individual or business entities may combine a mix of roles to create a business or income earning strategy. As summarized below, these strategies vary in profit generation and risk exposure. Specific criteria for membership in the groups to which allocations might be made are described in Section A-2.1.1.b and c.

● Summary of the Impact of QS Allocation on Long-term QS Distribution

Appendix E contains a detailed analysis of the relationship between the initial and long-term distribution of QS among groups. The results are summarized here. The main dynamic driving the long-term distribution is that more profitable entities are more likely to acquire the QS than less profitable entities; and initial recipients of QS are likely to have a period of greater profitability than those who do not receive QS or receive less QS. This initial advantage may, to some degree, be self-perpetuating. In considering relative profitability, both the total financial profits and the level of risk must also be taken into account. This analysis examines a firm's financial profitability as it is affected by the following factors:

- The firms relative operating efficiency (what it costs to produce)
- The firms vertical integration (which affects both operating efficiency and market power)
- The firm's ability to exert market power to capture above normal profits (what it earns)
- the firms cost to access to capital (what it costs to acquire capital)

Market power is defined as the ability to influence prices in order to obtain above normal profits for a sustained period. Exerting market power requires the existence of barriers to entry. Within the framework of these considerations, Table A-16 on page A-56 provides this section's main conclusions on the following:

- Status quo conditions
- The influences of the IFQ program on QS distribution (regardless of the initial allocation)
- The effect of initial allocation on the long-term distribution of QS

♦ *Summary of the Analysis in Appendix E*

The main points made in each section of Appendix E that support the conclusions in Table A-16 are presented below.

RAW FISH MARKETS AND RESOURCE RENT DISSIPATION OR CAPTURE UNDER STATUS QUO

(Section E.2)

This section describes how prices and quantities produced are determined in a typical market. The main points are as follows:

1. The yield constraint in fisheries (usually an OY or allocation) results in a gap between the minimum price harvesters are willing to fish for and the maximum price that processors are willing to pay.
2. The gap between these two values is the potential resource rents (amounts that could be collected for use of the resource).
3. Both sides will try to use bargaining power to capture a portion of those rents.
4. Instead of being captured, the competition to harvest more fish increases costs; money that could have been paid for the resource is instead committed to the harvest operations (and in some cases the processor operations). However, this result requires that the raw fish market be competitive (both buyers and sellers accept a going market price with little deviation based on negotiations, such that neither side exerts market power).
5. If participants on one or both sides of the market are able to exert some market power,[14] competition is reduced, and some resource rents may be saved from dissipation and preserved as private profit.

QP MARKETS AND INTERACTION WITH RAW FISH MARKETS

(Section E3)

The following assume a competitively functioning market, except as noted:

1. Under an IFQ program, the QP will represent an additional key input. The need to hold QP becomes an additional cost of providing the raw fish.
2. Costs of production, excluding the cost of the QP, are expected to decline by an amount that will be offset by the price of the QP.
3. In most circumstances, the QP holder is expected to capture the difference between the minimum price for which harvesters are willing to fish (excluding the cost of the QP) and the maximum that processors are willing to pay, i.e., the resource rents.
4. The reported transaction price for raw fish costs (reported ex-vessel value) will depend on who provides the QP for the transaction and the terms under which they are provided (e.g., a processor might provide the QP to a vessel at no charge, and the reported price will be the minimum price for raw fish the vessel is willing to accept (its costs plus a normal return of profit), or the vessel might provide the QP, and the price will include an amount that covers the vessels costs, as well as normal profit for the vessel, and the cost of the QP.
5. With respect to the QP owner's ability to exert market power,

[14] Note that for item 3 the term "bargaining power" was used rather than market power. Bargaining power is a short term concept. It may enable a firm to establish an above normal price. Marketing power requires that the above normal price be sustainable. Unless there is a barrier to entry, the higher price established through bargaining power will be dissipated as high profits invite competition.

a. Assuming a fully rationalized fishery, the QP holder will only be able to exert market power to the degree that there are not enough independent harvesters and processors in the market to establish effective going market prices for raw fish (to the degree that markets are not sufficiently competitive). However, even if such prices are established, inevitably, there will be opportunity to express some market power due to transaction costs such as convenience and search times or the linkage of groundfish with other fisheries (i.e., because of costs associated with finding a new buyer or seller, even in a competitive situation there may be some room for price negotiation). Ability to use market power to leverage higher prices will be limited by the fluidity of the QP and raw fish markets.
b. It will likely be difficult for a QP holder to increase the profits associated with its QP holdings through the use of market power to achieve QP prices substantially above those that reflect the value of the resource (resource rents). This is because, in the absence of overcapitalization (for the sector as a whole or within a locally isolated market), harvesters and processors will be unwilling to take prices that do not allow them to cover costs and normal returns on investment. It is the prices the harvesters and processors are willing to accept that determine the value of the QP (the potential resource rents). For example, if harvesters hold all the QP, they collect all of the resource rents but are not in a strong position to extract additional profits from processors, except possibly during the transition period during which the processors are overcapitalized. The same would be true if the processors held all the QP, assuming that the harvesting side is rationalized and not overcapitalized. However, surplus LEPs and the potential for excess capital in nonrationalized fisheries to seek employment in the West Coast groundfish fishery may provide an opportunity for processors witH QP to exert market power due to the availability of alternative harvesters, forcing harvesters to accept lower than normal returns.
c. Once the QS have been bought and sold at prices based on expected profits then, like the harvesters and processors, the QS holders offering QP for sale will have a price they must receive to compensate them for their investment in the QS purchase. Under such circumstances and assuming no excess capacity and competitive markets, no party to the transaction should be able to exert more market power during negotiations than is seen in any other competitively functioning sector of the economy.

QS FLOW AMONG GROUPS (INDEPENDENT OF THE INITIAL ALLOCATION)

(Section E.4)

In this section, we look at dynamics affecting the flow of QS among groups independent of the initial distribution. These dynamics affect the flow of QS through their impact on willingness and ability to pay for the QS (the center box in Figure A-4.) Topics addressed are as follows:

- Relative efficiency
- Vertical integration
- Market power
- Access to capital

These topics are represented by the hexagons in Figure A-4. Factors to be considered for each of these topics are provided in the related squares, and each square is accompanied by a note box indicating the nature of the dynamic or affect.

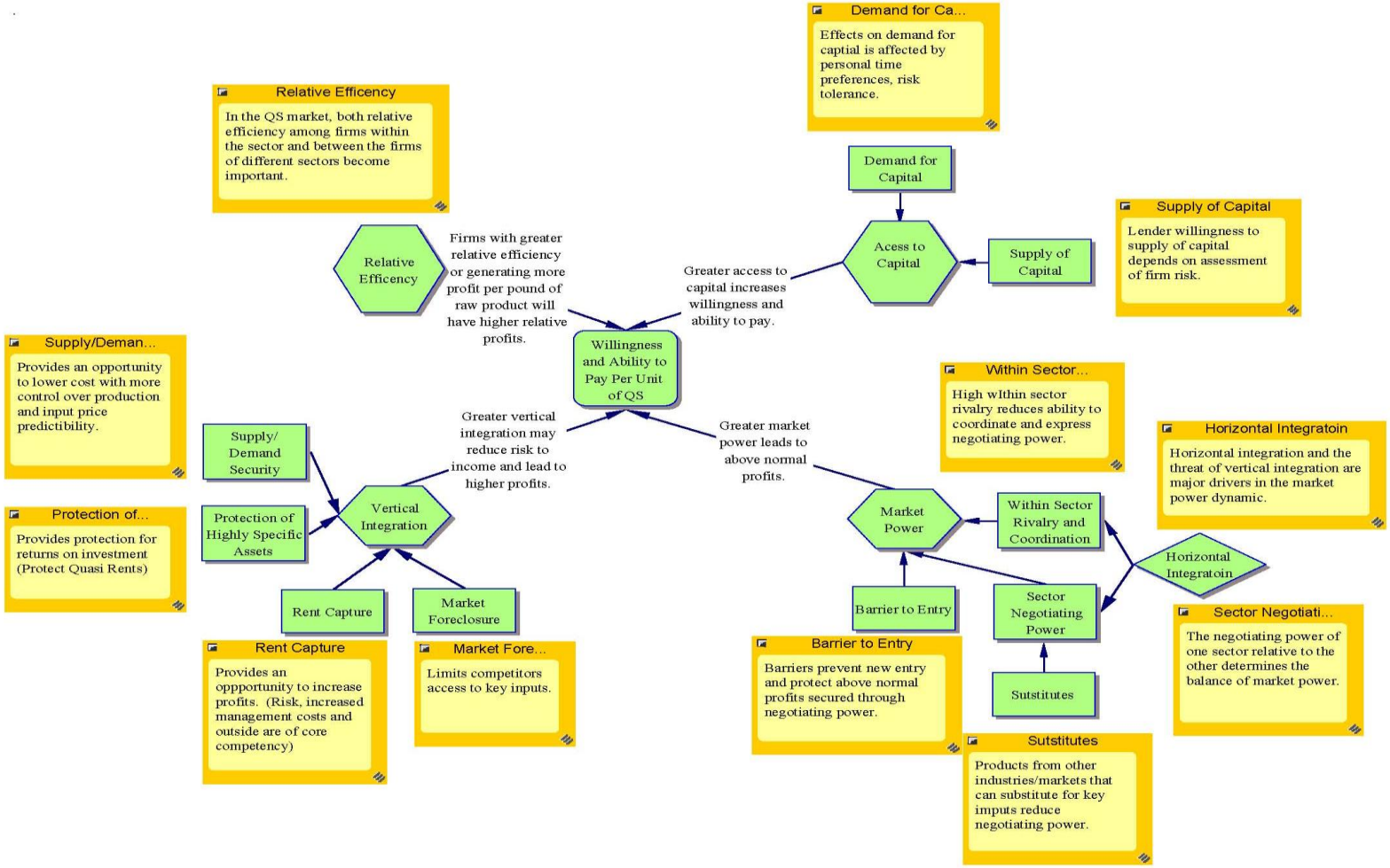


Figure A-4. Factors influencing QS flow among groups.

Relative Efficiency

(Section E.4.1)

This section of Appendix E explains the concept of relative efficiency within a sector with respect to profits per unit of raw product. Key points are as follows:

1. Those firms with greater relative efficiency are more likely to acquire QS over the long term.
2. There may be overcapitalization in both the harvesting and processing sectors, and the possibility that over the short term, IFQ management may provide more mechanisms for harvesters to increase efficiency than processors.
3. Firms with identical efficiency could have substantially different levels or profit per unit of raw product. A firm that generates more profit (including returns to capital) than another for the same amount of raw product will be more likely to accumulate QS. These differences may occur within a sector or across sectors. If harvesters tend to have the same efficiency per unit of raw product as processors but generate more profit per unit of raw fish, they will be willing to pay more for QS and will likely accumulate it over time, or vice versa.

Vertical Integration, Return on Investment (Quasi Rents), and Above Normal Profits (Economic Rents)

(Section E.4.2)

1. Under status quo, most vertical integration occurs through processor ownership of vessels and/or permits. There has been relatively little harvester participation in ownership of processors, though some has recently developed in the at-sea mothership fishery, and catcher-processing vessels are by definition vertically integrated.
2. The IFQ program provides processors a new opportunity to vertically integrate by acquiring QS, but acquisition of QS does not provide harvesters an opportunity to control processing operations. Therefore, vertical integration by harvesters is discussed under the section on market power.
3. There are a number of reasons to expect processor vertical integration, including supply security, profit protection, and capture and expansion of market share by preventing competitors from accessing a key input (raw fish), i.e., foreclosing competitor access.
4. Typically, vertical integration also involves certain management expenses and additional risks. QS provides an opportunity to exert control over harvesting operations at substantially less management expanse and risk than entailed in vessel ownership.
5. Firms that are already vertically integrated through ownership or control of vessels will have more profits per unit of raw product to protect with QS than firms that are not vertically integrated, and will, therefore, be more likely to accumulate QS over time.
6. Not applicable to the FPA (the FPA does not place a control limit on QP): If there were a control limit on QP, the opportunity for individual processors to vertically integrate would be limited by the control limits. If there is no grandfather clause provision for QP control limits, some processors could have found themselves in a position of needing to divest themselves of vessels in order to stay within the limits.
7. The opportunity for the sector as a whole to vertically integrate through acquisition of QS will depend on the total number of active processors and the accumulation limits. For example, with a 10 percent control limit on a particular species, if there were 10 large processors, all QS for that species could be controlled by processors (as would be the case if 10 harvesting companies controlled all the vessels).

Market Power, Horizontal Integration, and Consolidation

(Section E.4.3)

As a reminder, in this section of Appendix E we evaluate effects of the IFQ program on market power **independent of the effects of the initial QS allocation.** Using this approach we can then focus on the initial allocations incremental effect on market power separately from the effect of creating the IFQ program.

1. If a firm or sector is able to exert market power, it will be more willing and able to pay for QS. Exertion of market power implies markets are less competitive.
2. An adaptation of a widely used market power model (the Porter 5 Forces Model) specifies criteria for evaluating the following factors:
    a. Rivalry and coordination within a sector (Forces 1 and 2: situations for selling sector and buying sector)
    b. Relative bargaining power across sectors (between harvesters and processors, including the threat of substitutes)[15] (Forces 3 and 4: relative bargaining power and substitutes)
    c. Barriers to entry (Force 5)
3. Rivalry and coordination. The more rivalry there is within a sector, the more difficult it will be for members of the sector to exert market power. Ten criteria are used for this evaluation, including concentration of production within the sector and the presence of an active industry shakeout process.
    a. Under status quo, there are many reasons to expect high rivalry for both harvesters and processors. However, license limitation may constrain high rivalry among harvesters. For processors, previous industry shakeouts, the small number of firms handling most of the product, and the threat of the effects of another shakeout may reduce rivalry.
    b. Under IFQs, a shakeout among **harvesters** is expected, followed by a period of reduced rivalry with fewer total participants. The need to acquire QP may stimulate rivalry in the QS/QP market, but higher costs (e.g., observer costs) may stimulate cooperation among harvesters in their negotiations with processors over raw fish prices. Local markets will become more closely linked by the ease of transfer of QP across geographic distances. For **processors**, the low cost of moving QS/QP across geographic areas and the link between the QS/QP and raw fish markets will increase competition by decreasing the geographic isolation of local markets for raw fish. This will expand the number of processors that effectively have a role in competition for a particular harvest commitment (prior to catch). Rivalry may increase if processors attempt additional consolidation as a means of defending against the possible exercise of harvester market share. Rivalry will also increase because the expansion by any processor will require the direct and immediate contraction of processing by another processor (as compared to the current lag, which occurs as an expansion by a particular processor works itself out in the bimonthly trip limit based management system and marketplace).
4. Bargaining Power. Bargaining power of one sector with respect to another is an important element of market power. There are seven criteria for evaluating bargaining

[15] The 5 forces model separates the bargaining power of each side and the threat of substitutes into three separate market forces.

power (including ability to threaten vertical integration and ability to switch to a different processor or different harvester.

a. Under status quo, nearly all of the criteria favor processors.
b. Under IFQs, **harvester** bargaining power may increase. Harvesters with QS cooperate and use it to support their own processing facility or encourage a new entrant. Consolidation will leave fewer harvesters for processors to deal with. **Processor** bargaining power may increase or decrease. Processors may be able to vertically integrate at a lower cost than under status quo.[16] Liquidity of QP will expand the geographic area from which buyers with an interest in a potential QP/raw-fish sale may be drawn. This will increase the number of potential participants in the transaction, encouraging development of a market that functions well enough to establish "going prices," thereby reducing bargaining power. However, it may also increase pressure for further consolidation. This within-sector consolidation may be hampered by QS control limits, but pressures for consolidation may be strong enough for it to occur in spite of the control limits.

5. Barriers to entry are necessary to preserve any market power advantage that is achieved. Five criteria were used to evaluate barriers to entry, including government regulation and economies of scale.
    a. Under status quo, license limitation provides the barrier for harvesters and economies of scale may create barriers for processors.
    b. Under IFQs, the entry barrier for **harvesters** will be greater because of greater fixed costs related to compliance with program regulations and the need to acquire QS or access to QP to reach efficient scales of production. There may also be an increase in the entry barriers for **processors.** The increase in compliance costs for processors is likely to be relatively small compared to harvesters. If some processors experience higher profitability through receipt of an initial allocation of QS, their costs will be lower than later entrants who would have to buy QS to attain a similar level vertical integration and the associated advantages.

Access to Capital (Demand) – Discount Rates

(Section E.4.4)

1. The price of QS represents the present value of a stream of current profits.
2. Individuals who place a relatively high value on current income (as compared to future income) have what is called "high time preferences" and will not be willing to pay as much for QS as those with "low time preferences" (those who are relatively indifferent between receiving income now or in some future period).
    a. There are indications that fishermen may have high time preferences relative to others.
    b. Those with relatively low incomes also tend to have high time preferences. Crewmembers may fall into this category.

   If those in the harvest sector have higher time preferences than processors, then this factor may influence the flow of QS toward processors, regardless of the initial allocation.

[16] Under an option in which control limits apply to QP (not the FPA), vertical integration for larger processors would be limited by accumulation limits. Some larger firms may have had to reduce existing levels of vertical integration (depending on accumulation limit rules).

Access to Capital (Demand – Planning Horizon and Investment Recovery)

(Section E.4.5)

The length of time over which one anticipates receiving a benefit will also affect how much one is willing to pay for QS. However, the opportunity to sell the QS and fish-related businesses at the end of a personal planning horizon diminishes the importance of the planning horizon, with certain exceptions; for example, the QS owner who has special skills enabling him/her to generate levels of profit that subsequent owners are unlikely to anticipate will find it difficult to capture the profits associated with those special skills when he/she sells his/her QS. On this basis, we would expect QS to flow toward those with higher than normally expected skills or profitability and a longer planning horizon than similar individuals with shorter planning horizons. At the same time, those with higher skill levels may be tempted to remain in the fishery longer because of their inability to sell the QS for an amount that reflects their potential earnings over a longer period.

Access to Capital (Supply)

(Section E.4.6)

1. In determining risk, lender considerations include size of the firm, its diversification, assets that may be used as security, and the value of those assets outside the industry in which the firm participates. The cost of loans is lower for entities with lower risk profiles.
2. Harvesting firms tend to be smaller than processing firms, and less of the capital may be useful in other sectors, making it more expensive for harvesters to access capital as compared to processors (on average).
3. The IFQ program will decrease the risk profile for harvesters that remain after consolidation.
4. If it is anticipated that harvesters will be able to exert market power, there may be a perceived increase in risk to processor profits. There also may be a transition period during which processor profits are reduced prior to the exit of excess processing capital from the industry.
5. Harvesters and processors that acquire QS are likely to reduce risk and the cost of their access to capital as compared to firms that do not have QS.
6. A harvester without QS will be viewed as a substantially greater financial risk than a processor without QS because harvesters without QS cannot catch fish, while processors without QS are still able to buy.

SUMMARY AND EFFECT OF THE INITIAL ALLOCATION

(Section E.5)

Table A-16 summarizes the conditions for the harvesting and processing sectors with respect to each of the four major influences on willingness and ability to pay for QS. The first column provides the conditions under status quo and the second the expected influence of the IFQ program, as described above. The third column summarizes the effect of the initial allocation on the long-term

Table A-17. Summary of influences of the IFQ program and the initial allocation on the flow of QS with a focus on the harvesting and processing sectors.

	Status Quo	IFQ Program	Initial Allocation
Relative Efficiency: If there is an efficiency differential between the sectors, IFQ will flow to the more efficient sector (See Section E.4.1)			
	Given the nature of fishery management and imperfections in the function of markets, one sector may have greater relative efficiency than the other.	• If there is an efficiency differential between the sectors, IFQ will flow to the more efficient sector. Even the efficiency of the sectors is identical, profits per pound may vary and product will be an important driver of IFQ flow. • Over the short term, there are more mechanisms by which harvester sector efficiency may be enhanced than for the nonwhiting-processing sector.	The capital infusion represented by the initial allocation will provide an opportunity for harvesters and processors that receive an initial allocation to increase their efficiency. Increased efficiency will increase ability to accumulate QS.
Vertical Integration: Firms integrate vertically for market security, asset protection, rent capture, and market foreclosure. IFQs will increase vertical integration incentive (See Section E.4.2)).			
	Processors tend to be more vertically integrated than harvesters.	• Harvesters' vertical integration (acquisition of processing capacity) will not be constrained by accumulation limits. • As harvesters become more profitable, they could become more of a target for vertical integration by smaller processors (rent capture). • QS provides processors a less expensive way to vertically integrate harvesting activities and a new way to foreclose market opportunities of competitors. • Processor vertical integration could be constrained by control limits if such control limits are applied to both QS and QP.	• Initial allocations will enhance the recipient's resources for vertical integration. • If control limits are applied to QP, processor vertical integration would be constrained, and those processors grandfathered in at levels above the control limits would have a long-term advantage over those receiving less than those limits.
Market Power: QS will likely flow toward those with more market power because of their higher profits (See Section E.4.3))			
	Incentives for processor and harvester rivalry may each be constrained. There are more indicators that processors are likely to be able to exert bargaining power than there are for harvesters (this is not a statement as to whether or not either sector has in fact exerted market power) Barriers are necessary for long term-preservation of market power. Indicators of potential bargaining power favor processors and indicators of entry barriers may favor harvesters.	For harvesters • Rivalry is expected to decrease after an initial shakeout, • Bargaining power increase through consolidation and opportunity to vertically integrate, and • Entry barrier increase For processors • Rivalry is expected to increase, • Possible bargaining power decrease because QP liquidity increases the distance from which potential buyers may be drawn, • The result for entry barriers is more uncertain.	***As amount allocated to processors increases*** For harvesters: • Increased rivalry in QP and raw fish market including increased strategic stakes in the outcome • Latent permits may become active to handle processor QP • Fewer assets to support using the threat of vertical integration as a lever during price negotiations For processors: • Reduced exit barrier would tend to decrease rivalry • Increased assets to support vertical and horizontal integration • Processor-held QP can be used to activate latent permits, increasing processor bargaining power • A greater entry barrier (including a temporary scale advantage by larger processors) will help protect any negotiating advantages that are established.
Access to Capital: QS will flow to those with greater demand for and cheaper access to capital. (See Sections E.4.4–.4.6)			
	Harvesters may be less willing to pay for capital because of their high time preference. Processors may have access to cheaper capital because of they present a lower investment risks.	• Industry stability is expected to increase (particularly for harvesters), potentially decreasing the cost of capital. • QS may be of tenuous value as an asset for securing a loan. • Firms with cheap access to capital are more likely to acquire QS and grow. • The risk of lending to processors may increase, if the IFQ program increases harvester opportunity to exert market power.	• Initial recipients will receive an infusion of wealth that may give them cheaper access to capital (lower interest rates). • Harvesters not receiving enough QS to support their business plan will have a less secure income flow and, if financially distressed, may have a hard time securing loans for QS/QP acquisition or other capital investments. • For processors, QS/QP is not needed for operation, but an initial allocation will increase the security of their access to raw product, reducing risk and, therefore, lowering capital costs.

● Impact on Conservation (Resource Stewardship Effect)

Resource stewardship is a term often used to describe actions that are taken to benefit conservation of the resource. It has been proposed that IFQ programs generate a "resource stewardship effect" as a result of privatization of the opportunity to harvest fish. A recent study of IFQ systems worldwide showed that, even after taking into account factors such as the intensity of management, fisheries under IFQs appear less likely to be overfished (Costello, *et al.* 2008). We will look at four factors related to the degree to which an IFQ program might generate a resource stewardship effect and examine influence of the initial allocation on the likelihood that a resource stewardship effect is realized:

1. Degree of exclusivity of access
2. Discounted value for future benefits (i.e., delayed gratification)
3. Ethical action
4. Control over what happens on the vessel

♦ *Exclusivity*

Ownership of QS gives individuals a direct interest in the productivity of the resource as a whole, a portion of which cannot be impinged upon by others. However, it does not give them control or access to specific fish. Therefore, any action that a QS owner undertakes that either benefits or harms the resource is still shared proportionally with all other QS owners (NRC 1999, pg 36), as well as those sectors relying on the resource which are not under IFQ management. Nevertheless, the approximation of sole ownership is greater under IFQs than under license limitation or open access management. Under license limitation and open access, a fisherman is not even certain of receiving a share of the available harvest.

It may be that collective stewardship action (e.g., fishermen's associations working to benefit the resource) is encouraged by IFQs more than individual stewardship action. For example, Nova Scotia fishermen worked with managers to develop stronger conservation measures. At the same time, there were anecdotal reports that individual actions for personal benefit continued, even though they adversely affected the resource (high grading and under-reporting catch) (NRC 1999) (pg 106).[17] Collective actions (or collective restrictions) ensure that all participants are contributing to a particular outcome and make it more likely that the individual will receive a benefit commensurate with his or her contribution. Collective actions where the commitments are made up front will be most easily enforced (for example, an association of fishermen might invest in research to support a stock assessment). Other types of collective actions motivated by economic incentive require participants to trust one another to contribute to the collective good, resting on the belief that violators will be detected and penalized.

Sole ownership (i.e., exclusivity) may be a necessary condition for "stewardship" motivated by economic incentives alone; however, it does not guarantee a stewardship result. For example, economically driven stewardship may require that the returns available from harvesting all the fish and putting the net proceeds in the bank be less than the growth rate of the fish stock. This issue is addressed in the following section.

[17] Highgrading problems have appeared to have escalated in the Icelandic ITQ fishery where there is not full observer coverage. For other programs, such as those in New Zealand and the Alaska halibut fishery, it is reported that under reporting of catch appears to be minimal. There are some questions as to whether or not there may have been problems in the Alaska sablefish fishery (NRC 1999). Highgrading also occurred in the Alaska red king crab fishery after rationalization.

♦ *Discount Rates*

Assuming that someone is relatively certain of gaining the return from their investment in stewardship, one must still ask whether the return they will receive is enough to compensate them for incurring a cost and waiting for that return. The term associated with this concept of "delayed gratification" is discount rates. Discount rates are discussed more fully above and in Appendix E. If the stock growth/improvement rate is greater than the individual's discount rate, then it will make sense for the individual to make an investment in anticipation of the greater return. If it is difficult for humans to take into account returns that take longer than a generation to be realized (e.g., longer than 30 years), or longer than the remaining span of their lifetime, then economically driven stewardship incentives for some of the slowest growing west coast rockfish species may be limited. Thus, if QS holder discount rates are high and resource condition improvement rates are slow, even if a fishermen were relatively certain of reaping the benefits from his conservation action, there may not be sufficient incentive for fishermen to make the investment that stewardship actions require, purely based on economic incentives. An additional factor to consider is that the trawl sector is not the only sector reliant on the resource. So for example, assume that trawlers (collectively or individually) take some kind of extra action to help conserve the resource and other sectors take no extra actions. If that action results in improved stock productivity, the trawler would likely have to share that benefit with all the other sectors that rely on those species for which improvement is achieved. This reduces the future return from any present action.

♦ *Ethical Action*

Stewardship based on ethical action may occur even if the action does not make "economic sense" when we consider only exclusivity and discount rates. There is much research showing that fairness and reciprocity are strong determinants of human behavior (Falk, *et al.* 2002) Under the models in this body of research, individuals value an outcome both for its effect on themselves and on others. Game theory experiments developed by Falk, et al. classified participants into those strongly motivated by reciprocity and those motivated primarily by personal economic gain. They observed that institutional rules determined the observed outcome, i.e., determined whether the outcome in the human system is driven by reciprocity or solely by economic self-interest. If there is not an institutional rule that either externally forces cooperation or provides the possibility that participants will find ways to sanction one another, a non-cooperative outcome is more likely to result. Falk, et al. (Falk, *et al.* 2002) state "In a sense, institutions select the type of player that shapes the final result." The following section identifies some ways in which the structure of the institutions (i.e., rules on who is allowed to hold QS) may affect the opportunity for development of informal sanctions for non-cooperation.

Falk, et al. (2002) also identify other theories for outcomes that are not solely economically driven, including "moral norm activation" (Stern, *et al.* 1999). Under this theory, if people accept a value (e.g., fishery conservation), believe that things important to that value are threatened (e.g., that excess harvest could damage the status and productivity of a stock), and that they can take actions which will help alleviate the threat, they will take those actions.

♦ *Control over Activities on the Vessel*

If we assume that through economic or noneconomic values there is a potential for sufficient incentive to encourage stewardship behavior, then the question is who is in the best position to control such behaviors. In this discussion, we will assume that the QS holder has the greatest incentive for stewardship, due to combined economic and noneconomic values. Dawson reviews the issue of control over production from the perspective of transaction costs associated with contract formation and

contract enforcement (Dawson 2003). He identifies that specifying the exact behavioral deliverables in a contract, monitoring that behavior, and enforcing the contract become more difficult as the relational distance between the parties to the contract increases. For example, establishing standards, monitoring, and control are much easier with an employee than with a contractor. Following this line of thought, it appears that in terms of vessel operations the following would be a reasonable ranking of those with greatest control over stewardship behavior to those with the least such control.

- Crewmembers (most control if stewardship actions have to do with how individual fish are handled on deck)
- Vessel operator (most control for stewardship actions having to do with where the vessel fishes, length of tow, etc)
- Vessel owner/lessee (most control for stewardship actions having to do with gear and vessel equipment)
- Processor/permit owner
- Other entities

On this basis, if the Council wants to place maximum emphasis on the likelihood that the IFQ program will lead to stewardship behavior (possibly diminishing achievement of other objectives), the program should be designed to encourage ownership consistent with the priorities in the above list. Moreover, the decision on which groups will be allowed or encouraged to own QS could be part of the design of an institutional framework that supports a stewardship ethic, as discussed in the Ethical Action section (page A-58). This design may include consideration of the ability of QS holders to observe other QS/QP holders and harvesters and ability to impose sanctions. Those with the greatest ability to impose sanctions within a harvesting operation may be the owners of such operations. Those with the greatest ability to monitor the activities may be vessel operators and crewmembers.

♦ *Summary*

The initial allocation among groups is just that, an initial distribution. It does not determine where the QS will end up over time. However, those receiving an initial allocation will receive a leg up by the capital infusion represented by the allocations and will be in a better position to maintain their QS and acquire additional QS in the future.[18] Table A-17 summarizes the results with respect to each of the above sections. With respect to the potential stewardship effect, those present on the vessel will be able to most effectively act on the stewardship incentive (i.e., be able to implement stewardship actions at the least cost). This is consistent with Clark's finding that fishermen who lease will have little incentive to conserve because they do not have long-term access (Francis, *et al.* 2007).

[18] Up to QS control limits.

Table A-18. Summary of analysis of stewardship effect.

Exclusivity	QS owners have limited exclusivity because the benefit/cost of any action they take individually may be shared by all other QS owners as well as other sectors that rely on the same resource. Yet there is more exclusivity than under open access or license limitation.
Discount Rates	Even if individuals have some exclusivity, if they have a high discount rate, the increase in benefits over time may not be sufficient to compensate them for the near-term sacrifices. Fishermen have been reported to have relatively high discount rates.
Ethical Action	Ethical action may override (or act in concert with) action based solely on economic incentives. Therefore, lack of complete exclusivity or discount rates higher than benefit return rates does not mean there will not be a stewardship effect. Institutional design can affect whether or not ethical considerations dominate behavior. External sanctions or ability for participants to sanction one another may enhance the expression of a stewardship ethic. Buy-in on the problem and potential for individual action to help alter the outcome are important.
Control	Crewmembers and vessel operators may be in the best position (have the lowest cost) to monitor and control stewardship behavior.

- Impact on Sector Health

  - *Buyers/Processors*

There is an overlap between buyers and processors in that some businesses act only as buyers, some buyers act as processors (buying only for themselves), and some buyers act as processors but also buy raw fish for other processors. The set of all businesses functioning as buyers is of concern because it is they who interact with harvesters in the raw fish market. Those buyers acting as processors are of concern because of their larger capital investment in the fishery and the over investment that may have been caused by the regulatory regime. In Section A-2.1.1.d, we will discuss whether the Council allocation to "processors" would be to actual processors or to buyers (as a proxy for processors) and the implications of that choice on the results of the analysis. In order to minimize confusion between the terms used in the analysis and those used in the alternatives (e.g., allocation to processors), in the following discussion we will use the term "processors" to refer to both buyers and processors, unless otherwise noted.

COMPETITIVENESS

There are a number of aspects of sector competitiveness to consider:

1. Competition in negotiations with harvesters
2. Competitiveness within the sector (smaller processors vs. large processors)
3. Competitiveness in wholesale markets

Negotiations with Harvesters. In Appendix E, on market power, one of the focuses was on competitiveness within the sector in the context of the processing sector's interactions with harvesters in the raw fish market. There we found the following indicators:

- Processors are in a strong position to exert market power under status quo (whether they do or not) and may have cheaper access to capital than harvesters.
- An IFQ program under which processors do not receive an initial allocation would weaken that position.
- Even if weakened, processors could regain some strength through the acquisition of QS, but only up to accumulation limits (see Appendix E for a list of indicators of factors affecting the flow of QS among groups independent of the initial allocation).
- An initial allocation of QS would give them a stronger bargaining position than if they did not receive an initial allocation.

- If there are well-established market prices for QP and raw fish, it is then implied that strength of bargaining position will be less important in establishing market prices. To the degree that there are transaction costs associated with moving between one buyer and another (or from one seller to another), however, it will still be possible to use bargaining power to influence the price away from average market prices.

Specifically, an initial allocation of QS would do the following:

1. Provide a capital infusion that may allow processors to employ one of a number of different strategies to grow and increase their efficiency (e.g., acquisition of additional QS, horizontal integration, etc.).
2. Diminish the exit barrier (liquidation of QS would allow a firm to exit the industry with less debt or greater gains).
3. Initially provide processors with greater bargaining power (as compared to their initial situation under IFQs if they did not receive an initial allocation), useful mainly if the market is not competitive enough to strongly establish going market prices.
4. Create a greater barrier to new entry.
5. Create an even greater barrier to entry if there is a control limit grandfather clause (not part of the FPA).
6. Decrease the cost of processor access to capital.

The initial capital infusion may have a long-term affect on the distribution of wealth in the industry. The effect of the IFQ program on processors' ability to remain in business is discussed below in the section on investments (page A-62).

Effect on Smaller Processors. If there is not an initial allocation to processors, smaller processors may be at a disadvantage relative to larger processors. At this time, most of the LEPs that are owned by processors are owned by larger processors. Therefore, smaller processors would have to acquire QS or operate at a lower profit level (processors owning trawl permits will earn levels of returns for the QS granted to them that will not be available to those who purchase later). Either way, whether they choose to acquire QS or not, compared to those granted QS because they own permits, those without permits would be at a competitive disadvantage within the sector. Anecdotal information has indicated that those processors in the IFQ system in British Columbia who did not own vessels or were not closely partnered with vessels had a financially difficult time competing because of their need to make payments on capital borrowed for their QS acquisitions. This is consistent with reports from New Zealand that indicate lower economic satisfaction for later entrants who have to buy QS to enter the fishery (as compared to those receiving an initial allocation) (Dewees 2006). An initial allocation of QS would give smaller processors some QS to work with, and, if there is no QS control limit grandfather clause, it could substantially even the distribution of QS among processors. If there is a QS control limit grandfather clause, an initial allocation of QS would probably still leave smaller processors at a significant disadvantage in QS holdings as compared to the larger processors.

Effect on Larger Processors. If there is an initial allocation to processors, some larger processors will likely be at the control limits. If they are at the IFQ control limits, and the limits apply to both QS and QP, they would have no ability to extend their vertical integration (expanding their harvesting activities). If there is no grandfather clause, they may have to reduce their level of vertical integration. However, the FPA applies control limits only to QS and not QP. Once processors reach QS control limits, expansion of their shares of the market would have to occur without the support of QS. Whether large processors are more likely than small processors to expand their market share would depend on the relative profitability of adding an increment of production to a large-scale processor without the support of QS, as compared to adding the same increment of production to a small-scale processor with the support of QS.

Competition in the Wholesale Market. One factor to be considered is how the IFQ program may affect the competitiveness of west coast seafood processors in the wholesale market. While west coast processors may participate and have an advantage in local niche markets, many of the fish products currently produced in the west coast groundfish fishery are sold into a wholesale market in which there is global competition.

It has been argued that processors need to receive an initial allocation of QS and be able to accumulate larger volumes of QS in order to be competitive in the world market. However, processors do not need QS to process fish, and, if they cannot sell the available product, then fishermen or QP holders will be forced to lower their prices to move the available product. If fishermen are already accepting their minimum price (covering costs including normal profit), then the value of the QP will diminish. If the fishermen are at their minimum prices, and marginal QP values near zero, then it is likely that some fish would go unharvested. However, overall, the IFQ program will likely reduce operation costs and make west coast products more competitive on the global market thus increasing the volume of what processors are able to sell at a normal profit level even if processors do not receive an initial allocation.

An initial allocation to processors would improve individual processor marketing flexibility and profits. Individual processors would have more direct control over the price they pay for the quota (what they pay themselves for QP) and more immediate flexibility to respond to marketing opportunities with price adjustments rather than having to wait for the changing price signals to work their way through the QS and raw fish markets.

INVESTMENT, DEPENDENCE, AND DISRUPTION

Dependence on the groundfish trawl fishery is a function of the degree of investment in the fishery and the ability to employ the assets representing those investments in activities outside the groundfish trawl fishery. Thus, dependence on the groundfish trawl fishery implies that, absent an opportunity to earn income from this fishery, there would not be sufficient returns to compensate those making the original investments. The investments we will focus on in this section are primarily investments in physical capital, but there may also be investments in human capital (e.g., specialized knowledge or labor skills). The IFQ program will change the management system and markets, potentially disrupting a firm's ability to recover returns on fishery dependent investments and affecting a firm's ability to sustain participation in the industry. In this section, we will assess the conditions and mechanisms under which a firm's ability to recover returns on fishery-dependent investments and sustain participation will be adversely affected. We will also look at some qualitative indicators of the degree of that effect.

When the IFQ Program is implemented, those holding QSs are expected to capture the difference between the maximum price for raw fish processors are willing to pay and the minimum price at which vessel owners are willing to harvest, as resource rents. In question is whether QS/QP holders (whether they be harvesters or independent QS/QP holders) might also capture a portion of the processor's earnings needed to cover capital investments (their quasi rents).

Under status quo, if there is no processor overcapitalization, we would expect that the market would allow processors to cover their average total costs (i.e., earn enough to pay for their variable operating costs and earn a normal return for their fixed/capital costs). However, if there is more capital than is necessary to utilize the available raw product, some processors will produce at less than their optimal output, until the excess capital leaves the fishery. In Section 4.9, we identify that the nonwhiting processing sector could be overcapitalized due to the recent contraction in the fishery and that processors in the shoreside and mothership sectors may be overcapitalized due to their need to compete for vessel deliveries during the Olympic-style whiting seasons.

- Given an overcapitalized situation, processors will compete with one another to reach, as close as possible, their optimal level of output. In that competition, processors may bid away some of the profit that would otherwise go to return on their capital investment.

The following text box provides a technical explanation of this point.

Text Box: Technical Explanation of Dissipation of Returns to Capital when the Processing Sector is Overcapitalized

Figure A-5 illustrate the economic choices. The diagrams show a price or dollar cost per unit on the vertical axis and a quantity on the horizontal axis. The curves shown are supply curves for a single firm. Three curves are shown in each figure: the top curve shows average total cost (including capital investments), the lower curve shows average variable costs, and the curve crossing the other two shows marginal costs. The amount paid for raw fish is an input that affects the height of the curves. As the price of raw fish increases, all three curves move up. The difference between the left figure and the right figure is that the right-hand figure reflects a higher price for the raw product.

In order to achieve a normal profit, a firm must cover its variable and fixed costs (total costs). In the left-hand figure, a price of P1 for processed product would allow the firm to achieve a normal profit with the production of about 25 units. Twenty-five units represents optimum capacity for this firm; however, if the industry is overcapitalized, not all firms will be able to achieve optimum capacity. Assuming that wholesale prices are fixed (that the wholesale market is competitive), as a firm's production decreases, it can be seen that it will no longer achieve normal profits (in the left-hand figure the revenue line, P1, is below the total cost line when production is less than 25 units). At around 5 units of production, the firm would no longer cover variable costs and would cease production over the short term. Between 5 units and 25 units, the firm will continue to produce over the short run but over the long run it will not be able to replace capital as it wears out. Excess capacity in the sector means that some processors will face producing at levels at which they cannot cover total costs and will compete to reach as close to their optimal production levels as possible. In this example, assume there are only 50 units of harvest available and five companies, each with a cost structure identical to that described here. Each company will strive to maintain as close to 25 units of production as possible, using whatever leverage it has available to acquire product. For example, a company might vertically integrate, link its willingness to accept deliveries to other products for which there is not a surplus in processing capacity, guarantee its ability to receive a vessel's product during an Olympic fishery, or offer higher ex-vessel prices. If a processor must attract product by raising the ex-vessel price it offers, the company raises its cost curves. A $15 per unit increase results in the cost curves shown on the right. If this increase is enough for the company to win 22+ units of production, it will stay in business over the short term (i.e., cover its variable costs), but will not cover much if any of its fixed costs (i.e., its return on investment, quasi rents, will have been dissipated).

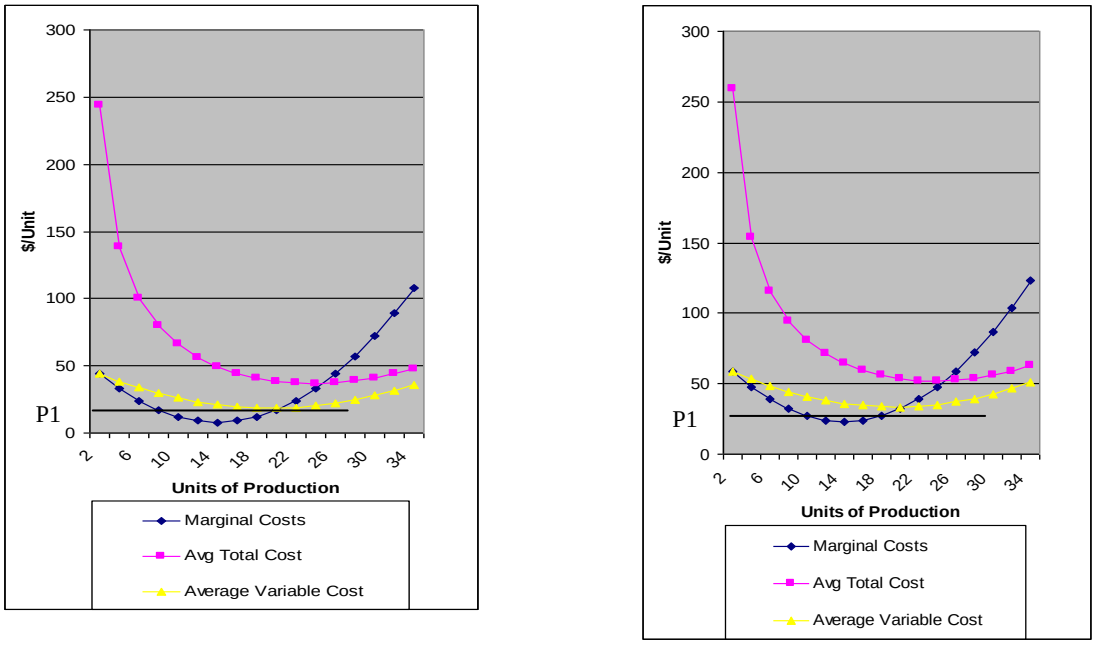


Figure A-5. Comparison of cost curves before (left) and after (right) an increase in the cost of a key input.

If there is overcapitalization in the processing sector, and the sector is fully competitive under status quo, processors will already be bidding away some of their rents in the competition for the limited amount of raw product available. The IFQ program will reduce flexibility to turn to alternative harvesters, which might further increase the competition and hence price for raw product. These processors may find their situation somewhat improved if the IFQ program results in an increase in total landings (through bycatch avoidance), provides processors an opportunity to reduce costs (most likely in the whiting fishery), or provides processors an opportunity to seek higher wholesale prices. Even so, until excess capital is dissipated, they may bid away any improvement as part of the competition for landings,[19] similar to their situation under status quo.[20] Capital will leave the fishery either as it wears out or as other markets are found for it. If a processor is covering its variable costs, but can get a higher return on investment from liquidation of its capital assets than it can from continuing to produce, it may choose to liquidate rather than remain in the fishery.

If processors are overcapitalized but able to compete for deliveries at least partially through their ability to handle volume (i.e., not solely based on prices offered for raw product), then they might be earning some return on their capital investments that may, after the transition to an IFQ program, be bid away in the competition for raw fish deliveries. This may be the situation for processors in the catcher vessel sectors of the whiting fishery.

If the processing sector does exert market power, then so long as they are able to continue to do so after implementation of the IFQ Program, QS holders will not be able to capture the processors' investment return-related profits. If the processing becomes competitive after implementation of the IFQ program, then it is possible that the QS holders will be able to capture some of the investment return-related profits so long as the sector remains overcapitalized. If the processing sector is not overcapitalized, it is less likely that the QS holders will be able to capture investment-related profits from the processing sector. Table A-18 provides a summary of the effects on processor return on investment as it varies by the degree of competitiveness in the sector under status quo.

[19] Unless there are means other than by offering to pay higher prices through which buyers ensure they have access to sufficient raw product.

[20] Since the nonwhiting fishery is already run at a slower pace, the opportunity for processing cost reduction or revenue increases may be relatively limited compared to the whiting fishery.

Table A-19. Effects on processor returns to investment resulting from the transition from status quo to an IFQ program.

Processing Sector Capitalization	Processing Sector Competitiveness		
	Market Power Exerted	**Processors Compete for Product Based on Price**	**Processors Compete for Product Based on Ability to Handle Capacity**
Fully Capitalized	Normal or above normal returns under status quo. QS holders will, at most, be able to capture resource rents (will not be able to capture processor profits that would go to return on investment).		
Overcapitalized	In a situation where market power is exerted overcapitalization would not normally be expected. However, under status quo, there could be processor market power and overcapitalization as a result of historic conditions (e.g., the contraction in the available harvest). Under IFQs, processors would maintain their previous profit levels unless the sector becomes competitive after the IFQ program is implemented (i.e., their market power is overcome).	Under status quo, returns to capital dissipated. This continues under the IFQ program until no longer overcapitalized (unless the IFQ program allows processors to exert market power, i.e., transition to a less competitive situation)	Under status quo, processors may be earning some returns to capital. Under IFQs, processors would no longer compete based on their capacity to handle product. If they then compete based on price offered for raw product, QS holders may be able to capture the profits associated with the processor assets (unless the IFQ program allows processors to exert market power, i.e., transition to a less competitive situation).

Note: Market power in the harvester sector is not considered in this table. If that sector is able to exert market power, they would capture some of the rent that QS holders would otherwise capture.

Under an IFQ program, in a situation where some profits that would otherwise go to capital might be lost by processors offering higher prices in the competition for raw product, it is important to consider the degree and duration of that loss. We do not necessarily expect that every firm will bid away all or even most of its returns to capital in the transition. Whether a particular firm is affected and the degree of impact depend on the cost structure and debt positions of other firms in the industry. In particular, the position of the weakest firms will have a significant bearing on the amount of profit that other firms dissipate in bidding for raw product to serve an overcapitalized industry. Firms with higher average variable costs and firms for which a significant portion of the difference between average total cost and average variable cost is dedicated to payments on a loan will have less flexibility to weather price competition. If these firms drop out quickly in the price competition, there will not be so much of a need for remaining firms to bid away a portion of their profits. Some of the capacity within a firm may also drop out of production to the degree that it goes unused. Ultimately, the price that processors will bid for raw product will be just below the average variable costs of the most efficient of the excess units of capital. (The units of capital that are in excess are considered to be those that are less efficient. On this basis, the price paid will be slightly below the average costs of the most efficient of the set of lesser efficiency capital units.) Each unit of capacity remaining active will be able to capture the profit that corresponds to the amount by which the efficiency of that unit exceeds the efficiency of the most efficient unit of dropped out capacity. A visual example of this concept is illustrated in the two diagrams in Figure A-6 of the following text box.

The above discussion indicates that the following:

- Under status quo, if the processing sector is overcapitalized and unable to exert market power, it will likely already be bidding away returns to capital, unless it is able to compete for raw product through nonprice competition (e.g., to handle a large volume of product during a derby fishery).
- If the processing sector is overcapitalized and unable to exert market power under an IFQ program, it may bid away some of its returns to capital as increased prices offered raw product

- The price that must be paid for raw produce will only increase until enough capacity is left idle such that the remaining active capacity is just able to process the available product.
- When that price is reached, the financial return for units of capital remaining active may be diminished, however, it is unlikely that there will be a complete loss of returns to investment
- Once excess capacity has left the fishery, normal returns to capital will be restored.

Text Box: Visual Illustration of Elimination of Capacity and Retention of Some Returns to Capital

Five hypothetical firms are represented with different average total costs (top end of each bar), average variable costs (bottom end of each bar) and debt service (difference between the bottom of the bar and the circle in the middle of each bar). With a price of wholesale price of P1 on the left hand side, the following occurs:

Firm A:Covers average total costs, average variable costs, and makes payments on debt.

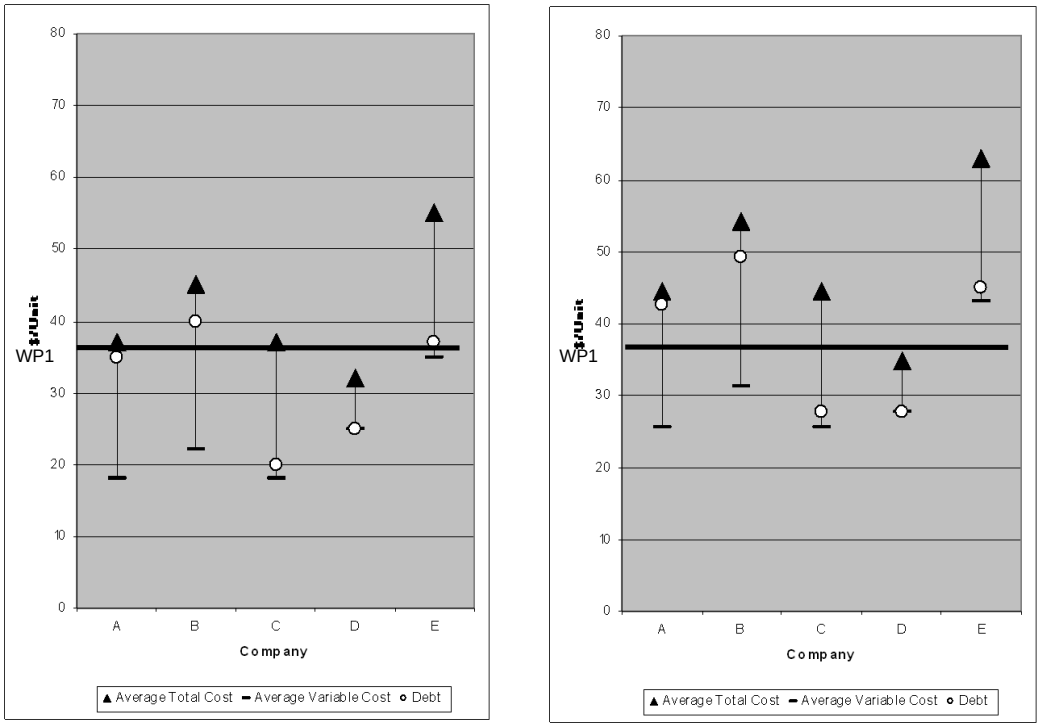
Firm B: Cannot cover average total costs but covers average variable costs (stays in business over the short run). Cannot make complete payments on debt.

Firm C: Covers average total costs, covers average variable costs, covers debt, and has some cash flow representing returns to capital (difference between total costs and debt payment plus variable costs).

Firm D: Covers average total costs, average variable costs, makes payments on debt, and has some earnings above total costs (above normal or economic profit)

Firm E: Cannot cover average total costs but covers average variable costs (stays in business over the short run and makes payments on debt).

If these firms now compete for raw product by raising ex-vessel prices, hence raising their average variable costs while revenues (P1) remain constant (figure on the right), firm E will drop out as soon as its average costs exceed P1. Firms A and B may also drop out if they cannot make arrangements for payments on their debt, and Firm C will remain for the short run, collecting some returns on capital investment, but if raw product prices do not drop back down, it will eventually have to exit as its capital wears out and has to be replaced. Firm D remains, covering its total costs. This figure illustrates the dynamics that may occur if firms have dissimilar cost structures and debts. If, instead, all firms have similar cost structures and debt, it would be more likely that production will be scaled back across the entire industry, with individual firms cutting out their least efficient units of production first. However, the same general rule would apply, with each unit of capacity remaining active capturing the profit that corresponds to the amount by which the efficiency of that unit exceeds the efficiency of the most efficient unit of capacity that drops out.



The right hand side figure assumes an increase in variable costs due to price competition for raw product deliveries.

Figure A-6. Hypothetical cost structures and debt positions for 5 firms at a set level of production.

Reduced Value of Processor Assets. Relative to status quo, processors are not expected to lose returns on their investment to QS holders unless processors are overcapitalized and either have been competing for raw fish deliveries based at least partially on something other than price (e.g., competition based on ability to handle volume), or have been able to exert market power to protect their returns to assets and lose that ability under an IFQ program (likely only under special circumstances, such as a somewhat recent contraction in supply). If processors are overcapitalized and under IFQs are unable to influence prices substantially away from a natural equilibrium (i.e., not able to exert market power), it does not necessarily mean that they will lose all of their returns to capital. They will still earn a return that is related to the difference in efficiency between their capital and the most efficient units of capital that drop out of production. Inability to exert market power does not necessarily mean that harvesters have exerted market power; it could also mean that both sides accept going market prices and are unable to use negotiating leverage to gain major deviations from those prices. To the extent that processor returns on irretrievable investment are diminished under IFQs, the allocation of QS to processors may provide them with an asset to compensate them for some of the loss. If processors are given an initial allocation of QS, one scenario is that the allocation may encourage more rapid rationalization of the processing sector by reducing the barrier to exit (making it easier for processors to recover capital losses).

SUMMARY

Compared to an IFQ program with no initial allocation of QS to processors, an initial allocation to processors may accomplish the following:

- Strengthen their bargaining position vis-à-vis harvesters in the raw fish market (to the degree that prices are influenced by negotiations rather than going market prices).
    - Over the short run (via the initial grant of an asset and via their ability to hold QS in excess of control limits)[21]
    - Over the long run, if they would not otherwise accumulate QS through purchase
- Under certain circumstances, compensate for partial losses of returns on investment.[22] [23]
- Possibly strengthen large producers relative to small producers (if there is a grandfather clause);
- strengthen small producers relative to large producers (if there is no grandfather clause and depending on relative efficiencies).
- *Not likely* affect competitiveness of west coast product in the wholesale markets but may allow individual firms to be more responsive to changes in marketing opportunities (to the degree that processors would not otherwise acquire the QS through purchase).
- Reduce exit barriers by providing compensation for capital losses by those who might seek to leave the fishery.

[21] Under FPA, however, this ability is limited to the first four years of the IFQ program, by the end of which time they must have divested themselves of their excess shares.

[22] If the processing sector is overcapitalized under status quo and unable to exert market power under an IFQ program, then it may experience a loss in the value of its capital if either (1) market power was being exerted under status quo, or (2) market power was not exerted under status quo, but at least some of the competition for raw product was on a basis other than price (e.g., the ability to handle a large volume of product in a timely manner). Note that under the latter condition the processors were likely already losing some of their return on investment under status quo (to the degree that price was a factor in the competition for raw product).

[23] Under IFQs, if processors are not able to exert market power, the amount of profit they bid away in the price competition is unlikely to be the full amount of profit related to return on investment.

♦ *Harvester Sector—Permits*

In this section, we will focus on the permit owner and the permit as an asset independent of harvesting activities.

INVESTMENT DEPENDENCE AND DISRUPTION

Dependence on the groundfish trawl fishery is a function of the degree of investment in the fishery and ability to employ the assets representing those investments in activities outside the groundfish trawl fishery. This is described more fully in the corresponding section above on processors (page A-62).

Under an IFQ Program, the LEP values are expected to decline substantially because of the following:

- The fleet is expected to consolidate down to a number of vessels that is less than half the current number of permits (Section 4.6).
- The permit by itself will not offer access to any amount of the groundfish trawl allocation.
- The permit has no alternative use (its value is entirely dependent on the access to groundfish that it allows).

While these permits were issued to qualified vessel owners at relatively low cost (a cost sufficient to cover administrative costs of issuing the permits) up to 65 percent of these permits have changed ownership since the implementation of the license limitation program (based on an examination of ownership information from the LEP office). Many of the exchanges are believed to have occurred at prices of several hundreds of thousands of dollars. Therefore, there are many owners who have made a substantial financial investment in the permits.

Table A-20. Estimated Catcher Vessel Permit values in March 2004 (Based on Dockstreet Broker Report on $/point).

Permit Length Category	Number in Category	Permit Length Endorsement	Points For Indicated Length	Permit Values Based on	
				$6,000/point	$10,000/point
Less than 40 feet	22	40 feet	6	$36,000	$60,000
40-50 feet	14	50 feet	10	$60,000	$100,000
50-60 feet	31	60 feet	16	$96,000	$150,000
60-70 feet	27	70 feet	23	$138,000	$230,000
70-80 feet	32	80 feet	32	$192,000	$320,000
80-90 feet	20	90 feet	43	$258,000	$430,000
90-100 feet	7	100 feet	56	$336,000	$560,000
>100	14				
Total	167*				

* Data on number of permits from summer 2009. Two permits were combined in 2008 and 2009, reducing the total number of catcher vessel permits from 169 to 167.

All of those who hold the permits, regardless of whether they purchased them or received them as part of the initial allocation, will experience a decrease in the value of that asset. Under status quo, all permits of a similar size class are of similar value in terms of the access they provide to the fishery (note: in the current climate, permits with similar size endorsements may trade at values related to their landing history because of speculation that QS will be given to permit owners). How a particular permit owner fares as a result of the IFQ program will depend on the amount of QS given to permit holders in aggregate (as opposed to the amounts provided to processors or for adaptive management), the formula for allocating among permits, and the amount of landing history associated with that particular owners

permit. It was estimated that annual resource rents for the nonwhiting fishery (the value of the QP) might run about $18 million per year (after subtracting $350/day for observer costs). QSs have been reported to trade for between 3.5 and 10 times the QP price. On this basis, the QS value might be expected to run between $63 million and $180 million. There are up to 169 permits that may qualify for nonwhiting sector QS. Therefore, on average these permit holders would receive between about $0.4 million and $1.0 million of QS per permit.

Table A-21. Estimated value of nonwhiting QS to be issued.

	3.5:1 QS:QP Ratio	10:1 QS:QP Ratio
Annual Value of Nonwhiting QP	$18,000,000	$18,000,000
Estimated Value of QS	$63,000,000	$180,000,000
Average QS per Permit	$387,000	$1,065,000

Note: A ratio of 3.5:1 has the same result as a discount rate of about 40 percent applied over 30 years. A ratio of 10:1 has the same result as a discount rate of about 10.5 percent applied over 30 years.

However, the owners of a permits which have relatively low landing history may experience a decrease in the value of their combined permit/QS assets (as compared to value of the permits before adding speculation about the IFQ program effects), even if 100 percent of the QS is given to permit holders (depending on other aspects of the allocation formula). For purposes of illustration, assume an average permit price of $200,000. Under the FPA, with 90 percent of the QS going to permits and an equal allocation component, if we assume a QS value of $180 million, no permits would be expected to receive QS in an amount worth less than $200,000 (Table A-21).[24] If a QS value of $63 million is assumed, then 44 permits (26 percent of all permits) would be expected to receive QS valued at between $100,000 and $200,000. Allocations that maximize amounts to any one permit (100 percent to permits with no equal sharing) are provided in Table A-22. Under such an allocation, there would be 38 permits (22 percent) receiving less than $200,000 worth of QS (assuming $180,000 as the value for all QS) (Table A-22). On the other hand, if only 75 percent of the QS goes to permits, and the QS is valued at $63 million, then 69 permits (41 percent) would receive less than $200,000 of QS (Table A-23). In Table A-24 and Table A-25, similar information is shown for 100 percent and 75 percent allocations, but with equal sharing. Comparing Table A-21 (the FPA—90 percent allocation to permits and equal sharing) to Table A-24 (100 percent allocation to permits and equal sharing) shows the effect of the 10 percent QS allocation for adaptive management. For example, if a $63 million value is assumed for QS, the 10 percent reduction increases the number of permits receiving less than $200,000 of QS from 36 to 44.

It is likely that some of those permits that would receive smaller amounts of nonwhiting QS would receive larger amounts of whiting QS or a co-op permit. Of the permits with nonwhiting history from 1994 to 2003, 58 also have some history in the shoreside or mothership whiting fisheries during that period. Unfortunately, we do not have a model available to estimate the increased efficiency and hence value of the QS that may be expected in the whiting fishery.

However, Table A-26 and Table A-27 provide the estimated ex-vessel value that might be taken witH QP issued for the shoreside whiting. It can be seen in Table A-27 that there are 110 permits with no shoreside whiting history. With equal allocation (and 80 percent allocation to permits), all permits would receive some amount of whiting QS, and half the ex-vessel value equivalent of the whiting QS would go to 22 permits that receive QS that might generate between $200,000 and $500,000 in annual ex-vessel value. With 100 percent of the allocation going to permits and no equal allocation, half the

[24] The calculation is based on applying the vessels share of all nonwhiting QS to the estimated value of the nonwhiting QS.

ex-vessel value equivalent of the whiting QS would go to 12 permits that receive QS that might generate between $500,000 and $1,000,000 in annual ex-vessel value. Because only 7 percent of the shoreside whiting QS is allocated equally among permits, most of the effect is probably the result of the 20 percent allocation to processors.

Table A-28 provides similar information for the mothership whiting fisheries. IFQs for the mothership sector are not part of the final preferred alternative.

Table A-22. Estimated nonwhiting QS value per permit, based on permit landing history, assuming the FPA (90 percent allocation to permits and with equal sharing of buyback history).

QS Value Per Permit	# Permits	% of Permits	% of QS Value
Assuming an Aggregate QS Value of $63 million			
0	-	-	-
1-1,000	-	-	-
1,000 - 50,000	-	-	-
50,000 - 100,000	-	-	-
100,000 - 200,000	44	26.0%	11.5%
200,000 - 500,000	105	62.1%	57.0%
500,000 - 1,000,000	20	11.8%	21.5%
> 1,000,000	-	-	-
Total	169	100%	90%
Total > 0	169	100%	90%
Assuming an Aggregate QS Value of $180 million			
0	-	-	-
1-1,000	-	-	-
1,000 - 50,000	-	-	-
50,000 - 100,000	-	-	-
100,000 - 200,000	-	-	-
200,000 - 500,000	33	19.5%	8.3%
500,000 - 1,000,000	72	42.6%	30.6%
1,000,000 - 2,000,000	55	32.5%	39.6%
>2,000,000	9	5.3%	11.5%
Total	169	100%	90%
Total > 0	169	100%	90%

Table A-23. Estimated nonwhiting QS value per permit, based on permit landing history, assuming 100 percent allocation to permits and no equal sharing of buyback history.

QS Value Per Permit	# Permits	% of Permits	% of QS Value
Assuming an Aggregate QS Value of $63 million			
0	6	3.6%	0.0%
1-1,000	9	5.3%	0.0%
1,000 - 50,000	19	11.2%	0.6%
50,000 - 100,000	11	6.5%	1.3%
100,000 - 200,000	11	6.5%	2.5%
200,000 - 500,000	55	32.5%	31.1%
500,000 - 1,000,000	53	31.4%	56.1%
> 1,000,000	5	3.0%	8.5%
Total	169	100.0%	100.0%
Total>0	163	96.4%	100.0%
Assuming an Aggregate QS Value of $180 million			
0	6	3.6%	0.0%
1-1,000	6	3.6%	0.0%
1,000 - 50,000	13	7.7%	0.1%
50,000 - 100,000	7	4.1%	0.3%
100,000 - 200,000	6	3.6%	0.5%
200,000 - 500,000	16	9.5%	2.8%
500,000 - 1,000,000	28	16.6%	12.2%
1,000,000 - 2,000,000	64	37.9%	52.1%
>2,000,000	23	13.6%	31.9%
Total	169	100.0%	100.0%
Total>0	163	96.4%	100.0%

Table A-24. Estimated nonwhiting QS value per permit, based on permit landing history, assuming 75 percent allocation to permits and no equal sharing of buyback history.

QS Value Per Permit	# Permits	% of Permits	% of QS Value
Assuming an Aggregate QS Value of $63 million			
0	6	3.6%	0.0%
1-1,000	9	5.3%	0.0%
1,000 - 50,000	23	13.6%	0.7%
50,000 - 100,000	12	7.1%	1.4%
100,000 - 200,000	19	11.2%	4.9%
200,000 - 500,000	73	43.2%	40.8%
500,000 - 1,000,000	27	16.0%	27.2%
> 1,000,000	0	0.0%	0.0%
Total	169	100.0%	75.0%
Total>0	163	96.4%	75.0%
Assuming an Aggregate QS Value of $180 million			
0	6	3.6%	0.0%
1-1,000	7	4.1%	0.0%
1,000 - 50,000	13	7.7%	0.1%
50,000 - 100,000	8	4.7%	0.3%
100,000 - 200,000	10	5.9%	0.8%
200,000 - 500,000	14	8.3%	2.5%
500,000 - 1,000,000	48	28.4%	20.0%
1,000,000 – 2,000,000	57	33.7%	43.7%
>2,000,000	6	3.6%	7.5.%
Total	169	100.0%	75.0%
Total>0	163	96.4%	75.0%

Table A-25. Estimated nonwhiting QS value per permit, based on permit landing history, assuming 100 percent allocation to permits with equal sharing of buyback history.

QS Value Per Permit	# Permits	% of Permits	% of QS Value
Assuming an Aggregate QS Value of $63 million			
0	0	0.0%	0.0%
1-1,000	0	0.0%	0.0%
1,000 - 50,000	0	0.0%	0.0%
50,000 - 100,000	0	0.0%	0.0%
100,000 - 200,000	36	21.3%	10.2%
200,000 - 500,000	98	58.0%	56.4%
500,000 - 1,000,000	35	20.7%	33.5%
> 1,000,000	0	0.0%	0.0%
TOTAL	169	100.0%	100.0%
Assuming an Aggregate QS Value of $180 million			
0	0	0.0%	0.0%
1-1,000	0	0.0%	0.0%
1,000 - 50,000	0	0.0%	0.0%
50,000 - 100,000	0	0.0%	0.0%
100,000 - 200,000	0	0.0%	0.0%
200,000 - 500,000	19	11.2%	5.2%
500,000 - 1,000,000	58	34.3%	23.0%
1,000,000 – 2,000,000	88	52.1%	67.1%
> 2,000,000	4	2.4%	4.8%
TOTAL	169	100.0%	100.0%

Table A-26. Estimated nonwhiting QS value per permit, based on permit landing history, assuming 75 perc ent allocation to permits with equal sharing of buyback history.

QS Value Per Permit	# Permits	% of Permits	% of QS Value
Assuming an Aggregate QS Value of $63 million			
0	0	0.0%	0.0%
1-1,000	0	0.0%	0.0%
1,000 - 50,000	0	0.0%	0.0%
50,000 - 100,000	0	0.0%	0.0%
100,000 - 200,000	54	32.0%	12.5%
200,000 - 500,000	109	64.5%	57.3%
500,000 - 1,000,000	6	3.6%	5.2%
> 1,000,000	0	0.0%	0.0%
Total	169	100.0%	75.0%
Total>0	169	100.0%	75.0%
Assuming an Aggregate QS Value of $180 million			
0	0	0.0%	0.0%
1-1,000	0	0.0%	0.0%
1,000 - 50,000	0	0.0%	0.0%
50,000 - 100,000	0	0.0%	0.0%
100,000 - 200,000	0	0.0%	0.0%
200,000 - 500,000	47	27.8%	10.5%
500,000 - 1,000,000	73	43.2%	31.5%
1,000,000 – 2,000,000	49	29.0%	33.0%
>2,000,000	0.0%	0.0%	7.5.%
Total	169	100.0%	75.0%
Total>0	169	100.0%	75.0%

Table A-27. Estimated ex-vessel value of shoreside whiting per permit for the FPA (80 percent to permits and equal sharing), based on QP issued for permit landing history (does not take into account net profits or expected future revenue that would be reflected in QS value) (total annual QP value is assumed to be $13.7 million).

Ex-vessel Value Per Permit	# Permits	% of Permits	% of QP Ex-vessel Value
80% Allocation to Permits, No Equal Sharing of Buyback History*			
0	-	-	-
1-1,000	-	-	-
1,000 - 50,000	129	1	0
50,000 - 100,000	6	0	0
100,000 - 200,000	10	5.9%	10.2%
200,000 - 500,000	22	13.0%	53.5%
500,000 - 1,000,000	2	1.2%	7.4%
> 1,000,000	-	-	-
Total	169	100%	80%
Total>0	169	100%	80%

*The amount of whiting that would be distributed under equal sharing is relatively small. See Section A-2.1.3.a (about 7 percent of the shoreside whiting allocation and 2 percent of the mothership sector whiting allocation.)

Table A-28. Estimated ex-vessel value of shoreside whiting per permit, based on QP issued for permit landing history (does not take into account net profits or expected future revenue that would be reflected in QS value) (total annual ex-vessel value associated witH QP is assumed to be $13.7 million).

Ex-vessel Value Per Permit	# Permits	% of Permits	% of QP Ex-vessel Value
100% Allocation to Permits, No Equal Sharing of Buyback History*			
0	110	65.1%	0.0%
1-1,000	8	4.7%	0.0%
1,000 - 50,000	11	6.5%	1.4%
50,000 - 100,000	5	3.0%	3.2%
100,000 - 200,000	7	4.1%	7.5%
200,000 - 500,000	16	9.5%	36.5%
500,000 - 1,000,000	12	7.1%	51.4%
> 1,000,000	0	0.0%	0.0%
Total	169	100.0%	100.0%
Total>0	59	34.9%	100.0%
50% Allocation to Permits, No Equal Sharing of Buyback History			
0	110	65.1%	0.0%
1-1,000	11	6.5%	0.0%
1,000 - 50,000	13	7.7%	2.2%
50,000 - 100,000	7	4.1%	3.8%
100,000 - 200,000	14	8.3%	15.1%
200,000 - 500,000	14	8.3%	28.9%
500,000 - 1,000,000	0	0.0%	0.0%
> 1,000,000	0	0.0%	0.0%
Total	169	100.0%	50.0%
Total>0	59	34.9%	50.0%

*The amount of whiting that would be distributed under equal sharing is relatively small. See Section A-2.1.3.a (about 7 percent of the shoreside whiting allocation and 2 percent of the mothership sector whiting allocation.)

Table A-29. Estimated ex-vessel value of mothership whiting per permit, based on QP issued for permit landing history (does not take into account net profits or expected future revenue that would be reflected in QS value) (total annual ex-vessel value associated witH QP is assumed to be $6.9 million).

Ex-vessel Value Per Permit	# Permits	% of Permits	% of QP Ex-vessel Value
100% Allocation to Permits, No Equal Sharing of Buyback History			
0	137	81.1%	0.0%
1-1,000	0	0.0%	0.0%
1,000 - 50,000	4	2.4%	1.1%
50,000 - 100,000	6	3.6%	6.6%
100,000 - 200,000	6	3.6%	14.2%
200,000 - 500,000	15	8.9%	67.9%
500,000 - 1,000,000	1	0.6%	10.2%
> 1,000,000	0	0.0%	0.0%
Total	169	100.0%	100.0%
Total>0	32	18.9%	100.0%
50% Allocation to Permits, No Equal Sharing of Buyback History			
0	137	81.1%	0.0%
1-1,000	0	0.0%	0.0%
1,000 - 50,000	10	5.9%	3.9%
50,000 - 100,000	6	3.6%	7.1%
100,000 - 200,000	15	8.9%	33.9%
200,000 - 500,000	1	0.6%	5.1%
500,000 - 1,000,000	0	0.0%	0.0%
> 1,000,000	0	0.0%	0.0%
Total	169	100.0%	50.0%
Total>0	32	18.9%	50.0%

SUMMARY

- LEPs are highly specific assets, the value of which is likely to decline substantially with the implementation of an IFQ program.
- Owners of permits without much history may experience a decline in the value of their permits that is not fully offset by the value of the QS they receive.
- At most, 65 percent of the permits have changed ownership since the implementation of the program. The remainder of the permits continues to be owned by entities that received them at little cost as part of an initial grant.

♦ *Harvest Sector Vessels*

We will focus on vessels as the main unit around which the harvesting operation is organized. The permit owner and the vessel owner are believed to be the same about 87 percent of the time (based on a matching of permit owner and vessel owner addresses).

Table A-30. Indications of vessels leasing permits.

	Name of Vessel Owner and Permit Holder	Address of Vessel Owner and Permit Holder
Same	136 Permits (76%)	155 Permits (87%)
Different	42 Permits (0.24%)	23 Permits (0.13%)
Total	178 Permits*	178 Permits*

* When the initial data sets were drawn, there were 179 permits (including 10 catcher-processor permits). More recently, one permit has been combined with another. This table was developed from a more recent data draw.

Anecdotal information indicates that, in some cases where a vessel owner and permit owner information do not match, the permit is being purchased by the vessel owner, and transfer is scheduled to be completed when the final payment is made.

COMPETITIVENESS

Negotiations with Processors. In the sections of Appendix E on market power (summarized starting on page A-49),we focused on the harvesting sector's interactions with processors in the raw fish market. There we found the following indicators:

- Harvesters are in a weaker position than processors to exert market power under status quo.
- Access to capital may be more expensive for harvesters than processors because of the smaller size of their businesses and most of their primary assets have fewer alternative uses.
- There are more mechanisms through which harvesters may gain efficiency under an IFQ program than processors (over the long-term, both sectors will rationalize).
- If harvesters receive all the QS at the time of initial allocation, their bargaining position will be significantly strengthened; competition among harvesters initially will be isolated to the QS/QP market (processors may acquire QS over time), and there will be incentive for harvesters to cooperate in the raw fish market. Bargaining power is important to the degree that prices are influenced by negotiations rather than going market prices.[25] [26]
- See Table A-16 for a list of indicators of factors affecting the flow of QS among groups independent of the initial allocation).

Specifically, as the allocation of QS to processors increases as follows:

- The capital infusion to harvesters decreases.
- The exit barriers increase lengthening the IFQ program transition period.
- Harvester competition in the raw fish market will increase reducing their bargaining power.
- The cost of harvester access to capital would increase.
- The likelihood of harvester bankruptcies would increase.

The initial capital infusion may have a long-term effect on the distribution of wealth in the industry.

Competition within the Sector. Those vessels that have the advantage of receiving QS as part of the initial allocation will be better able than new entrants to compete in the raw fish market for the opportunity to deliver on processor held QP. As the amount allocated to processors increases, that advantage will be diminished due to the reduction in the initial allocation of QS going to vessels. If the QS control limits had been set lower than they were under the FPA and if there were a grandfather clause, the vessels qualifying for larger amounts of QS would have had an ongoing advantage over those receiving less than the control limits (the advantage of operating at a scale larger than allowed for those not grandfather in at levels above the control limits). An increase in the amount allocated to processors would have reduced this differential in the advantage for those receiving the most QS, by reducing the amount by which their initial allocation was in excess of control limits. Information on

[25] If there are enough participants acting independently on both sides of a local market then the sellers and buyers will tend to be price takers, and whoever holds the QS will receive the profits related to resource rents.

[26] Under the FPA, there is no grandfather clause, and QS control limits are generally set well above initial allocation levels. If there had been a grandfather clause and control limits were lower, providing processors with an initial allocation would have resulted in lower grandfathering levels for those individual harvesters that would have received QS in excess of accumulation limits. They would not be able to achieve the same harvest scale that they would have with a 100 percent allocation to harvesters.

amounts that will be allocated to permits, relative to accumulation limits, and under different permit/processor splits is provided in Section A-2.2.3.e on accumulation limits. If there were a grandfather clause, over time, as the grandfather clause expires, holdings of the largest QS owners would diminish to within control limits. There may be some advantage for those receiving QS in excess of control limits, but that advantage will not extend beyond year four, by which time divestiture is required.

INVESTMENT DEPENDENCE AND DISRUPTION

Dependence on the groundfish trawl fishery is a function of the degree of investment in the fishery and ability to employ the assets representing those investments in activities outside the groundfish trawl fishery. This is described more fully in the corresponding section above on processors (page A-62). The situation for vessels, vis-à-vis QS holders, is similar to the situation of processors, i.e., to the degree that there is overcapitalization and price competition, vessel owners will likely give up some (not all) of their return on capital by way of accepting lower prices for raw fish or paying more for QP (until the point is reached at which there is no longer surplus capacity in the fishery). If, over the short term (until excess capital is dissipated), harvesters give up returns on capital to QP holders, it is not expected that the amount given up will be substantially greater under IFQs than what is given up or dissipated under status quo.

As with processors, the effect of the imposition of the IFQ program on returns to capital for vessel owners will depend on the degree to which those returns are already being given up or dissipated under status quo and the cost structure and debt positions of all firms in the sector. However, the new flexibility provided by the IFQ program may afford harvesters with more opportunity/necessity than processors to modify their operations rapidly, decreasing their total and average costs, particularly as compared to nonwhiting processors. If excess capacity leaves the harvesting sector more rapidly (the sector becomes rationalized), the period over which returns on investment are dissipated in bidding for QS could be shorter than that for processors. The illustrations provided above for processors (Figure A-5 and Figure A-6) can also be applied to harvesting operations in the nonwhiting and whiting fishery. The difference is that rather than bidding up the price of raw fish, the harvesters will increase their costs by bidding up the price of a different key input, the QP. A similar dynamic will ensue in which there will be opportunities for harvesters to reduce costs under an IFQ program as compared to status quo management, and relative cost structures and debt positions will determine how much of the potential profits are bid away to QP owners. The process by which vessels increase their economic efficiency as QS is consolidated and transferred from less efficient to more efficient producers. The process by which less efficient vessels leave the fishery is described in Section 4.6.2.1.

Harvesters must acquire QS or QP in order to harvest. The more of the QS that is given to harvesters as part of the initial allocation, the less they will continue to dissipate their returns on investment in bidding for a market for their raw fish or for QS/QP.

If 100 percent of the QS is given to permit holders, the need for harvesters to give up returns on capital in order to bid more for QS would depend on how the initial allocation matches up with their existing and optimal production levels. As the amount given to processors increases a harvester's need to acquire QS (or access to QP) in order to continue its operations increases.[27] The top half of Figure A-7 provides a scattergram showing how entities fare under the FPA as compared to the PPA. The left-hand side of the figure shows results for entities that only harvest (hold permits) and the right-hand side shows results for entities that process, some of which also hold permits. From this figure, it can be seen that, despite less total QS going to harvesters under the PPA, most harvesters (63) may have fared slightly

[27] Processors do not need QS in order to maintain their existing operations.

better with the PPA than under the FPA (58 fared better under the FPA). The reason for this is likely the effect of the grandfather clause provision, and this result may be somewhat misleading. First, the reason the PPA appears to perform better for many individual entities is that the initial allocations to any one entity are capped at 1.5 percent[28] of the nonwhiting QS. Looking along the horizontal axis, it can be seen that a number of entities are expected to receive well more than 1.5 percent of the QS (one at about 7 percent and several at between 1.5 and 2.5 percent). The amount of QS that these entities would not receive because of the assumed accumulation limit approaches 10 percent, and that amount has been redistributed to permit holders with initial allocations below the limits. Additionally, a number of other permit holders while not restricted by the aggregate limits were restricted by the individual species limits. Under the PPA, their allocations are reduced and redistributed to those who are under the control limits. Thus, for many, the increase in the amount of the initial allocation going to harvesters under the FPA is not enough to offset what they might have expected to gain under the PPA, which has no grandfather clause and no opportunity to divest.[29] These results may be misleading because there is a high likelihood that those entities expecting to exceed the control limits because of their ownership of multiple permits would divest themselves of some of their permits prior to the initial allocation in order to capitalize on the value of the QS represented by those permits prior to the time the QS is actually issued. Therefore, many of those who appear to gain under the PPA would not gain nearly as much, or might have a worse outcome under the PPA. The bottom half of Figure A-7 compares the revenue that permits might expect from their initial allocation of QS under the FPA to their recent revenue (2004 to 2006 average). Figure A-8 provides a similar comparison for the PPA. Figure A-9 through Figure A-14 compare the Council's PPA to other allocation formulas, varying various central elements.

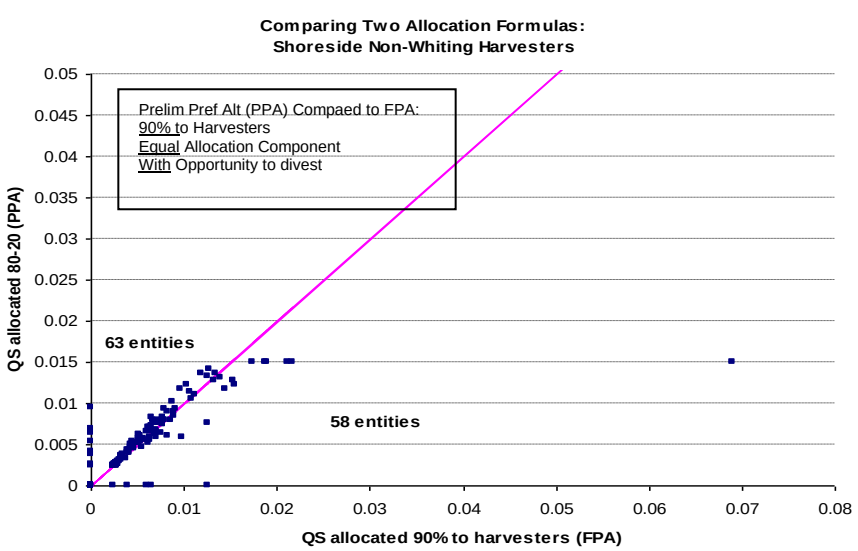
With respect to shoreside whiting, the PPA and FPA are virtually identical because both allocate 80 percent to harvesters and 20 percent to processors. The QS control limits are not constraining, so the presence or absence of a grandfather clause does not have an impact on the initial distribution (Figure A-16). The largest producing harvesters would receive the most with a 100 percent allocation to harvesters and no equal sharing. A comparison of this option to the PPA is provided in Figure A-17. Under the FPA, 25 harvesters would receive less QS than they need to achieve their recent average (Figure A-16) as compared to 21 entities that would receive less under a 100 percent allocation to harvesters (Figure A-17).

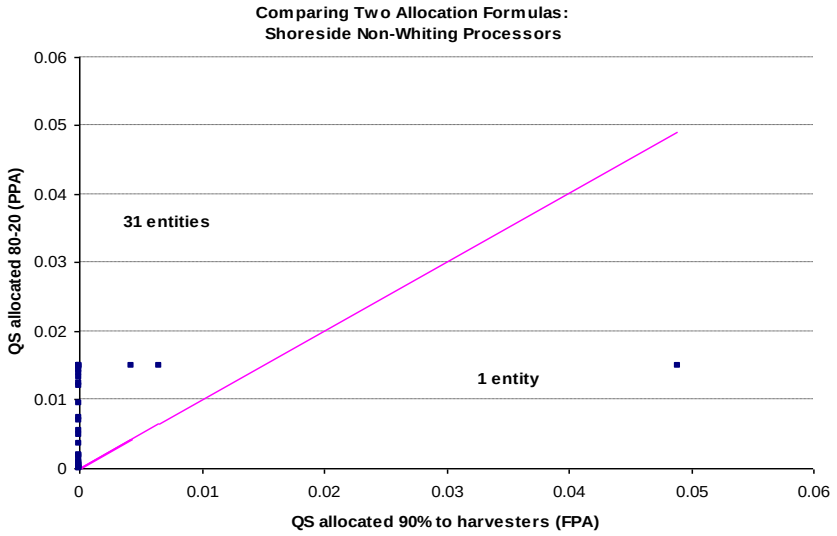
Additional comparisons are provided in Figure A-18 and Figure A-19. Figure A-18 compares the PPA to an allocation formula with 50/50 split between harvesters and processors. Figure A-19 compares the PPA to an allocation formula with no equal sharing. Both alternative allocation formulas also include a grandfather clause; however, because the QS control limit is not limiting for whiting, the presence or absence of the grandfather clause does not affect the results.

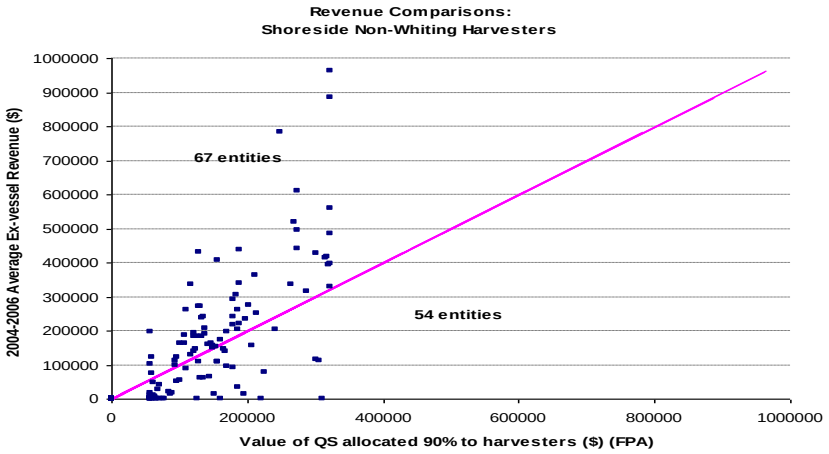
Similar information is provided for the mothership whiting fishery in Figure A-20 and Figure A-21. Under the FPA, the mothership sector would be managed with co-ops rather than IFQs.

[28] The 1.5 percent aggregate control limit was the most restrictive of the options considered by the Council and was selected for the analysis to illustrate the maximum effect of the grandfather clause provision.

[29] The FPA also does not have a grandfather clause, but, under the FPA, those over the control limits are allowed to receive their initial allocation and then sell it to others.







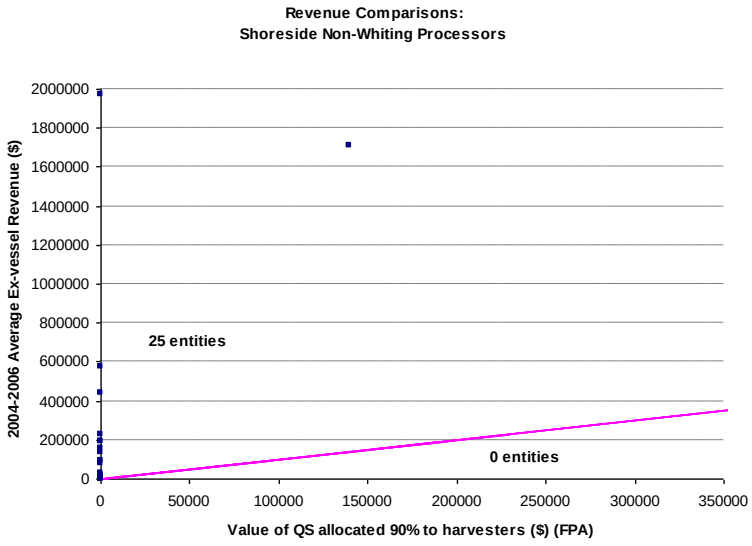
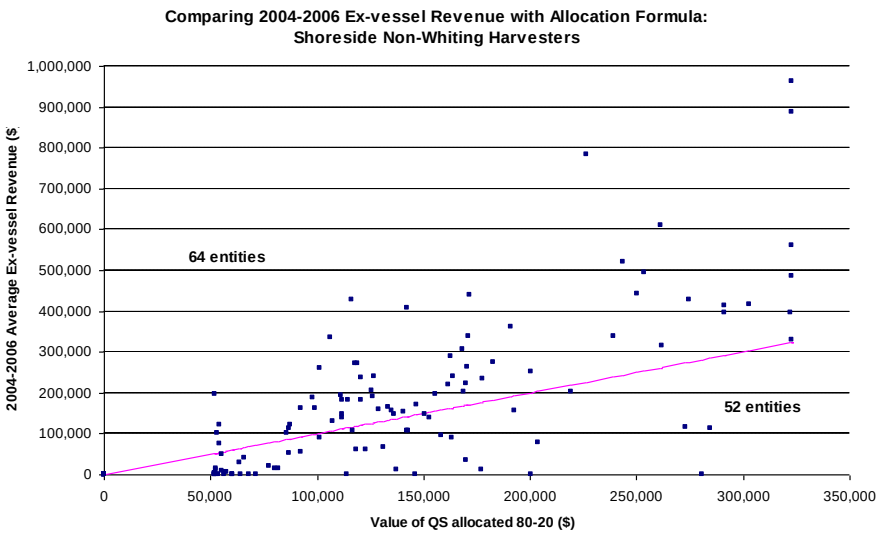


Figure A-7. QS allocations for FPA (90 percent initial allocation of QS to harvesters, 10 percent to adaptive management, with equal allocation of buyback shares, and with opportunity to divest) (QS amounts are entire initial allocation) compared to QS allocations for PPA (80 percent of initial allocation for harvesters, 20 percent for processors, with equal allocation of buyback shares and no grandfather clause) and converted to ex-vessel revenue and compared to average 2004 to 2006 ex-vessel revenue of landings for each entity (bottom)—entities that only harvest (left) and those that process (right)—any QS for processor-held permits is on the right.



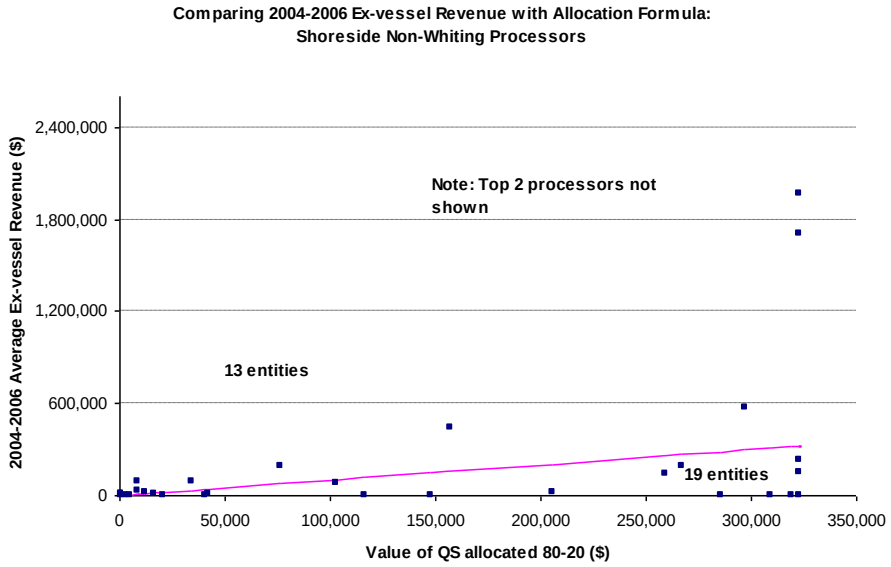


Figure A-8. Annual ex-vessel value estimated for QSs allocated to entities that only harvester (left) and those that process (right) in the shoreside nonwhiting sector under the PPA allocation formula (PPA: 80 percent harvester – 20 percent processor initial allocation of QSs, equal allocation of buyback shares, and no grandfathering for initial allocations over the accumulation limits) compared to average 2004 to 2006 ex-vessel revenue of landings for each entity.

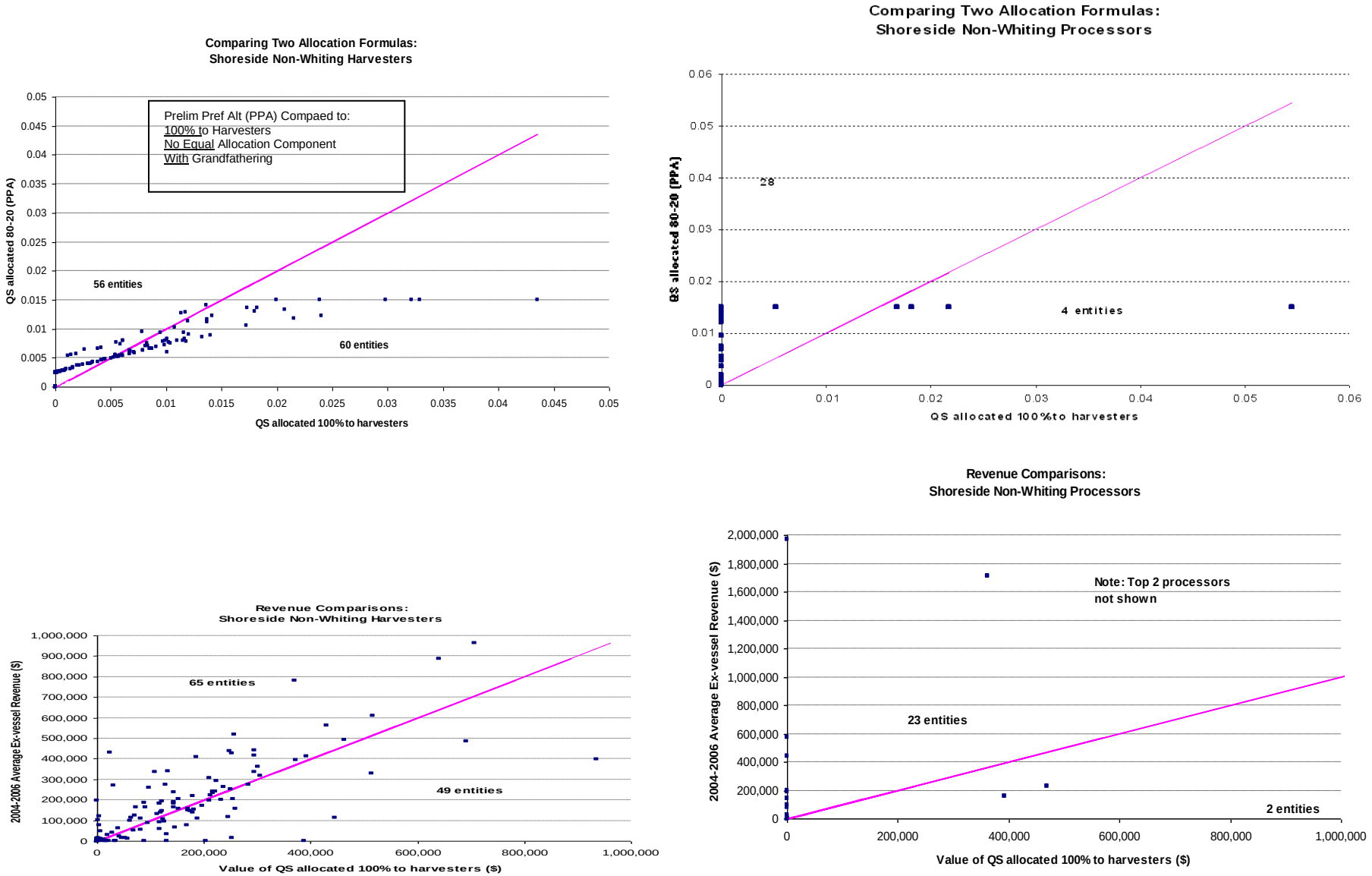
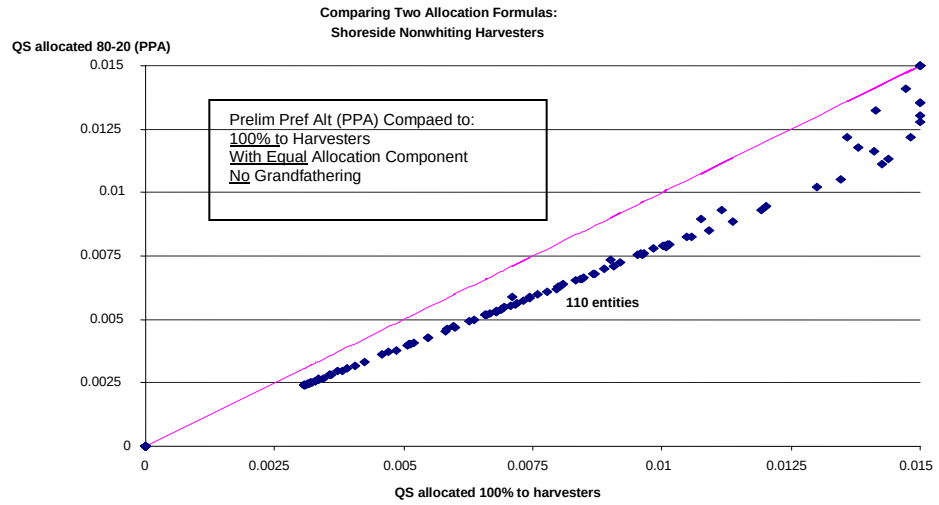
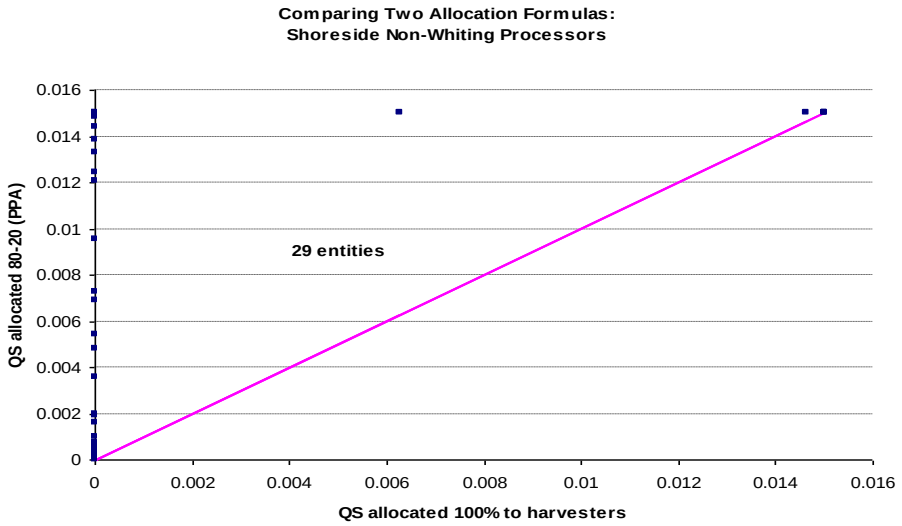
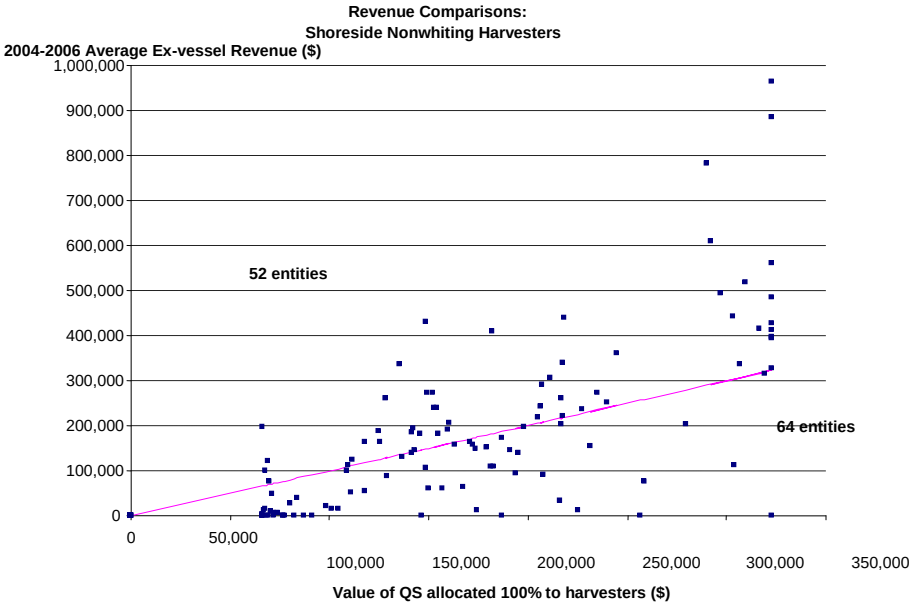


Figure A-9. QS allocations for formula with 100 percent initial allocation of QSs to harvesters, no equal allocation of buyback shares, and with a grandfather clause for QS allocations over the accumulation limits compared to QS allocations for PPA (top) and converted to ex-vessel revenue and compared to average 2004 to 2006 ex-vessel revenue of landings for each entity (bottom)—entities that only harvest (left) and those that process (right)—any QS for processor-held permits is on the right.







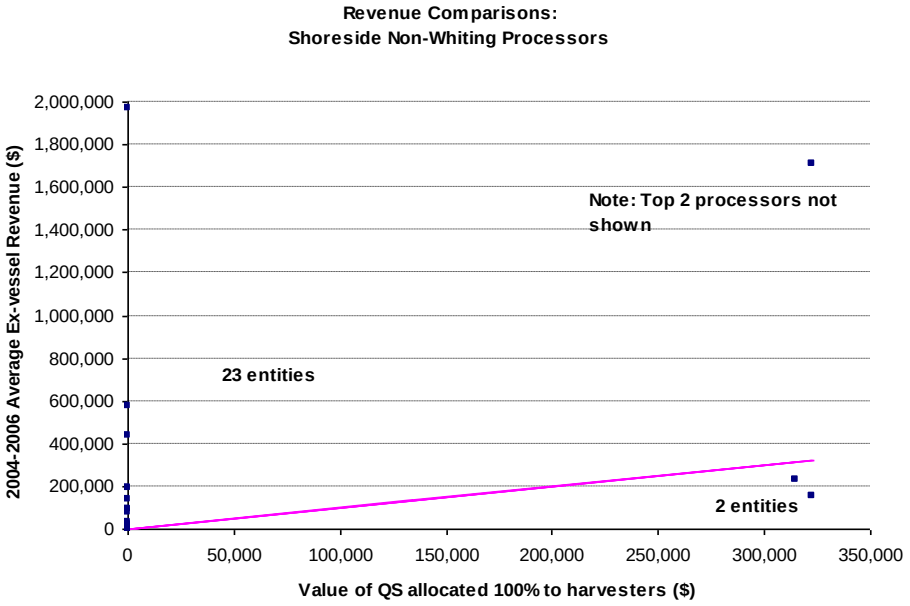


Figure A-10. QS allocations for formula with 100 percent initial allocation of QSs to harvesters, equal allocation of buyback shares, and no grandfather clause for initial allocations over the accumulation limits compared to QS allocations for PPA (top) and converted to ex-vessel revenue and compared to average 2004 to 2006 ex-vessel revenue of landings for each entity (bottom)—entities that only harvest (left) and those that process (right)—any QS for processor-held permits is on the right.

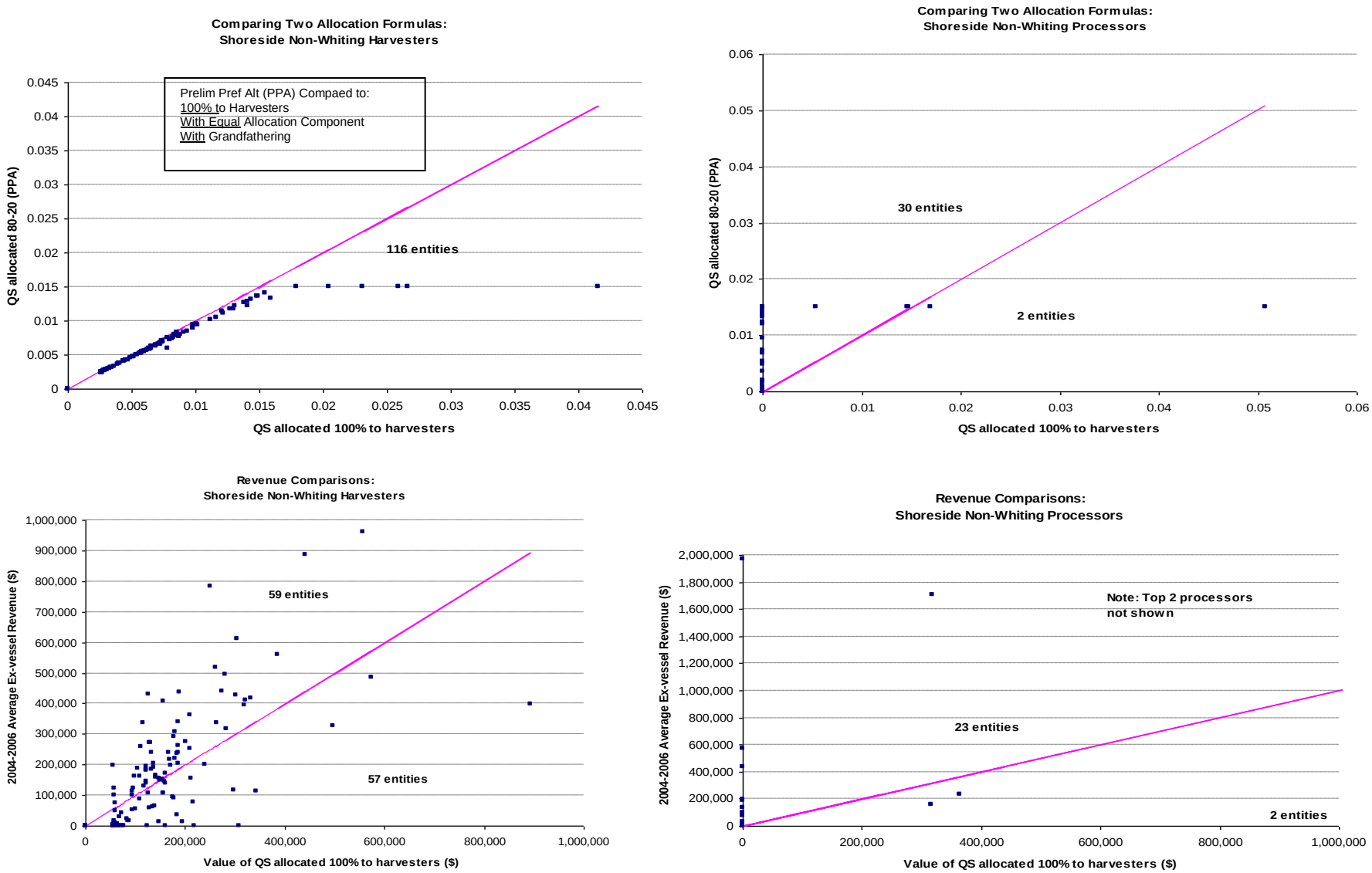


Figure A-11. QS allocations for formula with 100 percent initial allocation of QSs to harvesters, equal allocation of buyback shares, and a grandfather clause for initial allocations over the accumulation limits compared to QS allocations for PPA (top) and converted to ex-vessel revenue and compared to average 2004 to 2006 ex-vessel revenue of landings for each entity (bottom)—entities that only harvest (left) and those that process (right)—any QS for processor-held permits is on the right.

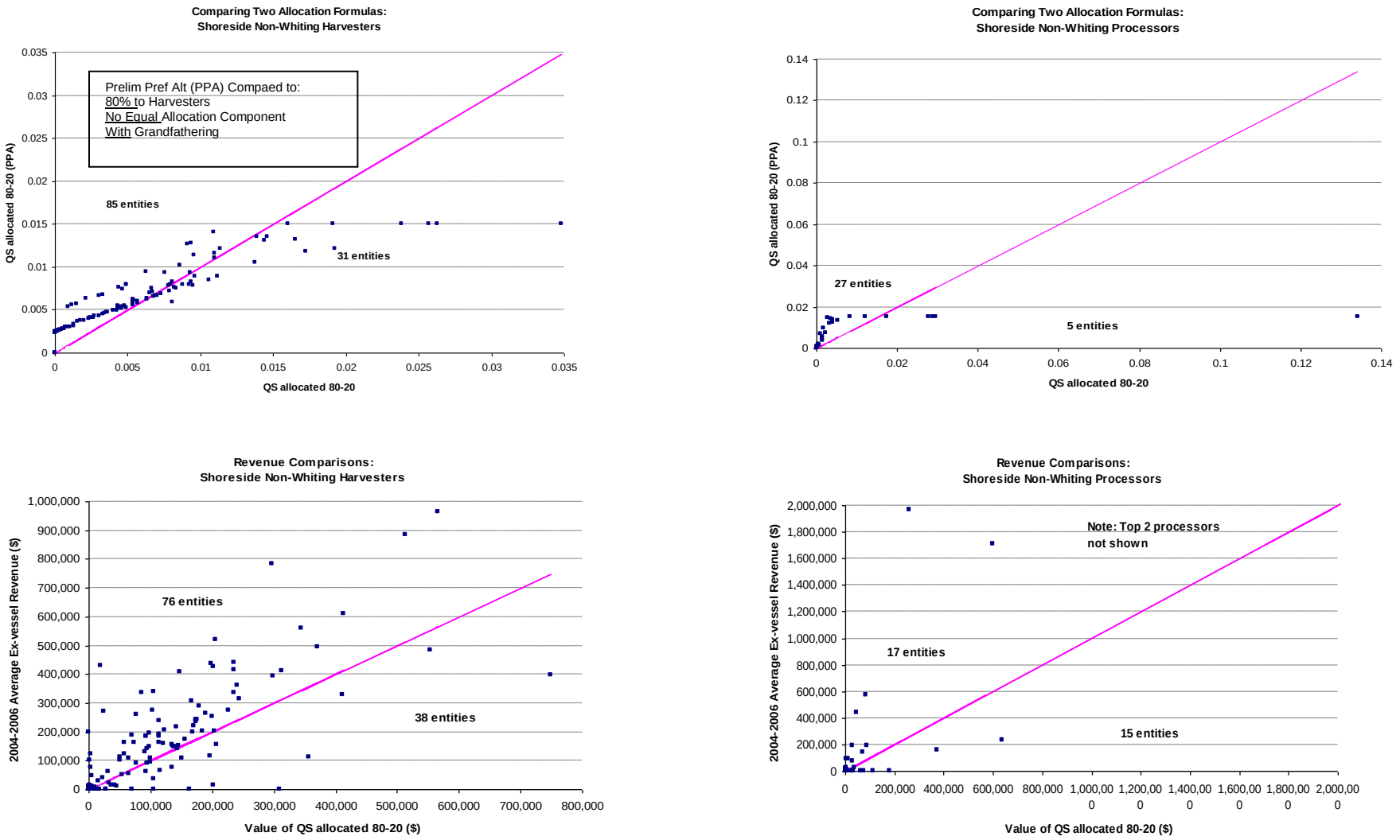


Figure A-12. QS allocations for formula with an 80 percent initial allocation of QSs to harvesters, no equal allocation of buyback shares, and with a grandfather clause for initial allocations over the accumulation limits compared to QS allocations for PPA (top) and converted to ex-vessel revenue and compared to average 2004 to 2006 ex-vessel revenue of landings for each entity (bottom)—entities that only harvest (left) and those that process (right)—any QS for processor-held permits is on the right.

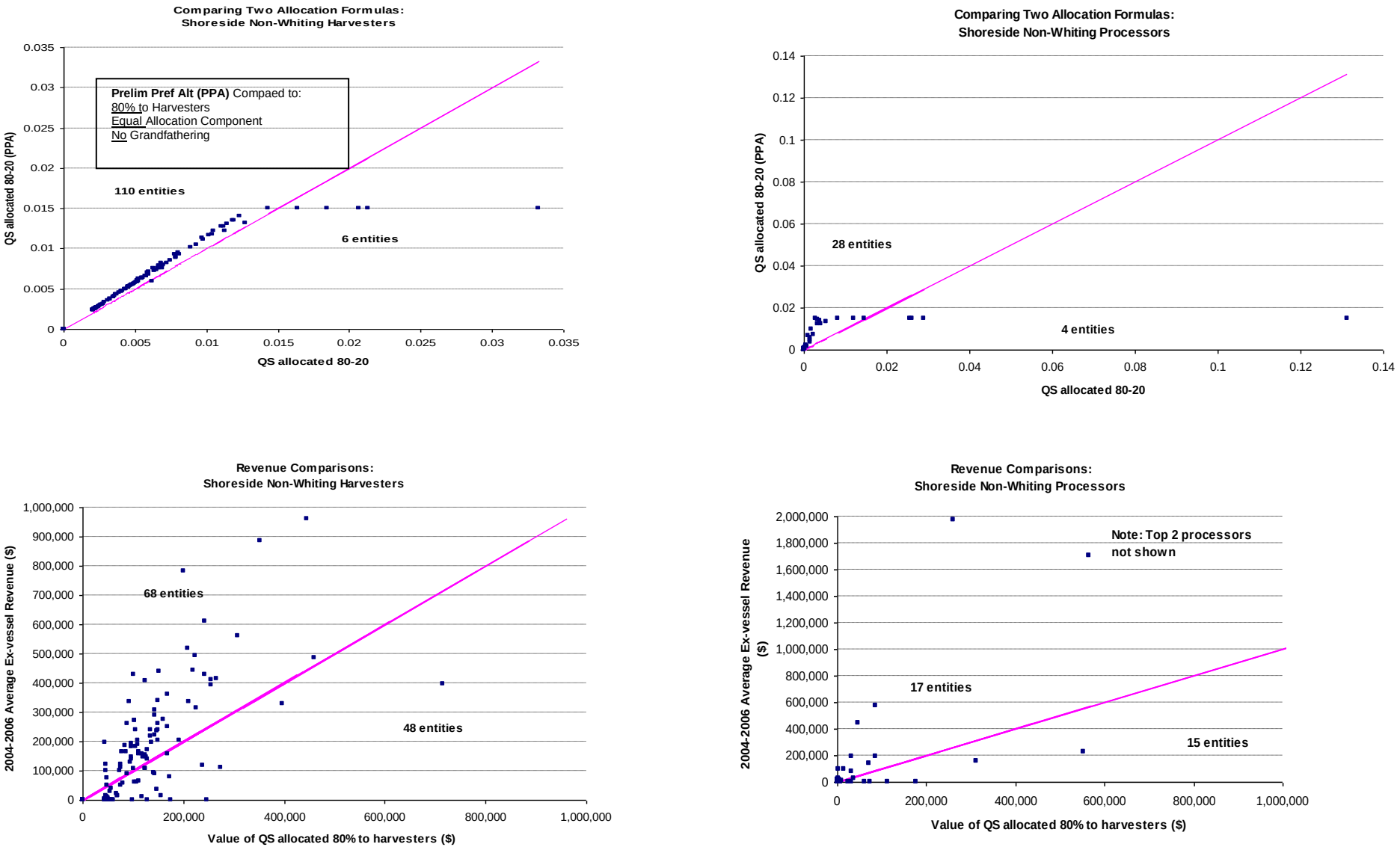
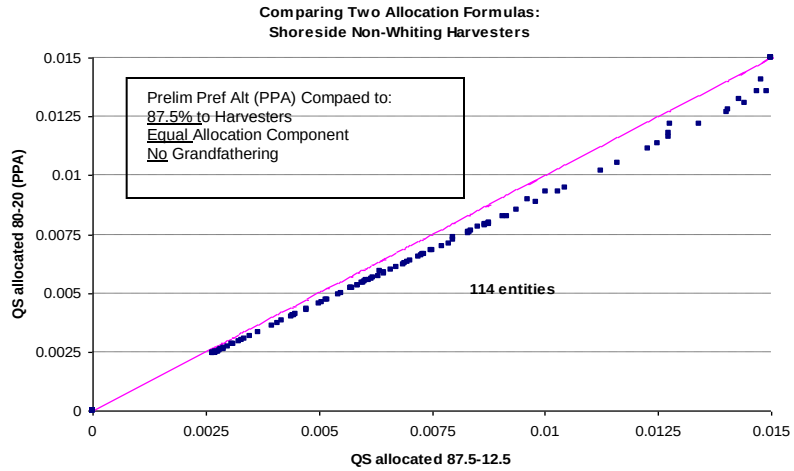


Figure A-13. QS allocations for formula with an 80 percent initial allocation of QSs to harvesters, equal allocation of buyback shares, and with a grandfather clause for initial allocations over the accumulation limits compared to QS allocations for PPA (top) and converted to ex-vessel revenue and compared to average 2004 to 2006 ex-vessel revenue of landings for each entity (bottom)—entities that only harvest (left) and those that process (right)—any QS for processor-held permits is on the right.



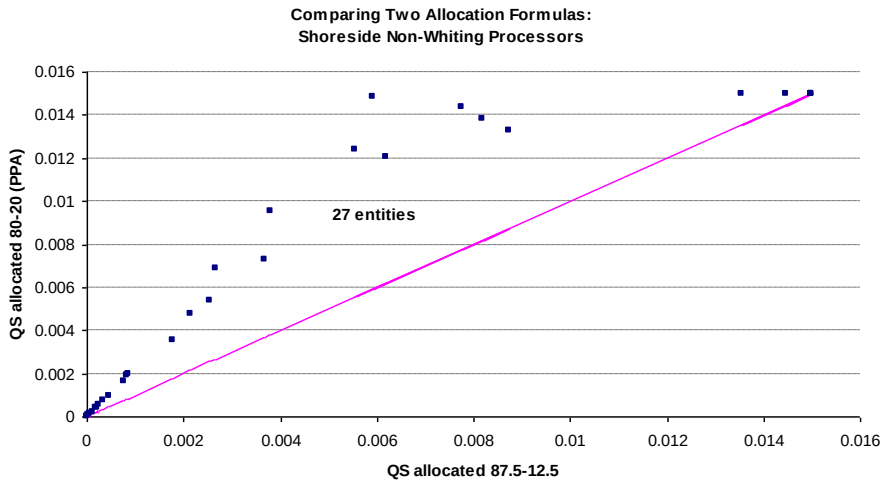
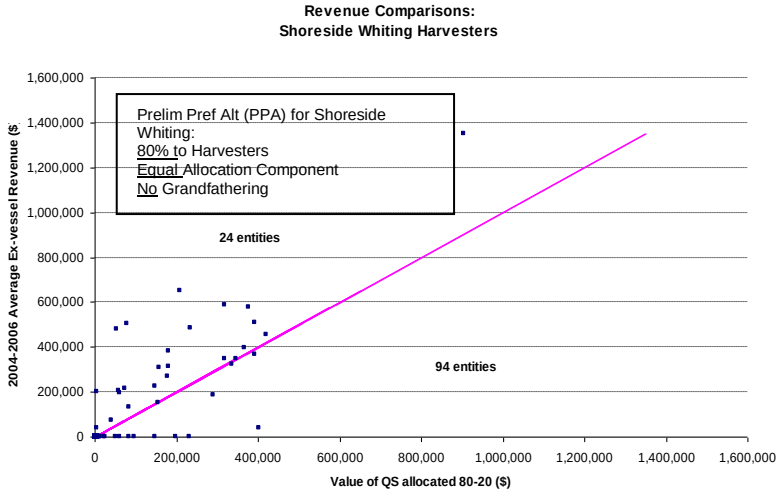


Figure A-14. QS allocations for formula an 87.5 percent initial allocation of QSs to harvesters, equal allocation of buyback shares, and no grandfather clause for initial allocations over the accumulation limits compared to the PPA.



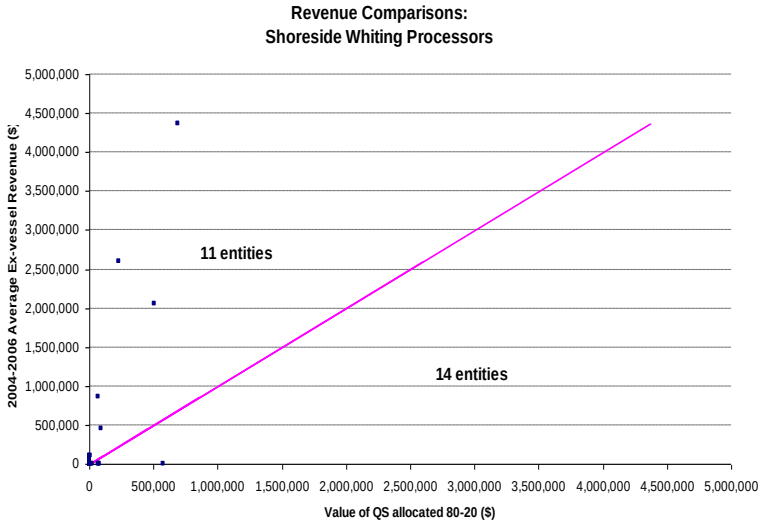
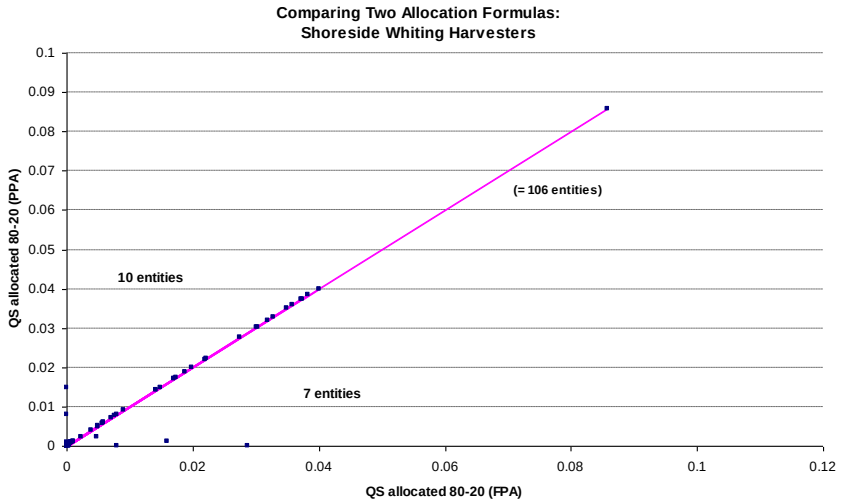
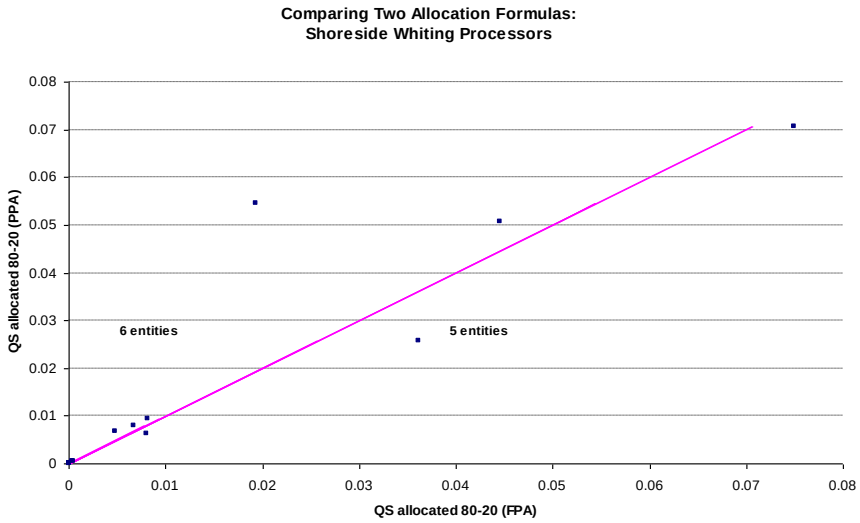
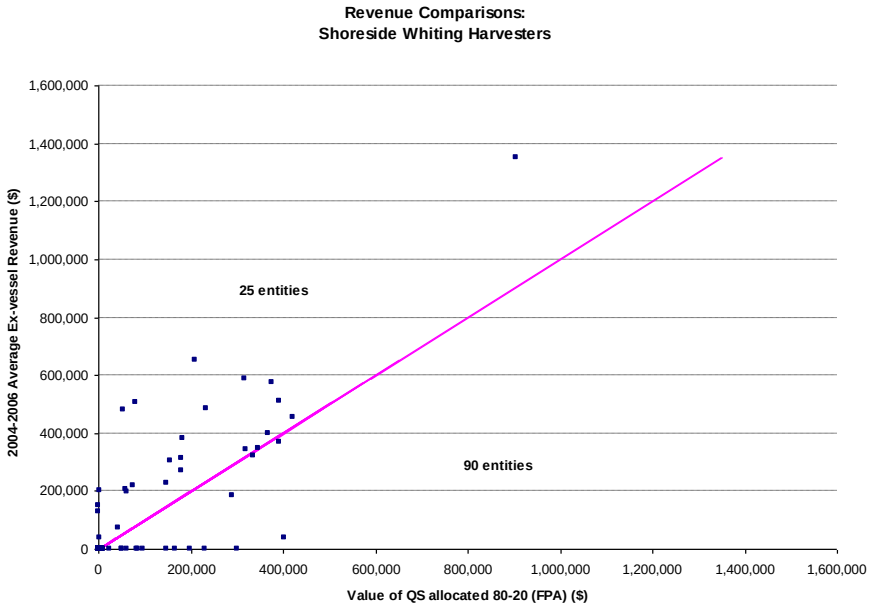


Figure A-15. For whiting, the annual ex-vessel value of QSs allocated to entities that only harvester (right) and entities that processors (left) in the shoreside whiting fishery under the PPA allocation formula (PPA: 80 percent harvester – 20 percent processor initial allocation of QSs, equal allocation of buyback shares, and no grandfathering for initial allocations over the accumulation limits) compared to average 2004 to 2006 ex-vessel revenue of landings for each entity.







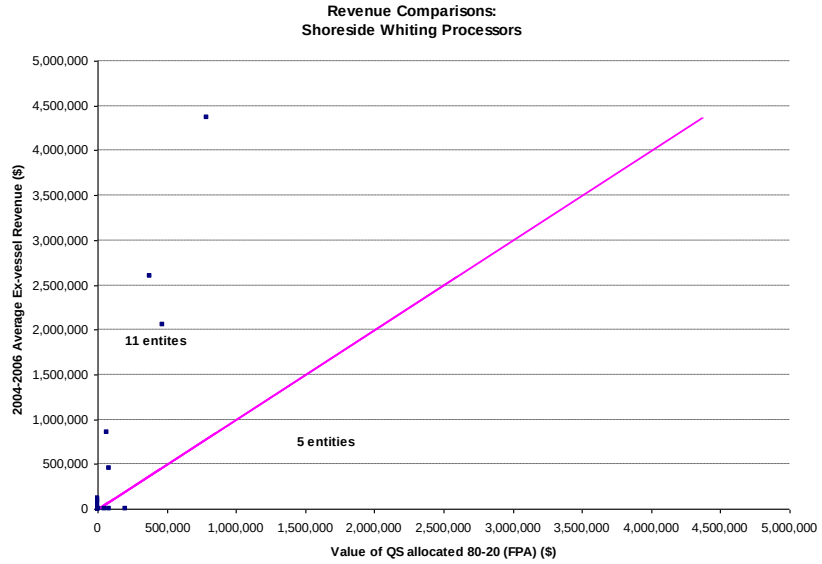
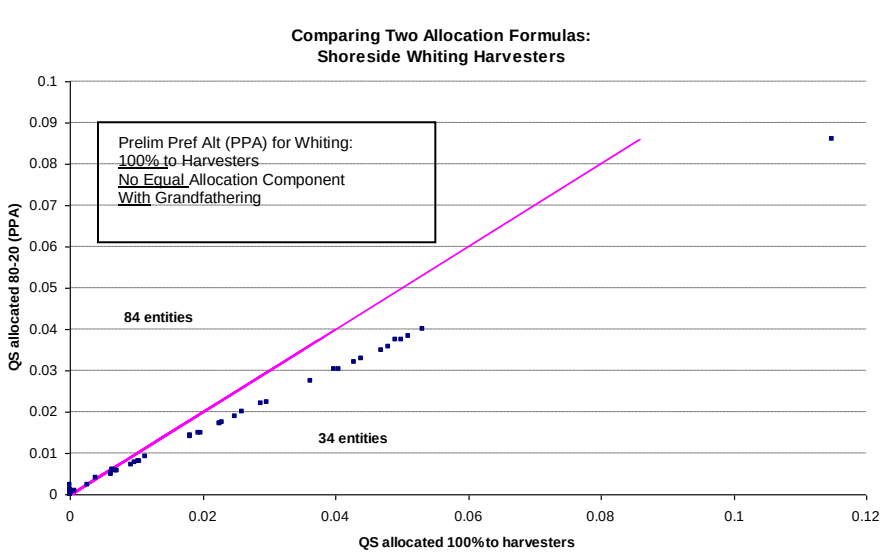
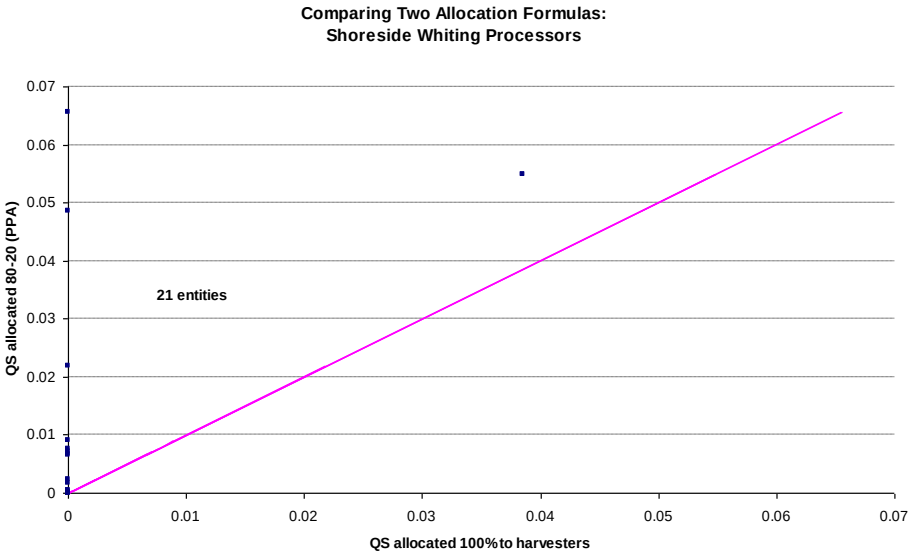
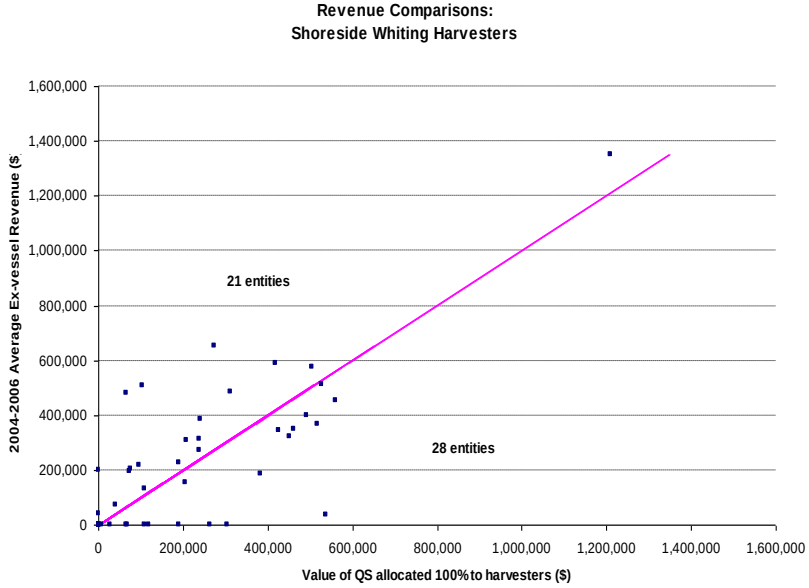


Figure A-16. For shoreside whiting, comparison of the FPA to the PPA, and converted to ex-vessel revenue and compared to average 2004 to 2006 ex-vessel revenue of landings for each entity (bottom)—entities that only harvest (left) and those that process (right)—any QS for processor-held permits is on the right.







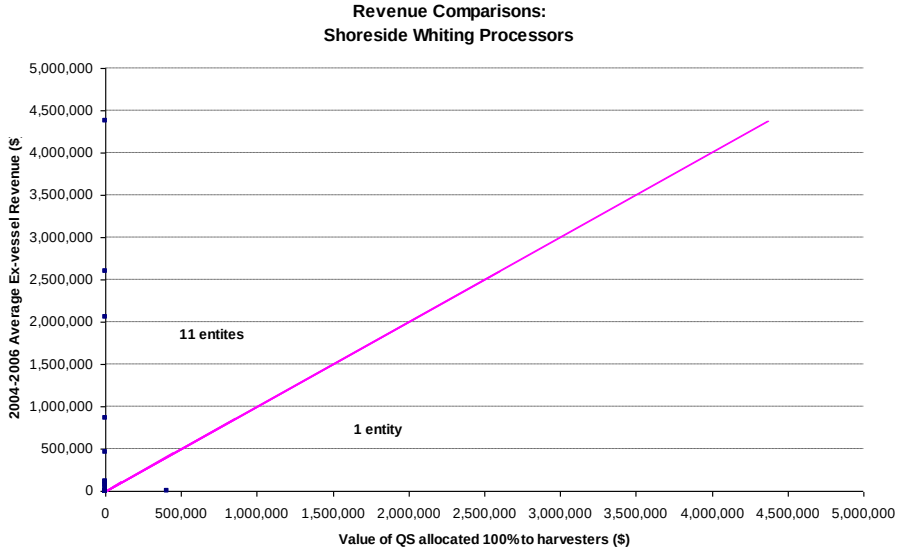


Figure A-17. For shoreside whiting, comparison of the PPA allocation formula to one with 100 percent initial allocation of QSs to harvesters, no equal allocation of buyback shares, and with a grandfather clause for initial allocations over the accumulation limits.

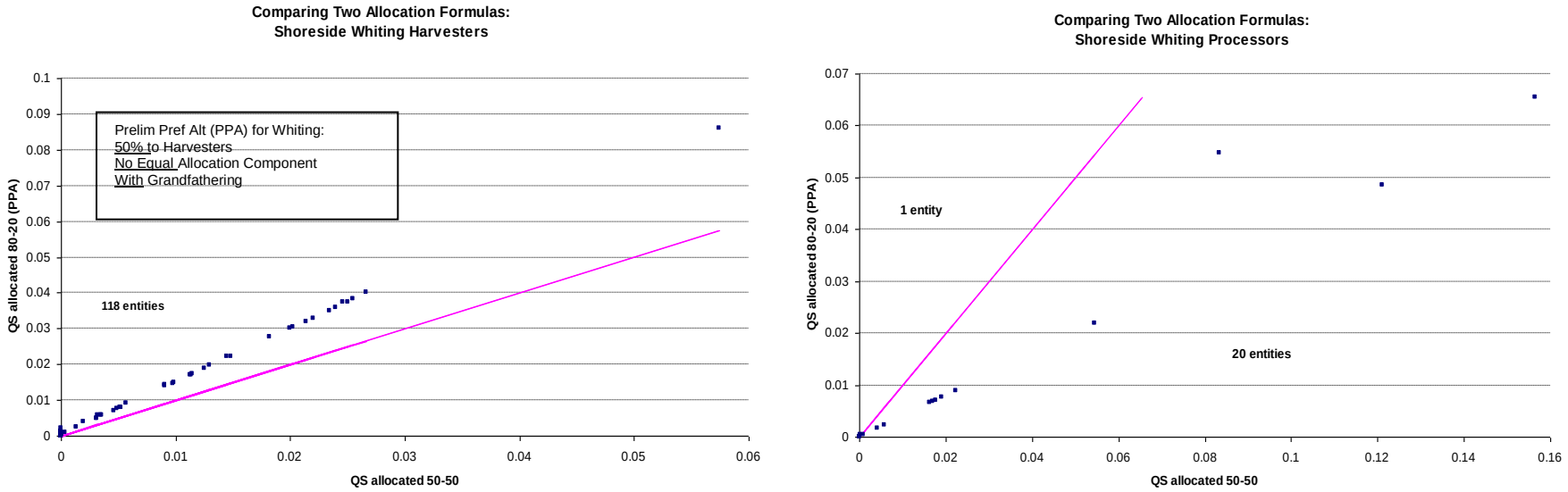


Figure A-18. For shoreside whiting, comparison of the PPA allocation formula to one with 50 percent initial allocation of QSs to harvesters, 50 percent initial allocation of QSs to processors, equal allocation of buyback shares, and with a grandfather clause for initial allocations over the accumulation limits.

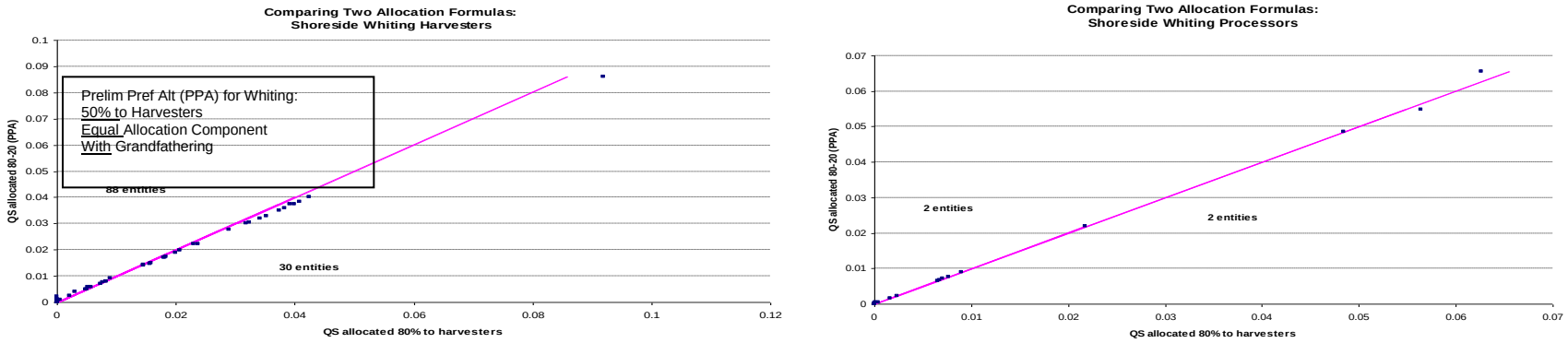


Figure A-19. For shoreside whiting, comparison of the PPA allocation formula to one with an 80 percent initial allocation of QSs to harvesters, no equal allocation of buyback shares, and with a grandfather clause for initial allocations over the accumulation limits.

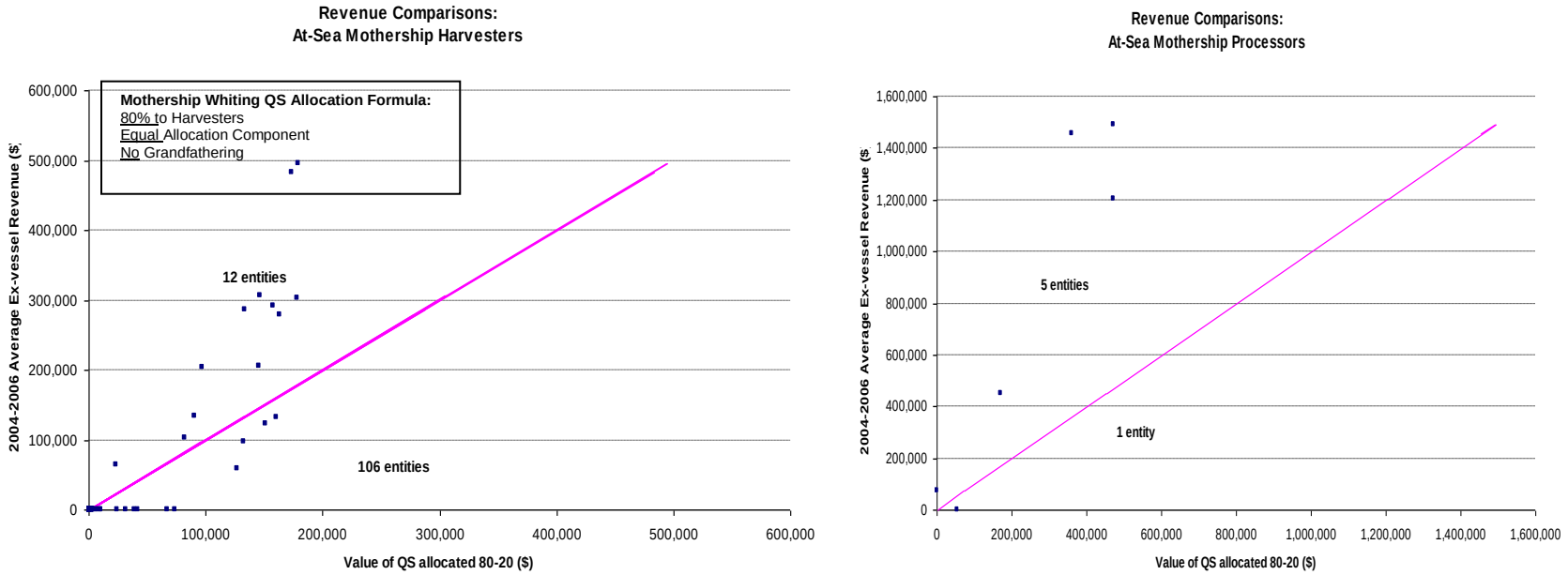
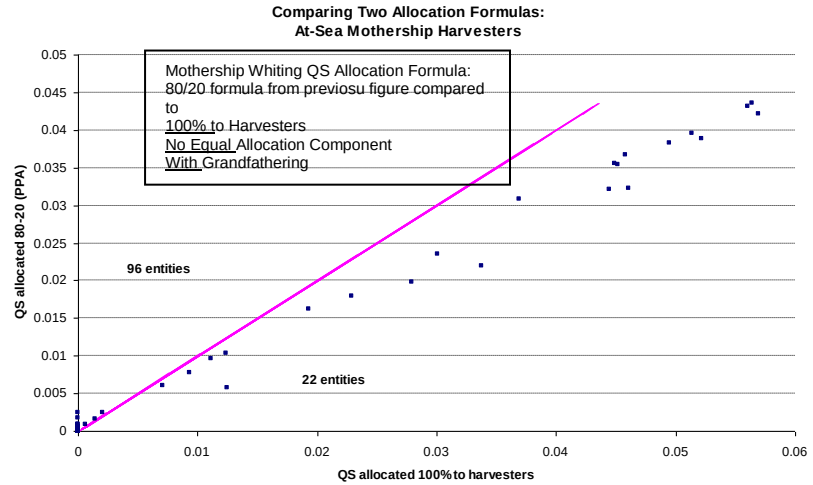
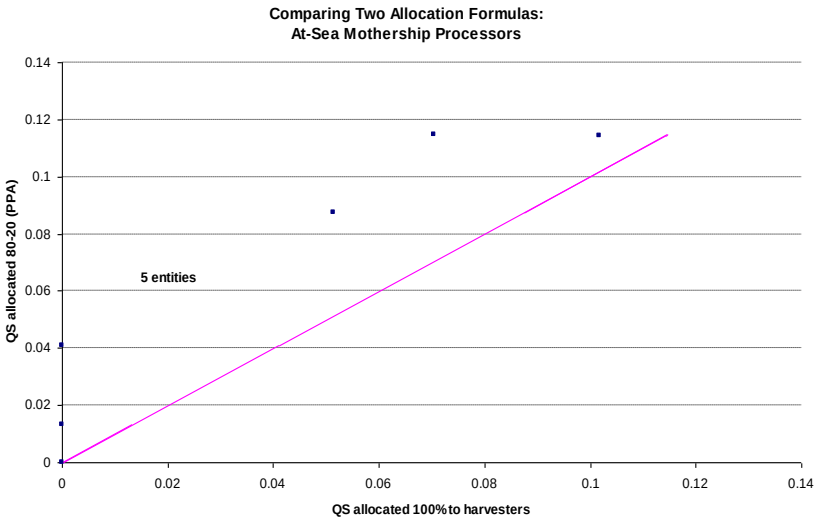
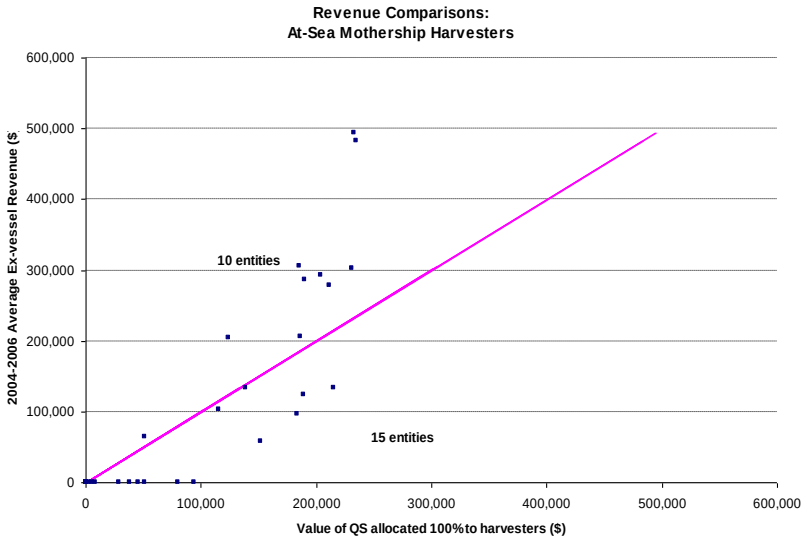


Figure A-20. For mothership sector whiting, the annual ex-vessel value of QSs allocated to harvesters and processors in the at sea mothership whiting fishery (under an allocation formula using 80 percent harvester – 20 percent processor initial allocation of QSs, equal allocation of buyback shares, and no grandfathering for initial allocations over the accumulation limits) compared to average 2004 to 2006 ex-vessel revenue of landings for each entity.







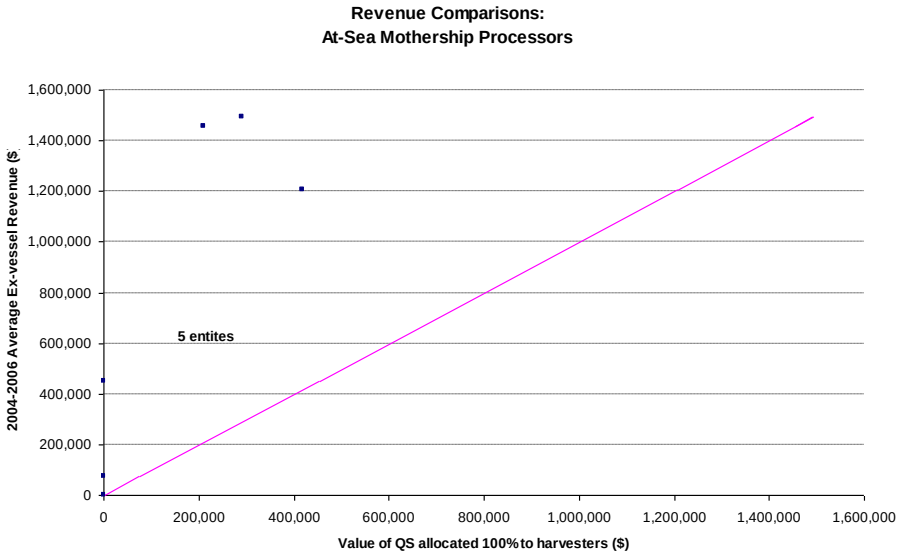


Figure A-21. For mothership sector whiting, comparison of the PPA allocation formula to one with a 100 percent initial allocation of QSs to harvesters, no equal allocation of buyback shares, and with a grandfather clause for initial allocations over the accumulation limits.

Vessel owners that are not permit owners (i.e., do not receive an initial allocation of QS) will be in a particularly difficult position with respect acquiring QS in terms of both their need and their ability to borrow money for QS acquisition. However, they will essentially be in the same position as a new entrant (Francis, *et al.* 2007) (except they will have already made substantial capital investments and have some expertise in the fishery). For harvesters already under some financial stress (in particular those which do not have much equity in their capital assets), the need to acquire QS or access to QP, combined with limited assets to provide as collateral for QS purchase will put them at a greater risk for bankruptcy or exiting the fishery, as compared to a processor in a similar financial situation that does not receive QS. Harvesters leaving the fishery are part of the rationalization process. To the degree that harvesters do not receive the QS they need for their operations, firms may leave the fishery more rapidly when the program is first implemented.

a. The relative position of harvesters receiving QS compared to those not receiving an initial allocation will be affected by the price of QS and whether or not the firm has recovered its previous capital investments or is still making payments (Table A-30). When the fishery is fully rationalized the price of the QS will represent the profits associated with resource rent. When it is overcapitalized, the price of the QS may also include some profits that would otherwise have gone to returns for capital investments. A firm may receive the QS free as part of an initial allocation, may be able to purchase QS at a price that represents the rent to the resource, or may have to pay a higher QS price (one that represents rent to the resource and some additional amount associated with the degree of overcapitalization in the fishery). Each of these situations are represented in the rows of Table A-30. The firm may come into this situation from one of two positions with respect to its capital investment, either at a time when it has fully recovered the cost of the capital investment (having repaid any loans taken to make the investment) or at a time when it is still making payments on the original investment (the columns of Table A-30). A firm that has existing debt and has to acquire QS (or access to QP) before the fishery is completely rationalized, may find it difficult to remain in the fishery (lower right hand cell of Table A-30).

Table A-31. Effect of the IFQ program on a firm's economic status with respect to capital investment, depending on QS price (rows) and whether or not it is still making payments on existing capital investments (columns).

	Status the Firm's of Capital Investment	
Cost of IFQs	**Recovered Capital Investment (Little Outstanding Debt)**	**Still Paying for Capital Investment (Outstanding Debt)**
Endowment Received at Minimal Cost, as Part of Initial Allocation	Excellent position for growth and competition. Endowment plus cash flow associated with already paid for capital and greater efficiency.	Increased ability to pay for capital with better efficiency under IFQs.
Purchase: QS Price Represents Resource Rent	Should be able to recover QS cost through profits, plus have some additional cash flow associated with already paid for capital.	Should be able to recover QS cost through profits.
Purchase: QS Price Represents Resource Rents and Some Profits That Would Otherwise Go to Returns to Capital Investment	Should be able to recover QS cost through profits and some of the cash flow associated with already paid for capital.	May have to exit fishery if the increase profits are not enough to compensate for the cost of the QS and make payments on capital investment.

In the section below on Current and Historic Harvests (page A-98), the effect of an allocation of QS to processors on existing permit-processor associations (based on 2004 to 2006 patterns) is evaluated. In that section, it shows that, assuming these associations would otherwise remain stable, an allocation of

QS to processors would increase disruption to these associations, in part because some processors would receive allocations that did not receive trawl landings from 2004 to 2006.

SUMMARY

Greater amounts of QS given to harvesters as part of the initial allocation will achieve the following:

- Strengthen their bargaining position compared to processors in the raw fish market (to the degree that prices are influenced by negotiations rather than "going" market prices).
- Provide more harvesters with amounts of QS that provide at least as much future harvest opportunity as they have taken in recent years.
- Reduce disruption that might result from the immediate departure of firms that receive substantially less than what they need to stay in business and that are unable to finance additional purchases.
- Result in lower exit barriers by providing compensation for capital losses by those who seek to leave the fishery.
- Decrease borrowing costs by providing harvesters security of an asset that can be used to demonstrate that they have a viable business model when seeking financing for further capital investment (there are indicators under status quo that harvesters are in a weaker position than shoreside processors to acquire access to capital).

♦ *Labor—Harvester*

The following summarizes the findings of Section 4.4.2 on the impacts of the IFQ program on crewmembers.

> In the harvesting sector, the number of crew and captain jobs are expected to decline, but more of the jobs are expected to be full time. Additionally, crew shares may decline but that decline may be offset by an overall increase in vessel earnings such that total earnings per remaining crew member increases. The nature of compensation may also change. Traditionally, crewmembers have taken part in the risk and reward of the harvest operations by taking their income as a share of the vessel revenue, and the share earned by a crewmember varies with their skill level. Under IFQs, there is sometimes a change from share-based compensation to wage-based compensation.

An initial allocation of QS to crewmembers would not necessarily prevent a shift from share-based to wage-based compensation, but would provide crewmembers who have some record of participation a more certain opportunity to maintain a larger share of the harvesting profits. This form of compensation would provide them an award in perpetuity (for the duration of the IFQ program or for as long as they decide to hold the QS, regardless of whether they continue to work as a crew member).

As with physical assets, labor also earns a return that will be affected by the creation of an IFQ program. Crewmembers who earn above average shares because of their development of particular skills may lose the advantage of those skills if they are forced to move into another occupation. However, humans are more malleable than physical capital in terms of their ability to take on different tasks.

The main source of new entrants to the fishery is captains and crewmembers. During Council deliberations on the effect of the program on crewmembers, it has been noted that new entry by crewmembers will be facilitated by the liberal eligibility requirements for owning QS (A-2.2.3.a) and the high degree of QS divisibility, which allows crewmembers incrementally to acquire capital and speed their accumulation of wealth. The IFQ program will make it more expensive to enter the fishery, but will provide a more stable industry for new entrants.

The balance of the allocation of QS among harvesters and processors will affect harvester labor through the speed of adjustment required, the geographic distribution of harvest operations, and the distribution of activity among vessels. As described for harvesters, as the allocation to processors increases, the speed of rationalization in the fishery is likely to increase. More rapid rationalization of capital will require a more rapid adjustment by labor. In addition to the duration and timing of jobs, the initial allocation will affect the locations and vessels on which there are opportunities. While over time, QS is expected to flow to ports that are able to support the most efficient complex of harvesting and processing operations,[30] due to transaction costs and other ways in which the economic system does not function in the ideal, the initial distribution will likely affect the short- and long-term geographic distribution of activities (and hence employment opportunities). The more QS that goes to processors, the more the location of harvest/landing activity will be initially directed by factors related to processing operation costs; and the more likely it is that jobs will be on processor owned vessels as opposed to vessels of independent harvesters.

SUMMARY

1. There is some reason to expect that compensation rates for crewmembers will decline. An initial allocation of QS to crewmembers would provide them with an opportunity to maintain a larger share of the vessel profits.
2. As allocation to processors increases, the speed of rationalization in the harvesting sector is likely to increase requiring more rapid adjustment by crewmembers.
3. Geographic distribution is likely to be affected by the initial allocation. The more allocated to processors, the more harvest/landing activities will be initially directed by factors relating to processing operation preferences and the more likely it is that jobs will be on processor-owned vessels as opposed to independent harvesting vessels.

♦ *Labor—Processor*

The main effect of the initial allocation of QS to processors is likely to be the geographic distribution of processing jobs. The types and numbers of jobs may also be affected by the relative size of the processing operations in the industry. The effect on size of processor operations is discussed in the section above on allocation to the processor sector. The effects on labor are discussed in Section 4.12 on processor labor.

● Impact on Net Benefits

The impacts considered in this section are closely related to the overall economic efficiency outcome (i.e., net benefits or social welfare).

We will look the impact of the initial allocation of QS among groups on net benefits as it is affected by the following:

- Price setting in markets
- Transaction costs
- Implementation costs

[30] Taking into account both travel costs to and from the fishing grounds and to distribution centers for wholesale products

♦ *Price Setting in Markets*

In an efficiently functioning market, neither buyers nor sellers are able to influence price because of the existence of competing buyers and sellers. Everyone in the market is a "price taker," accepting the "going" price. Bargaining power is, by definition, limited. Under certain circumstances, such as when there is a limited number of competitors (see Appendix E for additional discussion), the potential for participants in the market to exert market power increases.

If one side or the other in a market is able to influence price away from the market equilibrium, (i.e., exerts market power) there are generally two effects on economic welfare: (1) it redistributes income toward the side of the market with market power and (2) it reduces overall production in the economy (reduces net benefits). Here the concern is net benefits.

The discussion of the effects of the allocation on market power is summarized very generally as follows:

- Under status quo, there are more indicators that processors may be able to exert market power than harvesters.
- The creation of an IFQ program will likely increase to some degree the potential for harvesters to exert market power or resist processor market power independent of the amount of QS they are initially granted, to the degree that the fleet is rationalized and excess capacity removed. However, even with the main trawl fleet rationalized, there may be some excess capacity that remains, to the degree that vessels in nonrationalized fisheries can be adapted to participation in the groundfish trawl fishery. This opportunity to adapt capacity from other fisheries could adversely affect the fleet's ability to exert market power or resist processor market power.
- If market power, as defined here, exists under status quo, whoever receives an initial allocation of QS is likely to be in a better position to exert market power and accumulate additional QS, unless the creation of the IFQ program changes the system enough that all entities become price takers, for the most part accept the going price.

The IFQ program could potentially break down some of the local market isolation that may currently be limiting the number of effective participants in the market and providing them opportunity to exert market power. It could also both encourage consolidation among processors and encourage or discourage the entrance of new processors with an uncertain net effect on price competition among processors. Local market isolation and other factors that may change the nature of price setting as compared to status quo are discussed in Appendix E. If the markets change such that there are many more players on each side, everyone will become price takers and holding QS will not enhance one's negotiating power.

However, even if the IFQ program and initial allocation allows an entity to exert market power, the effect on net benefits is less clear than under standard economic theory. Under standard economic theory when there are a limited number or buyers or sellers, the exertion of market power can lead to a reduction in total production, reducing net benefits. [31] [32]However, in fisheries production, market power is constrained by government regulation of a key input (the amount of fish caught). Based on current production levels and demand, and the fact that the only costs for a QS holder to produce QP (release QP onto the market additional QP) are transaction costs, it does not appear likely that total annual production will be diminished, even if one side or the other is able to control market prices that total annual production will be diminished. Therefore, market inefficiencies related to reduced production would not be expected. Given that it is not likely that production will be affected by the exertion of monopolistic/monopsonistic (single seller/buyer) power or oligopolistic/oligopsonistic (very limited number of sellers/buyers) power, any market power established as one outcome of the IFQ program or initial allocation will affect the distribution of total net benefits rather than the amount of total net benefits.

♦ *Transaction Costs*

In order for QS to be used, the QP issued to the QS holders will have to be transferred to a vessel account. Transaction costs are those costs associated with the search for an input, the bidding and negotiation process, monitoring performance on the transaction contract, and transaction contract enforcement. The greater the distance in ownership between the QS holder and the vessel, and the more dispersed the ownership of the QS, the greater will be the transaction costs. The entity most certainly connected with the vessel is the vessel owner. Allocations to vessel owners are not being considered. The next entity that is most probably linked to the ownership of a particular vessel is the permit owner (about 87 percent of the permits appear to be owned by the vessel owner). Crewmembers are also associated with vessels but are probably more mobile between vessels and there are more crewmembers than vessels. Therefore, an allocation to crewmembers would involve the negotiation of more transactions and greater transactions costs than an allocation to vessels. Processors also have close connections to vessels (7 percent of permits, or 17 permits in total, are owned by processors). An allocation to processors would require fewer transactions, and would likely result in lower total transaction costs, than an allocation to crewmembers. However, except for processor owned vessels there would still have to be transfer of QP each year from QS owners to the vessel owners/operators.

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[31] NMFS guidelines on LAPPs suggest that excessive control of QS might result in an individual operating as a monopsonist or monopolist in the QS market and that this would lead to a less efficient fleet (NMFS 2007).

[32] Exerting monopoly like control over prices in a QP market has some particular challenges.

- If a dominant QS holder releases QP in a manner that reduces fleet efficiency, the amount individuals would be willing to pay for QP would be reduced by the reduction in efficiency.
- QPs are nonperishable and highly liquid
- Any QP released may be held by the buyer, reducing the QS holder's market power.
- While there is an opportunity cost for not using QP, the production cost of QP is almost zero, and any QP not released to a vessel by the end of the year expires; therefore, it is likely that all will be released.

The main profits available through the exertion of market power are those that would otherwise go to the QP holder, unless the following occurs:

- Profits that would otherwise go to return on investment are captured (i.e., there is some excess capital in the fishery or within a local area),
- The power is used to affect prices in a transaction that does not include the QPs being used to establish the market power.
- The dominant QS holder is able to achieve price discrimination (charge each potential buyer the maximum he/she is willing to pay rather than a market price based on the release of a reduced quantity of QS, the more typical way a monopolist would extract additional rents).

On this basis, it appears that transaction costs will be lower with an allocation to permits than with an allocation to processors, with the exception of those processors that may operate their own vessels.

Another factor affecting transaction costs is how the QS are distributed compared to the recent distribution of catch among fishery participants. The greater the difference, the more transactions required to get the QS/QP into the hands of those who need it to continue their operations. If these transactions do not occur, higher costs will emerge as dislocation costs since those who have been recently catching the fish will no longer be able to do so, and those receiving the QS may ramp up to higher levels of production than they have experienced in the recent past. In the section below on equity, a quantitative assessment is provided of the difference between the distribution of QS among participants and the recent participation history of those participants (Current and Historic Harvests on page A-98). That section (Figure A-22) shows how QS would be distributed among associations of processors and harvesters (based on 2004 to 2006 landings activities). This figure shows that, there is a greater mismatch between recent production by processors-permit associations and the QS distribution to those processor-permit associations with a 25 percent allocation to processors.

♦ *Administrative Costs*

Each group to which an initial allocation is given will add to the administrative start-up costs of the program. The least expensive way to make an initial allocation would likely be through an auction that is open to all comers; however, such an option is not among those that have been identified for full analysis. Permit owners are a defined group; therefore, an allocation or auction to permit holders would likely be relatively in expensive, as compared to an allocation to crewmembers. While an allocation to crewmembers is not impossible, it would be difficult because crew licensing varies by state and data are not kept on the crewmembers working on each boat. Such an approach could require the development of complex rules for evaluating crewmember qualifications or simple rules that either do not allocate to the intended crewmembers, or allocate to substantially more people than the intended crewmembers. In either case, the costs of the initial allocation would increase substantially. An allocation to crewmembers is not being considered at this time. The other group for which the Council is considering an allocation is processors. The costs of allocating to processors will depend on the rules developed for the allocation. Information about buyers is included on every fish ticket, but there is no information on the ticket about whether the buyer (1) is a processor and (2) processed the fish documented on the fish ticket. The Council's intent is to allocate to processors, but an allocation to buyers was considered as a lower cost proxy for the allocation to processors. This is discussed in more detail in Section A-2.1.1.d. The administrative costs of the initial allocation will somewhat affect total net benefits, particularly at the start of the program, but the start-up costs will likely have negligible effects on net program benefits over the long run. Direct costs of the initial allocation will be covered by fees collected from the applicants.

♦ *Summary*

- Even if the initial distribution of QS results in some parties being able to exert market power, the effects are more likely to be distributional than to have an adverse impact on net benefits.
- As the amount of QS issued to processors increases, transaction costs will increase as QP issued to processors holding QS will have to transferred to vessels each year in order to be used (unless processors acquire vessels).
- As the amount of QS issued to processors increases, there is a greater mismatch between recent production by processors-permit associations and the QS distribution to those processor-permit associations.
- Program administrative costs increase with each additional group to which an allocation is made and costs will likely be higher for an allocation to those groups that are less well defined.

● Impact on Equity

Equity has various definitions, including "freedom from bias or favoritism" (Merriam-Webster dictionary) and conformity with rules or standards. Unlike net economic benefits, we do not have measures of equity that are commonly accepted standards against which we can evaluate the effects of an action. The best we can do is provide information on effects that are generally believed to have equity implications and rely on decision makers to balance the equity considerations with conservation and efficiency objectives for which there are more commonly accepted standards. With respect to equity considerations and initial allocation, the MSA directs that consideration be given to (i) current and historical harvests; (ii) employment in the harvesting and processing sectors; (iii) investments in and dependence upon the fishery; and (iv) the current and historical participation of fishing communities (Section 303A(c)(5)). Items (ii) and (iii) are explicitly covered above. Items (i) and (iv) will be covered under topics of this section. This section is organized around the following topics:

- Compensation for harm
- Excessive shares
- Current and historic harvests.

♦ *Compensation for Harm*

"Compensation for harm" is an equity rationale that has been proposed for guiding the initial distribution of QS. The potential adverse impacts of the IFQ program on capital assets and labor assets are discussed in the above section on "Sector Health." Potential adverse affects on communities is discussed in Section 4.14. These sections relate to the consideration of current and historical harvests for participants and communities in the context of the initial allocation.

♦ *Excessive Shares*

What constitutes **"excessive shares"** may be socially determined or economically determined. On an economic basis, an excessive share would be one that would be expected to result in a sector with market power. This concern is addressed above in the section on net benefit related effects. From a social policy perspective, concentration of ownership affects the social and community structure and the sense of equity that may, in part, be grounded in the history of fishery management, which has largely been based on common property concepts. In general, excessive shares will be controlled directly through QS control limits. The choice of the amounts of the initial allocation that goes to harvesters and processors affects whether there may be excessive shares only to the degree that there is a grandfather clause to the QS control limits. In the section on sector health, graphs are provided that show the expected concentration of QS in comparison to recent harvest levels for permits and processors for various permit/processor splits and for the presence or absence of a grandfather clause. As an example of the nature of the effect, with a 100 percent allocation to permits, no equal sharing, and no grandfather clause, the most QS that goes to a single entity that only harvests is about 4.3 percent, and the most that goes to a processor is close to about 5.5 percent (Figure A-9). If, instead, there is an 80 percent allocation to permits and a 20 percent allocation to harvesters, the most that goes to a permit is about 3.5 percent, and the most that goes to a processor is about 13.5 percent (Figure A-12). If there is not grandfather clause, then the allocation between permits and processors will not affect excessive shares because no one will be grandfathered in above the accumulation limits that any entity would be eligible to achieve through the acquisition of additional QS. The allocations illustrated in Figure A-9 and Figure A-12 would be capped at the amount of the initial allocation. Section A-2.2.3.e on accumulation limits (including QS control limits) and the grandfather clause includes tables that show the amounts of QS that would be allocated in excess of the accumulation limits, depending on the split of the allocation among harvesters and processors. Under the FPA, there will not be a grandfather clause, but individuals

will be allowed to receive QS in excess of limits and then given a period to divest of them (up to four years). Thus, while an entity would not be able to maintain an allocation above the QS control limit, it would still be able to benefit from selling that allocation. Because some processors also own permits (qualifying for both permit and processor history), the decision not to allocate nonwhiting QS to processors will likely result in a lower maximum initial allocation to any single entity than would result if an allocation were made to processors.

♦ *Current and Historic Harvests*

EFFECT ON QS AVAILABLE FOR RECENT TRADING RELATIONSHIPS

With respect to the question of the distribution of initial allocation between permits and processors, it is apparent that the distribution of more or less to permits and processors will proportionally affect the difference between what they receive and what they need to continue at production levels of the recent past. In the section on sector health, we compared the QS permits would receive to their 2004 to 2006 landings and the QS that processors would receive to their 2004 to 2006 landings (with the caveat that processors do not "need" QS to maintain their production levels). Here we will examine the effect of this decision on trading relationships.

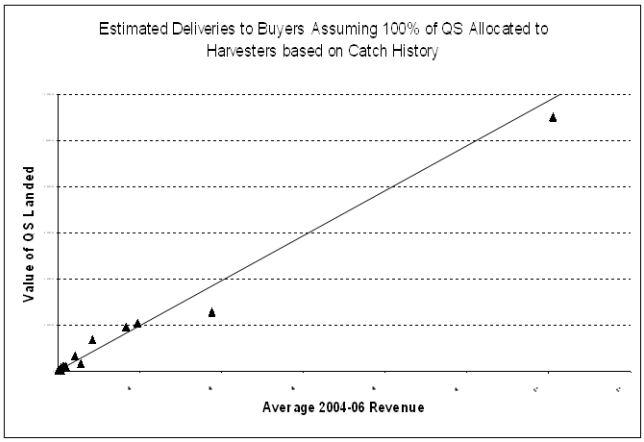
The question to be evaluated is, "If permits and processors wish to maintain their historic practices with respect to the amounts of fish each permit delivers to each processor, how will the decision on the split of QS between these groups affect their ability to do so?" For the purpose of this evaluation, we looked at the pattern of deliveries among vessels and processors for 2004 through 2006. In Figure A-22 though Figure A-25, we plot amounts of landings and amounts of QS allocated to these trading relationships from the processor's perspective (i.e., summarize for each processor the amount of QS it received, together with that received by permits delivering to that processor.)[33] These figures show that when the amount of QS initially allocated to combinations of permits and processors is considered, the greater the direct allocation to processors, the more divergence occurs between the amount of QS going to participants in these relationships and the amount of recent landings that occurred within those relationships.

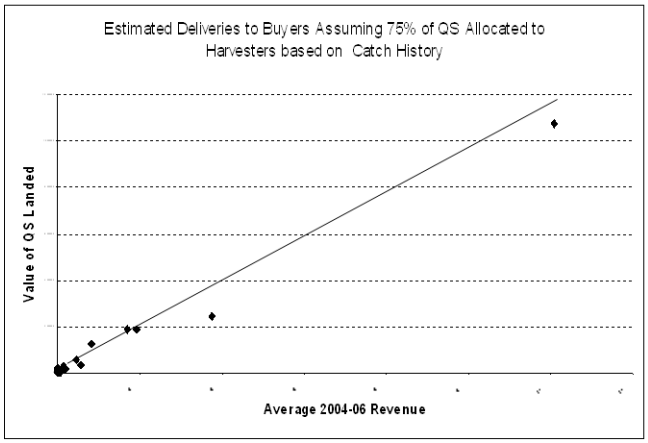
In Figure A-22, the QS allocations to each set of relationships are contrasted to the average 2004 to 2006 landings within each relationship (the amount of groundfish trawlers delivered to a particular processor). The figure on the left shows the results if 100 percent of the nonwhiting QS allocation goes to permits, and the figure on the right shows the results if 75 percent of the nonwhiting allocation goes to permits and 25 percent to processors. The top figures show the general distribution without showing the units. Points along the diagonal line from the origin are those at which the trading relationship (the harvesters and processors together) will receive an amount of QS that is comparable to its 2004 to 2006 deliveries. The bottom figures show the distribution among those trading relationships with less than $200,000 of QS and less than $200,000 of 2004 to 2006 landings history. The left-hand panel shows that with a 100 percent allocation to permits, there are some processor-permit associations that will receive little or no QS history relative to their 2004 to 2006 activities. For example, for a QS allocation based 100 percent on permit history there are five processor-permit associations (the top and bottom left hand panel combined) with more than $20,000 of history for 2004 to 2006 that will receive QS less than what would be needed to maintain their 2004 to 2006 average. If a 25 percent allocation is given to processors, the right-hand panel shows six or seven trading relationships in this category. The right-hand panel also shows that, if there is a 25 percent allocation to processors, seven trading relationships

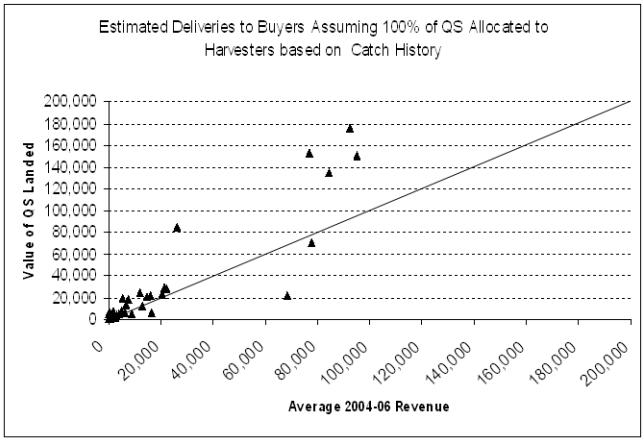
[33] For a permit delivering to more than one processor, QS for the permit was distributed between processors in proportion to the 2004 to 2006 deliveries to those processors. The objective of the analysis is not to say whether these delivery patterns will be maintained, but rather will QS go directly to the entities that could maintain them if they choose to negotiate to maintain previous delivery patterns.

that had less than about $25,000 of 2004 to 2006 history will receive more than about $60,000 of QS. Figure A-23 shows a direct comparison of results with 75 percent going to harvesters (vertical axis) and 100 percent going to harvesters (horizontal axis). In this figure, it is seen that trading partnerships that involved more than $40,000 in ex-vessel value fared better under the 100 percent allocation to permits. To understand these results better, Table A-31 is provided. This table displays the number of permits delivering to processors based on the 2004 to 2006 deliveries. Most processors with less than $20,000 of 2004 to 2006 history received deliveries from only one or two permits. Of the 42 processors falling into this category, six received from between three and five permits and two from seven or eight permits and the remainder from on permit. Some permits deliver to more than one processor and so will be counted more than once in the table.

Figure A-24 compares the amount of QS trading relationships receive under the FPA to their 2004 to 2006 average. Thirty-nine trading relationships will receive QS that represents more QP than their 2004 to 2006 average revenue, and 27 would receive less QS. Figure A-25 shows that 40 trading relationships were better off under the PPA than under the FPA. However, the relationships that receive the most QS either do better under the FPA than under the PPA, or are relatively unaffected by the choice between the two.







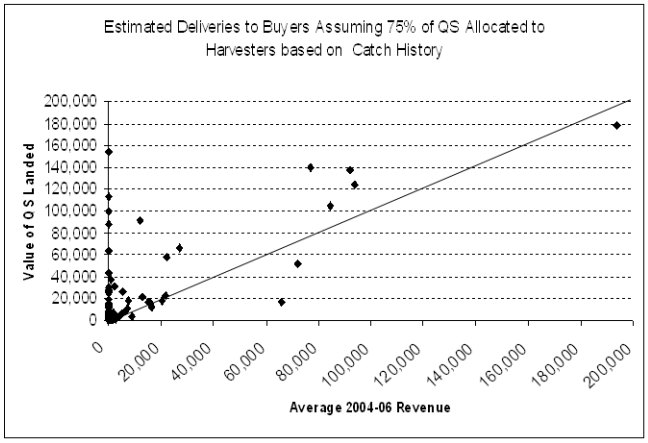


Figure A-22. The ex-vessel value of nonwhiting QP going to processor-permit relationships under two allocation formulas as compared to 2004 to 2006 ex-vessel revenue for those relationship (notes: each point represents a processor and the permits delivering to it; lower panels are a magnification of the upper panels; these formulas include a grandfather clause, but no equal sharing).

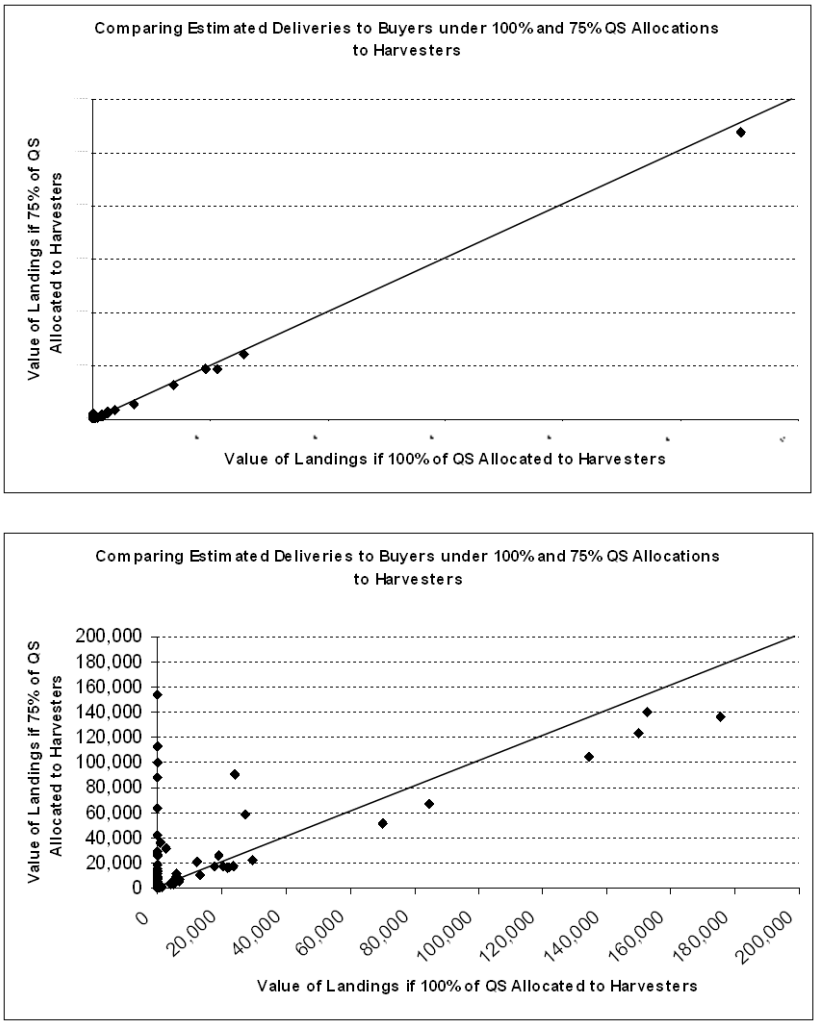


Figure A-23. Comparing a 100 percent allocation to permits to a 75 percent allocation to permits: ex-vessel value of nonwhiting QP going to processor-permit relationships (notes: each point represents a processor and the permits delivering to it; lower panels are a magnification of the upper panels; these formulas include a grandfather clause but no equal sharing).

Table A-32. Number of processors categorized by number of permits delivering to different classes of processors based on average annual 2004 to 2006 ex-vessel value of deliveries received by the processor.

Number of Permits Delivering	2004–06 average buyer purchases ($ ex-vessel payments)						Total
	<10,000	10,000-20,000	20,000-100,000	100,000-250,000	240,000–1 Million	>1 Million	
1	22	1	2	1	0	0	26
2	11	0	1	0	1	0	13
3	1	1	3	1	0	0	6
4-5	2	2	2	0	1	0	7
6-8	1	1	2	1	0	0	5
9-20	0	0	0	1	1	1	3
21-100	0	0	0	0	0	3	3
Total	**37**	**5**	**10**	**4**	**3**	**4**	**63**

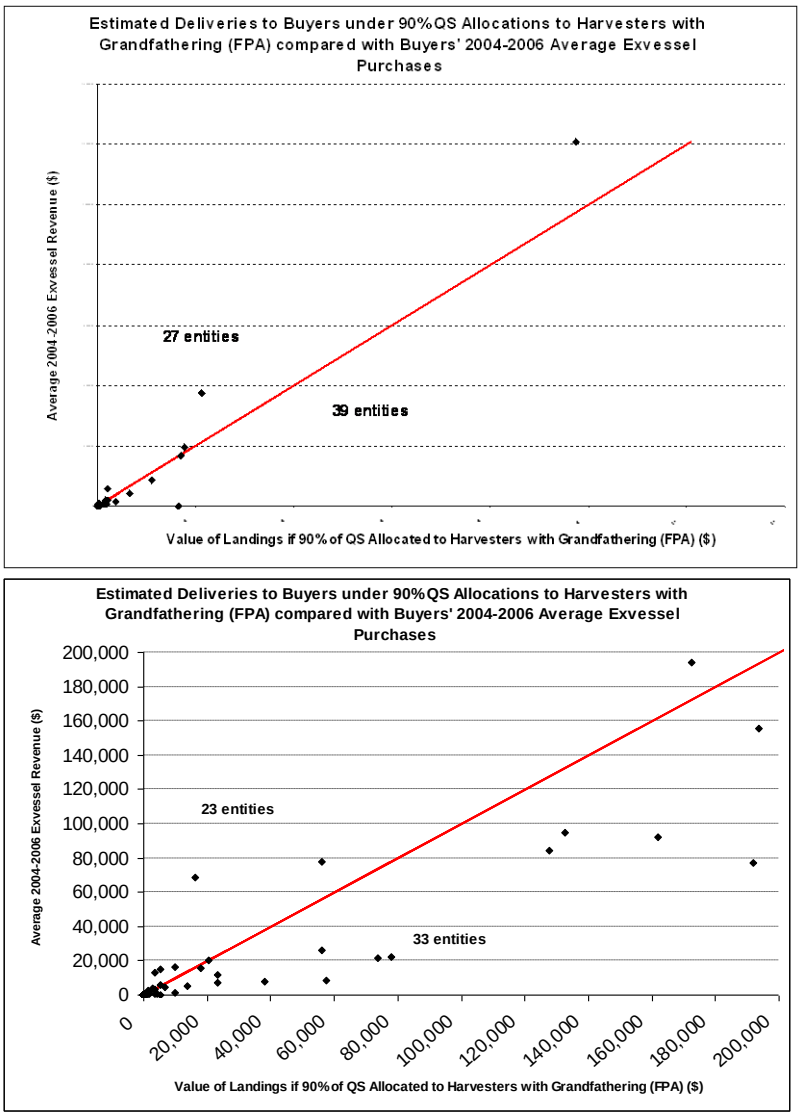


Figure A-24. The ex-vessel value of nonwhiting QP going to processor-permit relationships under the FPA as compared to 2004 to 2006 ex-vessel revenue for those relationship (notes: each point represents a processor and the permits delivering to it; lower panel is a magnification of upper panel; the FPA formulas include equal sharing and no grandfather clause, but a divestiture opportunity).

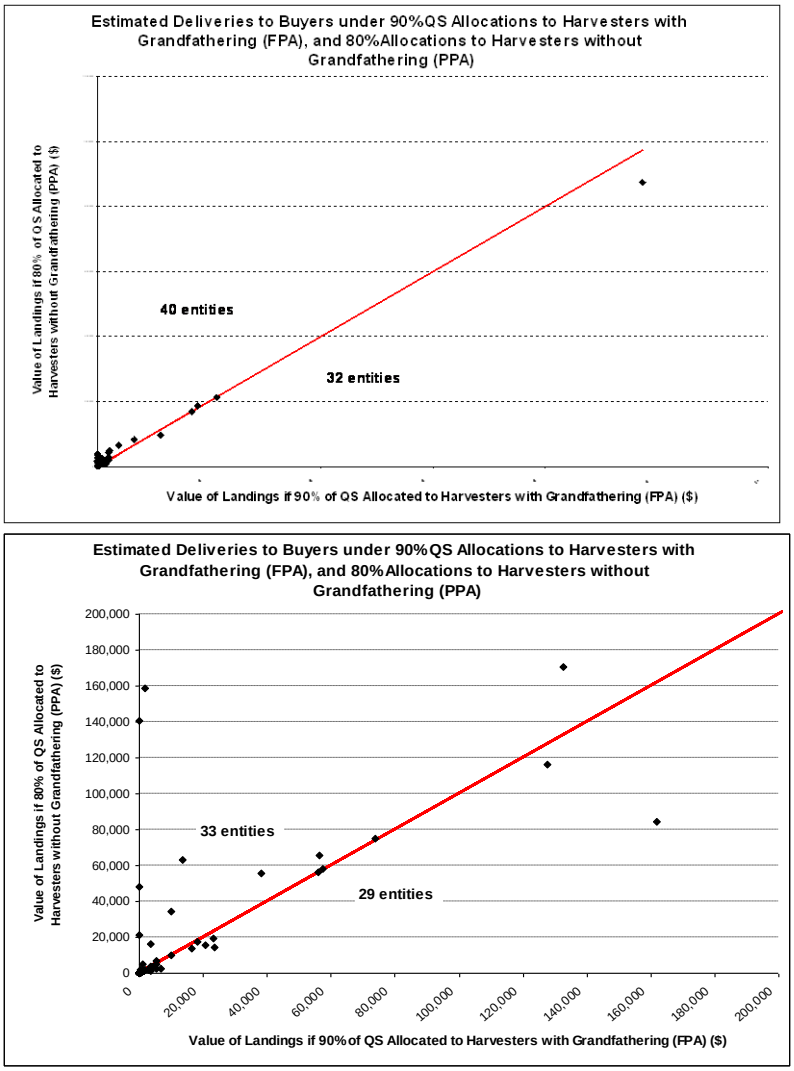


Figure A-25. Comparing the PPA to the FPA: ex-vessel value of nonwhiting QP associated with the QS going to processor-permit relationships at time of initial issuance (notes: each point represents a processor and the permits delivering to it; lower panel is a magnification of the upper panel; these formulas both include equal sharing, and neither has a grandfather clause, but the FPA allows QS to be issued in excess of control limits and then divested).

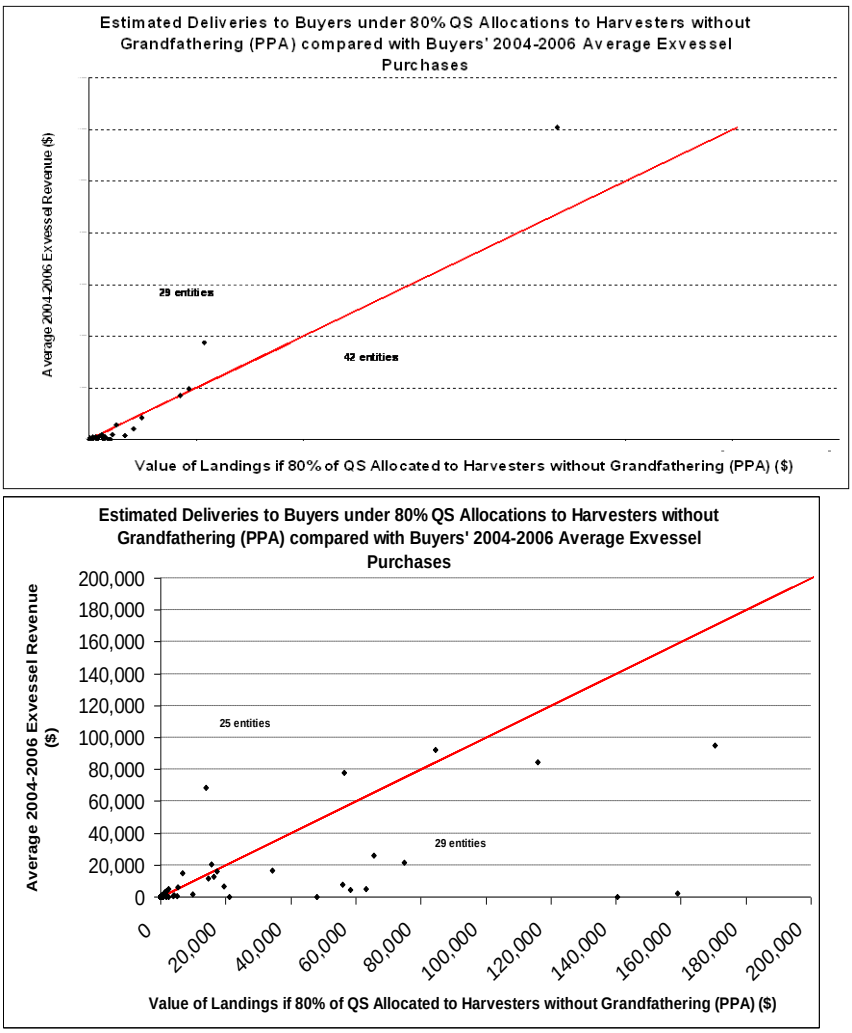


Figure A-26. The ex-vessel value of nonwhiting QP going to processor-permit relationships under the PPA as compared to 2004 to 2006 ex-vessel revenue for those relationships (notes: each point represents a processor and the permits delivering to it; lower panel is a magnification of upper panel; the PPA formulas include equal sharing and no grandfather clause).

Allocation Basis as a Means of Accounting for Current Participation

One way to take into account current harvests up to the date of the allocation is to attach the allocation criteria to an asset that is transferable as participants enter and exit the fishery (as opposed, for example, to attaching the allocation criteria to a person who may no longer be a participant in the fishery at the time of initial allocation). On the harvester side, the vessel (under Amendment 6) and the permits (under Amendment 8 [which was tabled], Amendment 9, and the sablefish tier system) have been used as the asset against which qualification criteria are measured. Anecdotal information suggests that fishermen have been relying on the permit to be the most likely vehicle that the Council would use for the allocation of QS. Allocation based on criteria related to other assets, such as the vessel or a processing facility, would be viewed as a change from past practices. For processors, it has not been necessary up until now to identify such a key asset (there have been no allocations to processors). In

Section A-2.1.1.d, consideration will be given to how historic participation criteria might be specified to take into account exit and new entry during the period that this program has been under deliberation.

SUMMARY

- **Compensation for Harm:** QS may be issued to those with assets that will be adversely affected by the IFQ program (see sections above on sector health). Rather than allocating QS to communities, the Council has ensured that communities can purchase QS if they desire and are included an AMP to address impacts on communities (Section A-3).
- **Excessive Shares**. If there is a grandfather clause (or no grandfather clause, but an opportunity to divest, as under the FPA), the maximum amount of QS initially allocated to those who receive the most increases as the allocation to processors increases. The effect of excessive shares on efficiency is discussed in the net benefits section. With respect to equity issues, determination of what constitutes an excessive share is a value judgment made by the Council.
- **Current and Historic Harvests.** Figures are provided comparing how processor-permit trading partnerships fare with and without an allocation to processors. In general, processor-permit trading partnerships to which more than $40,000 would be allocated (QS translated to QP using 2004 to 2006 landings and prices) fare better with a 100 percent allocation to harvesters than with a 75/25 permit/processor split.

● Impact on Communities

This issue of allocating to communities is discussed above in the section providing a rationale for not allocating to communities and the section on equity and compensation for harm. Here we focus on the effect of the choice of allocating among permits and processors on communities.

Recognizing the QS can easily be moved between communities, we can look at the locations of the home offices for permits and processors receiving an initial allocation and how the distributions among these locations would vary depending on choices made with respect to the amount allocated to processors and harvesters. This also tells us where the owners of QS most likely reside and the individuals who will be collecting and spending the profits from QS ownership. Table A-32 provides information on how nonwhiting QS shifts among communities as the balance of the initial allocation shifts between processors and permits. In this table, it can be seen that certain communities serve as the home office for buyers, but not for harvesters (they go to -100 percent with a 100 percent allocation to harvesters). Most towns with residents that in aggregate are expected to receive in excess of about one half million dollars' worth of QS (based on ex-vessel value of one year's QP) receive more QS as the amount allocated to processors go down (8 of 13 towns). In the north (Washington and Oregon), the aggregate holdings of the residents of six of eight of these towns increase, but in the south (California), the aggregate holdings of the residents of only two of five of these towns increase. In terms of where initial QS holders reside, increasing the allocation to harvesters appears to increase the dispersion of QS among the towns with major QS holdings (those for which associated QP would be worth in excess of one-half million dollars in ex-vessel value). Those towns with less quota than that, and which lose QS as amounts to harvesters increase, represent only 2 percent of the total QS holdings (assuming a 75 percent allocation to harvesters).

Table A-33. Distribution of nonwhiting QS allocations and estimated value of associated QP, by QS owners' residence and/or head office (note the allocation formulas provided as examples here do not include a processor recent participation screen, the recent participation screen would substantially reduce the number of communities listed).

	Landing history-Based Allocation + No Equal Sharing and Grandfather Clause			Landing history-Based Allocation + Equal Sharing of Buyback History and Grandfather Clause			Effect of Eliminating Equal Sharing (Difference Between Landing history-Based Allocation and Equal Sharing (% change)		
	75% Allocation to Harvesters	Difference Relative to 75% Allocation to Harvesters (% change)		75% Allocation to Harvesters	Difference Relative to 75% Allocation to Harvesters (% change)				
QS Owner's Home Office	Annual Value of Nonwhiting QP Allocation ($ thousands ex-vessel)	87.5% Allocation to Harvesters	100% Allocation to Harvesters	Annual Value of Nonwhiting QP Allocation ($ thousands ex-vessel)	87.5% Allocation to Harvesters	100% Allocation to Harvesters	75% Allocation to Harvesters	87.5% Allocation to Harvesters	100% Allocation to Harvesters
Blaine	$84	-0.50	-1.00	$83	-0.50	-1.00	0.01	0.01	
Bellingham	$971	-0.19	-0.39	$843	-0.25	-0.49	0.15	0.23	0.40
ANACORTES	$212	0.17	0.33	$211	0.17	0.33	0.01	0.01	0.01
Seattle	$2,020	0.05	0.09	$2,128	0.05	0.11	-0.05	-0.06	-0.06
Port Townsend	$0	-0.50	-1.00	$0	-0.50	-1.00	0.00	0.00	
Port Angeles	$63	-0.50	-1.00	$63	-0.50	-1.00	0.00	0.00	
Neah Bay	$1	-0.50	-1.00	$49	0.15	0.30	-0.98	-0.99	-1.00
La Push	$2	-0.50	-1.00	$2	-0.50	-1.00	0.00	0.00	
Aberdeen	$287	0.17	0.33	$297	0.17	0.33	-0.03	-0.03	-0.03
WESTPORT	$4	-0.50	-1.00	$4	-0.50	-1.00	0.00	0.00	
Willapa Bay	$315	0.11	0.23	$367	0.12	0.24	-0.14	-0.15	-0.15
Illwaco	$38	-0.50	-1.00	$86	-0.13	-0.26	-0.56	-0.75	-1.00
Astoria	$2,472	0.16	0.31	$2,165	0.16	0.31	0.14	0.14	0.14
Garibaldi	$532	0.13	0.26	$489	0.13	0.26	0.09	0.09	0.09
Newport	$1,561	0.15	0.31	$2,002	0.16	0.31	-0.22	-0.22	-0.22
Waldport	$0	-0.50	-1.00	$0	-0.50	-1.00	0.07	0.07	
Florence	$94	0.13	0.25	$101	0.13	0.26	-0.07	-0.07	-0.07
Winchester Bay	$0	-0.50	-1.00	$0	-0.50	-1.00	0.00	0.00	
Charleston	$2,107	0.16	0.32	$1,872	0.16	0.32	0.13	0.13	0.13
BANDON	$153	0.17	0.33	$179	0.17	0.33	-0.14	-0.14	-0.14
PORT ORFORD	$150	0.17	0.33	$129	0.17	0.33	0.16	0.16	0.16
Brookings	$978	0.16	0.33	$956	0.16	0.33	0.02	0.02	0.02
Gold Beach	$0	-0.50	-1.00	$0	-0.50	-1.00	0.00	0.00	
Crescent City	$477	0.12	0.24	$466	0.12	0.24	0.02	0.02	0.02
Trinidad	$0	-0.50	-1.00	$0	-0.50	-1.00	0.00	0.00	
Eureka	$202	0.13	0.25	$355	0.14	0.29	-0.43	-0.44	-0.45
Fields Landing	$630	-0.09	-0.19	$597	-0.11	-0.22	0.06	0.07	0.10

Table A-33 cont. Distribution of nonwhiting QS allocations and estimated value of associated QP, by QS owners' residence and/or head office (note that the allocation formulas provided as examples here do not include a processor recent participation screen, the recent participation screen would substantially reduce the number of communities listed).

	Landing history-Based Allocation + No Equal Sharing and Grandfather Clause			Landing history-Based Allocation + Equal Sharing of Buyback History and Grandfather Clause			Effect of Eliminating Equal Sharing (Difference Between Landing history-Based Allocation and Equal Sharing (% change)		
	75% Allocation to Harvesters	Difference Relative to 75% Allocation to Harvesters (% change)		75% Allocation to Harvesters	Difference Relative to 75% Allocation to Harvesters (% change)				
QS Owner's Home Office	Annual Value of Nonwhiting QP Allocation ($ thousands ex-vessel)	87.5% Allocation to Harvesters	100% Allocation to Harvesters	Annual Value of Nonwhiting QP Allocation ($ thousands ex-vessel)	87.5% Allocation to Harvesters	100% Allocation to Harvesters	75% Allocation to Harvesters	87.5% Allocation to Harvesters	100% Allocation to Harvesters
Ukiah	$1,606	0.03	0.06	$1,415	0.01	0.02	0.14	0.16	0.18
Bodega Bay	$196	-0.10	-0.20	$333	0.01	0.02	-0.41	-0.47	-0.54
San Francisco	$1,881	-0.06	-0.11	$1,802	-0.07	-0.13	0.04	0.05	0.07
Half Moon Bay	$636	0.07	0.13	$792	0.09	0.17	-0.20	-0.21	-0.22
Oakland	$1	-0.50	-1.00	$1	-0.50	-1.00	0.00	0.00	
Alameda	$0	-0.50	-1.00	$0	-0.50	-1.00	0.00	0.00	
Gilroy	$11	-0.50	-1.00	$11	-0.50	-1.00	0.00	0.00	
Santa Cruz	$137	0.16	0.32	$175	0.16	0.32	-0.22	-0.22	-0.22
Moss Landing	$293	0.13	0.26	$271	0.13	0.26	0.08	0.08	0.09
MONTEREY	$1,053	-0.09	-0.18	$963	-0.12	-0.23	0.09	0.12	0.16
Morro Bay	$213	-0.24	-0.47	$224	-0.22	-0.43	-0.05	-0.07	-0.11
Avila Beach	$20	-0.50	-1.00	$20	-0.50	-1.00	0.00	0.00	
Goleta	$0	-0.51	-1.00	$0	-0.51	-1.00	0.00	0.00	
Ventura	$0	-0.50	-1.00	$0	-0.50	-1.00	0.00	0.00	
Port Hueneme	$0	-0.50	-1.00	$0	-0.50	-1.00	0.00	0.00	
Camarillo	$0	-0.50	-1.00	$0	-0.50	-1.00	0.00	0.00	
Los Angeles area	$11	-0.50	-1.00	$11	-0.50	-1.00	0.00	0.00	
San Pedro	$0	-0.49	-1.00	$0	-0.49	-1.00	0.00	0.00	
San Diego	$0	-0.50	-1.00	$0	-0.50	-1.00	-0.02	-0.02	
Bakersfield	$0	-0.50	-1.00	$0	-0.50	-1.00	0.00	0.00	
Clackamas	$3,663	-0.30	-0.60	$3,578	-0.31	-0.62	0.02	0.04	0.08
OREGON CITY	$96	0.17	0.33	$100	0.17	0.33	-0.04	-0.04	-0.04
CENTRALIA	$175	0.17	0.33	$140	0.17	0.33	0.25	0.25	0.25
DALLAS, OR	$66	0.17	0.33	$83	0.17	0.33	-0.21	-0.21	-0.21
Arizona	$0	-0.50	-1.00	$0	-0.50	-1.00	0.00	0.00	
Hawaii	$0	0.16	0.32	$48	0.17	0.33	-1.00	-1.00	-1.00
Unknown	$61	-0.50	-1.00	$61	-0.50	-1.00	0.00	0.00	
TOTAL	**$23,471**			**$23,471**					

- Options 6a and 7 (FPA) for Whiting

Options 6a and 7 (the FPA) would allocation 20 percent of the whiting QS to processors but none of the QS for bycatch species associated with whiting. While the allocation of QS without bycatch species would create some initial disadvantages, the impact of this option is primarily one of wealth distribution. After the program is implemented, QS will be traded, and processors or harvesters will be free to acquire more QS or divest themselves of their initial allocation. Processors wanting the QS for bycatch species will be able to acquire it through QS trading. Any business that does not receive an initial allocation will be in a situation similar to any other entity that enters the fishery later; they can access more QS by purchasing them.

The effect of this option will likely depend on whether the bycatch species is constraining and whether there is a single shoreside sector or separate shoreside whiting sector.

If bycatch species QP are constraining, then a major portion of the resource rents that would otherwise be associated with the whiting QS would be expected to flow to the bycatch species. Assume the processors stayed at their initial allocation level and held no more than 20 percent of the whiting QS and none of the bycatch species QS. If the bycatch rates were such that taking 80 percent of the whiting QS used up all of the available bycatch species QP, then the remaining whiting QP held by processors would have little, if any, value.[34] The market place would not distinguish between whiting QS issued to processors and whiting QS issued to harvesters, so there would not be a direct impact on the value of the processor-held whiting QS. There are, however, a number of ways the situation could play itself out in the market. One possibility that illustrates the situation is that whiting QS might tend to be traded in bundles with bycatch species. Under such circumstances, processors might find that they would not be able to sell their 20 percent of the whiting QS for an amount that was proportional to 20 percent of the value of the whiting fishery unless they first acquired and bundled it with bycatch species QS. If the bycatch species do not tend to be constraining, then the value of the whiting QS issued processors would likely be close to proportional to the value of the whiting that the QS represents.

The bycatch species are more likely to be constraining if there are two shoreside sectors. Under the single sector approach (the FPA,) the QS needed to cover bycatch for a whiting trip would be the same as that needed to cover catch of the same species taken on a nonwhiting trip. With a larger pool available, the QS for species taken as bycatch in the whiting fishery would be less likely to be limiting than if there is are separate shoreside sectors. However, bycatch could still be substantially constraining for certain overfished species.

With the two-year moratorium on QS trading included under the FPA (Section A-2.2.3.c), processors wishing to balance their whiting QS with bycatch species QS or divest themselves of whiting QS will not be able to do so until the moratorium is over. This enforced imbalance in the species mix held by processors may create increased uncertainty and greater transaction costs during the moratorium.

- Allocation of QS or QP for the Adaptive Management Program

The allocation for the AMP is specified as an allocation of QS with an option for the Council to pass the associated QP through to holders of non-AMP QS in proportion to their holdings of that QS (if the QP is not needed for the AMP program). The other option considered was to allocation 100 percent of QS to permit holders (and possibly processors), but to hold back a portion of the QP each year for adaptive management, on an as needed basis. Holding back QS rather than QP will make it more difficult to

[34] To avoid this situation, processors might try to negotiate preseason agreements with vessels to harvest all of the processor-held QP first or in proportion to the amount of whiting delivered under vessel-held QP.

adjust the base amount of quota held back for the AMP. For example, if the Council decides explicitly to end the AMP, an adjustment would be needed to the holdings of QS by all other entities. Similarly, an expansion of the quota for AMPs would require reduction of QS holdings by all other entities. If instead the AMP program had been funded with quota simply by withholding QP, long-term adjustments to the QS dedicated to AMP program would be less burdensome. The decision would be made to reallocate the AMP QP to QS holders.[35]

[35] During the development of this program, for simplicity and clarity in the analysis, it has been assumed the total amount of QS will sum to 100 percent. In implementing the program, NMFS could choose to abandon that approach and let the total amount of QS range. This approach would change the amount of QP issued each year for any particular amount of QS. Allowing the amount of QS to float (not sum to 100 percent) might be particularly useful during the early phases of the program when appeals are being resolved. However, if such an approach is taken, adjustments to the AMP QS will be needed as additional QS is issued or revoked. The adjustments to the amount of AMP QS would be needed to ensure that the amount stays at 10 percent of the total.

A-2.1.1.b Permits

❖ *Provisions and Options*

Landing[36] history will accrue to the permit under which the landing was made. The owner of a groundfish LEP at the time of initial allocation will receive the QS issued based on the permit. (See section A-2.1.4 on permit combinations and other exceptional situations.)

❖ *Rationale and Options Considered, But Not Included*

Allocating to entities other than the current groundfish permit owner is considered under Section A-2.1.1.a. The provision of this section (A-2.1.1.b) specifies that the landings history over the entire life of the permit will accrue to the permit, including history prior to the time it was held by the current owner, and it explicitly states that the current owner will receive the allocation. An alternative approach, assigning permit history to the owner of the permit at the time the landing was made, would be akin to assigning the landings to a specific person. As mentioned in the previous section, assignment of landing history to a person has been avoided in the Council's groundfish LE system to facilitate entry and exit during deliberations on the program and to consider current participation and dependence in the fishery rather than historic activity. Another approach might be only to count the history of the permit while it is owned by the person who holds it at the time of implementation. While this would consider take current participation, it would not account for the investment and dependence on the fishery that is represented by the current owner's investment in the acquisition of the permit.

❖ *Interlinked Elements*

Assignment of the entire landing history of the permit to the permit's current owner is a key provision of this program. Change in this provision would require substantial reevaluation of many other provisions of the program.

❖ *Analysis*

Assignment of all of a permit's landing history to the current owner results in less disruption of capital investment and dependence than if, for example, the only landing history that counted was that of the current owner during the time he/she owned the permit. Allocation based only on recent history would put new entrants at a disadvantage and substantially redistribute current fishing activities affecting vessels, processors, workers, and communities. Thus this provision addresses both the Council objective of achieving change with minimum disruption (Objective 14 of the groundfish FMP) and section 303A(c)(5)(A) of the MSA, which requires that the Council establish procedures to ensure fair and equitable initial allocations, including consideration of (i) current and historical harvests, and (iii) investments in, and dependence upon, the fishery. Indirectly, the approach provides business stability that supports existing employment and community involvement in the fisheries (items (ii) and (iv) of MSA 303A(c)(5)(A)). Stability for investment also promotes objectives related to net benefits and efficiency.

[36] The term "landing," as defined in the regulations, includes both shoreside and at-sea deliveries.

A-2.1.1.c Processors and Processing Definition

❖ *Provisions and Options*

A special definition of "processor" and "processing" will be used for initial QS allocation. A main intent of the definition is to specify that, if QS is issued for processing, only the first processor of the fish receives an initial allocation of QS. See footnote for definition. *However, due to limitations on available documentation, fish "receivers" may be used as a proxy for "processors," as per the following section.*

Definition from footnote:

"**Processors"**

At-sea processors are those vessels that operate as motherships in the at-sea whiting fishery and those permitted vessels operating as catcher-processors in the at-sea whiting fishery.

A shoreside processor is an operation, working on U.S. soil, that takes delivery of trawl-caught groundfish that has not been "processed at-sea" and that has not been "processed shoreside"; and that thereafter engages that particular fish in "shoreside processing." Entities that received fish that have not undergone "at-sea processing" or "shoreside processing" (as defined in this paragraph) and sell that fish directly to consumers shall not be considered a "processor" for purposes of QS allocations.

"Shoreside Processing" is defined as either of the following:

1. Any activity that takes place shoreside; and that involves:
   - cutting groundfish into smaller portions; OR
   - freezing, cooking, smoking, drying groundfish; OR
   - packaging that groundfish for resale into 100 pound units or smaller for sale or distribution into a wholesale or retail market.

   OR
2. The purchase and redistribution into a wholesale or retail market of live groundfish from a harvesting vessel.

❖ *Rationale and Options Considered, But Not Included*

This section defines the types of activities that will be considered processing and part of the criteria used to identify entities that are eligible for a portion of the initial allocation of QS going to processors (Section A-2.1.1.d). A special definition of processor and processing will be used for initial QS allocation. For the purpose of applying the initial allocation formula for processing, only the first processing counts as processing. If processors are affected by the rationalization of the fleet it is likely that those effects fall on only the first processor of the groundfish, the processing entity most likely to have excess capital after fleet rationalization. This definition is designed, in part, to focus the initial allocation on first processors. Differences in impacts between buyers and processors will be discussed in the following section.

Under the groundfish FMP, the definition of "processor" is as follows:

> The "processor" is a "person, vessel, or facility that engages in processing, or receives live groundfish directly from a fishing vessel for retail sale without further processing.

The special definition used for initial allocation of shoreside sector QS eliminates the following processors from consideration:

- Those who do not take delivery (e.g., a harvesting company that does some processing but is not listed as the fish receiver on the fish ticket)
- Those who have only received groundfish caught with gears other than trawl or have not received any groundfish

- Those who have only received groundfish that has already undergone some processing
- Those who have only received and sold raw unprocessed groundfish

However, the definition of processing is broadened in some areas and more restricted in others. This definition has important implications for who qualifies as a processor.

Under the groundfish FMP, the definition of "processing" is as follows

> "Processing" means the preparation or packaging of groundfish to render it suitable for human consumption, retail sale, industrial uses, or long-term storage, including, but not limited to, cooking, canning, smoking, salting, drying, filleting, freezing, or rendering into meal or oil, but does not mean heading or gutting unless additional preparation is done.

The FMP definition excludes heading and gutting alone, while the special definition used for initial allocation criteria includes heading and gutting (cutting groundfish into smaller portions). The FMP definition is open-ended in that the possible methods of handling the fish are not limited to those on the list. The key part of the FMP definition is that the fish are prepared or packaged for human consumption, retail sale (which might include uses other than eating, e.g., fertilizer), industrial use, or long-term storage (which could go to any other use, e.g., meal for feedlots). Thus the restrictive parts of the FMP definition that are not included in this definition appear to be the words "preparation or packaging," and the exclusion of heading and gutting alone.

The special definition is not open-ended. It does not mention canning, salting, or rendering into meal or oil; therefore, these might be excluded, unless they fall under the category of "packaging that groundfish for resale into 100-pound units or smaller for sale or distribution into a wholesale or retail market." Canning may well come under this definition, as might the production of meal or oil, depending on how it is packaged. The "100-pound units or smaller" implies that any resale of raw fish, regardless of what is done to it, qualifies as processing so long as the unit of sale is less than 100 pounds. This brings into question what might be considered the "unit of sale." For example, if there is a business that buys groundfish and does nothing to it other than transport it and sell it to a processor, and the invoice lists out a number of species, some of which are in quantities of less than 100 pounds, would those transferred in quantities of 100-pound units or smaller count toward history for the selling or buying entity? This question would be most important for Options 2 and 3 of A-2.1.1.d.

❖ *Interlinked Elements*

The definition of processing and processor has important implications in determining who qualifies as a processor for the initial allocation and who processed the fish coming in on a particular delivery. The definitions come into play for initial allocation in Section A-2.1.1.d, where they are used to determine whether an entity is a shoreside processor (Option 2) and whether the history of a particular landing should be attributed to a particular shoreside processor (Option 3). Under Option 1, the entity registered as the receiver of the fish is used as a proxy for shoreside processing and receives credit for all deliveries shown on its tickets; therefore, the special definitions of processor do not come into play if this option is selected. These definitions and the choices made in Section A-2.1.1.d will in turn affect the types and difficulty of issues that may have to be dealt with in the appeals process (Section A-2.1.5).

If an allocation is not given to processors (Section A-2.1.1.a), then the provisions of Sections A-2.1.1.c and A-2.1.1.d will not be needed.

❖ *Analysis*

The primary objectives affected by this definition relate to questions of fairness and equity and administrative costs.

With respect to fairness and equity, there may be an issue of comparable treatment. Conditions under which a processor may qualify for QS based on harvesting history are determined by whether or not the processor has a permit with landing history; the criteria are the same for processors, for entities that only harvest, or any other entity that owns a LEP. However, the conditions under which a harvester may qualify for an allocation based on processing history are contingent not just on the nature of the activity on its face but also on the nature of the economic transactions which have led to that activity (i.e., whether it purchased the fish). Some of the criteria for processing specify that the product must be for resale (implying an initial purchase, third item in the first criteria for shoreside processing), or that the product must have been purchased and redistributed (second criteria for shoreside processing). Other criteria are not phrased to require an initial purchase. Harvesters in the shoreside nonwhiting fishery that are also listed as fish receivers receive credit as processors if their processing was done shoreside and it includes the cutting of groundfish into smaller portions or the freezing, cooking, smoking, and drying groundfish. These criteria apply equally to an entity that only processes or one that also harvests regardless of the nature of the economic transaction that led to that activity. For those criteria phrased to require purchase, if the permit owner is acting as its own processor, i.e., shows up as the purchaser on the fish ticket and subsequently caries out the activities specified in these criteria, it appears that it might not qualify for processing history. Traditional processors receiving fish from their own vessels might also be affected by this wording. We do not have information to tell us the degree to which trawl harvesters that acted as fish receivers may have repackaged fish or sold live fish, therefore, we cannot estimate the magnitude of this issue. The exact impact will depend on how this provision is implemented in regulation by NMFS, and the process of drafting the regulations will provide an opportunity for clarification of intent with respect to these provisions.

The possible need for some additional guidance with respect to the intent of the provision that defines processing as the resale of groundfish in "100 pound units or smaller" is identified in the section on rationale. If disputes arise between the first buyer and second buyer about who was actually the first processor of a particular landing, an argument with respect to some of the landing history may hinge on whether the fish was in units that are smaller than 100 pounds. To the degree that there is uncertainty about this or other criteria, administrative decisions will be more difficult, there may be more appeals, and more call for Council involvement in the appeals process. All of these would elevate the administrative costs of the program.

A-2.1.1.d Attributing and Accruing Processing History

❖ *Provisions and Options*

Use at-sea fishery observer data and weekly processing reports to document history for allocations to **at-sea processors**. [37]

For an allocation to **catcher-processors**, see A-2.1.1-b.

For an allocation to **mothership processors,** history accrues to the vessel on which the at-sea processing occurs.

MS Option 1: The owner of the vessel at the time of the initial allocation will receive the initial allocation.
MS Option 2: If a bareboat charter exists, the bareboat charterer will receive the initial allocation.

For an allocation for **shoreside processors:**

Option 1: attribute history to the receiver reported on the landing receipt (i.e. the entity responsible for filling out the state fish ticket). *The fish receiver would serve as a proxy for processor because of limited availability of official documentation on actual processing history.*

Option 2: attribute history to the receiver reported on the landing receipt, if that entity meets the definition of a processor with respect to trawl-caught groundfish. *The option is similar to Option 1 except that the fish receiver would have to demonstrate at least some processing of trawl-caught groundfish.*

►**Option 3:** same as Option 1, except history may be reassigned to an entity not on the landings receipt, if parties agree or through *an agency* appeals process. *The intent of this option is to provide an opportunity for landing history to be assigned to the entity that actually processed the fish.*

For shoreside processors, allocations go to the processing business. For all three of the options for accruing history, successor-in-interest will be recognized. NMFS will develop criteria for use in determining the successor in interest with respect to the entities listed on the landings receipts or otherwise covered in one of these options.[38]

❖ *Rationale and Options Considered, But Not Included*

The focus of this section is on identification of the entities to which processing activities will be attributed and identifying rules for the accrual of that history. For the allocation to harvesters, landing history is attributed to the permit, and it accrues to the permit and whoever owns the permit at time of initial allocation.

For catcher-processors, the entities identified as catcher-processors are well defined based on their ownership of LEPs and no issues have been raised indicating that there is any difference between those who own those permits and vessels and those who operate them. Because this fleet operates under the

[37] Note: The Council's preliminary preferred alternative does not include IFQs for the at-sea sectors (catcher-processors and motherships). Options related to those sectors will only be relevant if the Council changes the management approach as part of final action.

[38] Transfer of physical assets alone should not be considered a basis for successor in interest. Business relationships such as transfer of the company name and customer base might be reasonable evidence of successor in interest.

trawl license limitation program, the same rules used for the catcher vessel history are used for the catcher-processors.

To apply a QS initial allocation formula to processors other than catcher-processors, the allocation formula is applied to the processing business rather than any particular physical asset. For the mothership sector, the mothership vessel is the primary unit for which data are available. Therefore, in the mothership allocation, we first determine the vessel history and then attribute that history to a processing business. For mothership processors, there is at least one vessel for which there is a difference between the business that runs the processing operation and the one that owns the vessel. On that basis, two options have been identified. These options capture the range between allocating all of the QS to the vessel owner and allocating all of it to the vessel charterer.

If the Council makes an allocation to shoreside processors, the stated intent is that the allocation go to the entities that first process the fishery. In some cases, the first buyer may not be the first processor. It has been the Council view that it is the first processors that have the greatest amount of capital assets that may be affected by the IFQ program. The focus on processors rather than first buyers may also be supported by MSA section 303A(c)(5)(A) which identifies the need to consider processing labor in the development of the initial allocation but makes no mention of fish buyers. However, the Council's ability to carry out the intent to allocate to first processors is affected by the quality of the data available. Government databases that track landings to entities at the needed species and species group level (the fish tickets database) provide information only for the first receivers (buyer-only or buyer-processor) and not for subsequent purchasers. While an allocation to the first processors might possibly be carried out using information not in government databases, it may substantially increase administrative burden and cost. The difficulty of developing standardized criteria for evidence of processing (particularly at the species level), the costs of data collection, and the likely need for extensive dispute resolution led the Council to develop a set of options that, to varying degrees, approximates the ideal result.

The first option allocates only to those entities that are on the fish ticket, no attempt is made to differentiate between those buyers that transfer the fish to first processors and those buyers that process themselves. This option relies solely on information in the fish ticket database. It is generally believed that the large majority of the trawl groundfish landings are delivered to buyers that process their own fish.

The second option allocates to the same set of entities but requires that they demonstrate engagement in at least some processing of trawl-caught groundfish. Once that threshold is met, all LE trawl landings received by that entity would qualify. This may screen out those entities that never acted as a processor, but would not attempt to differentiate between the fish those entities received and processed and the fish those entities received and transferred on to another for first processing. It would require some additional administrative costs but a relatively small amount in comparison to the task of determining of processing history for every landing. If the second had been selected, the Council may have added a timeframe. As currently worded, an entity that does not presently qualify could qualify by arranging to process some trawl-caught groundfish between now and when the applications for an initial allocation are due.

The third option provides an opportunity to base the entire allocation to processors on the history of the entity that first carries out that processing. The default position would be the same as Option 1, that the history goes to the buying entity. However, that landing history could be reassigned to a second receiver of the fish either if both companies came forward and agreed to the reassignment, or if an appeal were granted resolving a dispute between two claimants. If it is correct that the large majority of the catch is in fact processed by the first receiver, the number of potential disputes may be small relative to the total number of landings in the landing history database.

The Council selection Option 3 for its FPA. While there was concern about the lack of documentation available to implement Option 3 and the potential appeals that could result, it was noted

Another issue that had to be decided for shoreside processors is which entity associated with any shoreside activity should be considered the business entitled to the allocation. For the license limitation program, it was decided that the initial permit allocation would follow the hull and go to the current owner of the fishing vessel because the vessel was the primary asset needed to operate a fishing business and the value of that asset would be affected by the initial allocation. Allocating to the owner of the vessel at the time of initial allocation allowed for entry and exit during the deliberations. In that program, a provision was also made to allow for the substitution of one vessel for another due to certain hardship conditions.

For the at-sea processing allocation, following the vessel works as the primary basis for the allocation though there is some question about it with respect to the motherships, as discussed above. For shoreside processors, the physical assets associated with the shoreside business are varied and it is difficult to identify one asset that might be said to define a processing operation. For example, a processor could own its land and all its buildings and equipment or it may lease some or all of its primary assets. If an allocation were based on the current ownership of a key physical asset, fisheries managers might have to choose between owners of a number of primary assets (land, building, processing equipment). Furthermore, over time, some of these assets may have been moved between fishery and nonfishery-related activities. On this basis, the Council decided that with respect to processing history the allocation should go to the processing business itself (the entity running the processing operation) and, hence, not necessarily to the owner of the physical assets used in processing. However, this raises questions about the means by which historic and recent participation are considered. For harvesters, by following the vessels (the Amendment 6 license limitation program) or the permit (the IFQ program allocation to harvesters), changes during the Council deliberations process and historic dependence and involvement are accommodated. If current and historic participation for processors are to be tracked in a manner similar to what is done for harvesters, then some means is needed for the determining the successor in interest for shoreside processing operations. Consistent with the determination of which business entity associated with a processing operation should receive the initial allocation (i.e., the operator of the processing business, rather than the owner of the processing capital), the Council determined that transfer of physical assets alone should not be considered a basis for determining successor in interest. The Council identified that the transfer of business relationships, such as transfer of the company name and customer base, might be the most important evidence of successor in interest. Further development of the provisions will be left to NMFS, both for the criteria to identify successor in interest and the application of those criteria.

Consideration was given to an option that would give processing history to the first entity to receive the groundfish, but only for that groundfish which was processed. This option would have entailed most of the administrative costs of Option 3, but not have provided an opportunity for the first processor to qualify for history associated with fish acquired from a fish buyer. This option lies within the range between Options 1 and 3.

An option proposed by the TIQC, tying the transfer of processing history to the transfer of a facility, was rejected from further analysis. Initially, GAC members noted that the TIQC approach to accrual might be supported based on the numerous changes in ownership that have occurred in recent years within the processing industry. The underlying concepts are that if one company acquires another, it acquires both its assets and liabilities, and, with respect to the leasing provision, it the leaseholder really operates the processing business. This option would attribute the history to the current owner rather than past owners, reducing the dislocation that would occur through the allocation of IFQ to business entities no longer associated with the facility. However, during later deliberations it was decided that customer lists and the business name are more closely associated with the processing company and,

therefore, should be a primary consideration if a determination is required with respect to successor in interest to a shoreside processing operation.

❖ *Interlinked Elements*

Shoreside processing Option 1 would generate fewer reasons for appeal relative to Options 2 and 3. This may influence whether the Council believes there is a need for its involvement in the appeals process (Section A-2.1.5).

The recent participation requirements for shoreside processors (Section A-2.1.2.c) will determine the degree to which there is a significant difference between the allocation results and potential number of appeals for Options 1 and 2, but not with respect to Option 3.

❖ *Analysis*

Objectives related to fairness and equity will likely be affected as well as maximizing net benefits. The effect on net benefits will be primarily through the effect of this choice on the costs of program administration.

- Mothership Entity Options

The issue of whether to give an initial allocation to the owners of motherships or the charterer (where there is a charter) comes up in both the IFQ program and the co-op program. The implications of this decision for the IFQ program are quite different than for the co-op program. For the co-op program, the entity who receives the mothership permit will control whether the vessel is able to participate in the fishery. For the IFQ program, the mothership would not need QS to operate. If the charterer is given the initial allocation of QS, it will be in a stronger position to negotiate prices with the vessel owner. If the mothership owner is given the initial allocation, it can negotiate for some additional compensation from the charterer in return for the QS, or can sell the QS or QP elsewhere, in which case, the charterer can acquire that QS on the market if needed.

An allocation of QS is a distribution of new wealth, and one rationale for its allocation may be to offset losses that might be anticipated to result from the IFQ program. Since program performance will not be affected by the choice of whether to allocate to the vessel owner or charterer, the issue is primarily one of fairness and equity. To the degree that the mothership processors have been engaged in a race-for-fish and, therefore, there have been more participants than necessary, the value of the vessel owner's assets may decline with implementation of an IFQ program. An allocation of QS might then offset some of that reduced asset value. On the other hand, the market value of the charterer's business may change, depending on the effect of the IFQ program on projected profits for the mothership operation and whether the assets of the company include QS. The mothership charterer's profits may increase if it is able to reduce costs in a rationalized fishery, but may decrease if it has to pay higher ex-vessel prices. The net effect is uncertain, but a reduction or increase in the charterer's profits will also change what is available to pay the vessel owner. However, assuming there is a surplus of mothership vessels, the charterer may be less likely to use additional profits to increase what it actually pays for the charter.

- Shoreside Processing Entity Options

The allocation to the first entities that process is premised on the idea that these shoreside entities have more capital at risk than those who just operate buying stations. Implementation of the IFQ program may put returns to capital at risk, primarily to the degree that there is processor overcapitalization. If there is not processor overcapitalization, then processors are expected to earn normal returns on the

investments (technically termed "zero economic profit") under an IFQ program, regardless of whether they receive an initial allocation of QS (see Appendix E). One of the primary arguments given for allocating to processors is the need to maintain a balance of negotiating power between processors and harvesters. While the Council's desire to allocate QS to the first processor may not be fully realized through an allocation to buyers (Option 1), it is presumably the buyers who are in negotiation with the harvesters rather than the processors acquiring fish from the buyers. On that basis, the allocation to buyers (Option 1), while rough in its attempt to compensate those who may experience the most loss in capital value, may be more precise with respect to allocation objectives related to the effective balance of market power between harvesters and those to whom they sell. Option 1 is also the option with the lowest administrative cost because the allocation would be based entirely on information already in a government database.

In some transactions, a processor that normally buys and processes may serve as a buyer for some other business that first processes the fish (i.e., processing businesses are known to buy and process some fish while other fish they buy and pass on to another company). Option 2 would screen out all of those entities that only act as buyers and never process (those entities that only fall in Category 2 of Table A-33). There would be some additional administrative costs associated with determining whether a threshold processing criteria is met and that cost would likely be higher to the degree that there are uncertainties about the measures of those criteria (see Section A-2.1.1.c). This evaluation would be required for every applicant, though the determination would likely be relatively simple for many. As a result of applying this screen, a greater portion of the processor allocation of harvesting QS would go to those entities in Category 1 (there would be some deliveries for which no entity receives processing credit: those delivered to entities that have never processed groundfish). We do not have information available to tell us in advance the amount of QS that would be redistributed as a result of applying the screening criteria, nor do we know the number of entities that might apply. We do know that if the recent participation criteria (Section A-2.1.2.c) of the Council's PPA are applied, out of 208 buying companies with some buying history from 1994 to 2003, only about 42 would be eligible for an initial allocation of QS. It is likely that most of these did some processing of LE trawl groundfish and would have substantial evidence of that; therefore, the number of cases that might require more difficult individual evaluation would be small. If, instead of the preliminary preferred recent participation alternative (6 mt of LE trawl-caught groundfish in each of three years from 1998 to 2003), only one delivery is required, then there would be 124 potential qualifiers. This may result in a greater administrative burden.

Table A-34. Description of categories of buying and processing activities and, for each option for attributing history, whether the fish handled in those activities would be included or excluded in the allocation formula calculations.

Category of Activity	Description of Activity and Risk	Use of the History In the Allocation Formula		
		Option 1	Option 2	Option 3
1. Buy and Process	All purchases from harvesters that an entity bought and processed (activity which may be associated with the need to negotiate prices with harvesters and having the most capital at risk)	Included	Included	Included
2. Buy Only	All purchases from harvesters that an entity bought whether or not they processed (activity which may be associated with the need to negotiate prices with harvesters but may or may not have the most capital at risk)	Included	Included only if at some time the receiving entity processed some trawl caught groundfish	Excluded
3. Process Only (1st Processing)	All purchases from fish buyers made by those who only processed (activity which may be associated with entities not involved with negotiating price with harvesters but having only capital at risk)	Excluded	Excluded	Included

Under Option 3, every landing would be initially assumed to have been delivered to a processor, but every landing would also be open to question. Option 3 provides the opportunity to limit the allocation so that it only goes to those that fall under either category 1 or 3, identified in Table A-33. It most closely matches the stated intent of an allocation to processors and would match it exactly if every landing that falls in the third category is identified and any disputes resolved. For the large majority of the landings, it is likely that there would be no difference between the first receiver and the processor; however, because of the many landings occurring from 1994 to 2003, there is a potential for landings to be split in the processing plant, with some of the fish being processed by the buyer and others being passed on to another entity for first processing. For this analysis, it is not possible to know the number of landings that were not processed by the buyer, and, even if we have this information, it would not be possible to know the number for which a dispute might arise. Unlike for Option 2, the recent participation requirement will have little effect on the potential administrative costs. As with Option 2, clarity of the definition of processing activity will help reduce administrative costs.

The provisions related to successor in interest affects objectives related to fairness, equity, and net benefits. These provisions were developed with the intent of allocating to the entity that is currently active in the processing sector and most closely associated with the historic buying and/or processing activity. To the degree that the history reflects ongoing dependence and business activity, this approach is expected to minimize the number of transactions needed to get the QS into the hands of those who can use it. Processors can use the QS/QP on their own vessels or as leverage in negotiations with vessels delivering to them. Disputes, fairness, and equity concerns are most likely to arise in situations where some assets of one processing entity have been transferred to another, but both remain active in the industry. For example, a portion of the customer base was transferred, or one trademark or name under which a business operates was conferred but not another. Resolution of these issues in a fair and equitable manner that also minimizes disruption will depend in part on criteria that are being left to NMFS to develop.

A-2.1.2 Recent Participation

The recent participation requirement is evaluated in the following sections. Refer to Section A-2.1.3.a, "Allocation Periods" for additional discussion of the rationale for the periods used for the recent participation requirements.

A-2.1.2.a Permits (including catcher-processor permits)

❖ Provisions and Options

Recent participation is not required in order for a permit to qualify for an initial allocation of QS.

❖ Rationale and Options Considered, But Not Included

By allocating to permits, the Council ensures that the allocation will go to those that currently own assets in the fishery (the permit). A recent participation requirement would screen out permits that have been latent in recent years. A number of recent participation options were considered. Most looked at using 1998-2003 as the recent participation qualifying period, but no specifics were determined before this option was rejected. After reviewing the preliminary data, it was determined that the harvest history of the vessels that would be screened out by a recent participation requirement was not significant enough to warrant the costs of developing and implementing the provision and the resistance likely to be encountered by those screened out.

When the recent participation requirement was being considered, an option was proposed under which the requirement could be met for all catcher vessel sectors with participation in any one sector. Thus a permit that participated in the nonwhiting fishery in the early 1990s but only the mothership fishery during the recent participation period would be eligible for an allocation related to its nonwhiting history by virtue of its recent participation in the mothership sector.

❖ Interlinked Elements

The main provisions with which a recent participation requirement would interact are the initial allocation formulas of Section A-2.1.3.

❖ Analysis

The choice to have or not have a recent participation requirement primarily affects objectives related to fairness and equity and program costs. While a recent participation requirement might be considered reasonable and responsive to the MSA direction to consider current and historic participation and to consider investment and dependence, the likely impacts on the initial QS allocation appeared to be minimal with respect to their impact on the landing history based portion of the allocation. However, the impacts of a recent participation requirement may be somewhat more substantial if a portion of the QS is equally divided (Section A-2.1.3.a).

The following sections identify the effects of potential recent participation criteria for each catcher vessel sector. Table A-34 provides an overview of the cross participation among sectors by permits from 1994 through 2003.

Table A-35. Count of permits participating in each catcher vessel sector, by sector combinations for 1994 to 2003 participation.

	Number of Permits by Sector		
	Mothership	**Shoreside Whiting**	**Shoreside Nonwhiting**
Mothership Sector History Only	2	-	-
Mothership Sector and Shoreside Whiting (no shoreside nonwhiting participation)	3	3	-
Mothership and Shoreside Nonwhiting (no shoreside whiting)	2	-	2
Participation in All Three Sectors	25	25	25
Shoreside Whiting Only Catcher Vessels	-	-	0
Shoreside Whiting and Nonwhiting Catcher Vessels (no mothership whiting)	-	31	31
Nonwhiting Only Catcher Vessels	-	-	105
Sector Totals	32	59	163
None (no qualifying whiting or nonwhiting history)	1		
Total Catcher Vessels Permits (All Sectors)	**169***		

* As of the summer of 2008, there are 168 permits: Two permits were combined together.

- Shoreside Nonwhiting Catcher Vessels

Depending on the recent participation requirement, between 12 percent and 48 percent of the permits would be excluded from the shoreside nonwhiting by a requirement that a permit participate for a certain number of years in a recent period in order to qualify for an initial allocation (Table A-35 and Table A-36). A moderately stringent recent participation requirement (requiring participation in three out of six years from 1998 through 2003) would exclude permits with only 8 percent of the landings (Table A-37). Levels of minimum participation more likely to be selected would exclude even fewer landings from the initial allocation. A level which would exclude less than 25 permits would raise the allocation of everyone remaining by about no more than 5 percent, assuming the allocation is based entirely on landings history (i.e., if there is no equal allocation component).

If recent participation is combined with the equal allocation of buyback permit-related QS history (Section A-2.1.3.a), recent participation might have somewhat more of an impact. First we will look at the effect of the recent participation requirement on the 56 percent of the QS allocated based on permit landings history and then on the 44 percent that would be allocated equally. To illustrate, a requirement of a minimum of two years with shoreside nonwhiting landings from 1998 through 2003 will be considered in the context of an 80 percent allocation to permits. This recent participation requirement screens out 26 permits. As a result, the amount of QS an average permit receives based on its landing history would increase by about 2.9 percent and the average amount a permit receives based on equal allocation would increase by 8.4 percent (Table A-38). On average, the total allocation to each permit would increase by 11.3 percent (the actual amount of the increase for a particular permit varies by species and permit specific history). If a vessel could qualify with recent participation through catcher vessel landings in any sector, only 10 vessels would be screened out, and the amount of increase associated with equal allocation would decline from 8.4 percent to 2.8 percent (Table A-38). The effect on the history-based portion of the allocation would be four-tenths of one percent (Table A-39) and if only 56 percent of the allocation is based on history, then the recent participation requirement for the nonwhiting QS would increase the history-based allocation for all permits by about two-tenths of a percent, on average. So the combined effect of a recent participation requirement (two years of

participation from 1998 to 2003) that could be met with landings in any catcher vessel sector would be about a 3.0 percent increase for remaining participants, on average.

Table A-36. Number of permits not meeting recent participation requirements for a variety minimum participation periods and numbers of years of participation required during the participation period (buyback permits not included).

Shoreside Nonwhiting Minimum Participation Requirement						
Recent Participation Period	Number of Years For Which Deliveries Could be Required to Meet Recent Participation Requirement					
	1 year	2 years	3 years	4 years	5 years	6 years
2000-2003	34	42	55	75		
1999-2003	23	35	45	57	76	
1998-2003	19	25	39	48	61	79

Table A-37. Percent of permits with some shoreside nonwhiting landings during 1994 to 2003 (N=163) not meeting recent participation requirements for a variety minimum participation periods and numbers of years of participation required during the participation period (buyback permits not included).

Shoreside Nonwhiting Minimum Participation Requirement						
Recent Participation Period	Number of Years For Which Deliveries Could be Required to Meet Recent Participation Requirement					
	1 year	2 years	3 years	4 years	5 years	6 years
2000-2003	21%	26%	34%	46%		
1999-2003	14%	21%	28%	35%	47%	
1998-2003	12%	15%	24%	29%	37%	48%

Table A-38. Percent of 1994 to 2003 shoreside nonwhiting landings by permits that did not meet the indicated minimum participation requirements.

Shoreside Nonwhiting Minimum Participation Requirement						
Recent Participation Period	Number of Years For Which Deliveries Could be Required to Meet Recent Participation Requirement					
	1 year	2 years	3 years	4 years	5 years	6 years
2000-2003	7%	11%	15%	23%		
1999-2003	4%	7%	11%	15%	23%	
1998-2003	1%	5%	8%	12%	15%	24%

Table A-39. Effect of a recent participation requirement on the amount of equal share-based QS allocation a permit receives (assuming on average 44 percent of the QS is allocated equally among permits and 80 percent of the QS goes to permits).

Requirement : 2 Years of Activity in 1998-2003 **Sectors of Activity**	**Permits in the Sector(s)**	**Permits Screened Out**	**Permits Remaining**	**Permit Share of Equal Allocation of Permits are Screened Out**	**Percent Change in the Equal Allocation Portion for Each Permit**	**Change in Allocation as a Percent of Permit's Total QS Allocation (On Average)**
Nonwhiting	163	26	137	0.26%	19%	8.4%
Nonwhiting or Shoreside Whiting	166	18	148	0.24%	12%	5.4%
Nonwhiting, Shoreside or Mothership Whiting	168*	10	158	0.22%	6%	2.8%

* Of the 169 total permits one permit does not have any history from 1994 to 2003.

Table A-40. Number of permits and amount of landing history screened out by not meeting a 1998 to 2003 recent participation requirement with nonwhiting or shoreside whiting or mothership whiting deliveries.

All Sector Minimum Participation Requirement for Catcher Vessel Permits						
	Number of Years For Which Deliveries Could be Required to Meet Recent Participation Requirement					
Screened Out	**1 Year**	**2 Years**	**3 Years**	**4 Years**	**5 Years**	**6 Years**
Number of Permits	7	10	18	29	42	62
Percent of All Permits (169)	4%	6%	11%	17%	25%	4%
Sector of Deliveries	Percent of 1994-2003 the Sector's Deliveries Screened Out					
NonWhiting	0.3%	0.4%	2.0%	5.9%	10.3%	20.0%
Shoreside	0.0%	0.0%	0.0%	10.1%	14.3%	25.1%
Mothership	0.0%	0.6%	0.6%	4.3%	12.8%	16.7%

● Shoreside Whiting Catcher Permits

As with the shoreside nonwhiting permits, the impact from screening shoreside whiting with a recent participation requirement would do little to shift the landing history-based portion of the allocation. For the permits with some shoreside whiting landings (59), the proportion affected by recent participation requirements would be somewhat higher than for the nonwhiting vessels, 31 percent (18 permits) for a requirement of two years in 1998 to 2003 (Table A-40 and Table A-41), as compared to 15 percent (25 permits) for the same requirement for nonwhiting. As compared to the nonwhiting vessels, the amount of landing history affected by recent participation would be somewhat higher: 6 percent of the landings for a requirement of two years in 1998 to 2003 (Table A-42), as compared to 5 percent for a similar requirement the nonwhiting fleet. If the shoreside whiting and nonwhiting requirements are combined into a single recent participation requirement, as was proposed early on, the impacts would be even less (8 percent of the shoreside whiting permits and 2 percent of the shoreside whiting landings would be affected by a requirement of two years in 1998 to 2003; Table A-43). The amount of whiting affected by the equal allocation portion of the formula is very small (about 7 percent of all of the shoreside whiting QS would be equally allocated, as compared to 44 percent of the nonwhiting QS). Therefore, the effect of the recent participation requirement decision has a minimal effect on each individual permit's total allocation with respect to the equally shared portion of the shoreside whiting allocation.

Table A-41. Number of permits with some shoreside whiting landings during 1994 to 2003 that did not have shoreside whiting landings during the 1998 to 2003 qualifying period in the indicated number of years (buyback permits not included).

Shoreside Whiting Minimum Participation Requirement						
	Number of Years For Which Deliveries Could be Required to Meet Recent Participation Requirement					
Recent Participation Period	**1 year**	**2 years**	**3 years**	**4 years**	**5 years**	**6 years**
2000-2003	15	27	35	39		
1999-2003	13	22	30	38	42	
1998-2003	9	18	26	34	38	42

Table A-42. Percent of permits with some shoreside whiting landings during 1994 to 2003 (N=59) that did not have shoreside whiting landings during the 1998-2003 qualifying period in the indicated number of years.

Shoreside Whiting Minimum Participation Requirement						
	Number of Years For Which Deliveries Could be Required to Meet Recent Participation Requirement					
Recent Participation Period	1 year	2 years	3 years	4 years	5 years	6 years
2000-2003	25%	46%	59%	66%		
1999-2003	22%	37%	51%	64%	71%	
1998-2003	15%	31%	44%	58%	64%	71%

Table A-43. Percent of 1994 to 2003 shoreside whiting landings by vessels that did not have landings during the 1998 to 2003 qualifying period in the indicated number of years.

Shoreside Whiting Minimum Participation Requirement						
	Number of Years For Which Deliveries Could be Required to Meet Recent Participation Requirement					
Recent Participation Period	1 year	2 years	3 years	4 years	5 years	6 years
2000-2003	6%	19%	27%	33%		
1999-2003	3%	6%	11%	23%	31%	
1998-2003	3%	6%	11%	23%	31%	38%

Table A-44. Shoreside whiting permits and history screened out by not meeting a 1998 to 2003 recent participation requirement with nonwhiting or shoreside whiting deliveries.

Shoreside and Nonwhiting Whiting Minimum Participation Requirement						
	Number of Years For Which Deliveries Could be Required to Meet Recent Participation Requirement					
Screened Out	1 Year	2 Years	3 Years	4 Years	5 Years	6 Years
Number of Permits	3	5	6	13	18	22
Percent of Shoreside Whiting Permits (n = 59)	5%	8%	10%	22%	27%	37%
	Percent of 1994-2003 Landings					
Shoreside Whiting	0%	2%	2%	15%	19%	29%

Note: In March 2010, an error was discovered in one of the vessel identifier files that led to the misassignment of catch for six permits. For three of these permits, less than 1 percent of the catch history was affected; for one permit, 4 percent was affected. For the remaining two permits, 100 percent of the catch history was assigned to the wrong permit (i.e., the catch history was swapped between these two permits), and the distribution of harvest among years was off. The error does not have any effect on Table through Table .

- Mothership Whiting Catcher Vessels

A recent participation screen of two years from 1998 to 2003 would screen out fewer permits (8) and a somewhat smaller proportion of the mothership catcher vessel fleet (25 percent), as compared to the 18 permits (31 percent) that would be affected by a similar requirement for the shoreside whiting fishery

(Table A-42 and Table A-45). The amount of landing history screened out would be comparable to the nonwhiting fishery (6 percent, Table A-48). If the recent participation requirement could be met through any catcher vessel sector, the impacts would be even less with only six-tenths of a percent of the mothership whiting landings affected, Table A-39. Only 1 vessel delivering to the mothership sector would be screened out. The amount of mothership whiting affected by the equal allocation portion of the formula is very small (about 3 percent of all of the mothership whiting QS would be equally allocated, as compared to 44 percent of the nonwhiting QS). Therefore, the effect of the recent participation requirement decision will have minimal effect on each individual permits total allocation with respect to the equally shared portion.

Table A-45. Number of permits with some mothership whiting landings during 1994 to 2003 that did not have mothership whiting landings during the 1998 to 2003 qualifying period in the indicated number of years (buyback permits not included).

Mothership Whiting Minimum Participation Requirement						
Recent Participation Period	Number of Years For Which Deliveries Could be Required to Meet Recent Participation Requirement					
	1 year	2 years	3 years	4 years	5 years	6 years
2000-2003	9	14	20	22		
1999-2003	5	8	11	14	21	
1998-2003	5	8	11	14	21	23

Table A-46. Percent of permits with some mothership whiting landings during 1994 to 2003 (N=32) that did not have mothership whiting landings during the 1998 to 2003 qualifying period in the indicated number of years.

Mothership Whiting Minimum Participation Requirement						
Recent Participation Period	Number of Years For Which Deliveries Could be Required to Meet Recent Participation Requirement					
	1 year	2 years	3 years	4 years	5 years	6 years
2000-2003	28%	44%	63%	69%		
1999-2003	16%	25%	34%	44%	66%	
1998-2003	16%	25%	34%	44%	66%	72%

Table A-47. Percent of 1994 to 2003 mothership whiting landings by vessels that did not have landings during the 1998 to 2003 qualifying period in the indicated number of years.

Mothership Whiting Minimum Participation Requirement						
Recent Participation Period	Number of Years For Which Deliveries Could be Required to Meet Recent Participation Requirement					
	1 year	2 years	3 years	4 years	5 years	6 years
2000-2003	7%	19%	39%	48%		
1999-2003	2%	6%	11%	19%	43%	
1998-2003	2%	6%	11%	19%	43%	51%

- Catcher-Processor Vessels

A recent participation criterion for catcher-processors would not be applicable to the preferred alternative because the final Council recommendation did not include IFQs for this sector (see Appendix B).

Beginning in 1998, the catcher-processors operated under a voluntary co-op. Under the co-op structure, costs were reduced as fewer vessels participated (Table A-47), but revenues were shared among permit holders. Because of this voluntary agreement under which some vessels sat out of the fishery, it would be unfair at this point to impose a recent participation requirement. The voluntary co-op has been beneficial for the fishery and the economy. Imposition of a recent participation requirement would discourage the future formation of such voluntary co-ops if similar opportunities were to arrive in other sectors or fisheries.

Table A-48. Catcher–processor permits with some activity during 1994-2006.

	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
CP01	■	■	■	■	■	■	■	■	■	■	■	■	■
CP02	■	■	■	■	■	■	■	■	■	■	■	■	■
CP03	■	■	■	■	■	■	⊠	⊠	⊠	⊠	⊠	⊠	■
CP04	■	■	■	■	⊠	■	⊠	■	⊠	■	■	■	■
CP05	■	■	■	■	■	⊠	■	■	■	■	■	■	■
CP06	■	■	■	■	■	■	■	■	■	■	■	■	■
CP07	■	■	■	■	■	⊠	■	■	■	■	■	■	■
CP08	■	■	■	■	■	■	■	⊠	⊠	⊠	⊠	⊠	■
CP09	■	■	■	■	⊠	⊠	■	■	⊠	⊠	⊠	⊠	■
CP10	■	■	■	■	⊠	⊠	⊠	⊠	⊠	⊠	⊠	⊠	⊠
Total number active in the period	10	10	10	10	7	6	7	7	5	6	6	6	9
Minimum annual mt for the period	2,087	1,932	4,577	3,459	4,618	3,815	673	1,510	3,626	3,471	5,288	6,492	4,028

A-2.1.2.b Processors (Mothership) (N/A)

❖ *Provisions and Options*

This provision is not applicable to the preferred alternative because the final Council recommendation did not include IFQs for motherships (see Appendix B). The section header is maintained to provide continuity of numbering and cross referencing in various documents generated during this process.

Recent participation is required to qualify for QS:
1,000 mt or more of groundfish in each of any two years from 1997-2003.

❖ *Rationale and Options Considered, But Not Included*

Recent participation was considered for mothership processors for the same reasons identified for catcher vessels. IFQs for the mothership sector was not part of the final preferred alternative; therefore, the Council made no determination as to whether or not recent participation would be part of the program if IFQs were adopted for the mothership sector and an allocation give to processors. During deliberations on a recent participation criterion for this sector, in addition to the 1997 to 2003 option included for analysis, 1998 to 2003 and 1998 to 2004 were also considered. A period ending in 2004 was rejected because it went beyond the November 6, 2003, control date. A starting date of 1997 was used because it was the first year in which there was a three-way allocation between the whiting sectors.

❖ *Interlinked Elements*

Initial allocation is the main provision with which recent participation would interact. For recent participation requirements set at what would likely be considered reasonable levels, the effects of having or not having the requirement would be minimal.

❖ *Analysis*

The choice to have or not have a recent participation requirement primarily affects objectives related to fairness and equity and program costs. While recent participation might be considered reasonable and responsive to the MSA direction to consider both current and historic participation and investment and dependence, reasonable levels for such requirements would have little effect.

The recent participation period option selected for analysis of IFQs for the mothership sector coincided with the allocation period (Section A-2.1.4.c). This would make the recent participation criterion more of a minimum threshold than a screen that increases the emphasis on more recent years of the allocation period. Most mothership companies have consistent participation in the fishery (Table A-48). Four have not participated since 1995, and they would not receive an initial allocation for an allocation period that runs from 1997 to 2003. One company only entered the fishery after the allocation period. There is only one company that was absent for a number of years during the allocation period and might, therefore, be affected by requirement for a certain number of years of activity. To screen out any companies, the minimum participation requirement would have to require more than four years of activity; to screen out more than one company, the amount of landings required in each of those years would have to exceed 7,000 mt. The mothership recent participation option (1,000 mt in 2 years from 1997 to 2003) would not screen out any companies that would be eligible for an initial allocation. The option, therefore, would impose some minor administrative costs with respect to promulgation of the regulations with no effect on the allocation.

Table A-49. Mothership companies with some activity during 1994-2006.

	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
MS Company 1	■	■	■	■	■	■	■	■	■	■	■	■	■
MS Company 2	■	■	■	■	■	■	■	■	■	■	■	■	■
MS Company 3	■	■	⊠	⊠	⊠	⊠	⊠	⊠	⊠	⊠	⊠	⊠	⊠
MS Company 4	⊠	⊠	⊠	⊠	⊠	⊠	⊠	⊠	⊠	⊠	⊠	⊠	■
MS Company 5	■	■	■	■	■	■	■	■	⊠	⊠	⊠	■	■
MS Company 6	■	⊠	⊠	⊠	⊠	⊠	⊠	⊠	⊠	⊠	⊠	⊠	⊠
MS Company 7	■	■	■	■	■	■	■	■	■	■	■	■	■
MS Company 8	⊠	■	⊠	⊠	⊠	⊠	⊠	⊠	⊠	⊠	⊠	⊠	⊠
MS Company 9	⊠	■	⊠	⊠	⊠	⊠	⊠	⊠	⊠	⊠	⊠	⊠	⊠
Total number active in the period	6	7	4	4	4	4	4	4	3	3e	3	4	5
Minimum annual mt for the period	2,817	3,451	5,451	6,884	7,794	6,552	6,028	6,405	7,935	7,068	7,230	5,569	1,749
Average annual mt for the period	9,577	12,786	11,539	12,219	11,994 e	11,791	10,354	8,897	8,864	8,674	8,034	12,135	11,071
			■	= Active			⊠	= Not Active					

Note: Table updated, May 11, 2010

A-2.1.2.c Processors (Shoreside)

❖ *Provisions and Options*

No allocation was made to processors for nonwhiting trips; therefore, Nonwhiting Options 1 and 2 are not applicable to the Council's final preferred alternative.

Nonwhiting Option 1: 1 nonwhiting groundfish trip delivery from 1998-2003.
Nonwhiting Option 2: 6 mt or more of deliveries from nonwhiting groundfish trips in each of any three years from 1998-2003.

Recent participation is required to qualify for an initial allocation of QS:
Whiting Option 1:1 whiting trip delivery from 1998 to 2003.
Whiting Option 2: 1 mt or more of deliveries from whiting trips in each of any two years from 1998-2003.
►**Whiting Option 3:** 1 mt or more of deliveries from whiting trips in each of any two years from 1998-2004.

❖ *Rationale and Options Considered, But Not Included*

There is more transient participation in the shoreside processing sector than among trawl permits. The shoreside receipt of a trawl delivery from a vessel requires substantially less long-term commitment to the groundfish trawl fishery. Because of these issues related to dependency and involvement, the Council is considered a recent participation requirement for the shoreside processing sector. Initial information indicated that a recent participation requirement might substantially reduce the number of applicants, reducing administrative costs with a relatively minor effect on the allocation to those remaining eligible.

❖ *Interlinked Elements*

This provision most strongly interacts with the initial allocation formula, affecting the distribution of the initial allocation of QS. The fewer the buyers receiving allocations, the more QS exists for those receiving an initial allocation. If there were no QS control-limit grandfather clause and no opportunity to divest, the distribution of the initial allocation among processors would be strongly affected by the accumulation limit, causing a significant portion of the allocation to be redistributed away from those that would otherwise receive shares in excess of the accumulation limit. With the imposition of a recent participation requirement, the number of entities sharing the redistribution declines substantially, increasing the amount of the redistribution received by any one entity. However, while the Council's FPA does not include a grandfather clause, it does include a divestiture provision. Divestiture allows entities to receive an initial allocation in excess of QS control limits and provides them a period to divest themselves of excess shares.

❖ *Analysis*

As with harvesters and at-sea processors, the choice to have or not have a recent participation requirement primarily affects objectives related to fairness and equity and program costs.

A recent participation requirement will screen out some buyers and their associated history. The percent of landing history screened out affects the amount by which all other allocations would increase. For example, screening out 4 percent of the landing history would increase the allocation of all those

remaining by about 4 percent (given that there is not an equal allocation component to the processor allocation formula). The value of QS for which those who are screened out by a recent participation criterion might otherwise qualify could be comparable to the application fees (or substantially offset by the application fees). Under such circumstances, the loss from being screened out might be relatively minor. For example, if, for shoreside nonwhiting processors, a recent participation requirement were adopted of at least 1 mt in one year from 1998 to 2003, 124 firms with 3.7 percent of the 1994 to 2003 landing history would be screened out of the initial allocation (top row middle column of Table A-49). Assuming a total nonwhiting ex-vessel revenue of $24 million, a processor share of 20 percent and that 124 firms were screened out, the average ex-vessel revenue associated with the QP that might be issued annually to the firms eliminated by the recent participation requirement would average about $1,700. If the total Federal cost of the initial issuance of the QS is $500,000, and it is anticipated that about 300 entities will apply (the 121 entities owning permits and the 208 entities with some processing history), the application fees would be about $1,700. If the QS were to trade at a value equal to the annual ex-vessel revenue associated with the QP, then, on average, those screened out would not experience a substantial economic loss compared to their net gain from applying for and receiving QS (i.e., on average their application fee would have been close to value of the QS they received). However, QSs often trade at multiples of the expected ex-vessel revenue and lease QP price, such that the hypothesized application cost would only partially offset the loss a firm would experience from being screened out of the initial allocation.[39] Nevertheless, for those screened out by a recent participation requirement, it would be likely that a substantial portion of the lost opportunity to qualify for QS would be offset by their avoidance of the application fees. Section A-2.3.3 includes estimates of the expected program costs that can be compared to the values hypothesized here.

Using the hypothetical assumption that the processing cost associated with each application is $1,500, a recent participation requirement that screens out 124 companies would save the economy $211,000 and reallocate about 4 percent of the QS among the remaining 84 processors (an amount with an annual ex-vessel revenue equivalent of about $200,000).

The following sections contain information for each shoreside sector on the effect of the recent participation requirements on the number of buyers that would be potentially eligible for an initial allocation and the amount of landing history that would be screened out by application of the criteria.

- Nonwhiting

For the nonwhiting buyers, we consider the Council's two recent requirement participation options and an option included for analytical purposes (at least 1 mt of landings in at least one year from 1998 to 2003). As shown in Table A-49, 124 companies received at least one delivery of nonwhiting groundfish and 84 did not from 1998 to 2003 (Option 1). The deliveries to companies with some 1998 to 2003 participation represents 96.2 percent of the 1994 to 2003 deliveries. Requiring participation of 1 mt in a year would result in 84 qualifying companies and 124 excluded (middle column in Table A-49); however, the change in the 1994 to 2003 share of harvest by those meeting the standard is nearly imperceptible (96.2 percent compared to 96.1 percent). This small change reflects that many companies received very small amounts of groundfish, often in just one year during the 1994 to 2003 allocation period.

[39] QS often trade at a price that is between 3 and 10 times the QP lease price (Asche 2001). The QP lease price will be less than the annual ex-vessel revenue generated by the QP because the lease price will reflect profits related to the resource, after deducting for harvest costs. In 2004, total costs equaled revenue, including 5 percent return on capital (Lian, et. al, 2008). Under IFQs, a cost savings is expected of 50 percent to 60 percent. If QP prices are based on average vessel profits, they might be one half of ex-vessel revenue such that QS for $1,500 worth of fish might be expected to trade for about $3,750 (assuming a 5:1 QP:QP ratio).

Table A-50. Number of shoreside nonwhiting buying firms by maximum number of years of participation from 1998 through 2003 at indicated annual participation levels and those firms' share of the total 1994 to 2003 history (gray cells indicate firms do not meet the criteria of recent participation options).

Maximum Number of Years of 1998-2003 Participation	Annual Participation Level					
	1 delivery (>0 MT) (Option 1 requires 1 year >0 MT)		At Least 1 MT (Analytical Option requires 1 year >0 MT)		At Least 6 MT (Option 2 requires 3 years >6 MT each)	
	Number of Firms	Share of '94-'03	Number of Firms	Share of '94-'03	Number of Firms	Share of '94-'03
No Participation Greater than the Indicated Amount	70	3.7%	110	3.7%	125	4.0%
1	41	4.8%	26	4.9%	25	4.9%
2	31	2.3%	16	2.3%	12	3.7%
3	17	6.8%	15	8.3%	12	6.8%
4	6	3.6%	5	3.6%	5	4.2%
5	8	3.6%	7	2.0%	2	1.4%
6	21	75.1%	15	75.0%	13	75.0%
Total Meeting Standard (total of unshaded cells)	124	96.20%	84	96.10%	32	87.40%

The third column in Table A-49 is most restrictive, requiring an annual minimum participation of at least 6 mt to be counted as a participant in a particular year. Recent participation Option 2 requires such participation in each of three years during 1998 to 2003. As shown above in Table A-49, although fewer companies qualify (just 32 participated in three or more years with at least 6 mt), these companies received 87.4 percent of the groundfish during the 1994 to 2003 allocation period.

Geographic impacts by state are summarized in Table A-50. The number of companies that would not qualify under a given recent participation criteria is displayed above the dotted line (criteria not met), and those that would qualify are displayed below the dotted line (criteria met). Most of the companies receiving nonwhiting are located in California and the impact on California is proportionally greater than for the other states.

Table A-51. Number of shoreside nonwhiting buyers operating within each state and active during the indicated periods (1998 to 2003 and 1994 to 2003) and either meeting or not meeting the indicated criteria.

Recent Participation Options	Number of Firms					
	California		Oregon		Washington	
	1994-2003	1998- 2003	1994-2003	1998- 2003	1994- 2003	1998- 2003
Criteria from Council Option 1 (>0 MT in any year)						
Criteria Not Met	0	48	0	10	0	8
Criteria Met	134	86	38	28	28	20
Criteria from Analytical Option (>1 MT in 1 yr)						
Criteria Not Met	54	77	12	19	3	11
Criteria Met	80	57	26	19	25	17
Criteria from Council Option 2 (>6 MT in each of at least 3 years)						
Criteria Not Met	107	114	22	28	14	19
Criteria Met	27	20	16	10	14	9

The differences in the level of impacts between states are less dramatic when the proportional changes are considered rather than the totals. This is illustrated in Table A-51, which summarizes the effects on number of entities and quantity and raw product cost of the three options. The three options are compared for illustration purposes to the totals of quantity and raw product cost for all companies receiving nonwhiting within the allocation period. For the Option 1 requirement, there is less difference in the proportion of the impacts between Oregon and Washington than there is between either of those states and California. As the recent participation requirement is increased, the proportion of the number of entities affected within the state increases more for California and Oregon than it does for Washington, but the amount of landing history affected for Washington increases more than for California or Oregon,

Table A-52. Number of buyers and deliveries screened out by recent participation requirement options, by state.

Recent Participation Requirement	California		Oregon		Washington	
	Number of Companies Not Meeting the Indicated Recent Participation Requirement, Their 1994-2003 Purchases (weight and ex-vessel value), and Each Expressed as Percent of the State Total					
Option 1 Any Activity (>0 MT)	48 companies 37% of Total		10 companies 26% of Total		8 companies 29% of Total	
	7,062.9 mt 5%	$7.83 (mil) 5%	4,538.4 mt 3%	$4.35 (mil) 2%	1,904.0 mt 3%	$1.63(mil) 3%
Analytical Option >1 MT in any year	77 companies 57% of Total		19 companies 50% of Total		11 companies 39% of Total	
	7,080.5 mt 5%	$7.87 (mil) 5%	4,542.6 mt 3%	$4.36 (mil) 2%	1,910.0 mt 3%	$1.64(mil) 3%
Option 2 > 6 MT in three years	114 companies 85% of Total		28 companies 74% of Total		19 companies 68% of Total	
	17,639.3 mt 13%	$19.64 (mil) 14%	17,894.5 mt 10%	$17.26 (mil) 10%	10,225.5 mt 17%	$9.17 (mil) 19%
	Data for All Companies Active from 1994-2003					
ALL COMPANIES	134 companies		38 companies		28 companies	
	133,998.6 mt	$144.78 (mil)	170,424.8 mt	$178.31 (mil)	61,366.1 mt	$49.44 (mil)

- Whiting

For the nonwhiting buyers, the Council initially considered two recent participation options and added a third option when it took final action. The first two options the Council considered focused on a 1998 to 2003 recent participation period. The third option extended the recent participation period and the allocation period to 2004. We will analyze the Council's first two options and then provide a separate discussion of the impact of the Council's final recommendation. As shown in Table A-52, 17 companies received at least one delivery of whiting and 9 did not, from 1998 to 2003 (Option 1). The deliveries to companies with some 1998 to 2003 participation represent 94.3 percent of the 1994 to 2003 deliveries. Requiring participation of 1 mt in any two years would result in 9 qualifying companies and 17 excluded; however, the change in the 1994 to 2003 share of harvest by those meeting the standard is imperceptible.

Table A-53. Number of shoreside whiting buying firms by maximum number of years of participation from 1998 through 2003 at the indicated annual participation levels and those firms' share of the total 1994 to 2003 history (gray cells indicate firms that do not meet the criteria of recent participation options).

Maximum Number of Years of 1998-2003 Participation	Annual Participation Levels			
	1 delivery (>0 mt) (Option 1 requires 1 year >0 MT)		At Least 1 mt (Option 2 requires 2 year >1 MT)	
	Number of Firms	Share of '94-'03	Number of Firms	Share of '94-'03
No Participation Greater than the Indicated Amount	4	5.7%	6	5.7%
1	8	0.0%	6	0.0%
2	0	0.0%	0	0.0%
3	1	3.5%	1	3.5%
4	2	3.8%	2	3.8%
5	1	4.5%	1	4.5%
6	5	82.5%	5	82.5%
Total Meeting the Criteria (total of unshaded cells)	17	94.3%	9	94.3%

Note: The values in the zero row indicate the number of entities active only before or after 1998 to 2003.

The geographic distribution of companies that received whiting are shown in Table A-53 and Table A-54 (for a requirement of at least one landing in a year) and Table A-55 and Table A-56 (for a requirement of at least 1 mt in each of two years). On a state-by-state basis, the share of landings eliminated through the recent participation criteria is much greater for California than Oregon or Washington (in part, because the amount of total landings in California is so much smaller).

Table A-54. Number of shoreside whiting buyers in each state active during the indicated periods (1994 to 2003 and 1998 to 2003) and having a maximum of the indicated number of years of participation during that period (note: Option 1 requires at least 1 year >0).

Maximum Number of Years of Participation	Number of Firms with 1 Delivery For the Indicated Number of Years					
	California		Oregon		Washington	
	1994-2003	1998- 2003	1994-2003	1998- 2003	1994- 2003	1998- 2003
No Participation	0	1	0	2	0	1
1	4	4	2	1	4	3
2	0	0	0	0	0	0
3	0	0	1	1	0	0
4	1	2	1	1	0	0
5	0	0	0	1	0	0
6 or more	3	1	5	3	3	3
Total Meeting the Criteria		7		7		6

Table A-55. Quantity (in mt) by state and share of state total, 1994 to 2003 receipts, for shoreside whiting buyers screened out by whether or not they whiting during a 1998 to 2003 recent participation period recent participation criteria.

Years With More than 1 Delivery Received:	MT and Share of 1994-2003 History (1998-2003 participation period)							
	California		Oregon		Washington		Total	
	MT	Share	MT	Share	MT	Share	MT	Share
None	8,601	24.2%	27,265	4.5%	6,552	6.5%	42,418	5.7%
1 or More	26,927	75.8%	584,306	95.5%	94,032	93.5%	705,266	94.3%
TOTAL MT	35,528		611,571		100,585		747,684	

Table A-56. Number of shoreside whiting buyers in each state active during the indicated periods (1994 to 2003 and 1998 to 2003) and having a maximum of the indicated number of years of receiving at least 1 mt in the year (note: Option 2 requires at least 2 years >1 mt each).

Maximum Number of Years of Participation	Number of Firms with 1 mt In Each Year For the Indicated Number of Years					
	California		Oregon		Washington	
	1994-2003	1998- 2003	1994-2003	1998- 2003	1994- 2003	1998- 2003
No Participation	2	7	0	5	0	1
1	2	2	2	1	4	3
2	0	0	0	0	0	0
3	0	0	1	1	0	0
4	1	2	1	1	0	0
5	0	0	0	1	0	0
6 or more	3	1	5	3	3	3
Total Meeting the Criteria		3		4		3

Table A-57. Quantity (in mt) by state and share (%) of state total buying history (1994 to 2003) for shoreside whiting buyers screened by the number of years they received at least 1 mt of whiting during the 1998 to 2003 recent participation period.

Years With More than 1 MT Received:	MT and Share of 1994-2003 History (1998-2003 participation period)							
	California		Oregon		Washington		Total	
	MT	Share	MT	Share	MT	Share	MT	Share
0	8,601	24.2%	27,265	4.5%	6,552	6.5%	42,419	5.7%
1	55	0.2%	5	0.0%	191	0.2%	251	0.0%
2 or More	26,871	75.6%	584,301	95.5%	93,842	93.3%	705,014	94.3%
TOTAL MT	35,528		611,571		100,585		747,684	

When the Council took final action, it shortened the front end of the allocation period, changing it from 1994 to 1998 and extended the allocation and recent participation periods, changing them from 2003 to 2004. The extension of the recent participation and allocation periods did not allow any more buyers to qualify for an initial allocation. One new buyer first became active in 2004 (a buyer in California). Because the recent participation requirement requires two years of participation, that buyer will not be eligible for an initial allocation. Additionally, there were no buyers with only one year of participation from 1998 through 2003 who picked up a second year of activity with the extension of the recent participation period to 2004. Thus, the effect of extending the recent participation an additional year and modifying the allocation period will be to redistribute QS among those who were already qualified to receive an initial allocation.

A-2.1.3 Allocation Formula

A-2.1.3.a Permits with Catcher Vessel History

❖ *Provisions and Options*

QS will be issued for all fish management units within the scope of the program (see Section A-1.2) based on equal division and permit history, as follows:[40]

Equal Division:

Option 1: All QS allocated based on permit history (see following formulas).

- **Option 2**: An equal division of the buy-back permits' pool of QS among all qualifying permits plus allocation of the remaining QS based on each permit's history (see following formulas). (The QS pool associated with the buyback permits will be the buyback permit history as a percent of the total fleet history for the allocation period. The calculation will be based on total absolute pounds with no other adjustments and no dropped years.)

Permit History: The remaining QS will be allocated based on each permit's history (see following formulas).

For **nonwhiting** trips, permit history used for QS allocation will be calculated:

For nonoverfished species: using an allocation period of 1994-2003. Within that period use relative history and drop the three worst years.[41]

For overfished species taken incidentally:[42]

Overfished Species Option 1: as it is calculated for nonoverfished species.

- **Overfished Species Option 2:** use target species QS as a proxy based on the following approach: Apply fleet average bycatch rates to each permit's depth and latitude distributions and target species QS allocations. Fleet average

[40] Due to the divestiture provision of Section A-2.3.2.e, it is relatively unlikely that accumulation limits will constrain the amount of QS an entity receives in the initial allocation. However, if an entity qualifies for QS in excess of accumulation limits, and is does not qualify to receive that QS under the divestiture provision, the initial allocation will be constrained by first applying the aggregate limits and then, if necessary, the individual species limits. In using this approach, the entity's QS allocation should not be scaled back more than necessary to stay within limits and any QS not allocated will be reallocated to other QS recipients.

[41] State landings receipts (fish tickets) will be used to assess landings history for shoreside deliveries, and observer data will be used for deliveries to motherships. State landings receipts (fish tickets) will be used to assess landings history for shoreside deliveries. In some cases, fish ticket records do not identify species to the same level of detail used for the IFQ management units (e.g., reports "unspecified rockfish"). Under such circumstances, standard species composition routines usually used at the port level have been applied to vessel level data to estimate the species composition of such landings. In some instances, even after applying species composition information, there may be some fish ticket records that have a groundfish species categorization that does not match with one of the IFQ management units. Under such circumstances, when the initial allocations are made information other than that on the landings records and in logbooks might be used to assign the landing to its most probable species category.

[42] The intent is to provide an allocation method for QS for overfished species that addresses the vessel's need to have the QS to cover incidental catch in fisheries that target healthy stocks. The method would attempt to allocate the species to those who will be receiving QS for related target species. By allocating overfished species QS to those most in need of it, such an allocation would be expected to reduce disruption and transition costs. Currently, the list of overfished species that fall into this category is as follows: bocaccio, canary rockfish, cowcod, darkblotched rockfish, Pacific Ocean perch, widow rockfish, and yelloweye rockfish. This list may change by the time the program is ready to be implemented. If a major target species became overfished, it would not be intended that such a species would be allocated this alternative method (for example species such as Dover sole, sablefish, or Pacific whiting).

bycatch rates for latitudinal areas[43] divided shoreward and seaward of the RCA will be developed from West Coast Observer Program data for 2003-06. For the purposes of the allocation, a permit's QS for each target species will be distributed shoreward and seaward of the RCA and latitudinally based on the permit's logbook information for 2003-06. If a permit does not have any logbooks for 2003-06, fleetwide averages will be used.[44]

For **whiting** trips, permit history used for QS allocation will be calculated as follows:

For whiting, use an allocation period of 1994-2003. Within that period, use relative history and drop the two worst years. If a permit participated in both the shoreside and mothership whiting sectors, the same two years must be dropped for calculation of the permit's QS for each sector.[45]

For bycatch species (if IFQ is used for bycatch species):

Bycatch Option 1: use history for that species, as it is calculated for whiting

► **Bycatch Option 2:** use the whiting history as a proxy (i.e., allocation will be pro rata based on the whiting allocation).

Area Assignments: Landings history will be assigned to catch areas based on port of landing.[46]

Relative history (percent). For each sector, the permit history for each year is measured as a percent of the sector's total for the year.

In some situations the initial allocations may be constrained by accumulation limits. See Section A-2.2.3.e for a discussion of the limits and divestiture requirements.

Organization of the Analysis

The analysis will evaluate each of the elements of the allocation formula for permits, then the allocation formula as a whole in the following sections:

- Equal Allocation
- Allocation Period for History Based Allocation
- Drop Years Provision
- Incidental Catch Species Allocation
- Area Assignments
- Relative History
- Allocation Formula Results

The allocation formula results will be strongly influenced by the grandfather clause option selected in Section A-2.2.3.e. Not having a grandfather clause or divestiture would result in the reallocation of QS away from those who would have otherwise qualified for the shares, expanding the shares of all other recipients in proportion to their allocations. The Council's FPA adds a divestiture provision to the grandfather clause, substantially reducing, if not eliminating, any reallocation that might occur as a result of the application of accumulation limits (QS control limits).

[43] The four areas are as follows: (1) north of 47°40 N Lat; (2) between 47°40 N Lat and 43°55 N Lat; (3) between 43°55 N Lat and 40°10 N Lat; and (4) south of 40°10 N Lat.

[44] In order to determine an amount of aggregate target species to which bycatch rates will be applied, each vessel's QS will be multiplied by the trawl allocation at the time of implementation.

[45] State landings receipts (fish tickets) will be used to assess landings history for shoreside deliveries and observer data will be used for deliveries to motherships.

[46] Catch area data on fish tickets are not considered appropriate for this purpose. It is often filled out by fish receivers that assume the vessel has been fishing in nearby ocean areas. Therefore, it will be assumed that all catch comes from ocean areas near the port of landing.

The allocation of catcher vessel QS is intended for permits that are used for catcher vessels (permits other than those associated with catcher-processors). The first decision point in the allocation formula is whether a portion of the QS will be equally divided among permits. The portion that is not allocated equally will be allocated based on permit history. All other options for the initial allocation formula relate to the method used to allocate the portion of the QS that will be allocated based on history.

Early in the program, the quality of the vessel landings data set (fish tickets) was evaluated, and the amount of fish landed in species groups was compared to the current allocation categories. Landings are sometimes reported in nominal categories and species composition proportions developed from port sampler data are applied to those categories to estimate the actual catch composition. Estimation of catch composition in this manner provides statistically valid results for the fleet as a whole, but may not reflect the actual catch composition of a particular vessel on a particular day (for a particular landing). Despite this, it was decided that the species composition proportions applied to individual landings would be used for the initial allocation because it would yield a QS allocation that more closely parallels the actual catch composition than an approach that used landings information aggregated at a higher level to allocate individual QS for each species category.

Even after the application of the species composition information for some years and species, there were substantial amounts of unspecified rockfish that remained unclassified. Because there are sorting requirements for rockfish species for which there are specific management targets (OYs) it is assumed that the unclassified rockfish belong in the remaining rockfish category. "Shelf Rockfish" is the most likely single category to which the unspecified rockfish would likely belong; therefore, all unspecified rockfish were assigned to this category for purpose of analysis. During the initial allocation process there may be other evidence available, such as logbook information and the other species taken on the trip, which could indicate that a particular delivery would best be assigned to an alternative remaining rockfish category (either nearshore or slope rockfish). For 1994 to 2003, rockfish that was unspecified after application of species composition data composed 10 percent of all remaining rockfish in the north and 1 percent of all remaining rockfish in the south. However, for particular states and years, the proportion remaining in the unspecified is substantially greater (Table A-59).

Table A-58. Unspecified rockfish as percent of all remaining rockfish by year and state.

		1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	1994-2003
Unspecified rockfish north as a percent of minor rockfish north												
CA		1%	1%	2%	2%	0%	4%	1%	3%	0%	0%	2%
OR		3%	11%	11%	17%	29%	24%	0%	0%	0%	0%	12%
WA		2%	6%	20%	12%	11%	14%	1%	0%	0%	0%	10%
Total		2%	8%	11%	14%	21%	18%	0%	0%	0%	0%	10%
Unspecified rockfish south as a percent of minor rockfish south												
CA		0%	1%	0%	1%	3%	1%	0%	0%	0%	0%	1%
OR		0%	-	-	100%	43%	100%	0%	0%	-	0%	40%
Total		0%	1%	0%	1%	4%	1%	0%	0%	0%	0%	1%

While on a percentage basis, the amount of rockfish involved may be relatively small, the potential number of fish tickets with some unspecified rockfish remaining after application of species composition information may be substantial (Table A-57).

Table A-59. Number of fish tickets with unspecified rockfish by year and state (1994-1999).

	1994	1995	1996	1997	1998	1999	Grand Total
California	1,873	981	1,085	821	998	696	6,454
Oregon	1,081	1,332	1,913	2,073	1,658	1,459	9,516
Washington	1,259	2,011	1,845	1,551	1,045	1,147	8,858
Total	4,213	4,324	4,843	4,445	3,701	3,302	24,828

Equal Allocation

- Rationale and Options Considered, But Not Included

Equal allocation among all catcher vessel permits is intended to address equity concerns. During deliberations on allocation, it is often argued that past harvest does not create a prior right to future harvest; those with the history have "already been paid for those fish" and, therefore, their history should not entitle them to a greater allocation. Lotteries and equal allocation are two ways in which this concern can be addressed (NRC, 1999). Lotteries might be used if the amount to be equally allocated among all qualified recipients would be too little.

Under the equal allocation provision, all catcher vessel permits would receive an equal share of the allocation attributable to the buyback permit-related history, including history related to participation in the nonwhiting, shoreside whiting, and mothership whiting sectors. Development of the IFQ program started just as the LEP buyback program was being completed. The removal of permits representing approximately 44 percent of the landing history was used to provide a pool of QS that could be allocated equally without substantially reducing the amounts that a permit would receive if there had not been a buyback program, and QS had been allocated through a formula based completely on permit landing history.

The QS in the buyback permit pool will be tied to the sector that generated the landing history. For example, shoreside-landing history will generate QS tied to the shoreside sector. A catcher vessel permit that delivers to motherships will receive some shoreside nonwhiting QS from the buyback permit pool but those QS can only be used to cover catch delivered shoreside. The vessel receiving that shoreside QS might either decide to sell the QS or start making some shoreside deliveries, but it could not use the shoreside QS to cover deliveries to motherships.

The equal allocation element of the allocation formula has particular importance with respect to the allocation of overfished species because it is expected that some overfished species will substantially constrain the harvest of target species. Equal allocation with respect to overfished species is considered below in the section on overfished species allocation.

The Council's final preferred alternative would use co-ops to rationalize the mothership whiting fishery; however, because mothership catcher vessels are subject to the buyback program fees they would still receive a share of the equal allocation distribution of QS. Only two permits that participate in the mothership whiting fishery have not participated in the shoreside trawl fishery (Table A-34). While the shoreside sector will not gain the benefit of an equal share of the mothership sector allocation, the share of mothership history that would be equally allocated is relatively small, 2.3 percent of the mothership sector whiting compared to an average of about 44 percent for shoreside nonwhiting species.

- Interlinked Elements

Number of Trawl Sectors (Section A-1.3). Under the final preferred alternative, there is a single shoreside sector. Vessels making whiting deliveries will be able to cover nonwhiting bycatch using nonwhiting QS received as part of their initial QS allocation under the equal sharing provision.

Transfer Moratorium (Section A-2.2.3.c). Equal allocation redistributes QS to smaller harvesters in quantities in excess of what they have taken historically. If smaller harvesters wish to divest themselves of that QS, rather than using it themselves, the two-year moratorium on the transfer of QS will prevent them from making a permanent transfer, however, during that period they will be able to transfer their QP.

Accumulation Limit Grandfather Clause (Section A-2.2.3.e). If Council had selected an accumulation limit (QS control limit) and grandfather clause without a divestiture provision, incorporation of an equal allocation provision would change the impacts of the accumulation limit grandfather clause. Under such circumstances, those permit holders with the most history would be grandfathered in at lower levels with an equal allocation provision as compared to without an equal allocation provision. If there were no equal allocation and a grandfather clause, those receiving QS in excess of limits would be able to harvest at levels closer to their historic shares.

Overfished Species. In terms of impacts of the allocation formula, there is a strong interaction between the choice of allocation approaches for overfished species (an approach based on bycatch rates applied to targets species or one based on direct catch history) and the decision on whether to apply equal allocation to overfished species. Because of this interaction, equal allocation of overfished species is covered in the section below on the allocation approach used for overfished species.

- Analysis

The following are the categories of goals and objectives most affected by the equal allocation decision.

	Related Category of Goals and Objectives										
Section	**Conservation**	**Net Benefits**	**Disruption**	**Excessive Shares**	**Fairness and Equity**	**Harvester and Processor Sector Health**	**Labor**	**Communities**	**Small Entities and New Entrants**	**General Public**	**Program Performance**
Fairness and Equity and Disruption			X	X	X						
Net Benefits and Sector Health		X				X			X		
Communities								X			

♦ *Fairness, Equity and Disruption*

One of the rationales for the initial allocation relates to the compensation of the holders of physical assets for the loss in value of assets they have purchased. LEPs are one asset the value of which will be substantially diminished after implementation of an IFQ Program. Under status quo, permits of similar size are of similar value (assuming there is no speculation on permit value based on the associated landings history and the anticipation of an IFQ program). Comparable value of permits tends to support emphasis on equal distribution of QS among permits, since holders of permits of similar size would be similarly affected. On the other hand, long-term landing history relates to a harvester's overall investment and dependence on the fishery, a factor identified by Congress as important in considering the fairness and equity of the initial distribution (MSA 303A(c)(5)(A)(ii)). Allocation to those most invested and dependent on the fishery tends to reduce disruption. These factors support a landings emphasis on history-based allocation.

Part of the original rationale for the equal allocation of the buyback portion of the landing history was that since those permits were removed from the fishery no one would miss the QS that might be associated with that landing history; therefore, it could be equally distributed among all participants with little expected objection. However, the removal of those permits allowed fishing opportunities to improve starting in 2004. Harvesters have now had a number of years to adapt to their new harvest levels and will have had a number of additional fishing years before the program is implemented. This makes it more likely that an initial allocation that includes an equal allocation component will disrupt recent practices in the fishery and be perceived as less equitable.[47] At the same time during that period, harvesters were on notice that landings occurring after the control date would not count toward the initial allocation.

Table A-59 shows the share of 1994 to 2003 landing history by permits that were bought back in December 2003. The table shows that 91 buyback permits participating in the nonwhiting sector landed 43.62 percent of total groundfish round-weight during 1994 to 2003. This total includes more than half of certain groundfish species, such as arrowtooth flounder, spiny dogfish, and chilipepper. By contrast, the 20 buyback permits participating in the shoreside whiting fishery landed only about 7 percent of total groundfish in that sector, and the three at-sea catcher vessel buyback permits accounted for only about 2 percent of total groundfish delivered in that sector. Table A-60 shows aggregate landing history (mt) during 1994 to 2003 of OY species recorded by all non-CP LE trawl permits (i.e., permits that were bought back in December 2003, plus remaining permits). Table A-60 provides amounts that would be distributed equally per permit, assuming 169 permits.[48]

The initial allocation of QS will provide some compensation to owners of permits, the value of which is expected to decline substantially if an IFQ program is put in place. As was mentioned, under status quo permit values vary based on length. A 70-foot permit may have been worth about $200,000 in 2004 (Table A-19). Just over half the permits are 70 feet or less in length and, therefore, of equal or lesser value. Assessing the value of the QS that will be issued for permits is difficult because of uncertainties about trading prices for QS. There will be some relationship to the ex-vessel value, after subtracting harvesting costs and taking into account the multiyear stream of revenue that a QS holder might expect. While not a very precise or unbiased estimate of QS value, the ex-vessel value that might be associated with the amount of QS to be allocated equally provides a sense for the order of magnitude of the compensation that the equal allocation might provide to permit holders. An average ex-vessel value per

[47] This assumes that the vessels with permits that have the greatest amount of 1994 to 2003 history are the vessels most likely to have expanded their harvest with the increased opportunity occurring after implementation of the buyback program.

[48] As of the summer of 2009, the number of catcher vessel permits has declined to 167.

permit of $63,000 may be attributable to the equal shared portion of the nonwhiting QS allocation (Table A-61). Another approach to provide an order of magnitude estimate is to look at the estimated total value of nonwhiting QS that would be issued ($68 million to $180 million, Table A-20) and assume that the quantity of the QS allocated equally is proportional to the value of the QS allocated equally.[49] On this basis, the total value of the amount allocated equally would run between about $28 million and $79 million. Divided equally among 169 permits, this comes to between around $160,000 to $470,000 per permit (excluding whiting). These revenue and QS estimates should be reduced by 10 percent to account for the amount of nonwhiting QS that will be allocated for use in the AMP. There will be some marginal additional amount of value from equal allocation attributable to the equally shared whiting; however, this amount is likely to be relatively small (about $4,600 per permit before reducing by 20 percent to account for the amount to be allocated to processors).

A closely related issue is excessive shares. Accumulation limits are intended to prevent individuals from acquiring excessive shares; however, a grandfather clause was considered that would allow those with history qualifying them for initial allocations in excess of accumulation limits to receive allocations greater than the accumulation limit (QS control limit) and to retain that allocation indefinitely (divestiture not required). For those entities, a grandfather clause would provide a long-term advantage over those who receive an initial allocation below the limits. This advantage is viewed by some as an inequity. When combined with a grandfather clause, an equal allocation component would reduce the level at which entities were grandfathered in, thus reducing that long-term advantage. The Council's final preferred alternative allows entities to receive a full initial allocation (unrestricted by accumulation limits), but requires them to divest of their allocation within the first four years. This reduces the duration of the advantage of the allocation in excess of control limits and diminishes the importance of equal sharing in reducing the size of that advantage.

[49] Since the 44 percent that will be allocated equally is an average across a number of species and the value varies across species, the value of the equally allocated QS may be more or less than 44 percent of the value of all QS allocated. Using 44 percent of the value of the QS provides only a rough estimate for the value of the amount to be equally allocated.

Table A-60. 1994 to 2003 Aggregate Landing history Shares (percent) for *Buyback Permits*.

Species Group	Shoreside Nonwhiting	Shoreside Whiting	At-Sea (Mothership) Whiting CVs	Total nonCP Groundfish CVs
Lingcod - coast wide	44.16%	5.74%	0.14%	44.11%
N. of 42° (OR & WA)	45.93%	3.99%	0.14%	45.87%
S. of 42° (CA)	39.27%	28.53%	-	39.27%
Pacific Cod	51.06%	7.23%	2.70%	51.03%
Pacific Whiting (Coast wide)	64.48%	7.20%	2.28%	5.51%
Sablefish (Coast wide)	45.87%	4.51%	1.32%	45.29%
N. of 36° (Monterey north)	46.23%	4.51%	1.32%	45.62%
S. of 36° (Conception area)	36.77%	-	-	36.77%
PACIFIC OCEAN PERCH	44.40%	2.59%	1.71%	43.08%
Shortbelly Rockfish	46.92%	12.02%	0.00%	39.77%
WIDOW ROCKFISH	36.03%	7.54%	3.43%	33.92%
CANARY ROCKFISH	44.61%	5.59%	2.54%	44.46%
Chilipepper Rockfish	19.98%	-	-	19.98%
BOCACCIO	18.30%	-	-	18.30%
Splitnose Rockfish	24.90%	-	-	24.90%
Yellowtail Rockfish	42.77%	11.36%	4.39%	36.48%
Shortspine Thornyhead - coast wide	45.00%	27.62%	0.00%	44.99%
N. of 34°27'	49.71%	27.62%	0.00%	49.70%
S. of 34°27'	33.61%	-	-	33.61%
Longspine Thornyhead - coast wide	46.23%	69.91%	0.00%	46.24%
N. of 34°27'	46.23%	69.91%	0.00%	46.24%
S. of 34°27'	35.64%	-	-	35.64%
COWCOD	55.88%	-	-	55.88%
DARKBLOTCHED	48.44%	30.10%	1.82%	48.06%
YELLOWEYE	34.13%	0.21%	0.00%	34.06%
Black Rockfish - coast wide	21.40%	0.33%	0.00%	21.27%
Black Rockfish (WA)	59.88%	0.00%	-	57.87%
Black Rockfish (OR-CA)	16.00%	1.18%	0.00%	15.98%
Minor Rockfish North	45.51%	11.79%	2.12%	44.47%
Nearshore Species	59.46%	0.00%	0.00%	58.78%
Shelf Species	45.64%	3.34%	0.65%	44.17%
Slope Species	45.31%	38.31%	4.36%	44.84%
Minor Rockfish South	31.29%	-	-	31.29%
Nearshore Species	28.69%	-	-	28.69%
Shelf Species	24.95%	-	-	24.95%
Slope Species	33.27%	-	-	33.27%
California scorpionfish	3.74%	-	-	3.74%
Cabezon (off CA only)	4.11%	-	-	4.11%
Dover sole (total)	45.85%	56.27%	0.00%	45.85%
English Sole	38.79%	37.19%	0.07%	38.79%
Petrale Sole (coast wide)	47.51%	47.35%	0.00%	47.51%
Arrowtooth Flounder	53.41%	17.24%	1.06%	53.38%
Starry Flounder	12.36%	0.00%	-	12.35%
Other Flatfish	33.52%	62.08%	0.02%	33.53%
Kelp Greenling	10.13%	-	-	10.13%
Spiny Dogfish	69.43%	8.04%	3.73%	58.82%
Other Fish	40.98%	81.01%	0.00%	41.02%
Nearshore species	41.39%	4.72%	0.13%	41.35%
Shelf species	44.40%	10.98%	4.16%	42.89%
Slope species	43.71%	8.60%	3.22%	42.99%
Dover Sole, Thornyhead, Sablefish (DTS)	45.83%	7.27%	1.21%	45.73%
Total Groundfish	43.62%	7.22%	2.29%	14.39%
Number of Buyback Permits	91	20	3	91

Table A-61. 1994 to 2003 Aggregate Landing history (mt) for *All non-CP Limited Entry Trawl Permits (Buyback + Remaining)*.

Species Group	Shoreside Nonwhiting	Shoreside Whiting	At-Sea Whiting CVs	Total non-CP Groundfish CVs
Lingcod - coast wide	5,534.7	4.9	1.4	5,540.9
N. of 42° (OR & WA)	4,062.2	4.5	1.4	4,068.1
S. of 42° (CA)	1,472.4	0.3	0.0	1,472.8
Pacific Cod	5,341.2	2.9	0.2	5,344.2
Pacific Whiting (Coast wide)	922.2	745,047.3	408,768.2	1,154,737.6
Sablefish (Coast wide)	29,327.6	408.9	6.8	29,743.3
N. of 36° (Monterey north)	28,212.0	408.9	6.8	28,627.7
S. of 36° (Conception area)	1,115.6	0.0	0.0	1,115.6
PACIFIC OCEAN PERCH	4,936.9	105.0	54.2	5,096.1
Shortbelly Rockfish	221.9	9.9	33.0	264.8
WIDOW ROCKFISH	36,264.4	1,901.2	863.2	39,028.8
CANARY ROCKFISH	4,806.3	9.4	8.3	4,824.0
Chilipepper Rockfish	8,188.1	0.0	0.0	8,188.1
BOCACCIO	1,428.0	0.0	0.0	1,428.0
Splitnose Rockfish	3,286.3	0.0	0.0	3,286.3
Yellowtail Rockfish	21,897.9	2,616.1	2,244.6	26,758.5
Shortspine Thornyhead - coast wide	12,228.5	6.0	0.6	12,235.1
N. of 34°27'	8,647.5	6.0	0.6	8,654.1
S. of 34°27'	3,581.1	0.0	0.0	3,581.1
Longspine Thornyhead - coast wide	27,992.6	7.2	0.0	27,999.8
N. of 34°27'	27,992.2	7.2	0.0	27,999.4
S. of 34°27'	0.5	0.0	0.0	0.5
COWCOD	0.0	0.0	0.0	0.0
DARKBLOTCHED	4,847.5	21.3	31.0	4,899.8
YELLOWEYE	462.6	0.6	0.3	463.4
Black Rockfish - coast wide	187.8	1.1	0.0	188.9
Black Rockfish (WA)	23.1	0.8	0.0	23.9
Black Rockfish (OR-CA)	164.7	0.3	0.0	165.0
Minor Rockfish North	10,261.5	184.4	110.4	10,556.4
Nearshore Species	8.2	0.0	0.1	8.3
Shelf Species	5,840.7	139.8	66.3	6,046.9
Slope Species	4,412.5	44.6	44.0	4,501.1
Minor Rockfish South	5,123.0	0.0	0.0	5,123.0
Nearshore Species	60.5	0.0	0.0	60.5
Shelf Species	1,186.7	0.0	0.0	1,186.7
Slope Species	3,875.8	0.0	0.0	3,875.8
California scorpionfish	6.1	0.0	0.0	6.1
Cabezon (off CA only)	2.9	0.0	0.0	2.9
Dover sole	87,944.2	11.3	0.0	87,955.5
English Sole	10,435.8	6.3	0.2	10,442.3
Petrale Sole	16,836.0	5.4	0.0	16,841.4
Arrowtooth Flounder (total)	28,536.5	10.1	7.5	28,554.1
Starry Flounder	362.9	0.0	0.0	363.0
Other Flatfish	17,839.8	12.1	2.7	17,854.6
Kelp Greenling	1.8	0.0	0.0	1.8
Spiny Dogfish	4,006.2	191.7	594.8	4,792.6
Other Fish	4,847.0	5.9	0.9	4,853.8
Nearshore species	6,164.9	6.0	1.5	6,172.3
Shelf species	138,670.5	2,988.9	2,920.6	144,580.0
Slope species	156,870.8	2,099.9	1,027.6	159,998.3
DTS species	158,057.5	433.4	7.4	158,498.4
Total Groundfish	354,642.8	750,569.0	412,728.2	1,517,940.0
Number of Buyback Permits	91	20	3	91

Table A-62. Annual ex-vessel revenue equivalent per permit for QP which could be received through equal allocation (assuming 2004 to 2006 average prices and landing levels and 169 permits receiving an initial allocation).*

Species Group	Shoreside Nonwhiting	Shoreside Whiting	At-Sea Whiting CVs	Nonwhiting	
				Pounds/ Permit	Dollars/ Permit
Lingcod - coast wide					
N. of 42° (OR & WA)	45,161			435	267
S. of 42° (CA)	14,641			114	87
Pacific Cod	391,058			4,828	2,314
Pacific Whiting (Coast wide)	1,020	782,207	106,674	101	6
Sablefish (Coast wide)					
N. of 36° (Monterey north)	2,935,361			15,037	17,369
S. of 36° (Conception area)	34,453			237	204
PACIFIC OCEAN PERCH	39,514			503	234
Shortbelly Rockfish	83			29	0
WIDOW ROCKFISH	44,638			615	264
CANARY ROCKFISH	5,530			65	33
Chilipepper Rockfish	7,664			81	45
BOCACCIO	842			8	5
Splitnose Rockfish	20,817			385	123
Yellowtail Rockfish	92,698			1,283	549
Shortspine Thornyhead - coast wide					
N. of 34°27'	347,822			2,714	2,058
S. of 34°27'	117,416			719	695
Longspine Thornyhead - coast wide					
N. of 34°27'	361,400			4,189	2,138
S. of 34°27'					
COWCOD					
DARKBLOTCHED	63,468			824	376
YELLOWEYE	166			2	1
Black Rockfish - coast wide					
Black Rockfish (WA)	18			0	0
Black Rockfish (OR-CA)	320			4	2
Minor Rockfish North					
Nearshore Species	478			6	3
Shelf Species	14,557			219	86
Slope Species	69,029			878	408
Minor Rockfish South					
Nearshore Species	140			0	1
Shelf Species	1,538			14	9
Slope Species	55,624			647	329
California scorpionfish					
Cabezon (off CA only)	0			0	0
Dover sole (total)	2,528,160			40,000	14,960
English Sole	258,162			4,502	1,528
Petrale Sole (coast wide)	2,496,597			15,093	14,773
Arrowtooth Flounder	271,719			14,701	1,608
Starry Flounder	8,717			124	52
Other Flatfish	370,650			5,184	2,193
Kelp Greenling				0	
Spiny Dogfish	55,856			1,821	331
Other Fish	13,349			553	79
Total	**10,668,668**	**782,207**	**106,674**	**115,916**	**63,128**
Average Per Vessel	63,128	4,628	631		68,388

* Estimates do not include a reduction of 10% for nonwhiting species allocated to the AMP and do not include a reduction of 20% for whiting allocated to processors; at-sea whiting catcher vessel QS would not be available for equal allocation since this sector will be managed with co-ops.

♦ *Net Benefits and Sector Health*

Equal allocation may result in some misalignment between recent harvest patterns and the initial allocation, requiring the redistribution of either capital assets or the QS following the initial allocation. The need for the redistribution would depend on the desire and ability of those receiving QS in excess of their typical usage to use the QS themselves on their existing vessels (assuming the vessels have adequate capacity) and efficiency of their harvest operations relative to other harvesters that will be looking to acquire additional QS to increase production. Equal allocation may result in more transfers after initial implementation, increasing both private transaction costs and administrative costs. Additionally, if there is a correlation between historic size of harvest operations and efficiency (with smaller operations being less efficient) then QS will be initially allocated to less efficient operations. Transaction costs will always present a hurdle slowing the transfer of QS to more efficient operators. Thus, benefits early in the program will be somewhat greater whenever the initial allocation can be made to those who will use the QS most efficiently.

Often when there is an initial allocation of IFQ, few harvesters receive shares in amounts that are sufficient for them to pursue what they may view as their normal landings levels for recent years, [50] particularly the average and larger harvesters. One of the reasons for this is that allocations are often made based on averages. Under status quo, every year some vessels experience lower than their normal harvests or are absent from the fishery for the year. This creates greater opportunity for the remaining vessels but makes it impossible to allocate all vessels an amount of QS that might reflect their operating level for what they view as normal years. This dynamic leads to lower average allocations for the largest producers, however, the same kind of dynamic also diminishes the amounts the smaller producers receive relative to their landing history. After the initial allocation, there will be an opportunity for a harvester to purchase quota and restore its opportunity to harvest at its normal level. However, in bidding for the purchase of quota, even if a particular smaller operator has efficiency that is comparable to a larger operator, if smaller operators are less well capitalized, they may have a lesser ability to compete to purchase the additional QS needed to restore their operations to normal harvest levels. Under such circumstance, equal allocation may help preserve the economic health of smaller operators while larger operators are able to weather the additional capital demands on their own. On the other hand, if there is no difference between smaller and larger operators in their ability to access capital, or if for some reason larger operators tend to have more debt (or less equity) when the program goes into place, the equal allocation component could diminish overall sector health.

Figure A-27 illustrates expected shares of nonwhiting harvest allocated to each permit (vertical axis) as compared to the 2004 to 2006 average share of nonwhiting harvest for each permit (horizontal axis) assuming 100 percent of the allocation goes to harvesters. The top graph shows this comparison using a QS allocation formula based entirely on landing history, and the bottom graph shows the comparison using a QS allocation formula that includes equal sharing of the landing history related to buyback permits. Permits along the diagonal line would be expected to receive an allocation comparable to their 2004-2006 catch. The graphs show that with an allocation formula based only on landing history 93 permits would receive more than their 2004 to 2006 average, but with a formula that includes an equal allocation

[50] For example, if, over a four-year period, every vessel in a fleet had a pattern in which it harvested 100 mt for three of those years and 60 mt in another (with that pattern rotating randomly through the fleet) then when a harvest history based allocation is made, each vessel would only receive 90 mt, not enough to sustain its "normal" harvest level. Additionally, other factors in allocation formulas tend to reduce the peak amounts of harvest, for example being able to drop worst years. Using the previous numeric example, if every vessel drops its 60 mt year and takes credit for the three 100 mt years, the result is the same, 90 mt, because everyone's harvest history would increase by the same amount (i.e., their share of harvest history would be constant).

component 103 permits would receive more than their 2004 to 2006 average. Under either allocation formula, nearly all permits with more than about 1.0 percent of the 2004-2006 harvest receive less QS than their recent history. However, without equal allocation there were a number of permits with more than about 1.0 percent of the 2004-2006 harvest that received amounts of QS much closer to their 2004-2006 history. With equal allocation, the minimum share would be about 0.2 percent and all the permits with less than about 0.4 percent of the 2004-2006 harvest receive more QS than their recent history. With an allocation formula based on landing history the maximum share of total annual ex-vessel revenue for QS attributed to any permit would be about 2.5 percent while with an equal allocation the maximum share would be about 1.6 percent.

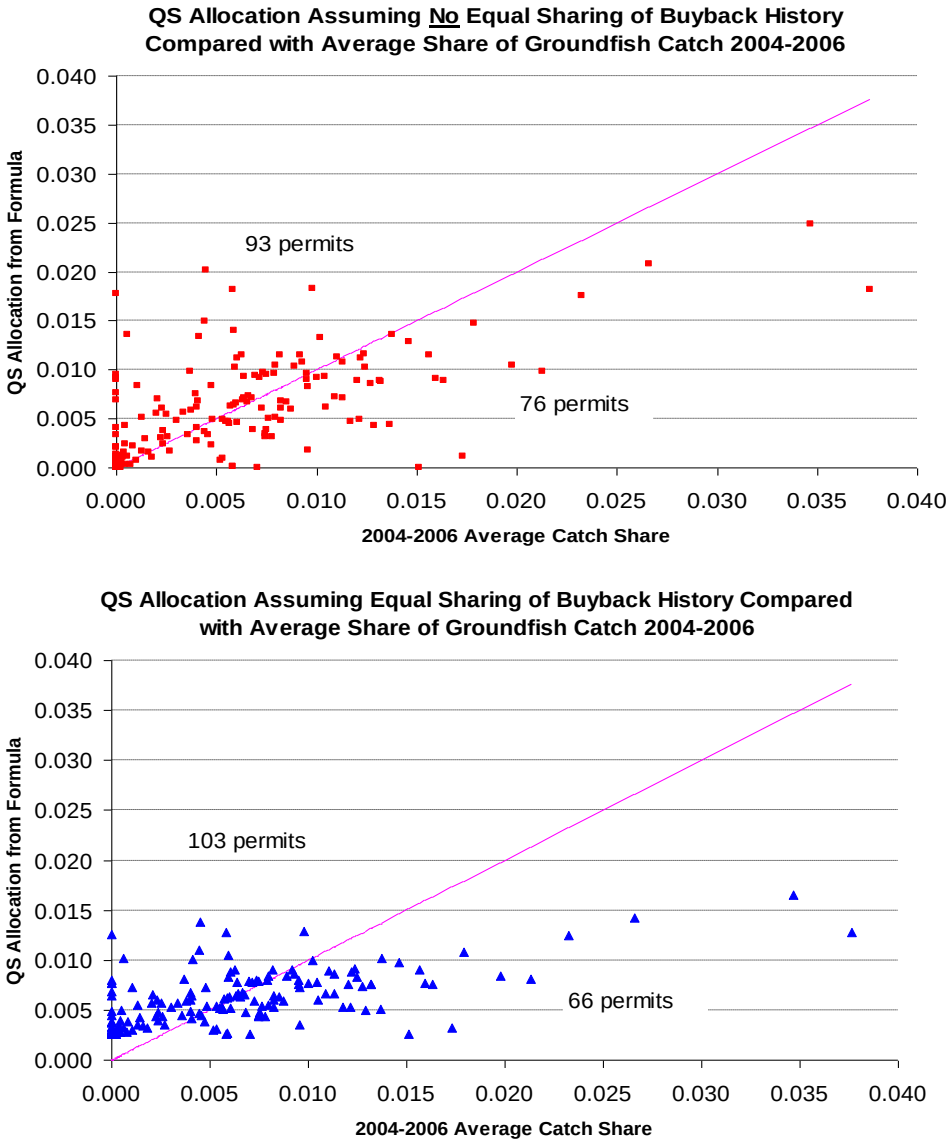


Figure A-27. Effects of equal sharing on the nonwhiting QS allocation given to permits depending on whether or not there is an equal allocation component and relative to the 2004-2006 catch share for each permit (assumes a grandfather clause and 100 percent allocation to permits).

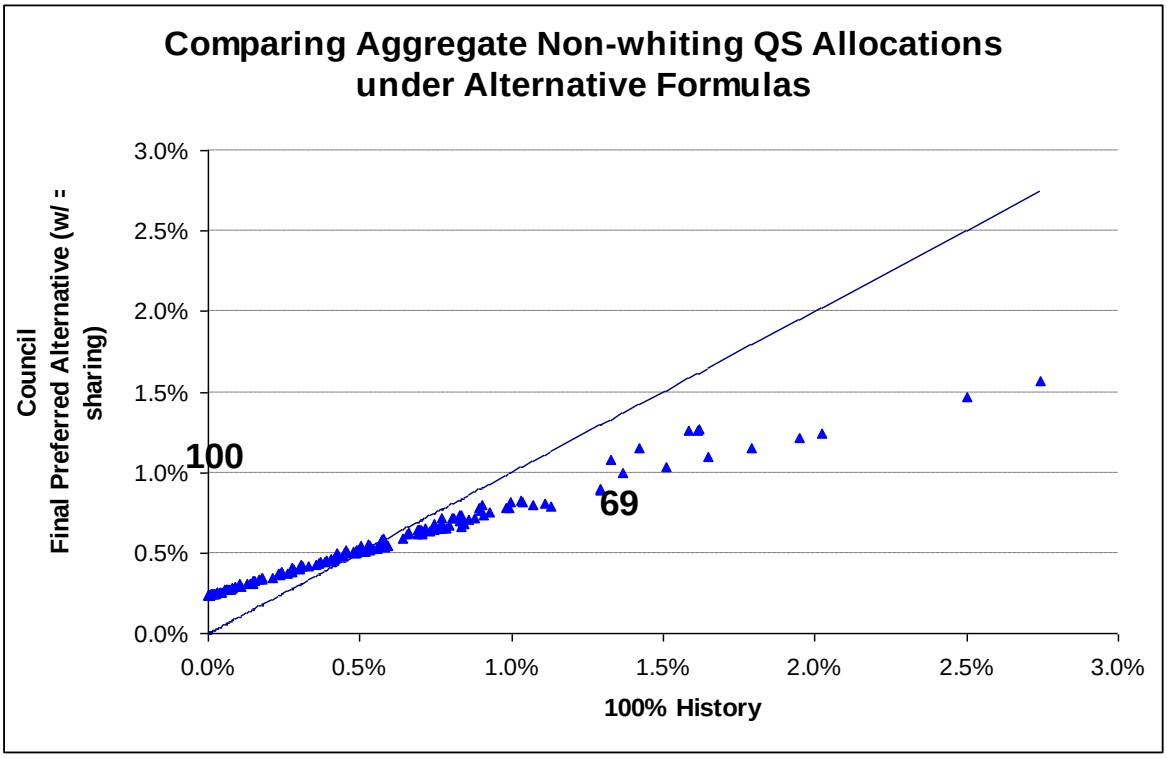


Figure A-28. Comparison of the QS allocation to permits using a formula based 100 percent on landing history to the QS allocation to the same permits using a formula that includes an equal sharing element.

♦ *Communities*

Assuming that past patterns are maintained after the initial allocation, equal allocation would cause a geographic redistribution among communities, primarily benefiting Newport, Brookings, Eureka, and Princeton/Half Moon Bay, as compared to an allocation based entirely on landing history (Section 4.14.5.4).

Allocation Periods

- Rationale and Options Considered But Not Included

The Council's final preferred alternative specifies 1994 to 2003 as the period for allocating QS based on landings history for processors (1994 to 2004 for shoreside whiting processors). This allocation period for permits runs from the inception of the license limitation program (1994) through the year of the Council's control date (2003). The 10-year span for the IFQ allocation is similar in length to the fixed gear sablefish tier program that used 1984 to1994, an 11-year period. When adopting its final preferred alternative for shoreside whiting processors, based on a compromise arrived at during industry negotiations, the Council extended the allocation period to 2004.

The allocation period that would most likely minimize dislocation and the attendant costs would be the few years just prior to the initial allocation. That period is not used, in part, because of issues related to the need to establish credible control dates to effectively manage the fishery while deliberations on new LE programs are underway.

A number of different periods were considered for different parts of the trawl rationalization program and different sectors (Table A-62). At its November 2007 meeting, the Council narrowed the options and standardized the periods to end in 2003. However, as noted above, the Council extended the period used for the shoreside whiting processors to 2004. The periods are detailed in Table A-63. For many sectors, there is a qualifying period to determine eligibility and a period on which the amount of the allocation is based. The primary purpose of this section is to focus on the periods used for the trawl IFQ program, however, the section also covers the rationale for each year considered as a start date or end date for all of the periods considered for both IFQ and co-op management.

Table A-63. Rationale for periods considered for various qualifying and allocation period provisions during development of the IFQ and co-op alternatives.

Time Period	Sector and Provisions (permit qualification/recent participation and allocation)	Summary of Rationale
1994-1999	IFQ – QS allocation, all sectors.	Emphasizes status of fishery prior to constraints to protect overfished species.
1994-2003	IFQ - QS allocation, all sectors. Co-op – Shoreside and mothership CV permits and allocations.	From the beginning of L (1994) to the control date (2003).
1994-2004	IFQ – Shoreside processor QS allocations. Co-op – Shoreside CV permits and allocations. Mothership CV allocations.	From the beginning of LE (1994) to a year that includes more recent participation, as compared to a period ending in 2003. For shoreside processors 2004 was included as a compromise that developed during negotiations leading to an industry consensus.
1997-2003	IFQ – Mothership processor recent participation and QS allocation. Co-op – Shoreside and mothership CV permits and allocations. Mothership processor permits. Catcher-processor endorsements.	A block of years that starts with the period in which there was a 3-way split of the whiting allocation and ends with the control date.
1997-2004	Co-op – C/P endorsement.	A block of years that starts with the period in which there was a 3-way split of the whiting allocation and adds a year beyond the control date to include more recent participation.
1998-2003	IFQ – Recent participation, all sectors. Co-op – Shoreside CV permits and allocations. Mothership CV allocations.	A block of years that reflects the fishery before and the disaster declaration in 2000, and acknowledges the control date (2003).
1998-2004	IFQ – Mothership recent participation qualification. Shoreside processor recent participation and allocation. Co-op – Shoreside and mothership CV permits and allocations. And Mothership processor permits. Shoreside processor permits.	A block of years that reflects the fishery before and after the disaster declaration in 2000, and adds a year beyond the control date (to include more recent participation). For shoreside processors 2004 was included as a compromise that developed during negotiations leading to an industry consensus.
1999-2004	IFQ – Recent participation, all sectors.	A block of years that includes one year just before the disaster declaration and an end date that includes more recent participation (increases emphasis on post disaster conditions relative to periods with earlier start dates)
2000-2003	IFQ – Recent participation, all sectors. QS allocation, all sectors.	A block of years starting with the year of the groundfish disaster declaration and covering four years (a period length similar to LEP allocation period).
2001-2003	IFQ – Allocation period, all sectors. Co-op – Shoreside CV permit.	A block of years that most closely reflects the current conditions for the fishery and at the same time acknowledges the control date (2003).

CV = Catcher Vessel.

Table A-64. Periods used in various qualifying and allocation provisions that remain as options in the trawl rationalization program alternatives.

Sector	Qualifying for Participation		Allocation	
	IFQ Recent Participation	Co-op Alt Endorsement/ Permit	IFQ Allocation	Co-op Landing history
Catcher Vessel Permit Owners				
o Nonwhiting Shoreside Catcher Vessels	None	N/A	'94-'03 (drop 3 worst years)	N/A
o Whiting Shoreside Catcher Vessels	None	'97-'03 (>500 mt)	'94-'03 (drop 2 worst years)	97-'03 (drop worst year)
o Whiting Mothership Catcher Vessels	None	Options: 1) 94-'03 (>500 mt) (FPA) 2) 97-'03 (>500 mt)	'94-'03 (drop 2 worst years)	Options: 1) 97-'03 (drop worst year) 2) 94-'03 (FPA) (drop 2 worst years)
Catcher-Processor Permit Owners	None	97-'03 (at least 1 delivery)	'94-'03 (drop no years)	N/A
Mothership	'97-'03 (>1,000 mt in 2 yrs)	97-'03 (more than 1,000 mt in each of 2 years)	97-'03 (drop no years)	N/A
Shoreside Processing Companies	Qualifying Period Options: 1) '98-'03 2) '98-'04 (FPA) Options for shoreside nonwhiting: 1) 1 delivery option, and 2) 6 mt in each of 3 years, Options for shoreside whiting 1) 1 delivery of any size 2) 1 mt of whiting in any 2 of years (FPA).	98-'03 (more than 1,000 mt in each of 2 years)	Allocation Period Options: 1) '94-'03 2) '98-'04 (FPA) (drop 2 worst years)	N/A

N/A = Not applicable
FPA = Council final preferred alternative.

1994. The earliest year for the allocation period options was set at 1994 because this was the first year of the license limitation program, which substantially changed participation in the fishery and altered delivery patterns. If the program is to allocate based on permit history, there would be no permit history before 1994 unless it is determined that permit history includes vessel history prior to that time. However, given the complexities of the qualification requirements for the original license limitation program, history prior to 1994 may be difficult to track and treat in an equitable fashion.[51] An initial year of 1994 implies a long allocation period. An allocation period from 1994 to 2003, 10 years, would not be unprecedented. The fixed-gear sablefish tier program used 1984 to 1994 as the allocation period, an 11-year period. An initial allocation covering this long period may give more weight to those who have long-term investment and participation in the fishery (and their successors in interest) as compared to those who may have made their investment in more recent years.

1997. The first year in which there was a fixed allocation among the three whiting sectors was 1997. The co-op portion of the rationalization program initially used 1997 to 2004 as the qualifying allocation period for catcher-processors, but using a start date of 1999. For the nonwhiting vessels, the choice of

[51] For example, LE permits were issued to vessels that replaced qualifying vessels prior to the start of the license limitation program. Additionally, for vessels under construction or conversion LE permits were granted on a par with vessels that qualified based on 1984 to 1988 landings history. The use of vessel landings history prior to 1994 may be viewed as inequitable for those that qualified for permits in 1994 based on having a vessel construction or conversion, as compared to those that qualified for permits based on 1984 to 1988 landings history, the former having had no opportunity to establish landings history prior to the completion of work on their vessels.

1997 as the start of an allocation period would decrease the emphasis on conditions prior to the declaration of a groundfish disaster in 2000, as compared to an allocation period that started in 1994. A start date of 1997 and an end date of 2003 would include three years prior to declaration of disaster conditions in the groundfish fishery and four years after that declaration.

1998. This year is used to start an allocation period that would run from 1998 to 2003 or 2004. In considering 1998 as the start for an allocation period, the Council would have to determine whether six or seven years is a period of sufficient length to allow vessels to demonstrate their level of activity and landings mix without needing to include special hardship provisions. Excluding 1994 to 1997 puts more emphasis on more recent participation patterns. A six-year period starting in 1998 would include landings history two years prior to the 2000 disaster declaration and four years from 2000 and after. Using 1998 as a start date for the allocation period covers a greater variety of fishing strategy opportunities than a period that starts in 1999, but not as much as one going back to 1997 or earlier.

1999. While a disaster was not declared until 2000, the first reductions in response to the discovery that some groundfish species were overfished began in 1999. An allocation period starting in 1999 would include the period after the disaster declaration as well as the one-year prelude to those more severe restrictions.

2000. In response to the discovery that a number of groundfish species were overfished, a disaster was declared for the 2000 fishery, and a number of severely constraining management measures were imposed. Using 2000 as the start of an allocation period would base the allocation entirely on fishermen's opportunities and choices under conditions present after the disaster declaration. Regulations prior to 2000 allowed extensive use of large footropes on trawl gear. In 2000, restrictions on the use of large footropes were used to shift trawl effort away from reef and rocky bottom substrates. Additionally, large closures on the shelf (rockfish conservation area closures) were imposed at that time. This substantially changed fishing opportunities and the mix of species landed. The year 2000 was used to start a four-year allocation period option that was considered (2000-2003). Four years is the period used to qualify vessels for the license limitation program. The use of the shorter qualifying period puts more emphasis on more recent conditions in the fishery but also increases the need to take into account short-term hardships.

2003. In order to prevent speculative effort and the consequent exacerbated management problems, a control date of November 6, 2003 was announced. This announcement put fishery participants on notice that fishing after 2003 would not be counted toward qualifying for IFQ. Since there was little fishing opportunity in the last two months of 2003, all of 2003 is being included in the allocation period.

2004. Using 2004 instead of 2003 as the final year for the qualification period would allow entities with more recent participation and less longevity in the fishery to have one additional qualifying year. It would include in the allocation period one year of fishing after the buyback program implementation, a year in which all remaining vessels had greater fishing opportunity. It would also violate the Council's 2003 control date and may adversely affect the Council's future ability to credibly use control dates to prevent vessels from racing for participation status.

● Interlinked Elements

This element does not directly interact with provisions other than the allocation formula (it is not dependent on nor is it depended on by provisions outside of the allocation formula). While it may somewhat modify the impacts of other provisions, the indirect interactions are not believed to be strong enough to make a substantial change to the analytical results for other provisions.

- Analysis

The following are the categories of goals and objectives affected by the decision on the time periods to use for qualification and allocation.

Section	Related Category of Goals and Objectives										
	Conservation	Net Benefits	Disruption	Excessive Shares	Fairness and Equity	Harvester and Processor Sector Health	Labor	Communities	Small Entities and New Entrants	General Public	Program Performance
Fairness, Equity, and Disruption			X	X	X		X	X			
Net Benefits and Sector Health		X	X			X			X		

♦ *Fairness, Equity, and Disruption*

This section will focus on the relevance of history during the allocation period to the current needs of participants in the fishery and customary standards for establishing resource allocations. To the degree that the QS allocation deviates from the current needs of participants, there is likely to be more disruption, which may also affect the distribution of job opportunities on vessels and possibly the distribution of activity among communities. Greater disruption decreases the likelihood that the allocation will be considered fair and equitable. At the same time, longtime participants in the fishery may view it as appropriately fair and equitable that they should receive recognition for the seniority of their participation and thus claim the privilege to use the resource. Seniority of use is often a factor considered in deliberation over who should have claim to future use of a resource (e.g., issues of "beneficial use" and "first-in-time" related to how surface and ground water use rights are assigned) (NRC 1999).[52] Additionally, the MSA requires consideration of both current and historic harvests in determining the initial allocation of QS (MSA 303A(c)(5)(A)(i) and (iv).

Longer allocation periods take more account of seniority and reduce the need for consideration of hardship provisions. At the same time, use of a longer allocation period implies reliance on long-term averages. If there has been a trend in the change from the start to the end of the allocation period, then the average will not reflect recent conditions in the fishery as well as would a shorter period of more recent years. Additionally, in a changing fishery, the amount of change that the initial allocation will induce will increase as the time between the allocation period and the actual allocation increases. Certain features of the IFQ program will mitigate some of these concerns. They include dropping worst years to address hardship (Section A-2.1.3.a, "Drop Years Provision"), using relative history to address changing fishery conditions across time (Section A-2.1.3.a, Relative History"), and the attribution of

[52] The allocation period may also affect communities if there have been geographic shifts in harvests while the distribution of vessels and permits have remained in the fishery. To the degree that permits have not moved out of an area, an allocation that includes older years may at least temporarily reverse a previous geographic trend that has shifted harvest from north to south (see Section A-1.2).

landing history to a permit to facilitate entry and exit and reduce the disruption that might otherwise occur through the initial allocation (Section A-2.1.1.b).

Longer allocation periods help to address hardships. Temporary circumstances may interfere with a particular vessel's operations such that its harvests over a certain period do not reflect its level of investment and dependence on the fishery. There are number of ways to deal with such hardship circumstances. One is to provide hardship exceptions and an appeals process, another is to allow vessels to drop their worst years, and a third is to provide a longer period of time over which level of involvement and dependence is determined. The Council's PPA relies on a combination of the latter two mechanisms (the opportunity to drop worst performance years and a long period across which to demonstrate performance).

In the context of a longer allocation period, relative history helps adjust for the variation in fishing opportunity among years. When a longer allocation period is used, it is more likely that it will encompass changes in the fishery such that conditions at the end of the period may vary substantially from those at the start as well as from the average over the period. The use of "relative history" is intended to adjust for changes in the fleet harvest opportunity by measuring each year's landing history for a permit as a percent or share of the total for the fleet rather than in pounds caught (also termed "catch over catch"). This compensates for changing opportunity across time but does not address changes in participants.

The long allocation period and associating the allocation with the permit provides for "seniority" of use, while at the same time new entrants receive an allocation that helps protect their more recent investment. By attributing and accruing landing history to a permit, those who have made investments to enter the fishery more recently do not necessarily lose out to those who made their investments earlier in time. This also allows longtime participants to receive more value for the business that they have built, if they choose to leave the fishery before a privilege system such as IFQs has been developed.

A shorter allocation period would provide less credit for seniority in use while still allocating to those who have invested more recently, according to their level of participation. A shorter period would potentially raise more issues of hardship by making it more difficult to allow an entity to drop enough years to cover hardship issues. Some may experience no hardships during the allocation period while others may have circumstances that affect production for a number of years. Allowing permits to drop any more than their one worst year from a four year allocation period would substantially dampen the amount of QS received by those with a consistent participation history (evening out the allocation). On the other hand dropping the worst 2 or 3 years from an 11-year allocation period can be done with much less impact on the allocation to those with consistent participation.

One of the major factors that will result in differences between the pattern of initial QS allocation and the patterns of fishery harvest in more recent years will be the effects of the buyback program. The buyback program occurred just after the 2003 control date. It substantially expanded fishing opportunity for all vessels, as reflected by higher trip limits, and initially resulted in a change in the proportional distribution of permits along the coast. The most effective way to address these changes would be to include years after 2003 in the allocation period. However, doing so would reward those who disregarded the control date announcement, create perceptions of inequity, and encourage fishermen to ignore such dates in the future, negatively affecting the Council's ability to credibly use control dates.

To indicate the degree to which certain conditions in the fishery have changed of the course of an allocation period beginning in 1994 we will look at three pieces of quantitative information. The first is the length of time a vessel has been associated with its current permit, the second is the length of time

the permit has been under the same ownership, and the third is the expected distribution of QS among communities in comparison to the recent distribution of harvest.

The longer the permit and vessel have been together, the more likely it is that the initial allocation of QS will reflect the needs of the current operation. If many permits and vessels have been together a relatively short period, it is more likely that a shorter allocation period would better reflect the level of involvement and dependence on the fishery. Fifty-seven percent of all permits are with the vessel for which they were originally issued (in 1994).

The longer the permit and owner have been together, the more likely it is that a longer allocation period will reflect a seniority or first-in-time allocation approach. At least 35 percent of the permits have not changed ownership since the implementation of the license limitation program.[53]

The expected initial redistribution among communities resulting from the initial allocation, as compared to the 2004 to 2006 harvest patterns are shown in Table A-71 on page A-209. For this table it is assumed that all individuals receiving QS will distribute their activity proportionally to their 2004 to 2006 averages. Additional shifts that may occur as a result of the move to the new IFQ program are not estimated due to the lack of needed data for geographically differentiated harvest cost and revenue models. There has been a northward shift in the groundfish harvest in more recent years (see Section A-1.2 discussion of area management). A more recent allocation might result in an initial geographic allocation more reflective of the current fishery. For example, a 2000 to 2003 allocation period would encompass years during which the fishery has been severely constrained to rebuild overfished species. The fishing opportunities during this period are probably more similar to the opportunities present in the 1990s and, therefore, might be more reflective of the current distribution of harvest. Since an allocation formula was not developed based on a shorter more recent period, we do not have any quantitative results to show whether a more recent but pre-2003 period might come closer to the 2004 to 2006 geographic distribution.

♦ *Net Benefits and Sector Health*

Where there is not a good match between the initial QS allocation and the distribution of capital and labor, dislocation and transaction costs could be incurred as a result of the need for realignment, adversely affecting net benefits and sector health. Under a situation in which ownership and harvest patterns are relatively stable, an allocation based on a long period that ends a number of years before the initial allocation would likely generate a good match between investment in the fishery and result in relatively low dislocation and transactions costs. In general, under a situation with changing conditions, an allocation period of shorter but adequate length[54] puts more emphasis on recent years and may result in a better match between the initial allocation and harvest distribution under current conditions. However, when the changing conditions involve a contraction of fishing opportunity (as for the groundfish trawl fishery), the distribution of capital in the fishery may be reflected more by the longer term fishing patterns than the pattern observed in the most recent years.

[53] The 35 percent estimate is based on an examination of name and address changes. It is possible that even more permits have remained under the same ownership if changes in name and address occurred without there being a true ownership change.

[54] Adequacy of the length used for a history-based allocation is dependent on the length of time needed to demonstrate the fishing levels and patterns on which a business relies relative to other participants.

Drop Years Provision

- Rationale and Options Considered But Not Included

Temporary circumstances outside of the control of the harvester may interfere with a particular vessel's operations, raising fairness and equity questions with respect to history-based allocation formulas and often leading to calls for special consideration of hardships and the need for an appeals process. Allowing permits to drop their worst years is intended as an alternative means of addressing hardship that will reduce program costs. At the same time, the general effect will be that those with a consistent history will lose QS to those who had at least some years of harvest significantly lower than other years. The use of a long allocation period complements the drop year provision in terms of reducing the need for hardship considerations and an appeals process.

- Interlinked Elements

This element reduces the need for hardship provisions and Council involvement in an appeals process (see Section A-2.1.5).

- Analysis

If a drop year provision can be substituted for hardship consideration and an appeals process, administrative costs will be reduced. While possibly an adequate substitute for a hardship consideration, it is imperfect in certain ways. First, the number of years dropped may not be adequate for some special circumstances (i.e., a longer-term hardship situation or a few shorter-term hardships during the 11 year allocation period). Second, dropping years may benefit some who have no claim to a hardship provision, to the detriment of those with larger more consistent landings history. Thus while creating a lower administrative cost method for providing fairness and equity to those who have experienced a hardship, the drop year provision may detract some from perceptions of fairness and equity for the more consistent harvesters. As an example of the effects on those who gain and lose from a drop year provision, the aggregate effect for Dover sole, thornyhead and sablefish shows that if landing history is measured in relative pounds (as it would be under the Council's final preferred alternative), the number of gainers from a drop year provision is between 118 and 132, while the number of losers is between 39 and 53, depending on the number of years a permit is allowed to drop (Table A-64). As the number of drop years increases from one to three, the number of gainers diminishes somewhat, from 132 to 118 permits, but the average amount gained by each permit increases over threefold from $732 to $2,565 (annual ex-vessel revenue assuming 2005 ex-vessel prices and levels of harvest). Results are shown for a number of other species, all of which show similar trends. At the top of the table, a comparison is provided for the effect of combining the drop year provision with absolute pounds instead of relative history (the choice between absolute and relative history is discussed in a following section). The effect is to slightly diminish both the number of gainers and the amount of their gain. While not displayed in this table, the difference in impacts between drop years using relative history and using absolute pounds was consistent across species. Table A-64 also shows the number of permits for which a particular year was the lowest. Years after the fishery disaster was declared (2000) have the most permits showing those as their lowest years. The first two years of the program also tended to have higher counts for low years with the middle years, 1996 to 1999, tending to show up less often as low years for permits. When absolute pounds are counted rather than relative history, the fishery disaster years show up even more frequently as the lowest years.

Table A-65. Shoreside nonwhiting sector: comparison of 2005 ex-vessel revenue from selected groundfish species under different drop year allocation options using allocation based on relative history (Council's final preferred alternative) and absolute pounds).

					Number of permits that recorded relatively low landing history each year									
	Drop 1 yr	**Drop 2 yrs**	**Drop 3 yrs**		**1994**	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**
				Absolute pounds analysis										
Species: Dover sole thornyhead and sablefish (DTS)		**$39,859**	starting avg per permit											
Permits gaining	130	125	117	Lowest *	24	13	5	9	20	13	20	37	43	31
$ average gain	+ $600	+ $1,320	+ $2,216	2nd Lowest	8	5	3	4	9	7	12	15	15	8
Percent change	+1.5%	+3.3%	+5.6%	3rd Lowest	7	5	4	4	9	8	12	22	10	14
Permits losing	41	46	54											
$ average loss	- $1,903	- $3,587	- $4,801											
Percent change	-4.8%	-9.0%	-12.0%											
				Relative history analysis										
Species: DTS														
Permits gaining	132	125	118	Lowest *	25	17	8	13	19	12	19	33	30	30
$ average gain	+$ 732	+ $1,551	+ $2,565	2nd Lowest	12	10	11	9	7	9	7	3	11	7
Percent change	+1.8%	+3.9%	+6.4%	3rd Lowest	10	11	10	10	11	9	14	10	8	2
Permits losing	39	46	53											
$ average loss	- $2,479	- $4,216	- $5,710											
Percent change	-6.2%	-10.6%	-14.3%											
Species: Petrale		**$17,184**	starting avg per permit											
Permits gaining	139	133	132	Lowest *	26	18	15	13	14	21	33	36	40	38
$ average gain	+ $141	+ $371	+ $668	2nd Lowest	11	9	8	5	10	6	4	9	9	10
Percent change	+0.8%	+2.2%	+3.9%	3rd Lowest	8	13	8	10	10	10	5	8	8	11
Permits losing	33	39	40											
$ average loss	- $593	- $1,267	- $2,204											
Percent change	-3.4%	-7.4%	-12.8%											

Table A-65. Shoreside nonwhiting sector: comparison of 2005 ex-vessel revenue from selected groundfish species under different drop year allocation options using allocation based on relative history (Council's final preferred alternative) and absolute pounds).

					Number of permits that recorded relatively low landing history each year									
	Drop 1 yr	**Drop 2 yrs**	**Drop 3 yrs**		**1994**	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**
Species: Arrowtooth		**$1,657**	starting avg per permit											
Permits gaining	125	121	115	Lowest *	17	16	15	12	19	15	17	17	23	28
$ average gain	+ $13	+ $29	+ $52	2nd Lowest	6	4	2	1	2	2	6	1	8	3
Percent change	+0.8%	+1.7%	+3.1%	3rd Lowest	3	5	6	5	5	3	2	5	6	2
Permits losing	16	20	26											
$ average loss	- $102	- $175	- $230											
Percent change	-6.1%	-10.6%	-13.9%											
Species: Other Flatfish		**$3,932**	starting avg per permit											
Permits gaining	132	136	130	Lowest *	31	18	10	7	16	15	23	23	34	31
$ average gain	+ $36	+ $78	+ $149	2nd Lowest	7	13	2	8	9	4	9	14	12	4
Percent change	+0.9%	+2.0%	+3.8%	3rd Lowest	11	8	9	8	7	9	14	12	7	8
Permits losing	40	36	42											
$ average loss	- $120	- $294	- $460											
Percent change	-3.1%	-7.5%	-11.7%											
Species: Lingcod		**$361**	starting avg per permit											
Permits gaining	148	144	137	Lowest *	19	14	16	16	18	19	40	54	49	62
$ average gain	+$1	+ $5	+ $9	2nd Lowest	14	4	8	11	2	1	3	5	9	3
Percent change	+0.4%	+1.3%	+2.6%	3rd Lowest	5	15	11	13	8	3	5	7	5	5
Permits losing	$24	$28	$35											
$ average loss	- 9	- 24	- 36											
Percent change	-2.5%	-6.7%	-10.1%											

* Permits with more than one zero year are counted multiple times in the lowest row. When this occurs they do not show up in the 3rd lowest or 2nd lowest rows (depending on whether they had two or three zero years).

Allocation of Incidentally Caught Overfished Species

- Rationale and Options Considered, But Not Included

♦ *Equal Allocation and Methods of Allocating Based on Harvest History for Overfished Species*

As with other species, incidentally caught overfished species would be allocated either entirely based on history (A-2.1.3.a, Option 1) or based on an equal sharing of the portion of the QS associated with the buyback permits and the remainder based on a formula relying on some variation on permit specific harvest history (A-2.1.3.a, Option 2). With respect to the portion of the overfished species QS allocated based on a method related to harvest history for nonwhiting trips, the formula may either directly assess overfished species harvest history using the 1994 to 2003 allocation period (Overfished Species Option 1), or it may take harvest history into account indirectly by assessing a permit's target species QS allocations and applying its recent harvest pattern (as measured by logbooks) and fleet average bycatch rates from the West Coast Groundfish Observer Program (Overfished Species Option 2). For whiting trips, a similar set of options is provided for allocation of the portion of the bycatch species QS that is to be allocated using a method related to harvest history: assessing history using 1994 to 2003 harvest information (Bycatch Option 1); or allocating overfished species in proportion to the whiting QS allocation (Bycatch Option 2).

In the Council's PPA (from June 2008), QS associated with the permit history of buyback permits (including QS for overfished species) was to be allocated equally among all nonbuyback permits (A-2.1.3.a Option 2). The equal allocation component of the PPA ensured that every permit would have some overfished species QS to go along with its target species QS. The remainder of the QS for overfished species was to be allocated on a basis that was expected to closely reflect a permit's need for overfished species bycatch (Overfished Species Option 2 and whiting trip Bycatch Option 2). However, when the Council took final action, it eliminated the equal allocation of the overfished species (with the exception of canary rockfish) QS associated with the buyback permits so that overfished species would be allocated entirely based on the portions of the allocation formula which the Council believed would most reflect the permit's need for overfished species QS to accommodated its target species. Thus, the Council's final preferred alternative for noncanary overfished species QS allocated for nonwhiting trips is to allocate it entirely based on the application of bycatch rate and logbook information to target species QS allocations (A-2.1.3.a Option 1 combined with Overfished Species Option 2). For whiting, all noncanary overfished species QS would be allocated in proportion to the whiting allocation (A-2.1.3.a Option 1 combined with Bycatch Species Option 2).[55] [56] For canary, the Council found that absent an equal allocation element there would be a geographically disproportionate impact on permits in areas such as Fort Bragg, California. On this basis, the Council at its November 2009 meeting revised its final preferred alternative from November 2008, deciding that the initial allocation of canary rockfish QS should be based on the PPA (i.e., the final preferred alternative for canary rockfish should include the equal allocation of QS associated with buyback permits).

[55] The Council's final preferred alternative is to manage the shoreside nonwhiting and whiting sectors as a single combined shoreside sector. Therefore, after determining the amount of overfished species QS to be allocated to a permit based on its past nonwhiting and whiting trips, the QS types would be merged so that only one type of QS would be issued, shoreside QS.

[56] All non-overfished bycatch species would be allocated equally based on the buyback permit history with the remainder being allocated to each permit holder in proportion to its whiting allocation.

The other main, overfished species, allocation option considered was to base the allocation directly on landings history (Overfished Species Option 1 and Bycatch Species Option 1). This approach would allocate overfished species to those who in the 1990s targeted the species that have since become overfished or who caught overfished species incidentally after they were declared overfished, rather than to those who need overfished species QS to prosecute current target fisheries. This approach was rejected on the basis of the desire not to reward bycatch during the rebuilding period and in order to provide QS to those who would need it to cover incidental catch taken with their target species QS allocation.

Numerous other methods were considered that are not reflected in the current options. One of these was the use of a constant fixed ratio applied to target species QS to determine the amount of bycatch species QS that would be issued for each permit. This approach, while better at meeting current needs than an allocation based on harvest history, would not be as precise in meeting current need (as measured by amounts of target species QS a permit receives) as an approach which uses each individual permit's logbooks and allocation of target species QS (the final preferred alternative). However, constant fixed overfished species to target species QS ratios based on fleet averages will be used for those permits that do not have logbook records for 2003 to 2006.

♦ *Specification of the Bycatch Method for Allocating Overfished Species*

Initially, the Council approved consideration of an option for allocating overfished stocks based on a bycatch rate that would be applied equally to all permits (a constant fixed ratio). The initial bycatch rate option would have used logbook data for the fleet as a whole, aggregated on a species-by-species basis. In other words, if 90 percent of the trawl caught Pacific cod occurred north of Cape Mendocino, and shoreward of the trawl RCA, each permit with Pacific cod catch history would be estimated to take 90 percent of its Pacific cod from that same area. However, it is unlikely that any single permit's distribution of fishing activity would be reflected by the fleet average; and the bycatch rate of overfished stocks can vary widely from one area to another. Therefore, a more detailed method was developed to estimate where permits might be fished under rationalization and assess the associated bycatch rates. Under the final preferred alternative, the bycatch rate method for allocating overfished species uses four latitudinal strata, two depth strata, and a permit's fishery patterns evaluated over the strata using 2003 to 2006 logbooks.

A complete description of the bycatch method for allocating overfished species is provided in Appendix C. This section of Appendix A documents some of the choices made by the Council in developing that method and related impacts.

LATITUDINAL STRATIFICATION

For the bycatch rate approach, the main design element that required additional Council deliberation was the question of the latitudinal strata to use for application of this approach. The bycatch rate approach can be applied on a coast wide basis or refined by stratifying into areas, which might result in allocations that better match the needs of permits that would most likely be fishing in a particular area. Available data indicate that bycatch rates can differ substantially by latitudinal area and by seaward or shoreward of the RCA. During its deliberations, the Council considered three latitudinal stratifications to apply the bycatch rate methodology Table A-65.

Table A-66. Latitudinal strata considered for the allocation of overfished species.

Number of Strata	Latitudinal Area Stratifications (North Lat)
2 Areas	North of 40°10' South of 40° 10'
4 Areas (preferred)	North of 47° 40' Between 47° 40' and 43° 55' Between 43° 55' and 40° 10' South of 40° 10'
5 Areas	North of 47° 40' Between 47° 40' and 43° 55' Between 43° 55 and 40° 10' Between 38° 0'and 40° 10' South of 38° 0'

The number of and dividing lines used for the stratifications were limited because the bycatch rates developed for the strata are based on samples and for smaller areas insufficient sample sizes exist to estimate a bycatch rate. The bycatch rates for eight latitudinal subareas that were used to compose the approaches for these area stratifications are provided in Figure A-29 though Figure A-35. For the above options, the entire area south of 38 ° north latitude is combined because several sub-areas do not appear to have sufficient observations for calculating an independent bycatch rate. The bycatch rates used for the Council's final preferred alternative are provided in Table A-66.

At its June 2008 meeting, the Council's PPA used the two-area approach for allocating overfished species for nonwhiting trips based on bycatch rates. When it took action after the public comment period on the preliminary DEIS (in November 2008), the Council indicated it would prefer to use an approach based on finer levels of stratification (either four or five strata). The Council reviewed these two finer area stratifications in March of 2009 and chose the four-area stratification over the five-area stratification. The Council selected the four-area stratification over the five-area stratification because observer program bycatch rates indicated that if the area south of 40° 10' north latitude were subdivided some permits would receive substantially reduced QS for some overfished species. Even with a four-area approach, at a later point in the process the Council found that there were some permits would receive very minimal amounts of QS for overfished species, for canary rockfish in particular. At that time (November 2009), the Council addressed this problem by deciding to equally allocation among all permits the QS associated with the permits that were bought back in the 2003 buyback program.

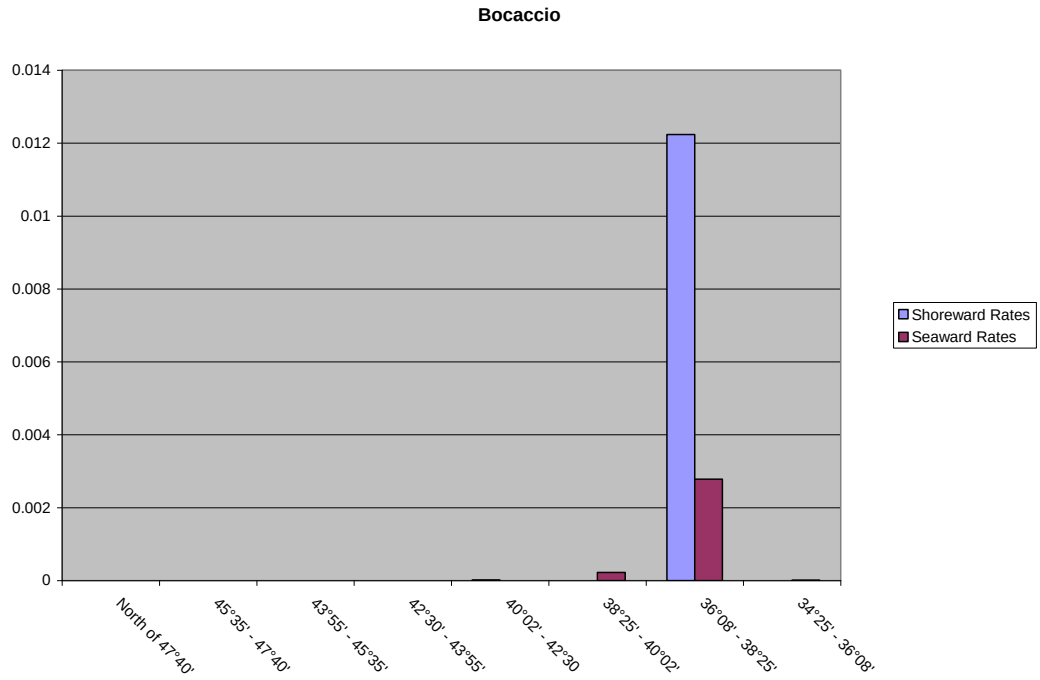


Figure A-29. Bocaccio, trawl bycatch rates for latitudinal areas off the west coast (also divided by depth, shoreward and seaward, first column in each pair is the shoreward bycatch rate).

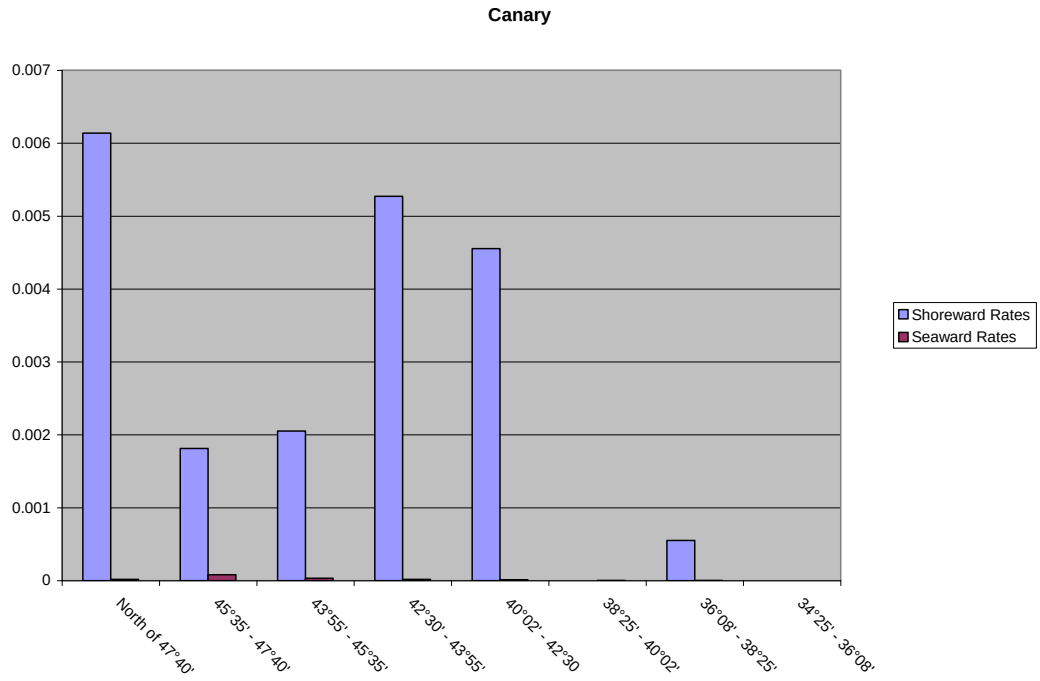


Figure A-30. Canary, trawl bycatch rates for latitudinal areas off the west coast (also divided by depth, shoreward and seaward, first column in each pair is the shoreward bycatch rate).

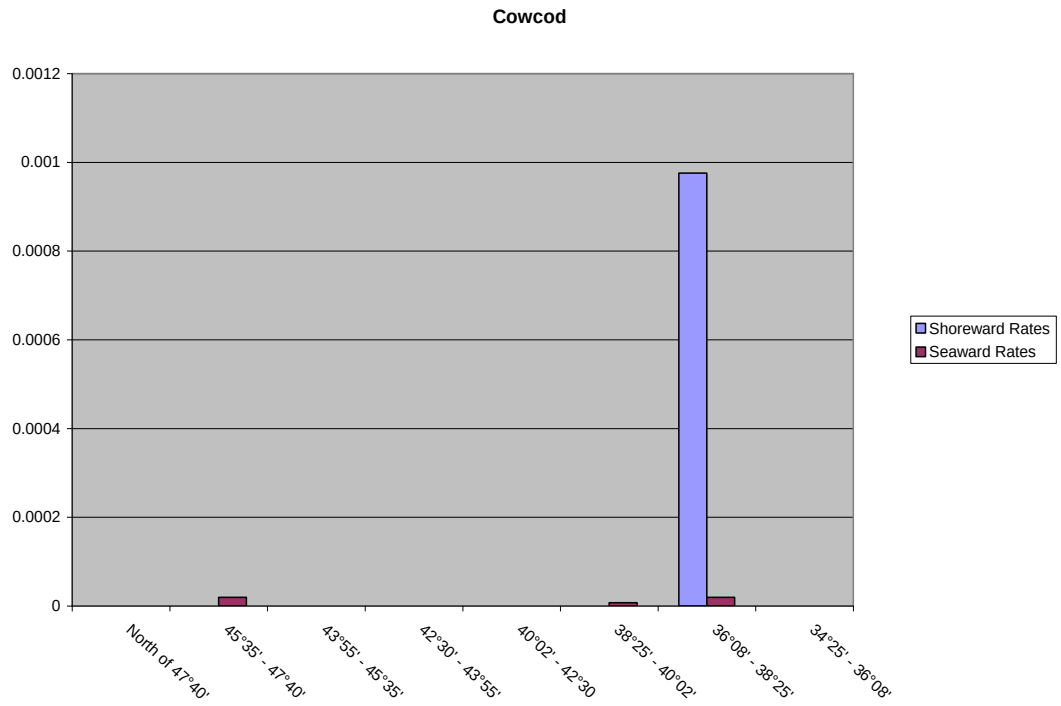


Figure A-31. Cowcod, trawl bycatch rates for latitudinal areas off the west coast (also divided by depth, shoreward and seaward, first column in each pair is the shoreward bycatch rate).

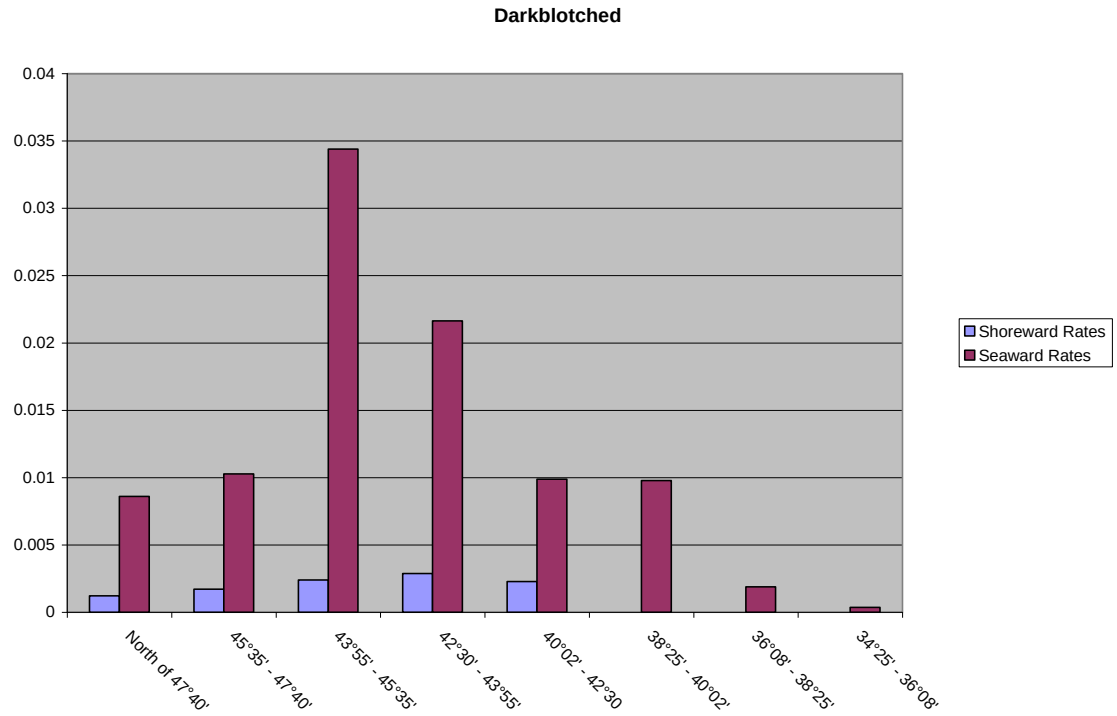


Figure A-32. Darkblotched, trawl bycatch rates for latitudinal areas off the west coast (also divided by depth, shoreward and seaward, first column in each pair is the shoreward bycatch rate).

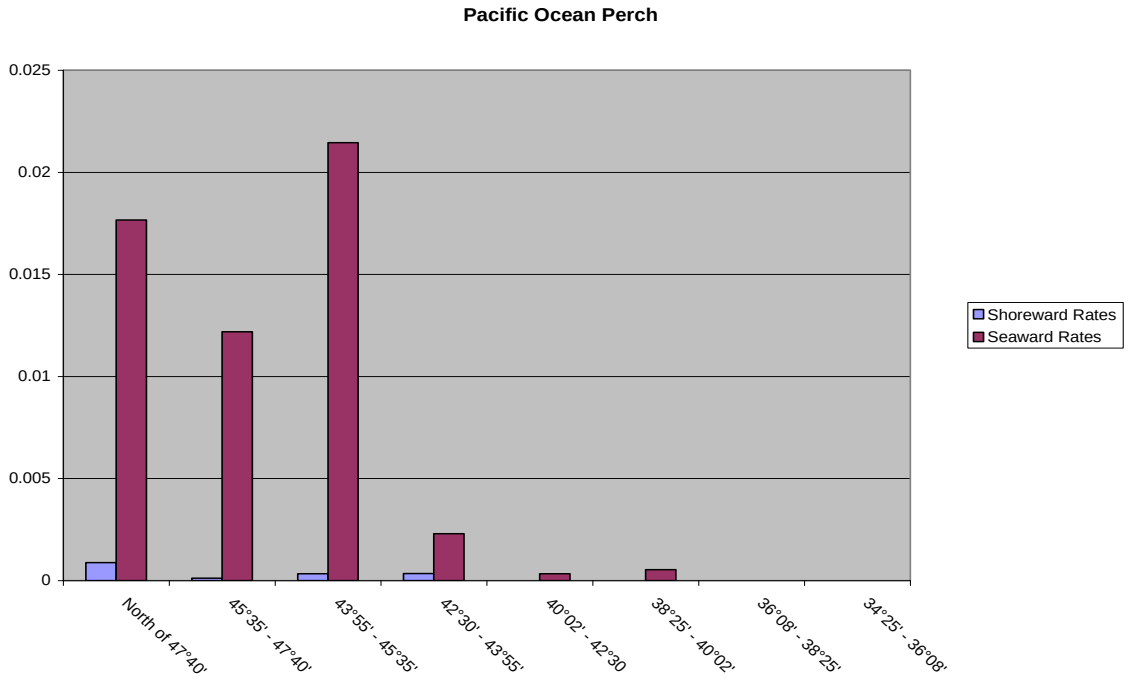


Figure A-33. Pacific ocean perch, trawl bycatch rates for latitudinal areas off the west coast (also divided by depth, shoreward and seaward, first column in each pair is the shoreward bycatch rate).

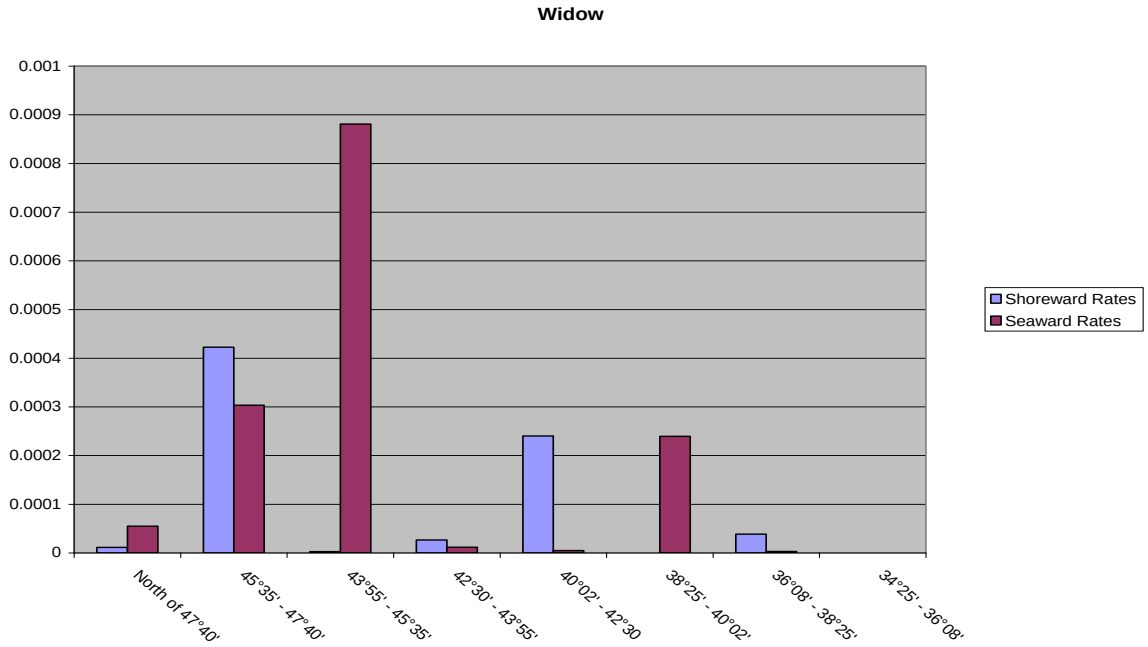


Figure A-34. Widow, trawl bycatch rates for latitudinal areas off the west coast (also divided by depth, shoreward and seaward, first column in each pair is the shoreward bycatch rate).

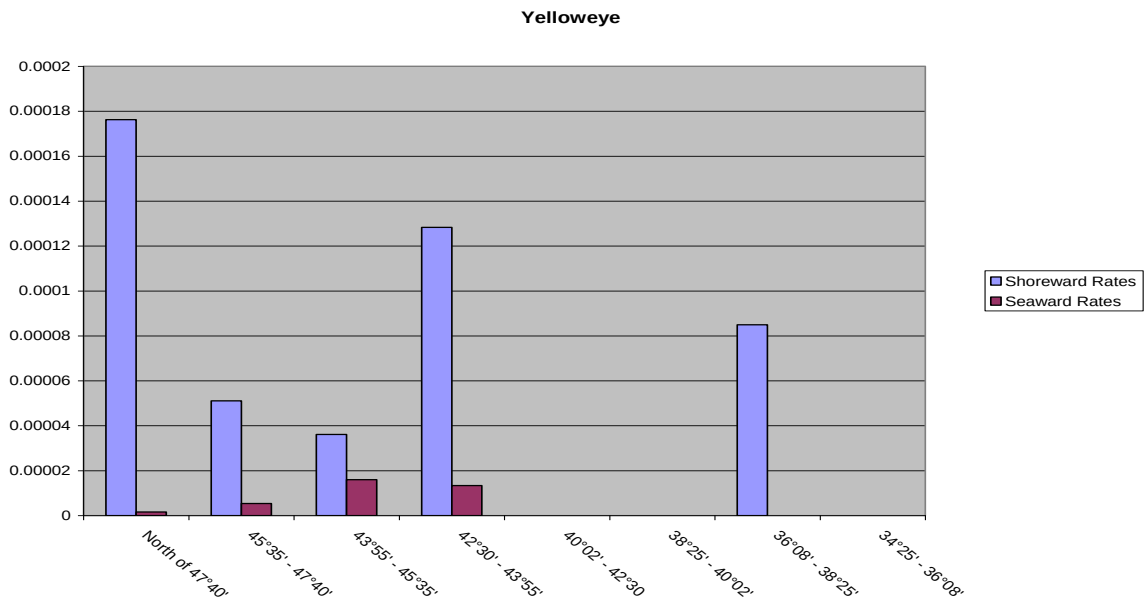


Figure A-35. Yelloweye, trawl bycatch rates for latitudinal areas off the west coast (also divided by depth, shoreward and seaward, first column in each pair is the shoreward bycatch rate).

Table A-67. Bycatch rates used for the allocation of overfished species, by latitudinal area and shoreward and seaward dept stratifications.

	S of 40°10'		40°10' to 43°55'		43°55' to 47°40'		N 47°40'	
Species	**Seawrd**	**Shorewrd**	**Seawrd**	**Shorewrd**	**Seawrd**	**Shorewrd**	**Seawrd**	**Shorewrd**
Bocaccio	0.00120	0.01115	-	-	-	-	-	-
Canary	0.00000	0.00050	0.00001	0.00485	0.00006	0.00186	0.00002	0.00614
Cowcod	0.00001	0.00089	-	-	-	-	-	-
Darkblotched	0.00480	0.000003	0.01476	0.00253	0.01837	0.00185	0.00860	0.00122
Pacific Ocean Perch	0.00022	-	0.00115	0.00014	0.01529	0.00016	0.01766	0.00088
Widow	0.00010	0.00004	0.00001	0.00015	0.00050	0.00034	0.00005	0.00001
Yelloweye	-	0.00008	0.00001	0.00005	0.00001	0.00005	0.00000	0.00018

LOGBOOK PERIOD

The bycatch rate approach to the allocation of overfished species relies on each permit's logbooks to determine the depth and latitudinal strata associated with the permit. The proportion of catch associated with each strata is used to distribute a permit's initial allocation of target species QS by strata. The bycatch rates are then applied to the permit's initial target species allocation associated within each strata. There were two periods considered for evaluation of a permit's logbook records: 1994 to 2003 and 2003 to 2006.

At its meeting, the GAC recommended that for the overfished species bycatch allocation formula the distribution of catch for each individual permit be determined based on 2003 to 2006 logbooks, as the best estimate for where the permit was most likely to fish after rationalization. The TIQC disagreed with this recommendation. Initially the TIQC believed that fleet average logbook data would be more

appropriate than individual permit logbook history during 2003 to 2006 because in more recent years vessels were forced to choose between fishing shoreward or seaward of the trawl RCA in the north. Since the catch history formula is based on the years 1994 to 2003, permits will receive QS for species that are found both shoreward and seaward of the RCA. Therefore, the TIQC initially favored the application of fleet average logbook data to each permit's QS allocation, so that each permit would be assigned both shoreward and seaward catch history. However, after further deliberations, the TIQC recommended the use of 1994 to 2003 logbooks as superior to the use of either fleet averages or the 2004 to 2006 permit specific logbooks. The TIQC viewed 1994 to 2003 permit specific logbooks as a better choice because it accounted for variation in the geographic distribution of each permit's harvest strategy and would better match with both the target species QS allocations (which were allocated based on 1994-2003 history) and the strategies that would have to be pursued to take those target species allocations. However, the GAC recommended that each permit's 2004 to 2006 logbooks be used. The Council concurred with the GAC and recommended use of 2004 to 2006 logbooks. It may be better to use a period when the RCAs were in place to estimate a permit's most likely pattern of activity, since the RCAs will remain in place after the trawl rationalization system is put into place. The RCAs were not in place for most of the 1994 to 2003 period but were in place for 2003 to 2006. Thus, use of 2004 to 2006 logbooks may better mirror the opportunities present with the RCA closures and other efforts to avoid overfished species.

● Interlinked Elements

An approach that allocates incidentally caught overfished species by transforming target species QS allocations using bycatch rates eliminates some of the problems that would result from application of the relative weights approach to measuring landing history. For example, using a relative weights approach a pound of canary caught in 2003 gives the same credit toward QP as would 100 pounds caught in 1998 (rewarding the retention of overfished species during rebuilding).

The equal allocation element of the allocation formula interacts with the allocation approach used for overfished species, significantly affecting the resulting allocation impacts.

● Analysis

The following are the categories of goals and objectives affected by the decision on how to allocate incidentally caught species.

	Related Category of Goals and Objectives										
	Conservation	**Net Benefits**	**Disruption**	**Excessive Shares**	**Fairness and Equity**	**Harvester and Processor Sector Health**	**Labor**	**Communities**	**Small Entities and New Entrants**	**General Public**	**Program Performance**
Overview		X	X		X	X	X	X			X
Direct Harvest History vs. Bycatch Rate Approach											
Latitudinal Strata for the Bycatch Rate Approach		X	X		X	X	X	X			X
Logbook Periods for the Bycatch Rate Approach		X	X		X	X	X	X			X
Impact of Equal Allocation on the Bycatch Rate Approach		X	X		X	X	X	X			X

♦ *Overview*

Empirical evidence from other quota programs throughout the world has shown that initial allocations of IFQ that differ substantially from current or recent fishing practices result in some negative consequences during the initial years of the program (dislocation of fishermen and high discard rates) (Branch, *et al.* 2006). Over time, these consequences would be reduced through QS trading and adjustments by capital and labor, but a more refined initial allocation, one that better matches expected needs, may still be able to avoid such negative consequence, reducing costs associated with the transactions necessary to realign the QS allocation and fishery participation patterns. Additionally, while the market is likely to end up making necessary adjustments to the ownership of quota, overfished species quota is likely to be extremely costly because it will constrain access to target species. An allocation that provides target species QS without the overfished species QS needed to cover bycatch may be economically disruptive to those already in the fishery that receive an initial allocation and must then choose between making the expenditures to acquire additional overfished species QS/QP or selling off their target species QS/QP and perhaps leaving the fishery.

For the foreseeable future, overfished species will be a constraint to the access of target species. In addition to potential efficiency benefits and reduction of disruption, an initial allocation of overfished species QS that is well matched to allocations of target species QS may be viewed as being more equitable.

The general categories of impacts described here are associated with each of the specific choices described in the following sections. For the purpose of the first section of this portion of the analysis, the focus is on comparing an allocation based on landings history to one based on bycatch rates, logbooks, and target species allocations. In order to isolate and highlight this difference, figures are provided that compare a scenario under which all overfished species QS is allocated based on landings history to one in which all overfished species QS is allocated based on the bycatch rate approach (there is no equal allocation component for either the target species or the bycatch species). After reviewing these results, we will look at the effect of the decisions on the strata to be used for the bycatch rate approach, the choice of time periods over which to assess individual permit logbooks, and the equal allocation element of the overfished species allocation formula (the Council's PPA) in comparison to the same formula without the equal allocation element (the Council's final preferred alternative).

♦ *Direct Harvest History vs. Bycatch Rate Approach*

In general, if allocations of overfished species are made based on landings history, the distribution of overfished species quota would be more heavily weighted toward a fewer permits. This is because recent incidental landings are proportionally more evenly distributed among permits than landings occurring when the now overfished species could be targeted. The permits that would receive the most are those were that had previously targeted overfished species when they were abundant and under more recent regulations catch of overfished species in the shoreside nonwhiting fishery has been largely discarded rather than landed. In Figure A-36 through Figure A-42, it can be seen that for all species more permits will receive a greater allocation under the bycatch rate approach than under a history approach for allocating QS. These data are summarized in Table A-67. By definition, the allocations using the bycatch rate approach would be in closer proportion to the target species QS than with a direct history approach. With the exception of canary rockfish, the amount of QS going to the recipient who would receive the most of a particular overfished species QS is greater with the landing history approach than with the bycatch rate approach. Additionally, with the exception of bocaccio, there are more recipients receiving in excess of 2 percent (20 percent for cowcod) for the direct history approach than with the bycatch approach (Table A-67). For cowcod the extreme is greatest. One permit would receive all of the cowcod using a landing history approach (assuming there is a grandfather clause).

Table A-68. Number of permits receiving more under the indicated method as compared to the alternative method (data summarized from Figure A-36 through Figure A-42).

	Allocation Method	
	Bycatch Rate Approach	**History Approach**
	Bocaccio	
Permits Favored by the Approach	51	45
Permits with More Than 2%	12	11
	Canary	
Permits Favored by the Approach	92	77
Permits with More Than 2%	7	8
	Cowcod	
Permits Favored by the Approach	72	1
Permits with More Than **20**%	0	1
	Darkblotched	
Permits Favored by the Approach	116	53
Permits with More Than 2%	0	10
	Pacific Ocean Perch	
Permits Favored by the Approach	120	44
Permits with More Than 2%	4	16
	Widow Rockfish	
Permits Favored by the Approach	112	57
Permits with More Than 2%	2	13
	Yelloweye Rockfish	
Permits Favored by the Approach	100	68
Permits with More Than 2%	6	11

Note: the allocation amounts shown in Figure A-36 through Figure A-42 and Table A-67 are based on an assumption that 100 percent of the initial QS allocation would go to permits. In the Council's final preferred alternative only 90 percent of the QS is allocated to permits, reducing all of the allocations under either approach by 10 percent. The general conclusions about the relative impacts of these two approaches to overfished species allocations would not be affected by an across the board reduction of 10 percent.

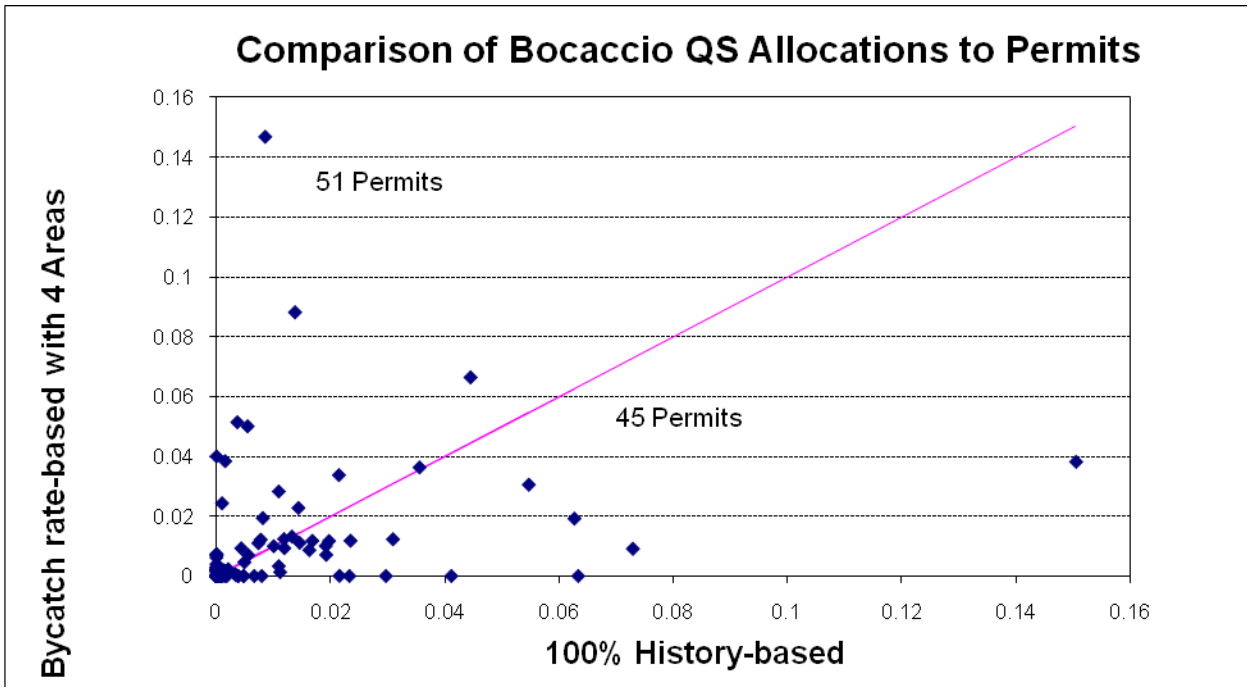


Figure A-36. Allocation of bocaccio QS for the nonwhiting fishery to permits based on landing history as compared to allocation based on individual permit logbook information on area strata and fleet average bycatch rates applied to target species QS (equal sharing is not included in either approach).

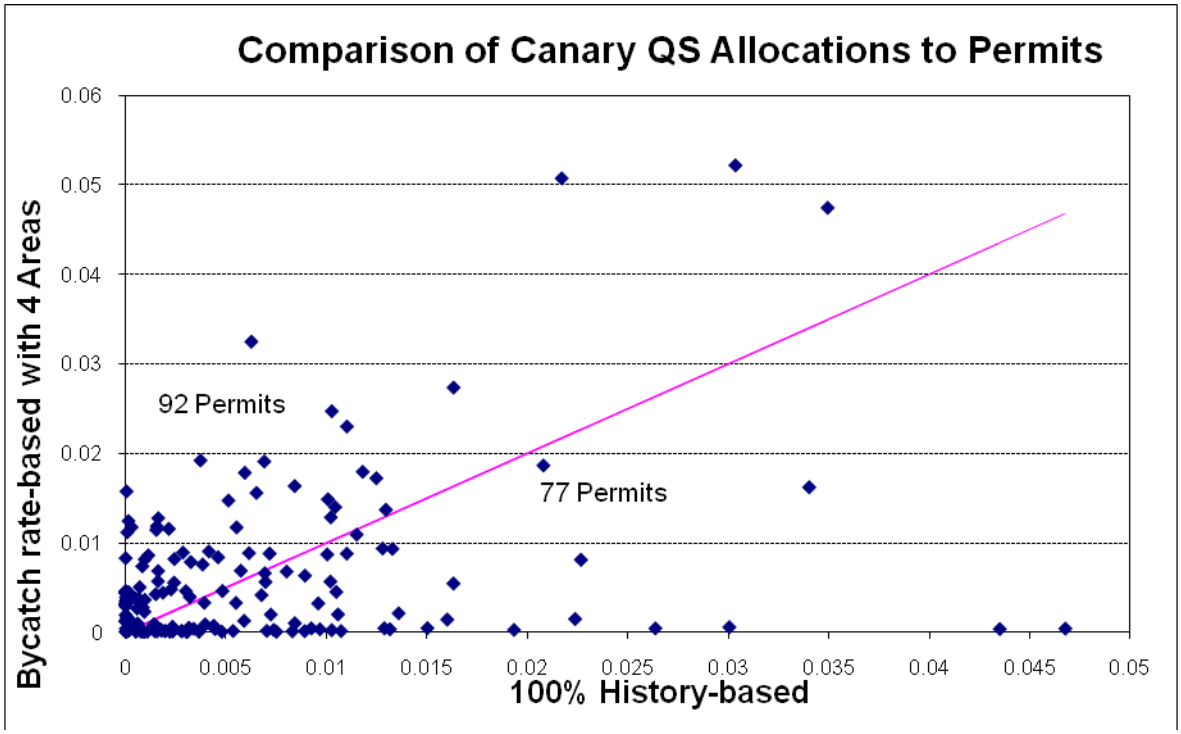


Figure A-37. Allocation of canary rockfish QS for the nonwhiting fishery to entities based on landing history as compared to allocation based on individual permit logbook information on area strata and fleet average bycatch rates applied to target species QS (equal sharing is not included in either approach).

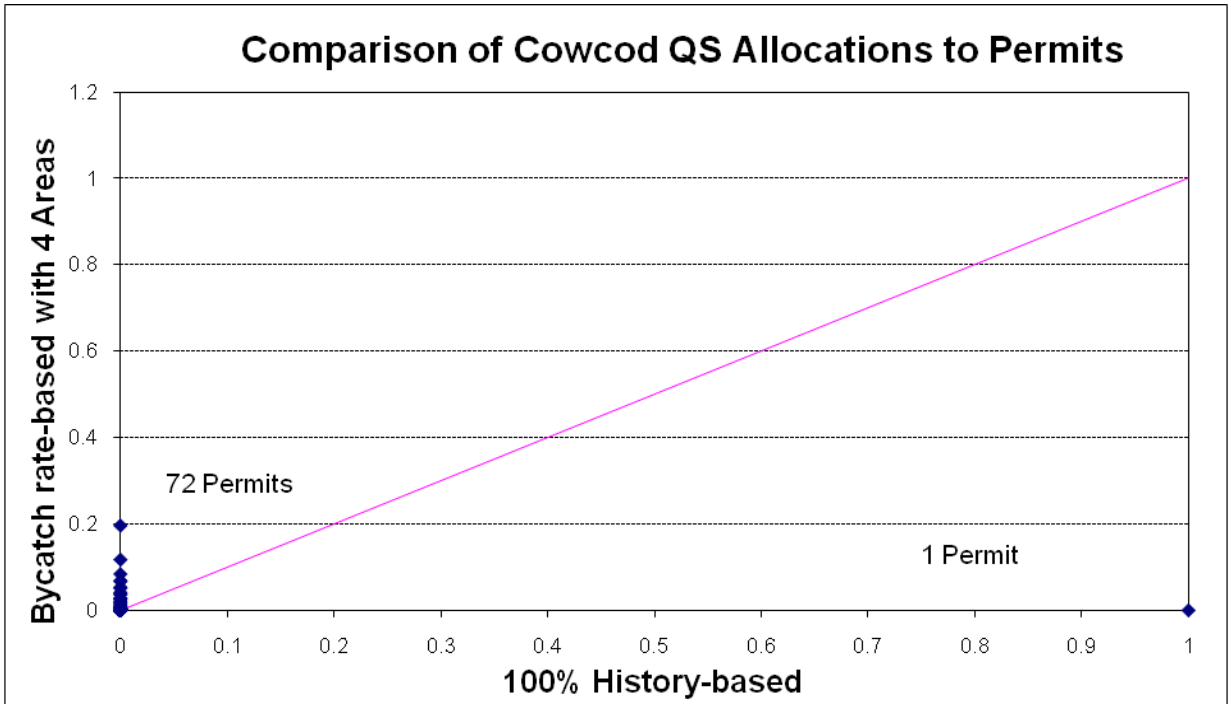


Figure A-38. Allocation of cowcod QS for the nonwhiting fishery to entities based on landing history as compared to allocation based on individual permit logbook information on area strata and fleet average bycatch rates applied to target species QS (equal sharing is not included in either approach).

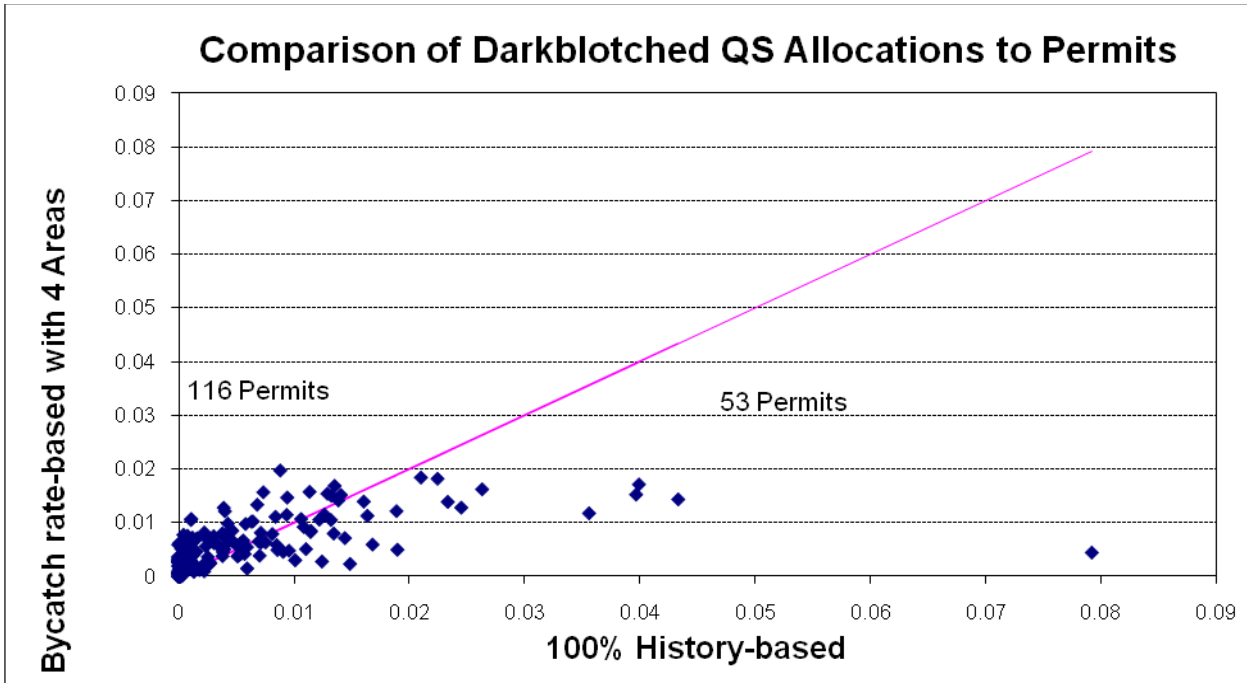


Figure A-39. Allocation of darkblotched QS for the nonwhiting fishery to entities based on landing history as compared to allocation based on individual permit logbook information on area strata and fleet average bycatch rates applied to target species QS (equal sharing is not included in either approach).

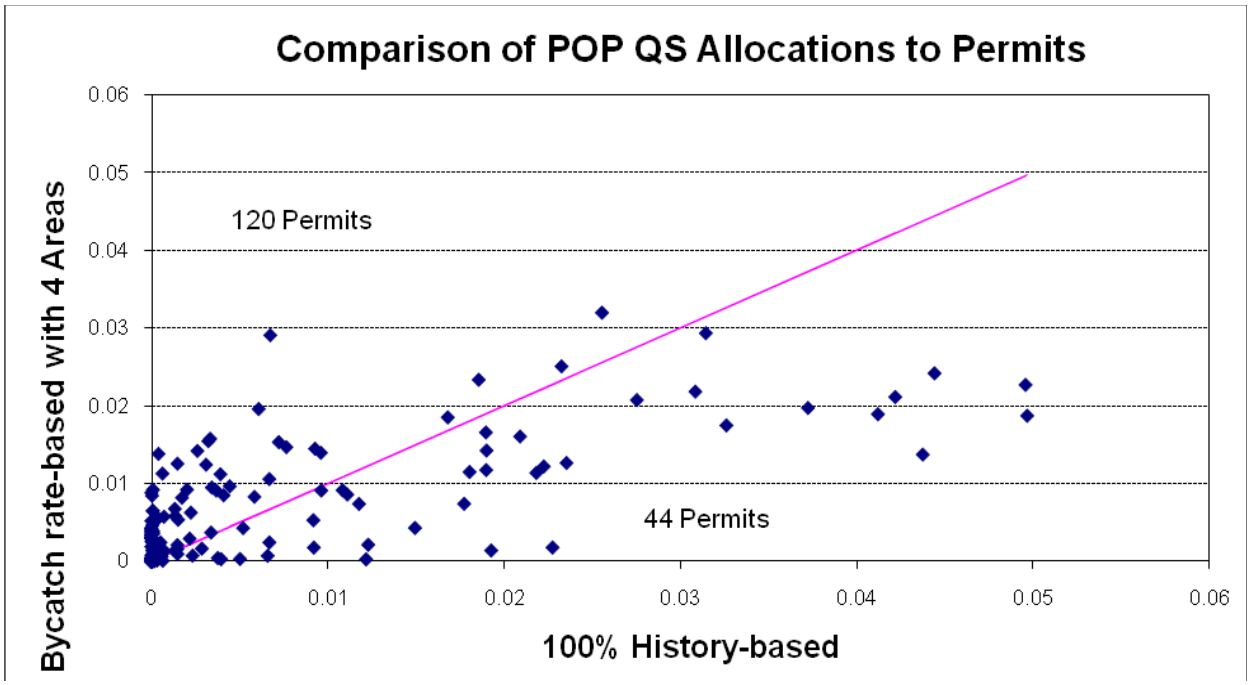


Figure A-40. Allocation of Pacific ocean perch QS for the nonwhiting fishery to entities based on landing history as compared to allocation based on individual permit logbook information on area strata and fleet average bycatch rates applied to target species QS (equal sharing is not included in either approach).

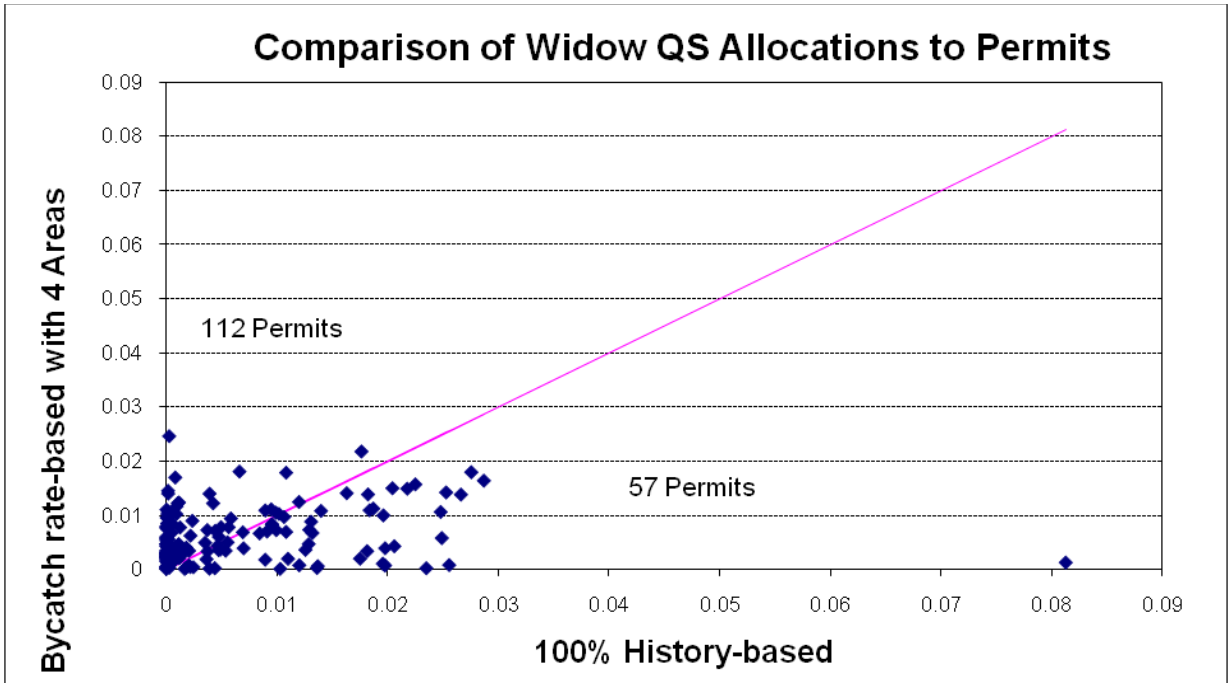


Figure A-41. Allocation of widow rockfish QS for the nonwhiting fishery to entities based on landing history as compared to allocation based on individual permit logbook information on area strata and fleet average bycatch rates applied to target species QS (equal sharing is not included in either approach).

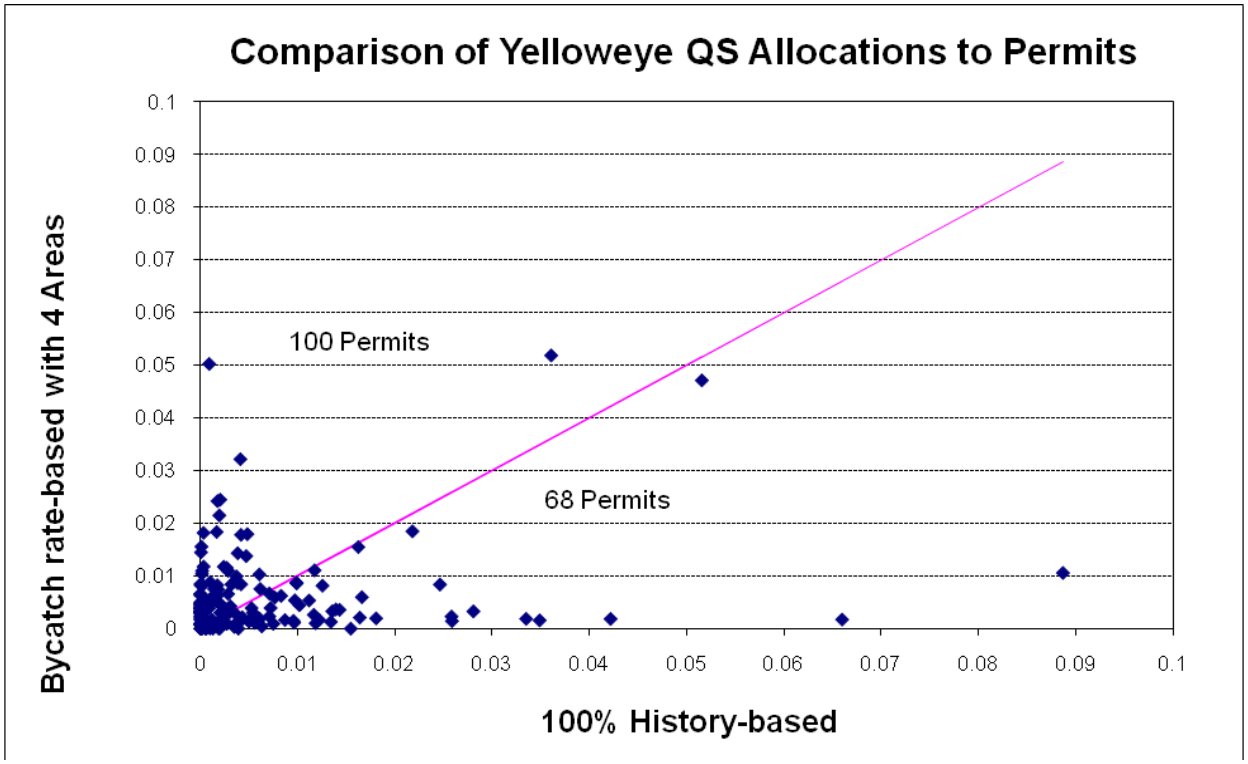


Figure A-42. Allocation of yelloweye rockfsh QS for the nonwhiting fishery to entities based on landing history as compared to allocation based on individual permit logbook information on area strata and fleet average bycatch rates applied to target species QS (equal sharing is not included in either approach).

Using the bycatch rate approach, there are 24 permits that do not have logbooks for 2004 to 2006 but would receive 10 percent of the nonwhiting QS. For these permits, logbook information would not be available to determine the appropriate bycatch rates to apply to their target species QS. Fleet average effort distributions would be used in the overfished species allocation formulas for those permits. Additional information on these permits is provided when the preliminary preferred and final preferred alternatives are compared, below.

Program costs will be increased by the need to determine the allocation for each permit based on that permit's 2004 to 2006 logbooks. Not all logbook data can be matched to fish ticket data and vice versa. The use of both of these data sets in the allocation formula could increase the likelihood of appeals. However, many of the details in the logbook data will not affect the results of the allocation formula. The overfished species allocation formula that relies on logbooks (see Appendix C for a more extensive description) uses the proportion of each permit's target species catch by depth and area strata. The allocation is affected by the ratios of the permit's effort in each of these areas, aggregated across all the target species harvested; therefore, the amount of any particular target species is less important than the proportion of the catch taken in each latitudinal and depth area strata. Use of a fleet wide average for all permits, instead of permit specific logbooks, would lower administrative costs. Administrative costs would also likely be higher if 1994 to 2003 logbooks were used, simply because the data are older and covers more years, increasing the amount of data processing needed, the potential data quality issues, and the potential number of appeals.

♦ *Latitudinal Strata for the Bycatch Rate Approach*

The Council considered assessing permit specific logbooks over two, four, and five latitudinal strata (Table A-65). Using a finer area approach (four or five areas) will tailor the overfished species allocations more specifically to a particular area. A finer area approach might result in less disruption for permits that continue to be used in a manner that is reflected by the period used for assessment of the permit's logbooks but might result in more disruption for permits that have been moved to different areas of the coast since the time period for which the logbooks were assessed. Figure A-43 through Figure A-49 illustrate the effect of the difference between the two-area and four-area approaches. In general, for most species more permits would receive a higher initial allocation using only two areas as compared to four areas, with those receiving the highest allocations generally receiving greater amounts of QS with the four-area approach than they would with the two-area approach. The exceptions are bocaccio and cowcod. For these species, more permits receive greater allocations with the four-area approach than with the two-area approach; and the result for those permits receiving larger amounts is relatively neutral with respect to the difference between the two-area and four-area approaches. However, there is one permit that would receive in the neighborhood of 10 percent of the bocaccio and cowcod under the two-area approach and that would receive substantially less under the four-area approach. For canary and darkblotched rockfish, the results are generally similar whether the two-area or four-area approaches are used (most permits are relatively close to the diagonal line that indicates the points at which there is no difference between the two alternatives). For Pacific Ocean perch and widow rockfish, there are groups of permits that receive substantially less under the four-area approach (less than one quarter of a percent under the four-area approach) which would receive substantially more under the two-area approach. However, even for these species, the pattern is maintained under which those receiving the highest amounts of QS do better under the four-area approach. This pattern, of those receiving the greatest allocations doing the best under the four-area approach, reflects the manner in which the allocations using four-area strata are more tailored to permit needs based on specific areas of activity rather than broader averages that come using the two-area approach.

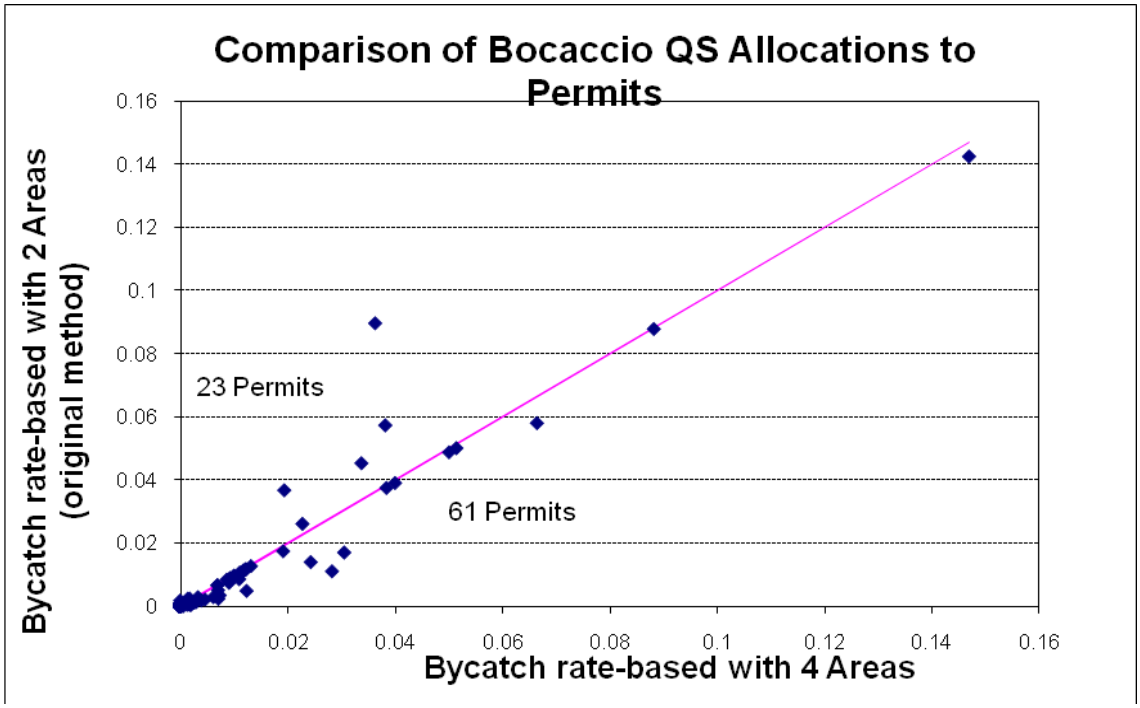


Figure A-43. Bocaccio allocations to permits under the two-area approach (north and south of 40°10'N Lat) and four-area approach (final preferred alternative) (includes allocations for nonwhiting trips only).

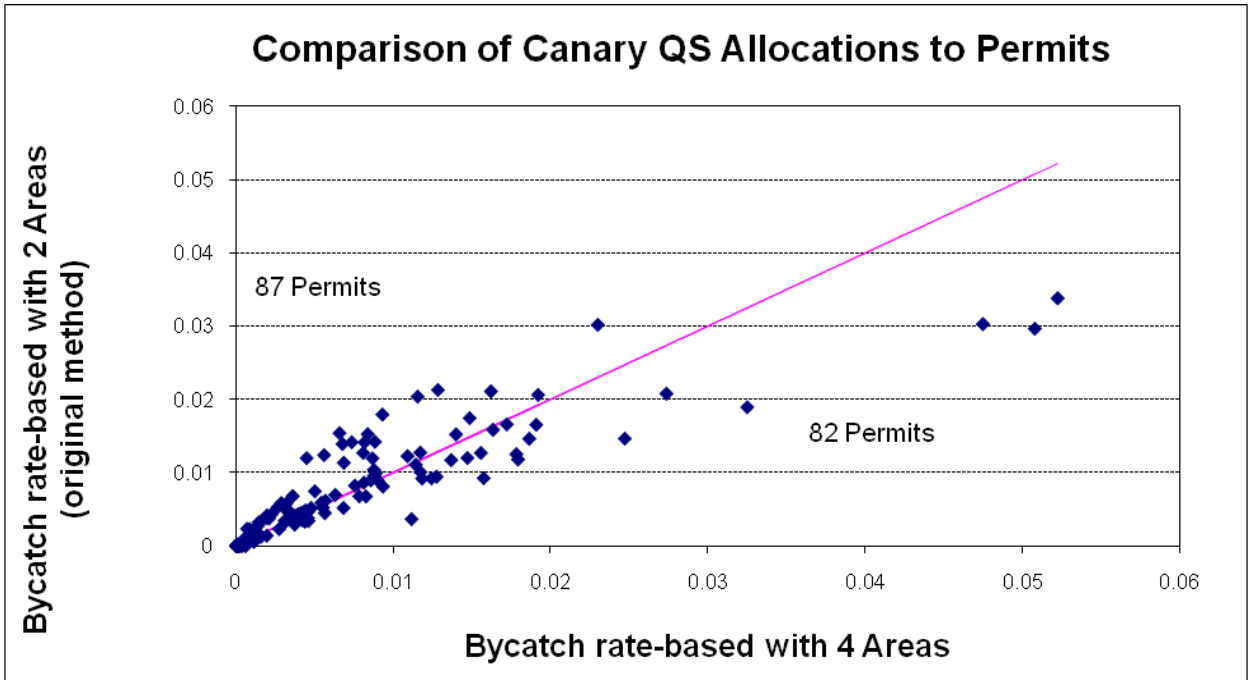


Figure A-44. Canary allocations to permits under the two-area approach (north and south of 40°10'N Lat) and four-area approach (final preferred alternative, but does not use the equal allocation element which is part of the Council's final preferred alternative for canary) (includes allocations for nonwhiting trips only).

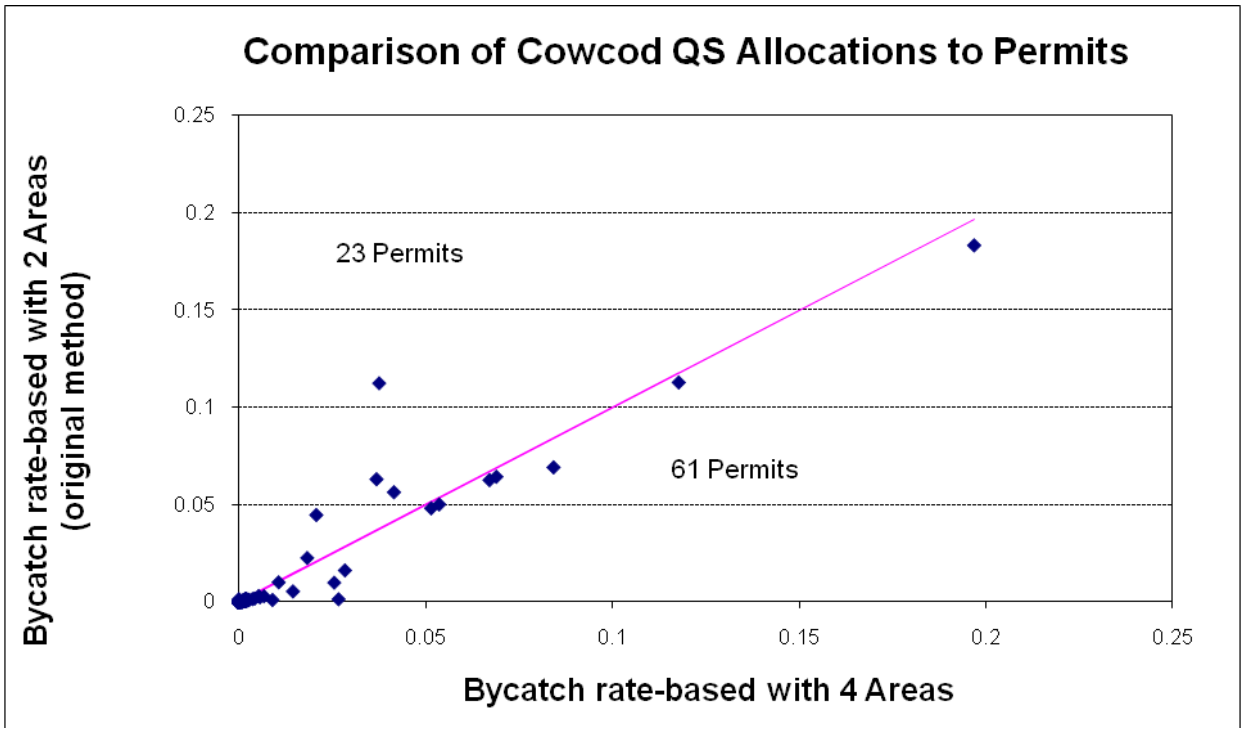


Figure A-45. Cowcod allocations to permits under the two-area approach (north and south of 40°10'N Lat) and four-area approach (final preferred alternative) (includes allocations for nonwhiting trips only).

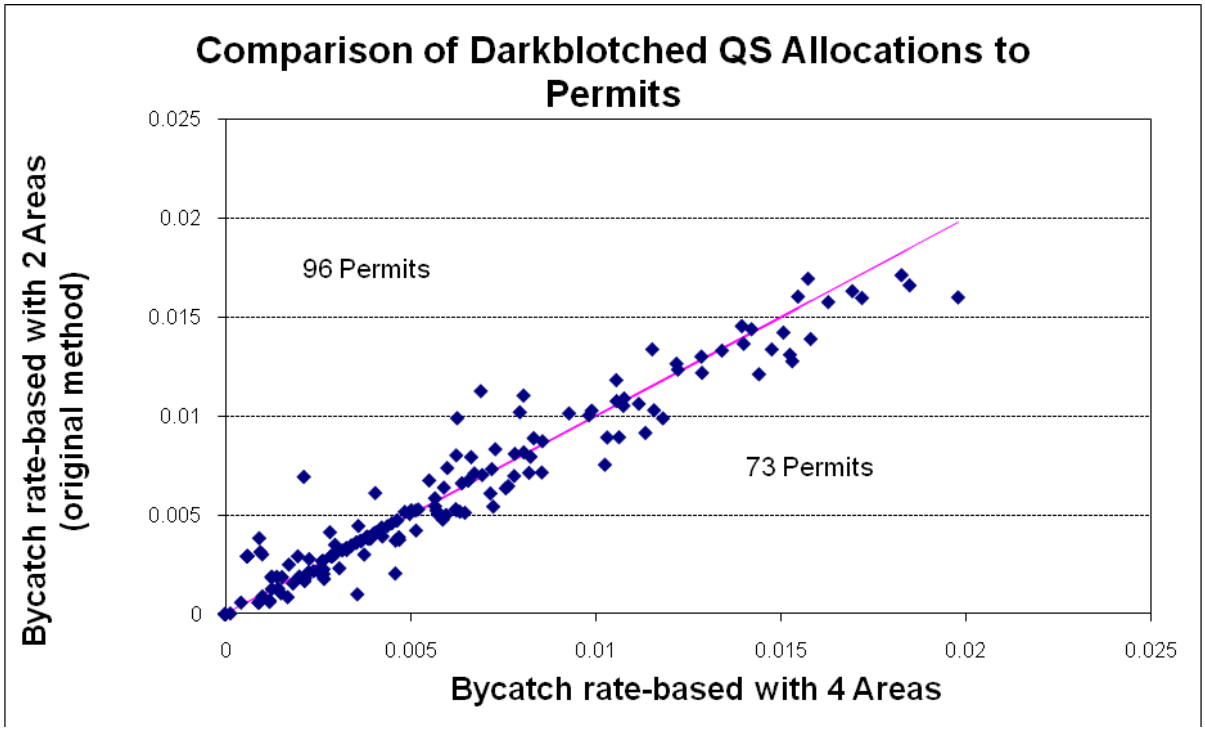


Figure A-46. Darkblotched allocations to permits under the two-area approach (north and south of 40°10'N Lat) and four-area approach (final preferred alternative) (includes allocations for nonwhiting trips only).

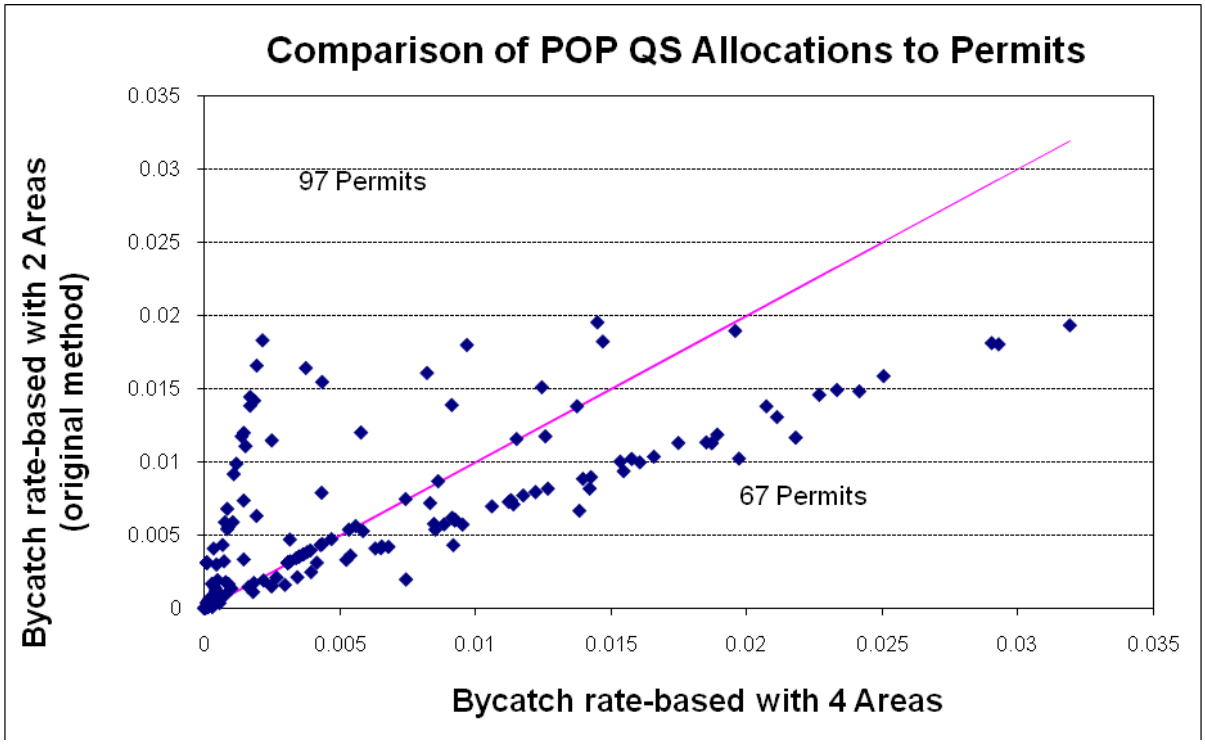


Figure A-47. Pacific Ocean perch allocations to permits under the two-area approach (north and south of 40°10'N Lat) and four-area approach (final preferred alternative) (includes allocations for nonwhiting trips only).

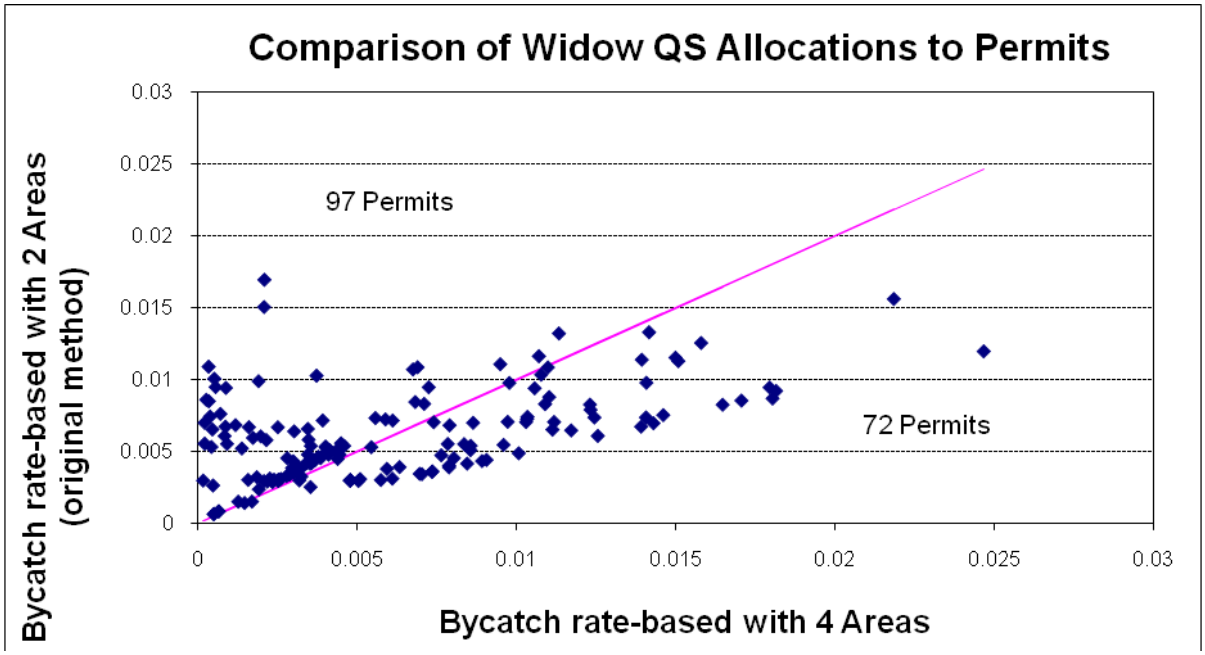


Figure A-48. Widow allocations to permits under the two-area approach (north and south of 40°10'N Lat) and four-area approach (final preferred alternative) (includes allocations for nonwhiting trips only).

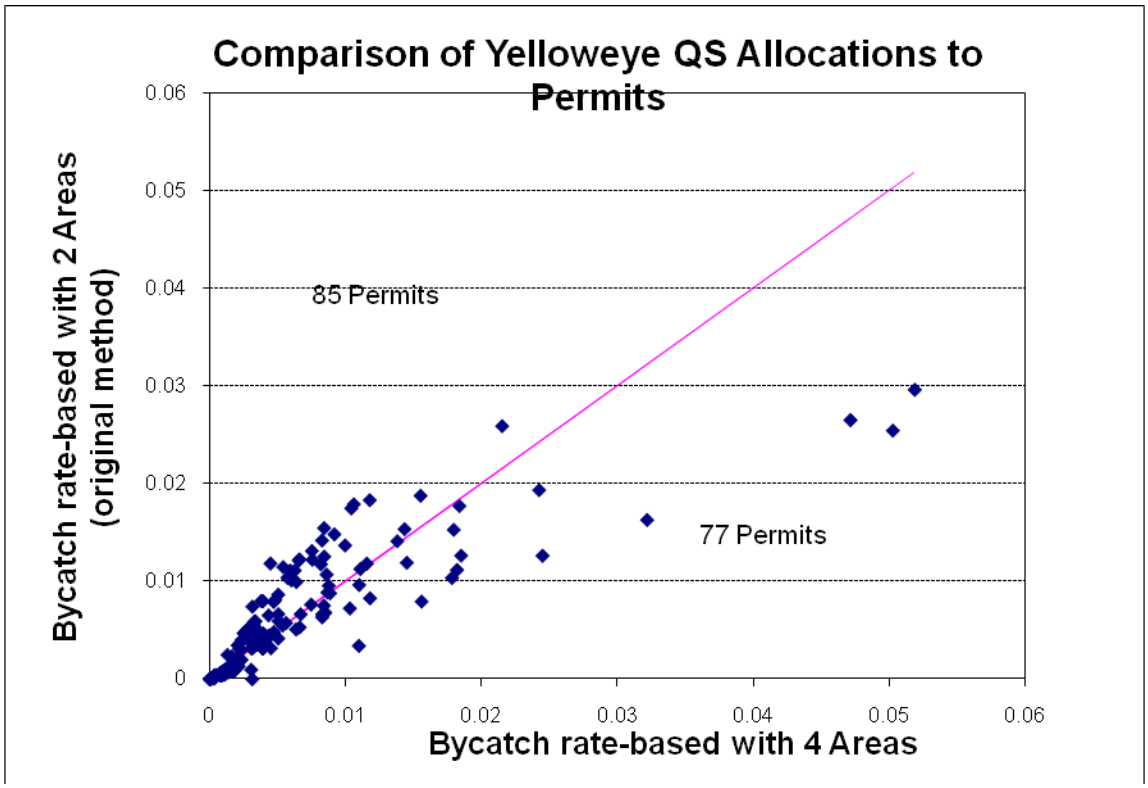


Figure A-49. Yelloweye allocations to permits under the two-area approach (north and south of 40°10'N Lat) and four-area approach (final preferred alternative) (includes allocations for nonwhiting trips only).

Figure A-50 though Figure A-56 illustrate the effect of the difference between the four area and five area approaches. From these figures, it is evident that the initial allocation of bocaccio, darkblotched, and widow are the species most highly affected by differences in the initial allocation formula. These results are different only for those entities with some 2003 to 2006 logbook history south of 40° 10' north latitude. The effect of applying the finest scale bycatch rate area, the five-area approach that splits the area south of 40° 10' north latitude into two regions, is that those entities with history in areas where darkblotched, bocaccio, and widow are most abundant would tend to receive relatively greater amounts of QS for those species. Inversely, the effect of applying the four-area approach is to more evenly spread out the initial allocations of darkblotched, widow, and bocaccio to entities with history south of 40° 10' north latitude.

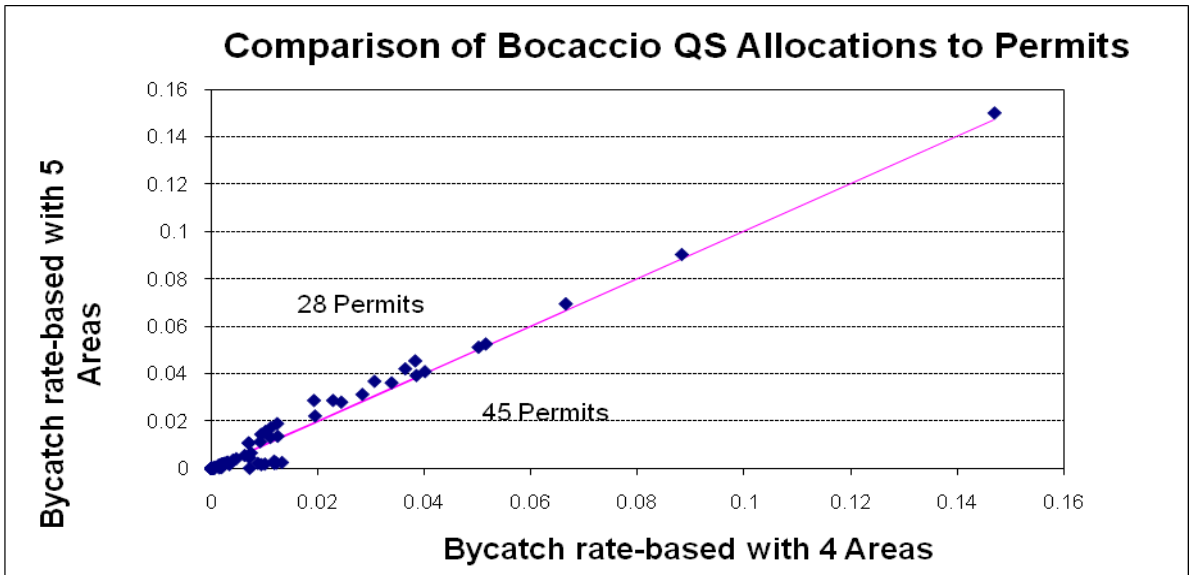


Figure A-50. Bocaccio allocations to permits under the four-area approach (moderately fine area) and five-area approach (finest area) (includes allocations only for nonwhiting trips).

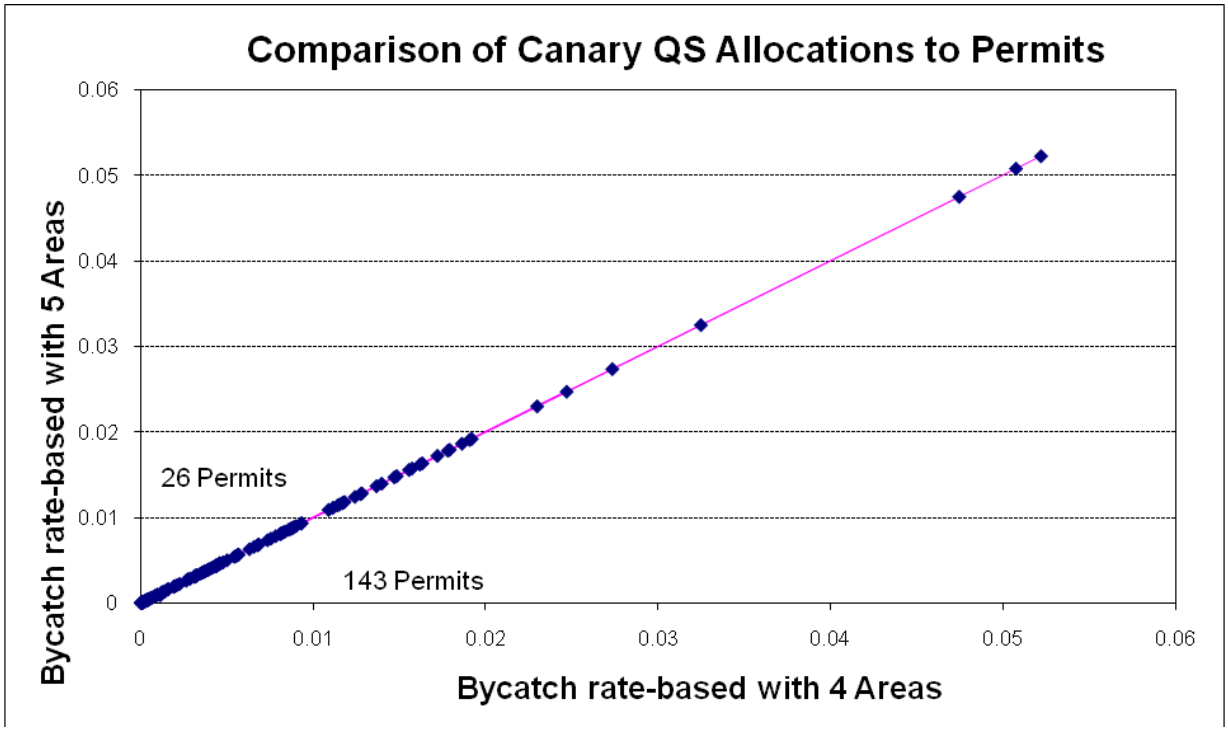


Figure A-51. Canary allocations to permits under the four-area approach (moderately fine area) and five-area approach (finest area) (includes allocations only for nonwhiting trips and does not use the equal allocation element which is part of the Council's final preferred alternative for canary).

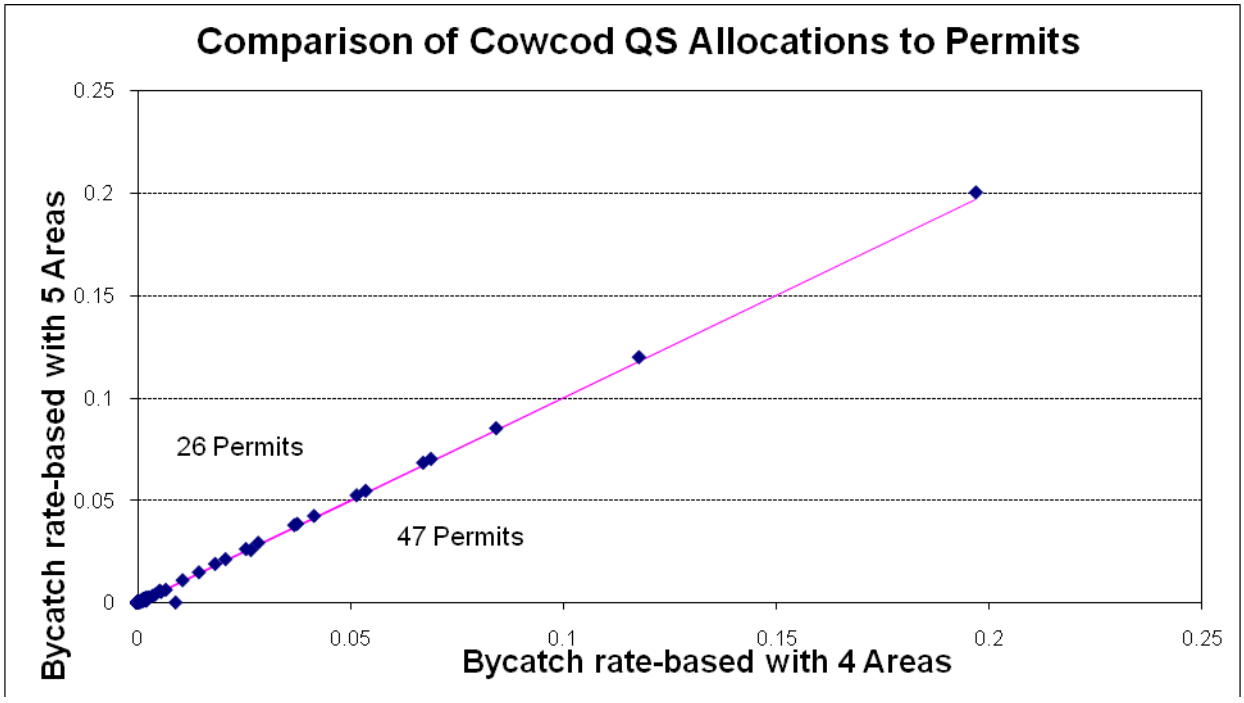


Figure A-52. Cowcod allocations to permits under the fou- area approach (moderately fine area) and five-area approach (finest area) (includes allocations only for nonwhiting trips).

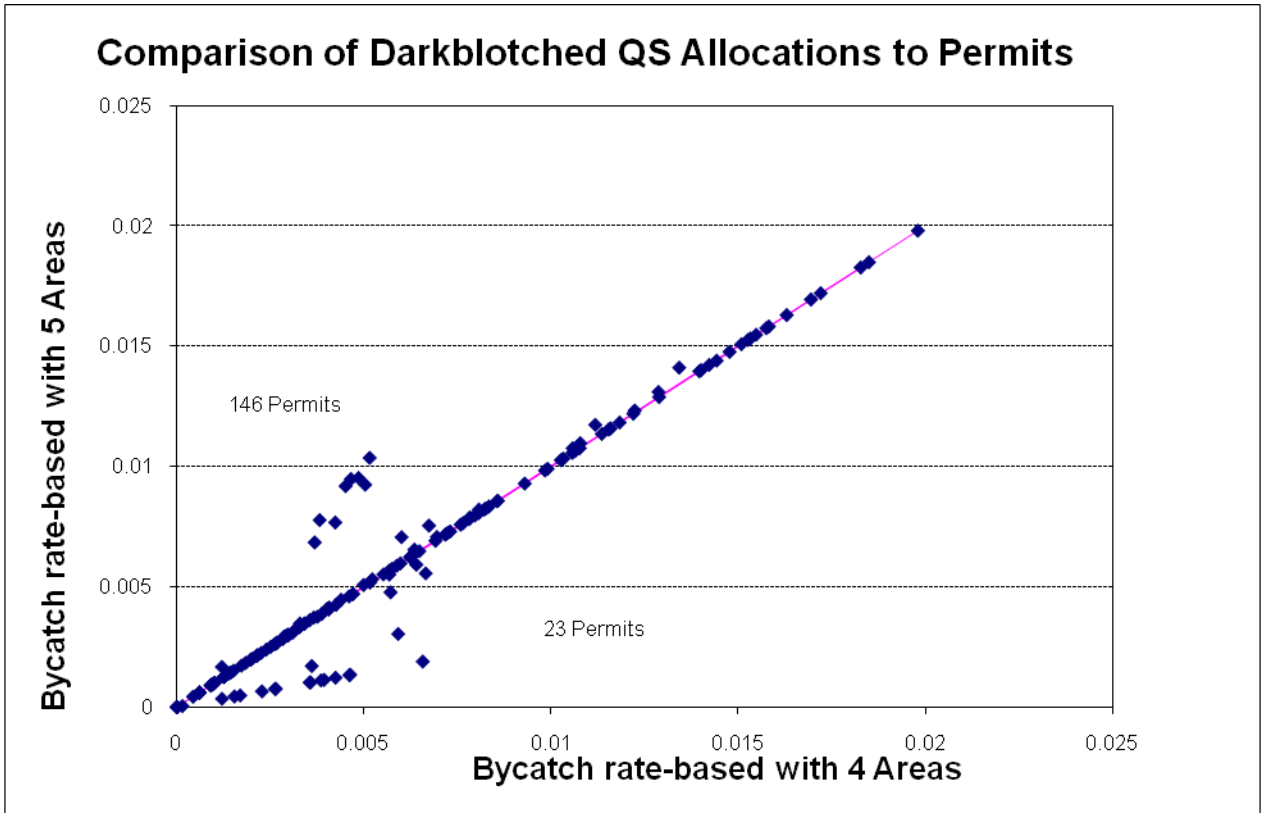


Figure A-53. Darkblotched allocations to permits under the four-area approach (moderately fine area) and five-area approach (finest area) (includes allocations only for nonwhiting trips).

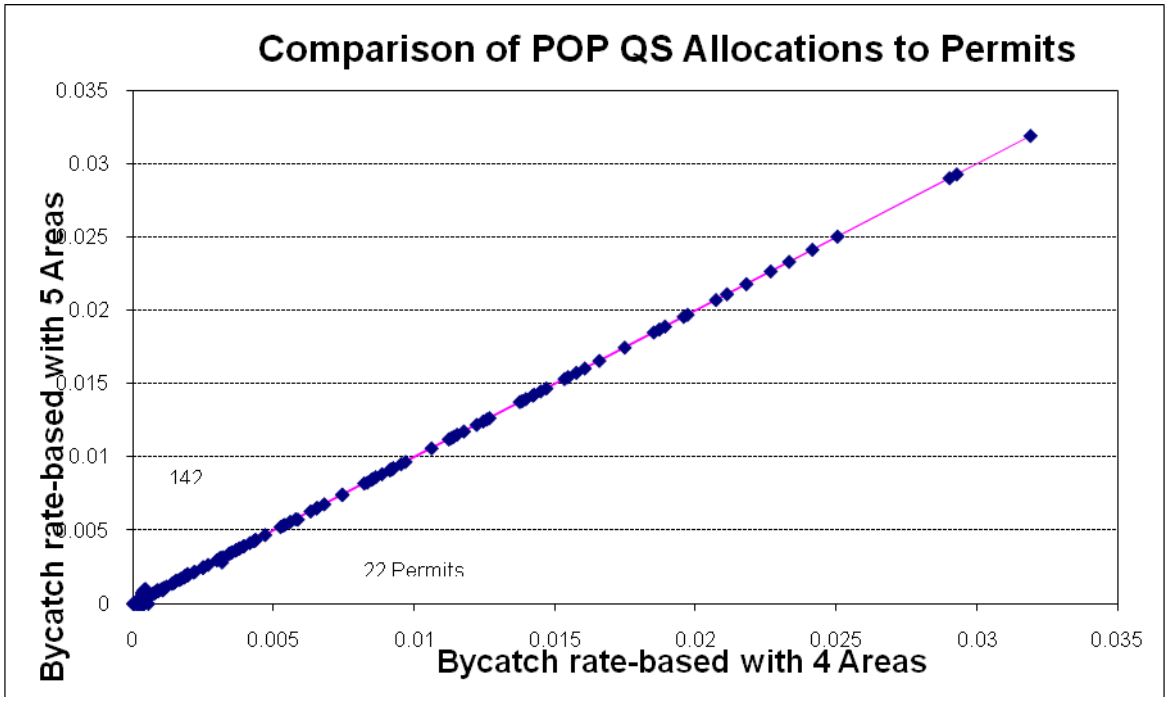


Figure A-54. Pacific Ocean perch allocations to permits under the four-area approach (moderately fine area) and five-area approach (finest area) (includes allocations only for nonwhiting trips).

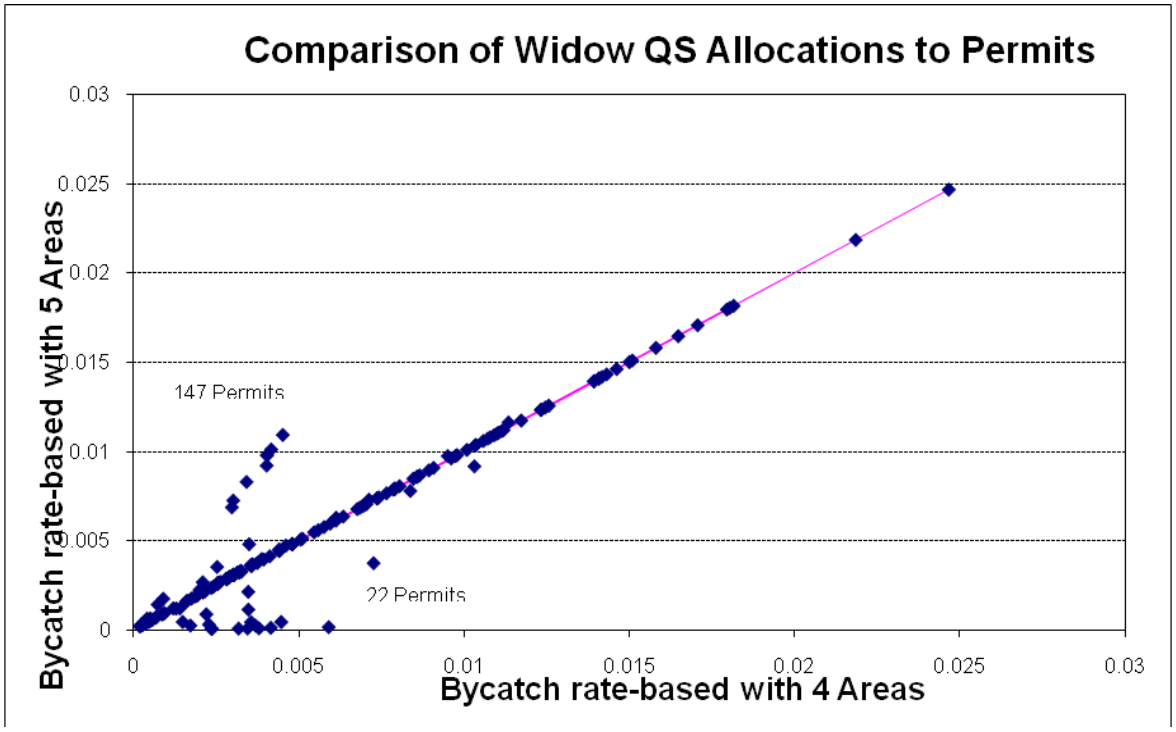


Figure A-55. Widow allocations to permits under the four area approach (moderately fine area) and five-area approach (finest area) (includes allocations only for nonwhiting trips).

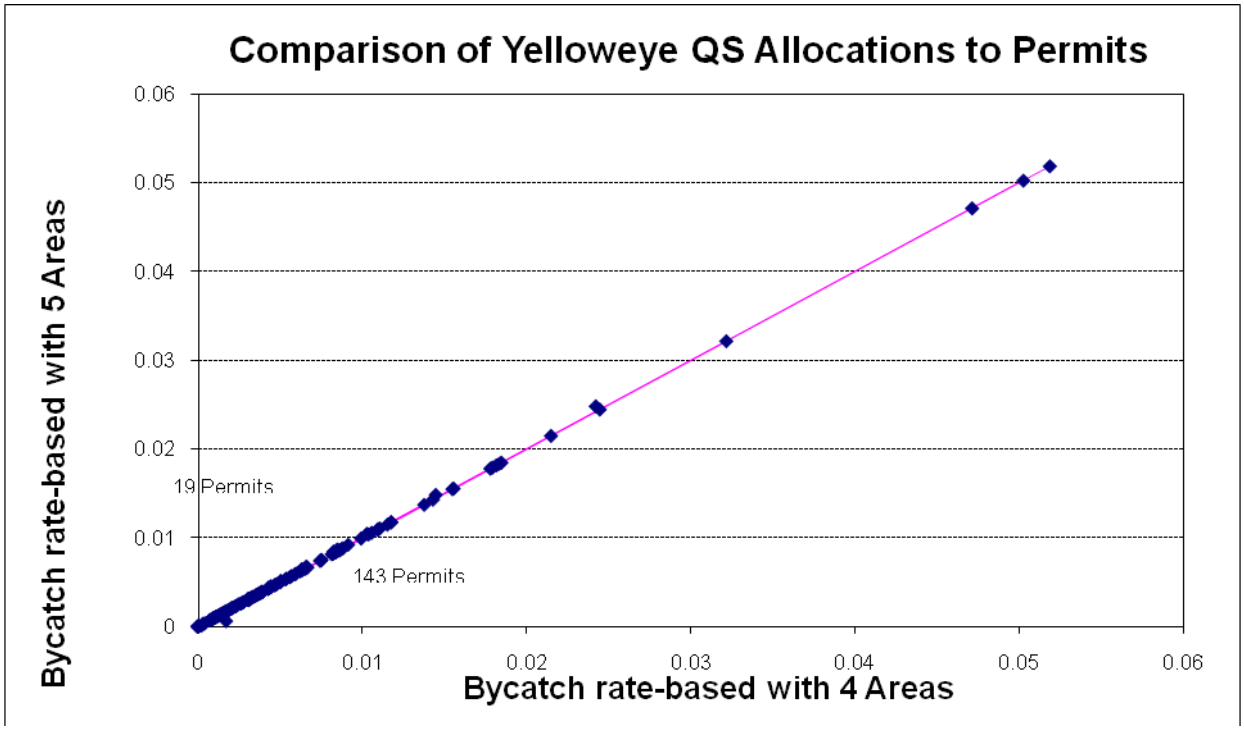


Figure A-56. Yelloweye allocations to permits under the four-area approach (moderately fine area) and five-area approach (finest area) (includes allocations only for nonwhiting trips).

♦ *Logbook Period for the Bycatch Rate Approach*

The choice of logbook periods has distributional implications for individual permits and geographically. For example, use of more recent logbook periods substantially increases the amount of bocaccio and cowcod going to permits associated with ports from San Francisco south (Figure A-57 and Figure A-58). Part of the reason for this is that some permits that were used to fish off California in the 1990s have moved and now fish in more northern ports. Thus, an allocation using 1994 to 2003 logbooks may not reflect current need for bycatch, not only because of the changes in fishing patterns within an area caused by changes in stock availability and area closures put in place to protect overfished species, but also because permits have been transferred to entirely different regions of the coast.

One concern about the use of more recent logbooks for the Council's final preferred alternative was been the impact on the canary QS allocations for permits in the Fort Bragg area. These Fort Bragg permits would receive very small amounts of canary QS (amounts that translate to only a few QP based on 2010 expected allocations). While, on a percentage basis, use of 1994 to 2004 logbooks would substantially increase the allocations to Fort Bragg permits because their allocations are so small to start with, and the observed bycatch rates are so low for the Fort Bragg area, the difference in allocation that results from using 1994 to 2003 logbooks, as opposed to using 2003 to 2006 logbooks, is not perceptible in Figure A-57 and Figure A-58. The Council revised its final preferred alternative to include an equal allocation element in order to provide some canary to permits that were receive close to none.

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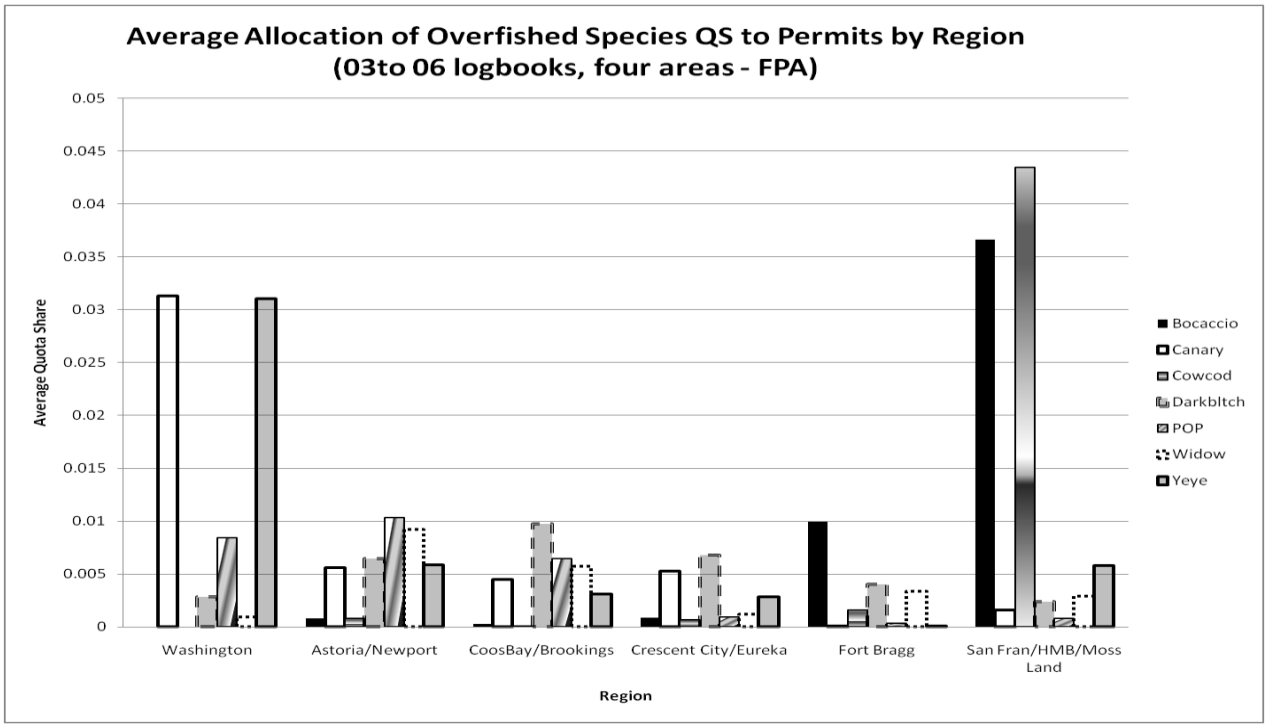


Figure A-57. Amount of QS allocated by region when the 2003-2006 permit logbooks are used to allocation overfished species QS (data in this graph reflect the Council's final preferred alternative, with the exception of canary [which does not include the equal allocation element of the Council's final preferred alternative]).

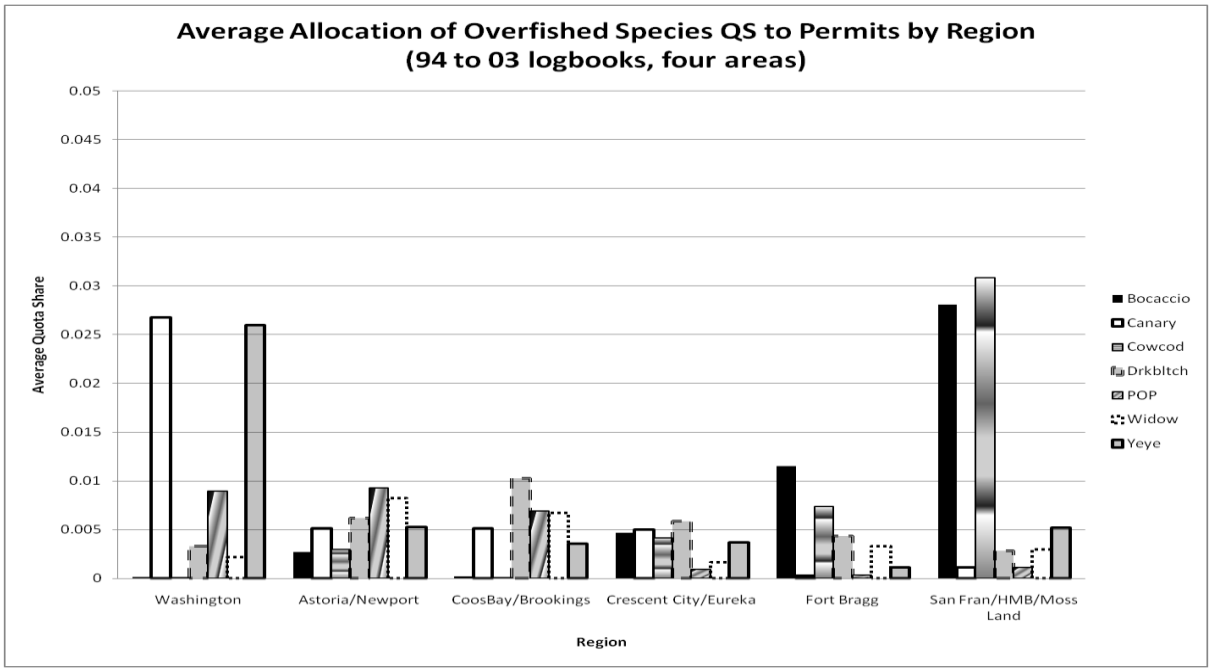


Figure A-58. Amount of QS allocated by region when the 1994 to 2003 permit logbooks are used to allocate overfished species QS (data in this graph reflect the Council's final preferred alternative, except that 1994 to 2003 logbooks are used instead of 2003 to 2006 logbooks and for canary the equal allocation element of the Council's final preferred alternative is not used).

♦ *Impacts of Equal Allocation Choice on the Bycatch Rate Approach*

We will now turn to a comparison of the PPA and the final preferred alternative with respect to the bycatch method for allocating overfished species and its interplay with the equal allocation component of the allocation formula. As discussed above, for overfished species, the equal allocation component of the allocation formula was included in the PPA but not in the final preferred alternative, except with respect to canary. Initially (November 2008), the Council specified there would be no equal allocation component for any overfished species, including canary. However, in November 2009, after reviewing the regionalized effects of the allocation formula and the minimal allocations of canary QS provided to vessels operating in ports such as Fort Bragg California, the Council decided to revise its final preferred alternative and include an equal allocation element for canary rockfish. On the following pages, we provide three sets of graphs for each overfished species (Figure A-59 through Figure A-80). The first graph in each set provides information for the Council's final preferred alternative (except for canary). For canary, the November 2008 final preferred alternative is displayed in the first graph of the group. That alternative was later revised. In the first graph in each group, permits are first assigned to an area based on the port in which they made the most landings from 2004 through 2006. Within each area, the permits are displayed in order from those with the least nonwhiting groundfisH QP allocation to those with the most.[57] For each permit, points are provided indicating the amount of its nonwhiting target QP allocation and the amount of its QP allocation for an overfished species. The set of nonwhiting target species displayed in the graph is the same as the set used in the overfished species allocation formula (the same as the set used by the WCGOP to calculate bycatch rates). Since the permit order within a graph does not change, the amount of nonwhiting QP and overfished species QP going to a particular permit will show up as points above/below one another. The units in which the QP are displayed are noted in the legend and vary among the graphs (e.g., metric tons, pounds, tens of pounds, hundreds of

[57] QS was converted to QP using the 2010 OYs and the Council's Amendment 21 allocation decisions.

pounds). Some permits will receive an initial allocation of overfished species in proportion to their allocation of whiting. In order to isolate the permits with some whiting history from the permits with no whiting history, the overfished species QP for permits with no whiting history are indicated using a triangle and the overfished species QP for permits with some whiting history are represented using a solid circle. Additionally, there are some permits with no 2003 to 2006 history. These permits have no recent logbooks and so they are allocated QP based on distribution of effort among areas for the fleet as a whole. The overfished species QP for these permits are identified with an open circle. The ports for these vessels were assigned using whiting delivery history or permit owner residence. The second graph in each set provides the same information using the PPA (i.e., the overfished species allocation formula does not include an equal allocation component). For the canary, group the second graph in the group is both the PPA and the revised (November 2009) final preferred alternative. To isolate the effect of the equal allocation of overfished species, the amount of the target species allocation to permit holders was kept constant between these two figures (i.e., 90 percent of the allocation for target species was allocated to permit holders[58]), and the bycatch rate method was held constant.[59] The final graph in each set shows for each permit the amount of overfished species allocated to the permit under the final preferred alternative as compared to the PPA. The permits are placed in order based on the results for the final preferred alternative, such that the estimates for each permit are above/below one another.

To illustrate how to read the graphs, we will look at the results for Pacific ocean perch (POP). In Figure A-72, it can be seen that for the area north of Westport and from the Columbia River to Newport there are a few permits that will receive almost no POP under the final preferred alternative, some of which have some relatively large nonwhiting quota allocations. The number of permits not receiving POP increases to the south, where POP encounter rates are lower. The nonwhiting QP amounts are displayed in metric tons, and the POP amounts are displayed in tens of pounds. The maximum amount of POP QP any single permit would get is just over 10,000 pounds (1,000 x 10 pound units), by a permit with at least some whiting history. The second and third highest amounts would be slightly less than 9,000 pounds each for two permits that do not have any whiting history. Under the PPA, the maximum amount of QP any single permit would receive is between 6,000 and 7,000 pounds and no permit would receive less than about 800 pounds (Figure A-73). Under the final preferred alternative, most of those permits in the south (south of Fort Bragg) which receive significant amounts of QP are those which had no logbooks from 2003 through 2006 and so are provided POP based on fleet averages. Approximately 110 permits would receive more POP under the PPA, with the remainder receiving more POP under the final preferred alternative (Figure A-74).

For canary, the maximum QP allocation to a single permit under the November 2008 final preferred alternative is just over 1,600 pounds and the minimums are very close to zero (Figure A-63). Under the PPA, which is also the November 2009 revised final preferred alternative, the maximum initial allocation to a single permit is just under 1,000 pounds and the minimums are just under 100 pounds (Figure A-64).

[58] The target species allocation formula was the same in the preliminary preferred and final preferred alternative. The only difference was that in the preliminary preferred alternative 80 percent of the QS for all species went to the permits and in the final preferred alternative 90 percent of the QS for all species went to the permits. Two isolate the effect of the equal allocation element, 90 percent allocation to permits was used for both figures.

[59] In the spring of 2009, the Council revised the bycatch rate method, specifying that four latitudinal subareas be used instead of two. For purposes of isolating the most important difference between the preliminary and final preferred alternative (the presence and absence of the equal sharing part of the allocation formula), the four-latitudinal-area bycatch method has been used in both the preliminary and final preferred alternatives for the overfished species allocations.

Under the final preferred alternative for darkblotched, five permits would receive only about 10 pounds of darkblotched rockfish Figure A-69. All of these are located from Fort Bragg south, and one of the permits has more nonwhiting groundfish than any other permit in the area.

In general, one of the patterns that shows up in the figures is that permits receiving larger amounts of QS for overfished species tend to be better off without equal allocation than with equal allocations. Two exceptions stand out: canary rockfish (Figure A-65) and widow rockfish (Figure A-77). For these two species, some of the permits receiving larger allocations receive even more with an equal allocation element. The permits in these situations appear to be permits with significant whiting history but lesser amounts of nonwhiting fishery relative to the rest of the nonwhiting fleet. Therefore, their allocation of overfished species QS for their nonwhiting trips increases with the equal allocation of QS related to buyback permit history. The amounts of overfished species associated with whiting trips that would be equally allocated is quite small because only 7 percent of the shoreside whiting was taken by permits that were bought back and the amount of nonwhiting species allocated to the shoreside whiting fishery is small for most species.

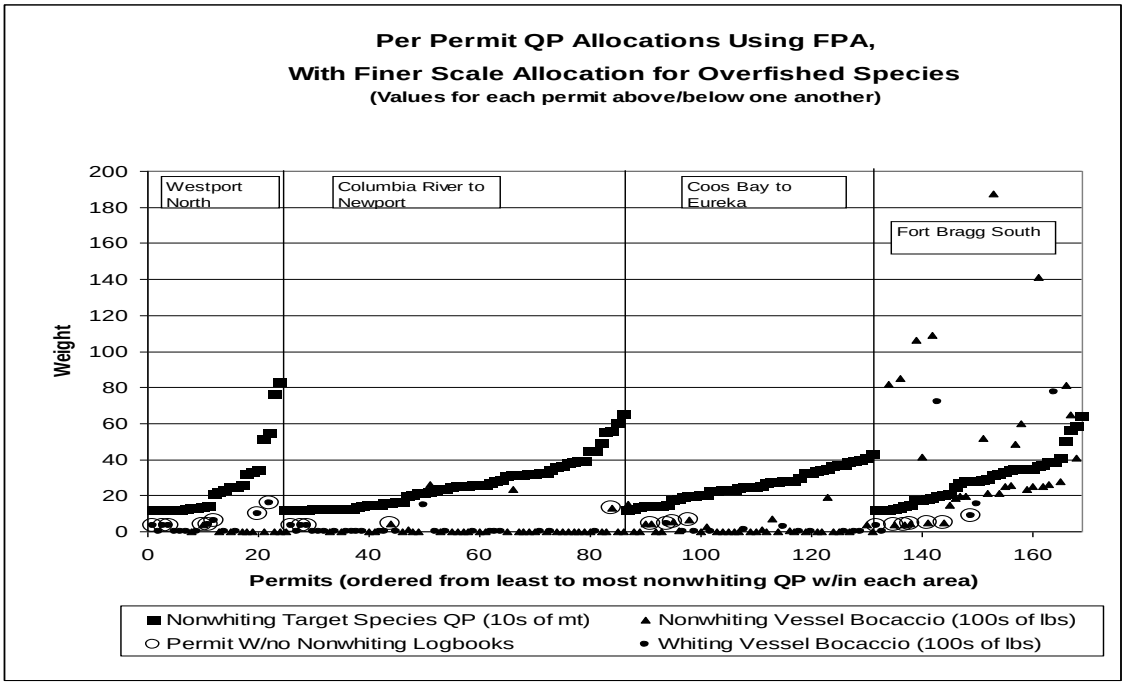


Figure A-59. Per permit allocations of nonwhiting target species and bocaccio QP using 2010 allocations under the Council's final preferred alternative (any permit with some shoreside whiting trips was classified as a whiting permit, permit locations assigned based on primary port from 2004 to 2006).

Notes: Assumes half the OY projected to go unused in 2010 is allocated to the trawl fishery.
Last permit in series has a value of 31,100 pounds for bocaccio (off the graph).

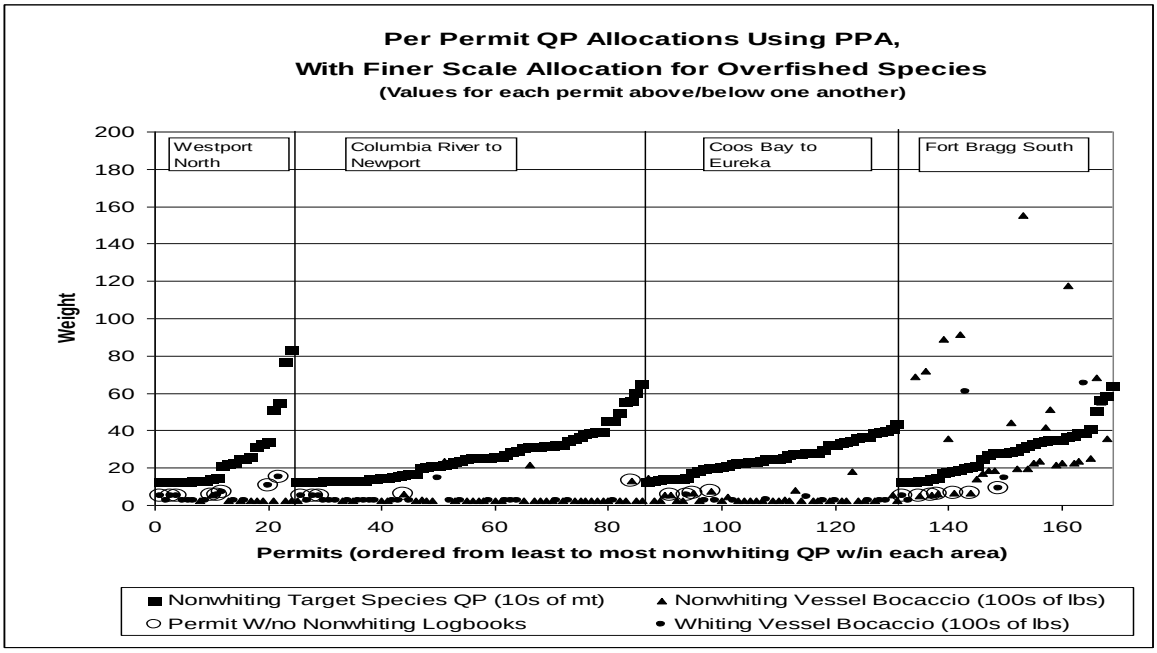


Figure A-60. Per permit allocations of nonwhiting target species and bocaccio QP using 2010 allocations under the Council's PPA (any permit with some shoreside whiting trips was classified as a whiting permit, permit locations assigned based on primary port from 2004 to 2006).

Notes: Assumes half the OY projected to go unused in 2010 is allocated to the trawl fishery.
Last permit in series has a value of 25,700 pounds for nocaccio (off the graph).

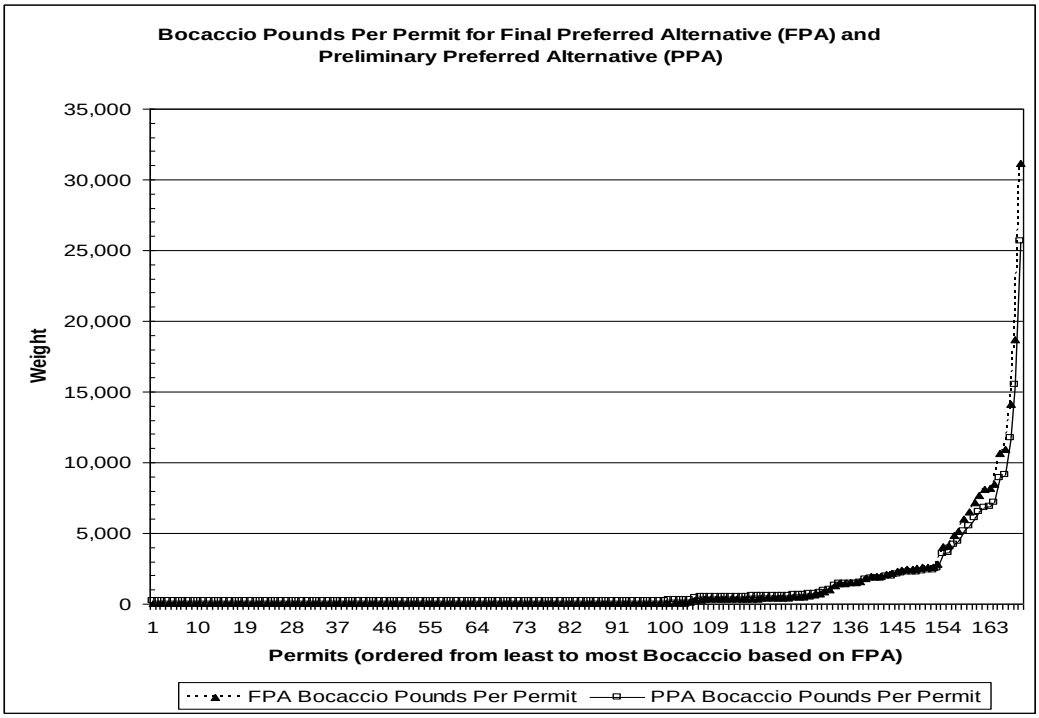


Figure A-61. Per permit allocations of bocaccio QP under the Council's final and PPA (permits are arrayed in the same order for both alternatives).

Notes: Assumes half the OY projected to go unused in 2010 is allocated to the trawl fishery.

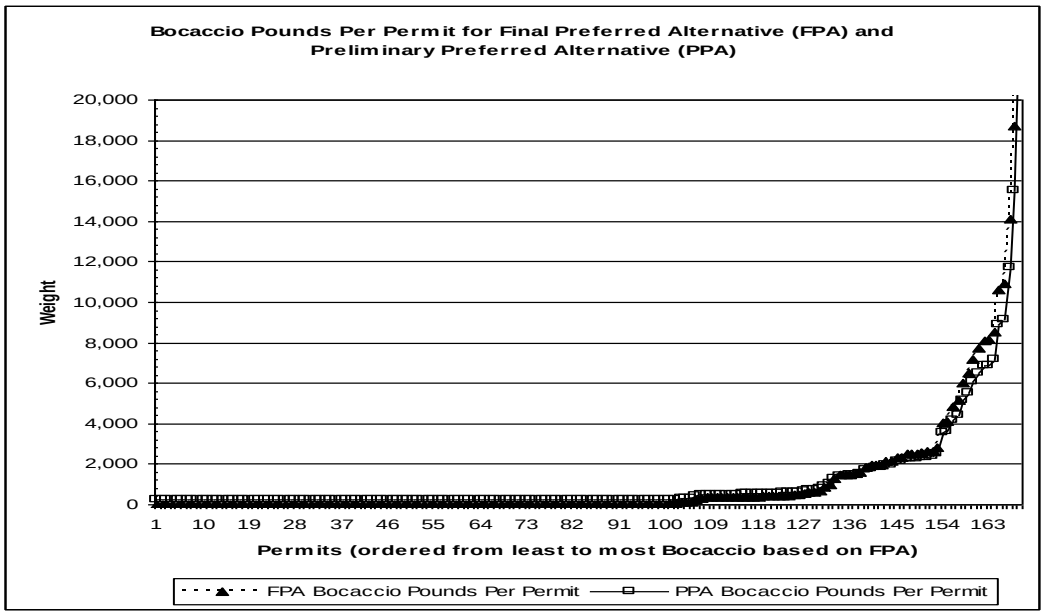


Figure A-62. Per permit allocations of bocaccio QP under the Council's final and PPA (permits are arrayed in the same order for both alternatives) - magnification.

Notes: Assumes half the OY projected to go unused in 2010 is allocated to the trawl fishery.

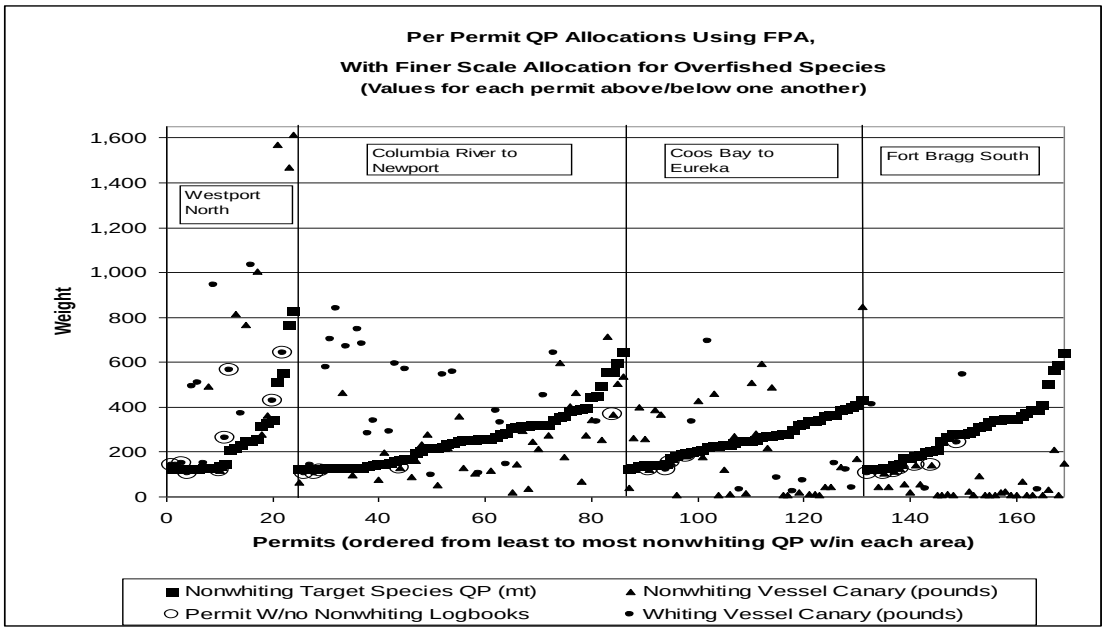


Figure A-63. Per permit allocations of nonwhiting target species and canary QP using 2010 allocations under the Council's Nov 2008 final preferred alternative (any permit with some shoreside whiting trips was classified as a whiting permit, permit locations assigned based on primary port from 2004 to 2006).

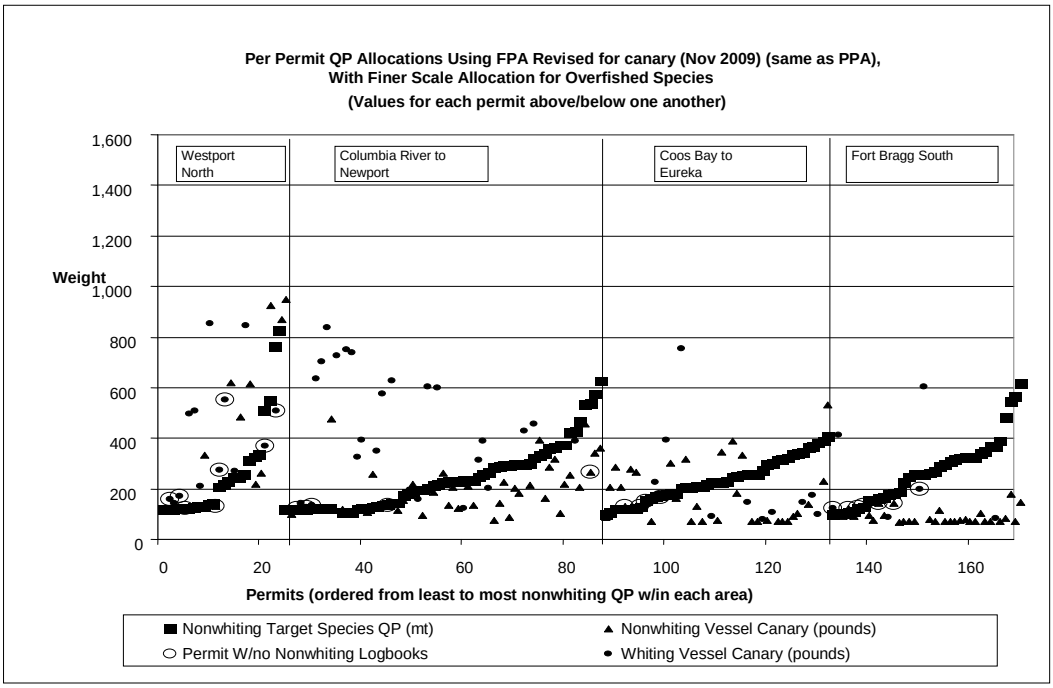


Figure A-64. Per permit allocations of nonwhiting target species and canary QP using 2010 allocations under the Council's revised final (Nov 2009) preferred alternative, revised for canary, (any permit with some shoreside whiting trips was classified as a whiting permit, permit locations assigned based on primary port from 2004 to 2006).

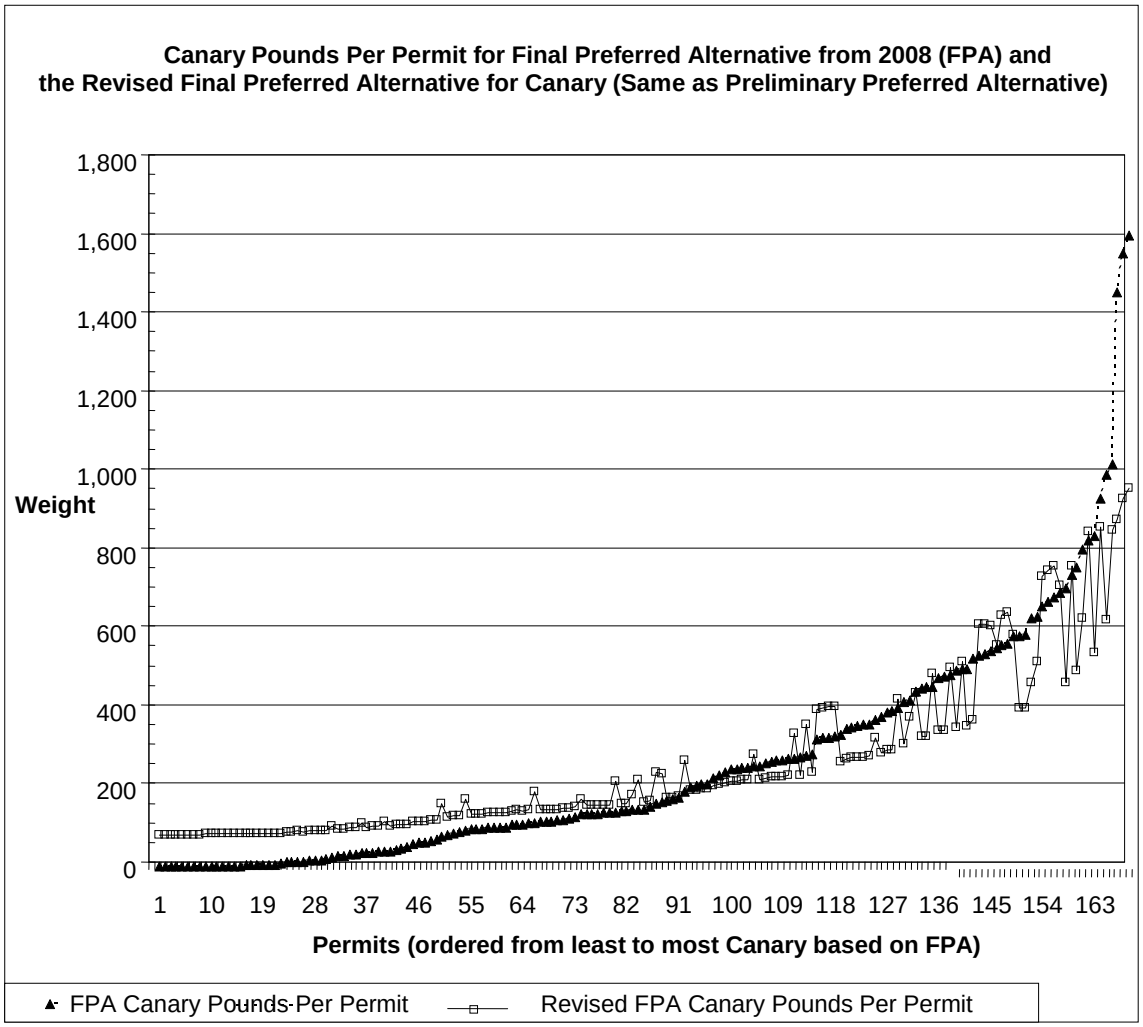


Figure A-65. Per permit allocations of canary QP under the Council's final (Nov 2008) preferred alternative and its revised final (Nov 2009)/PPA (permits are arrayed in the same order for both alternatives).

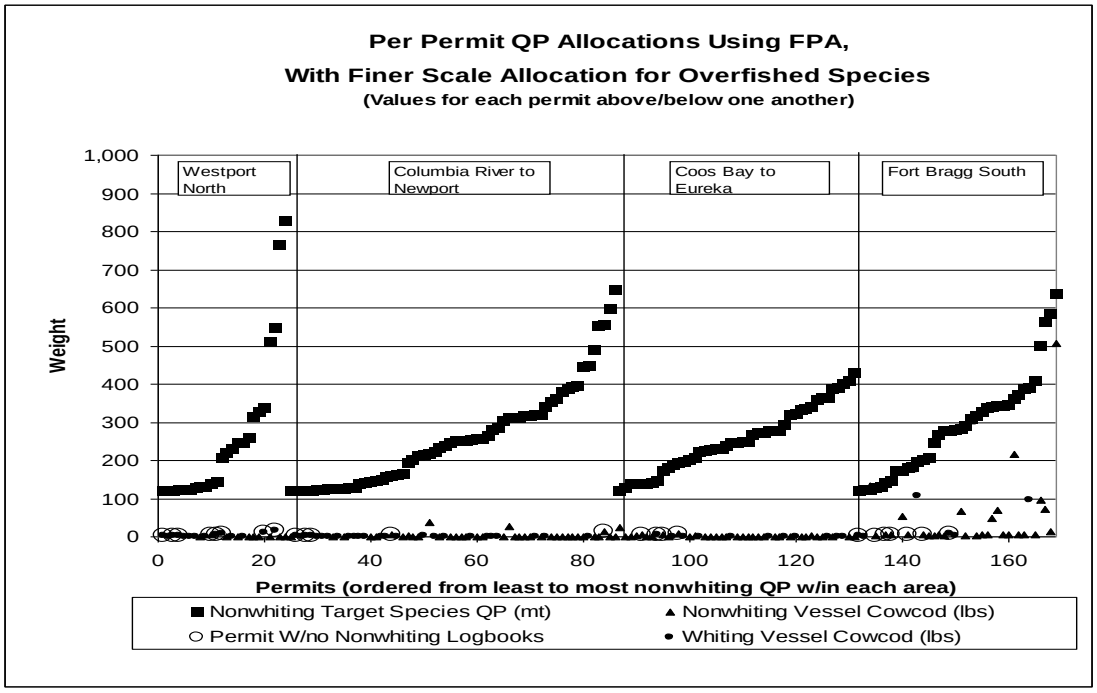


Figure A-66. Per permit allocations of nonwhiting target species and cowcod QP using 2010 allocations under the Council's final preferred alternative (any permit with some shoreside whiting trips was classified as a whiting permit, permit locations assigned based on primary port from 2004 to 2006).

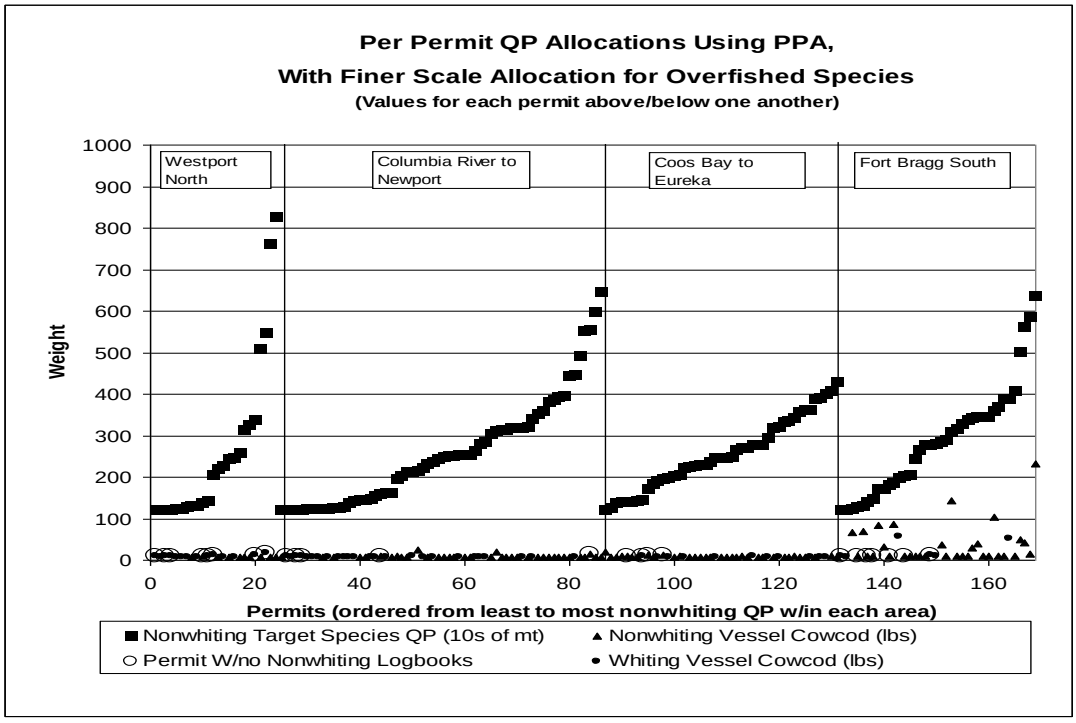


Figure A-67. Per permit allocations of nonwhiting target species and cowcod QP using 2010 allocations under the Council's PPA (any permit with some shoreside whiting trips was classified as a whiting permit, permit locations assigned based on primary port from 2004 to 2006).

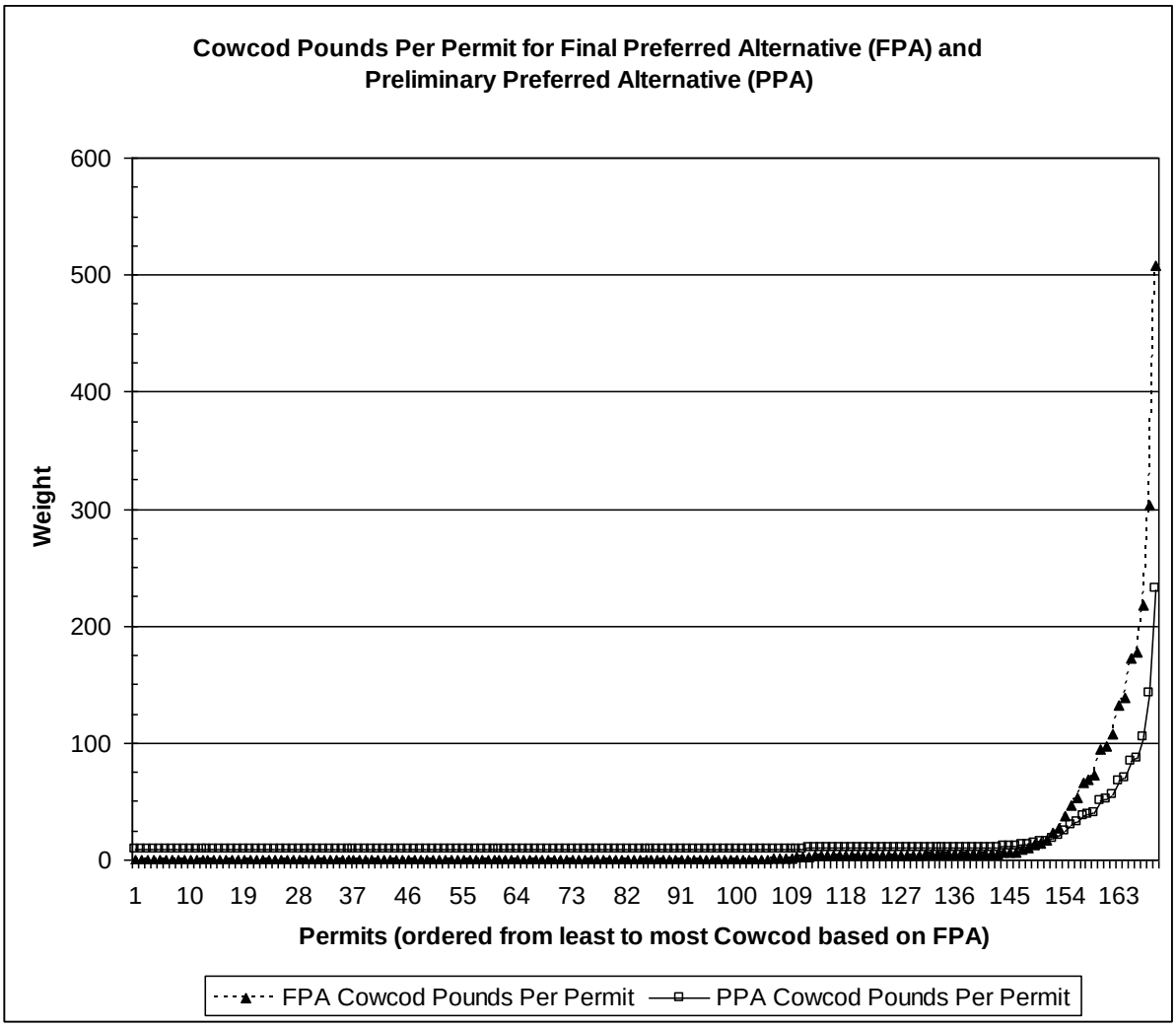


Figure A-68. Per permit allocations of cowcod QP under the Council's final and PPA (permits are arrayed in the same order for both alternatives).

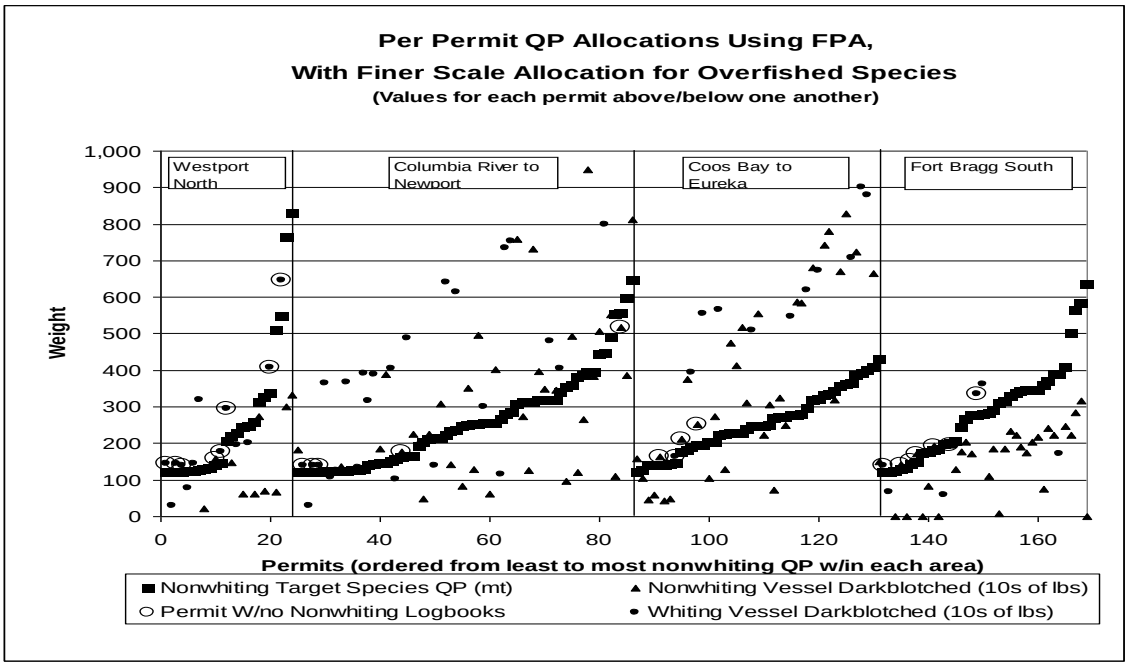


Figure A-69. Per permit allocations of nonwhiting target species and darkblotched QP using 2010 allocations under the Council's final preferred alternative (any permit with some shoreside whiting trips was classified as a whiting permit, permit locations assigned based on primary port from 2004 to 2006).

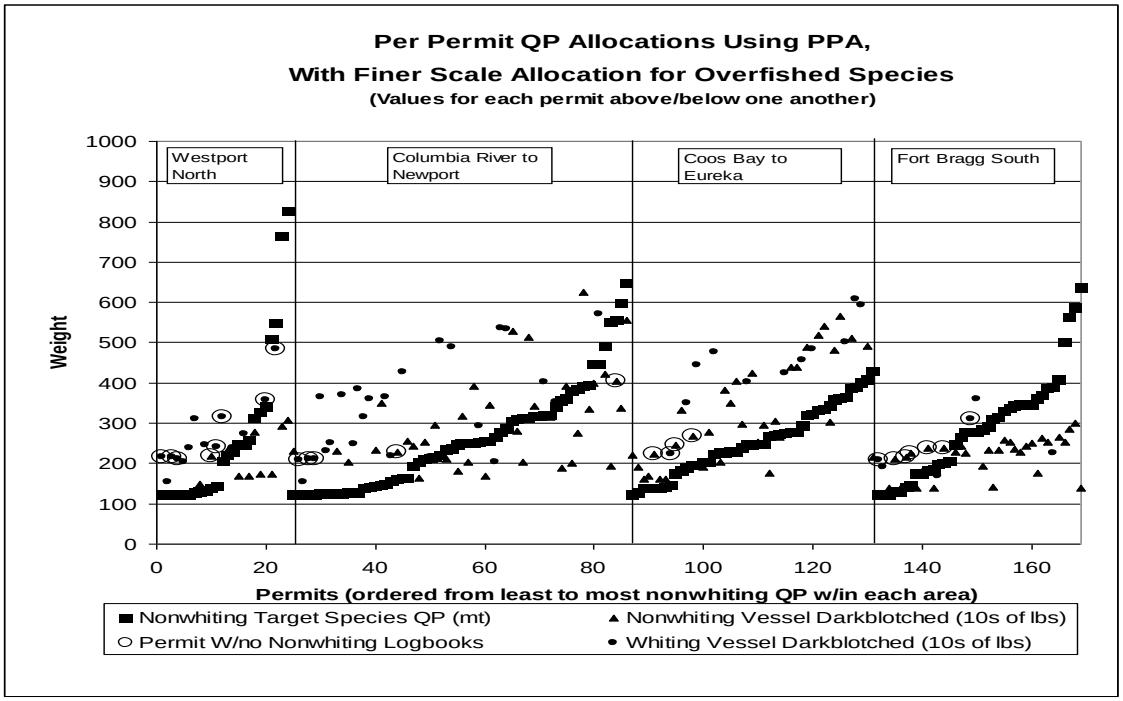


Figure A-70. Per permit allocations of nonwhiting target species and darkblotched QP using 2010 allocations under the Council's PPA (any permit with some shoreside whiting trips was classified as a whiting permit, permit locations assigned based on primary port from 2004 to 2006).

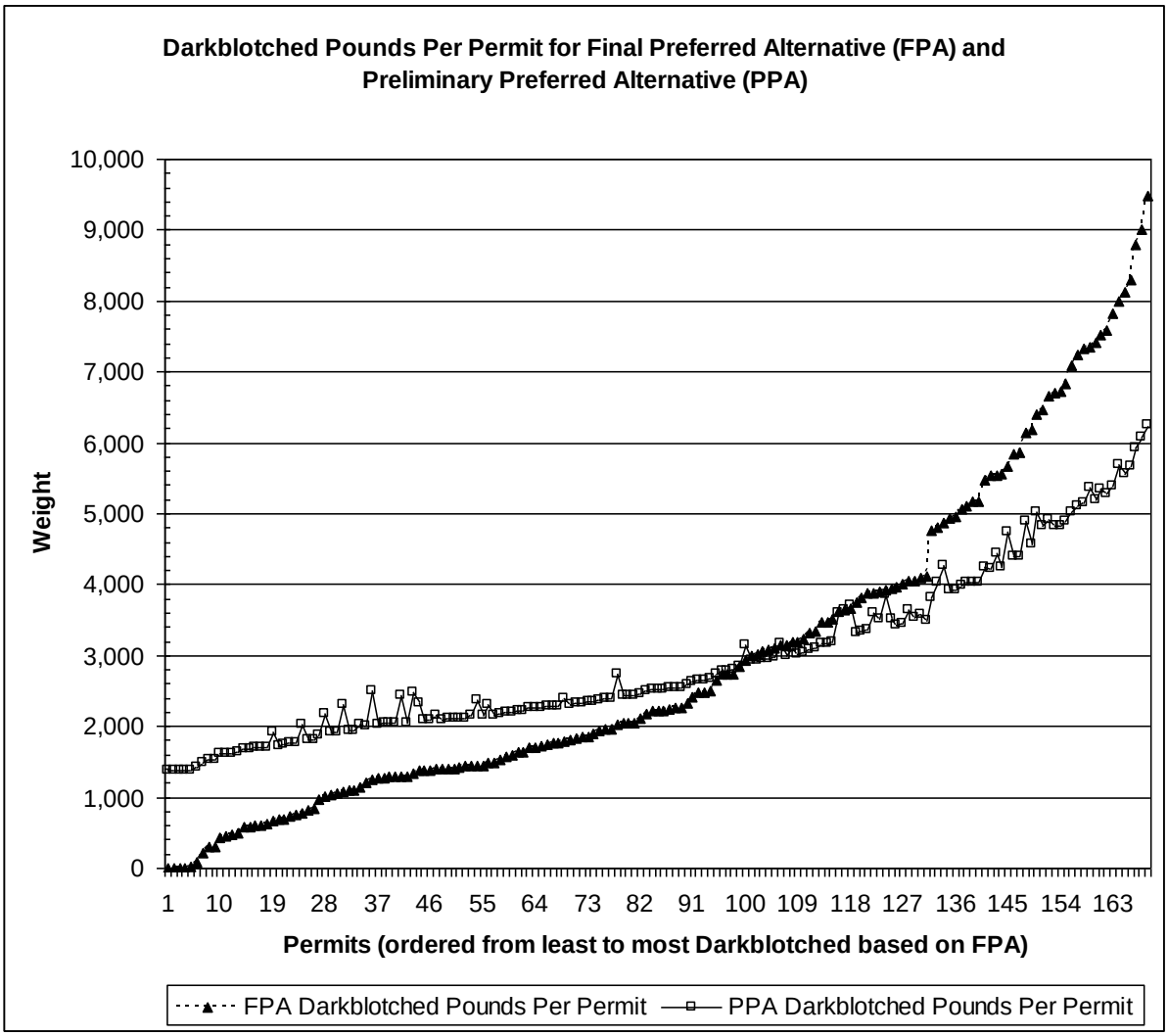


Figure A-71. Per permit allocations of darkblotched QP under the Council's final and PPA (permits are arrayed in the same order for both alternatives).

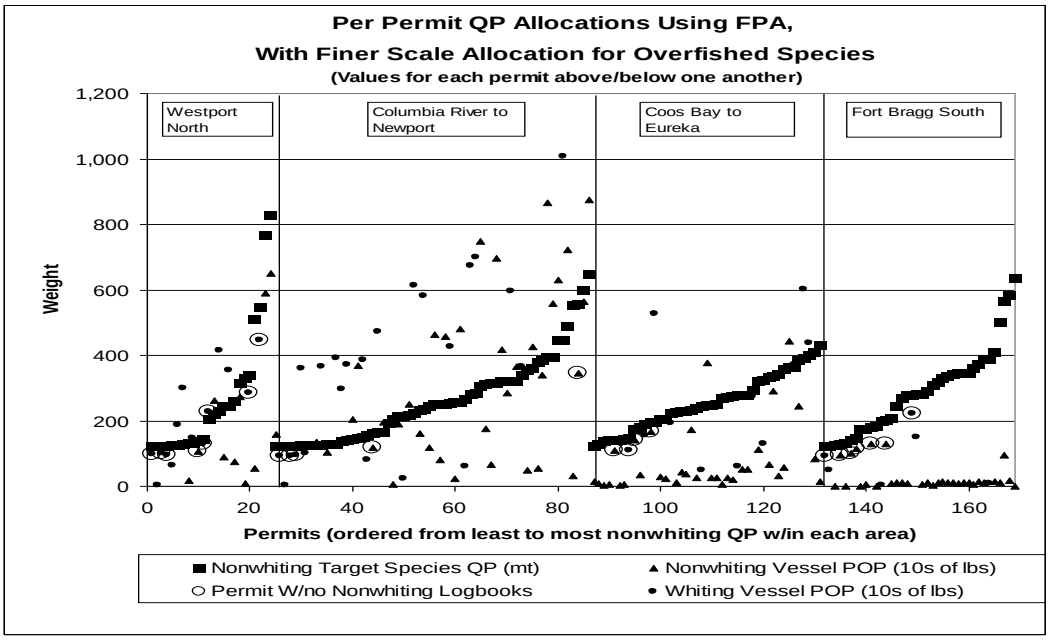


Figure A-72. Per permit allocations of nonwhiting target species and POP QP using 2010 allocations under the Council's final preferred alternative (any permit with some shoreside whiting trips was classified as a whiting permit, permit locations assigned based on primary port from 2004 to 2006).

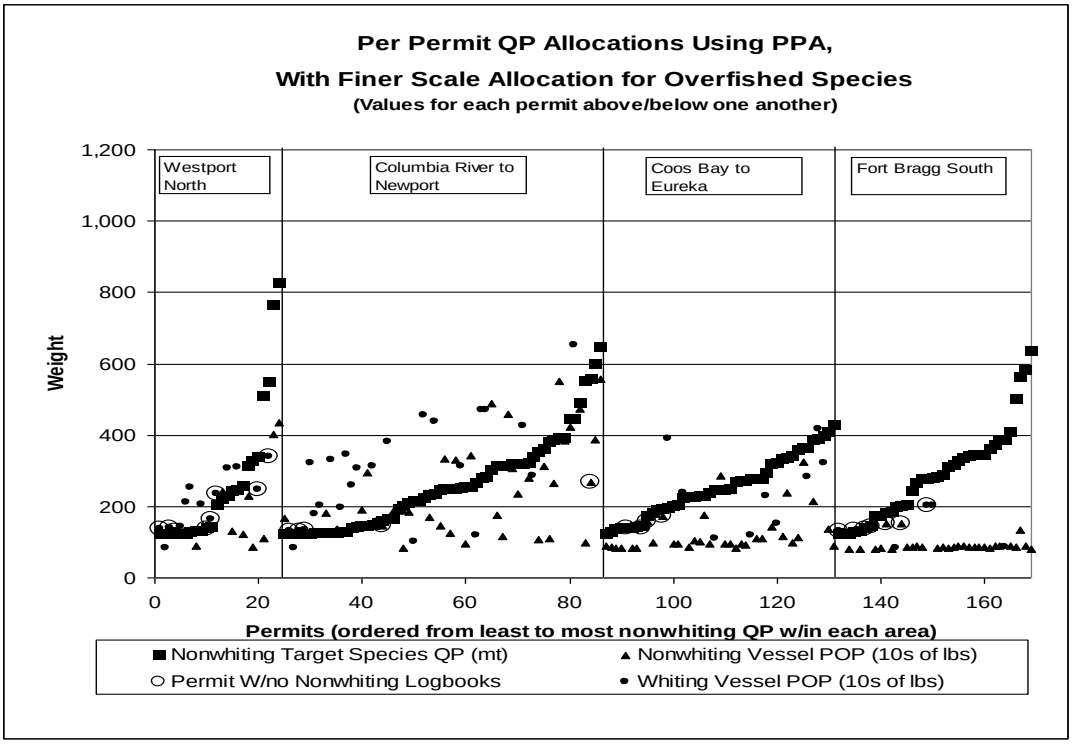


Figure A-73. Per permit allocations of nonwhiting target species and POP QP using 2010 allocations under the Council's PPA (any permit with some shoreside whiting trips was classified as a whiting permit, permit locations assigned based on primary port from 2004 to 2006).

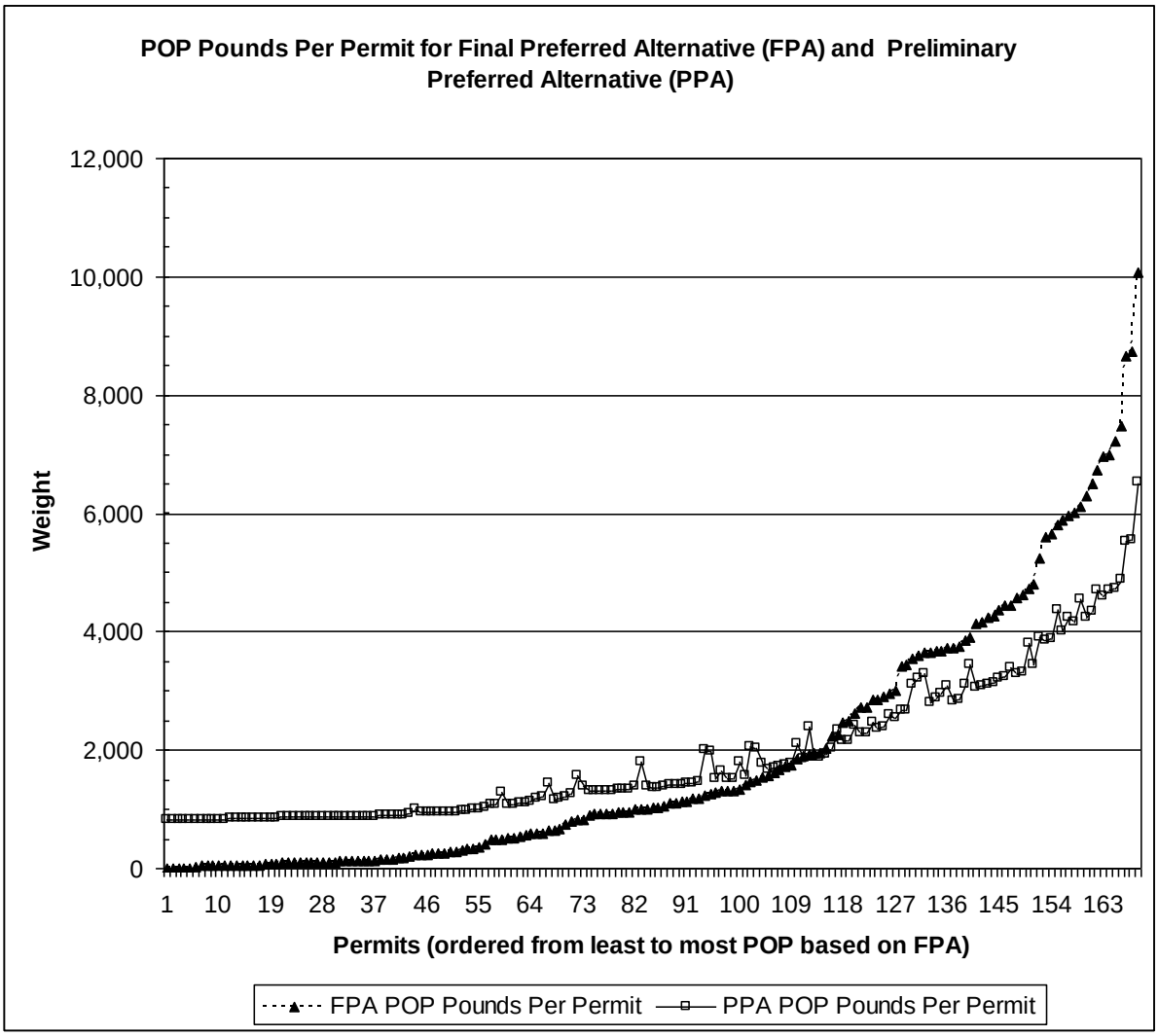


Figure A-74. Per permit allocations of POP QP under the Council's final and PPA (permits are arrayed in the same order for both alternatives).

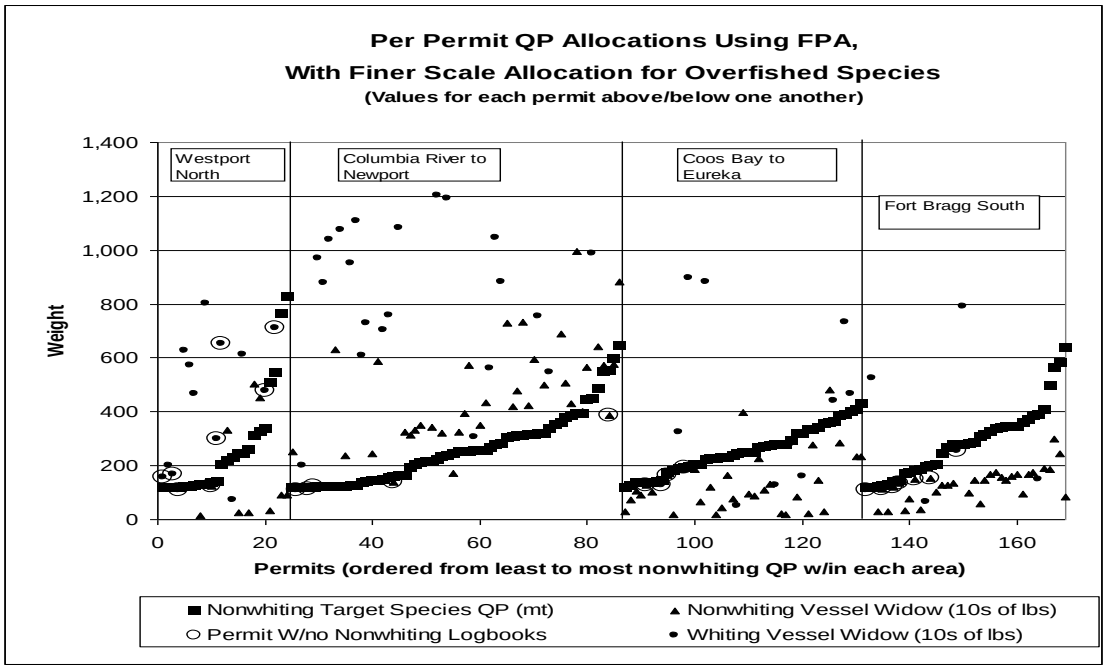


Figure A-75. Per permit allocations of nonwhiting target species and widow QP using 2010 allocations under the Council's final preferred alternative (any permit with some shoreside whiting trips was classified as a whiting permit, permit locations assigned based on primary port from 2004 to 2006).

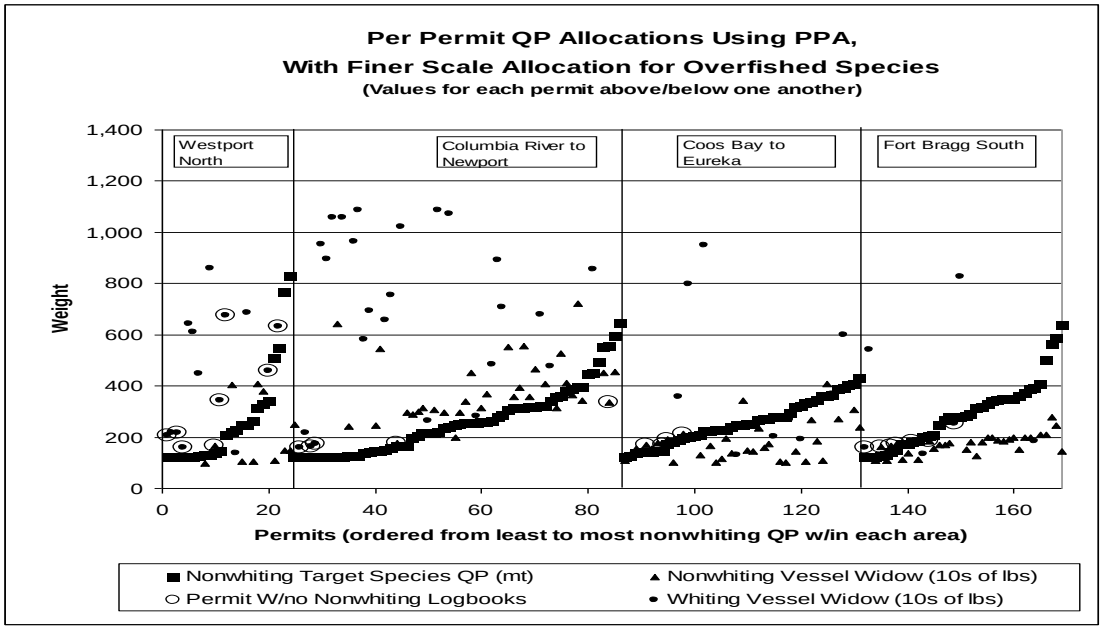


Figure A-76. Per permit allocations of nonwhiting target species and widow QP using 2010 allocations under the Council's PPA (any permit with some shoreside whiting trips was classified as a whiting permit, permit locations assigned based on primary port from 2004 to 2006).

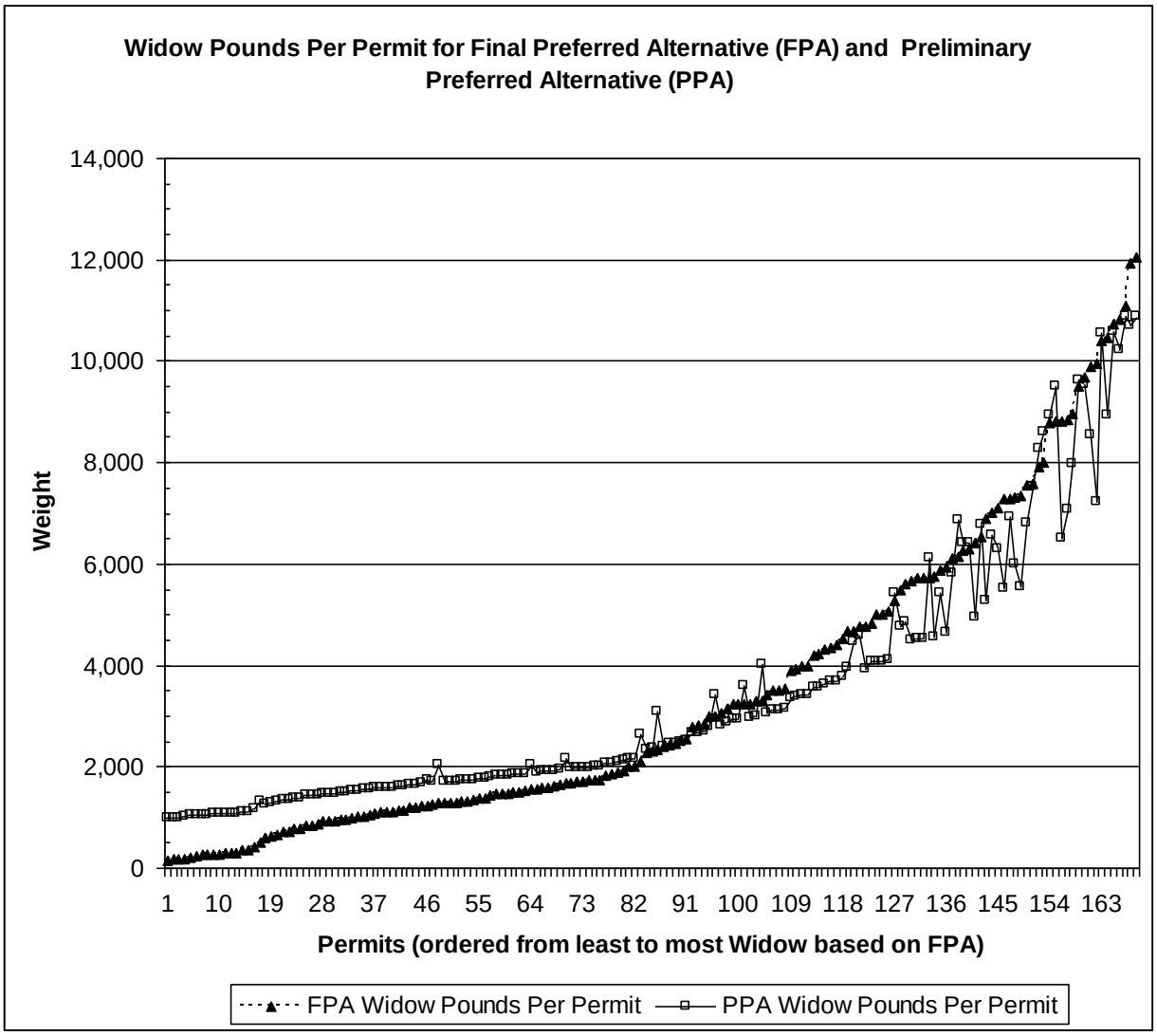


Figure A-77. Per permit allocations of widow QP under the Council's final and PPA (permits are arrayed in the same order for both alternatives).

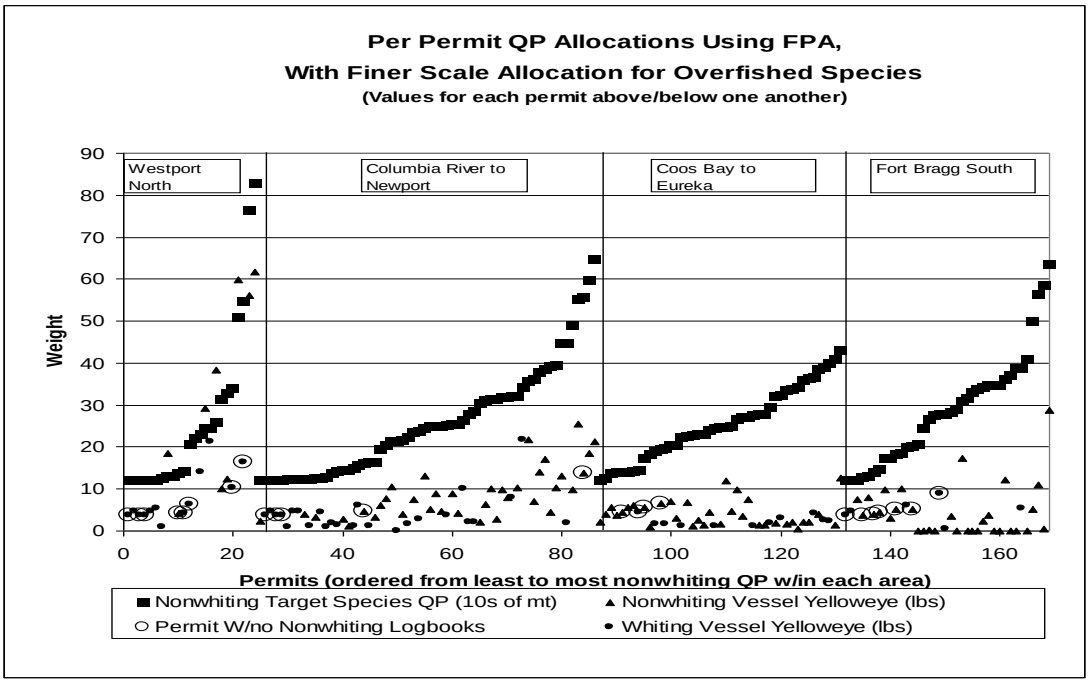


Figure A-78. Per permit allocations of nonwhiting target species and yelloweye QP using 2010 allocations under the Council's final preferred alternative (any permit with some shoreside whiting trips was classified as a whiting permit, permit locations assigned based on primary port from 2004 to 2006).

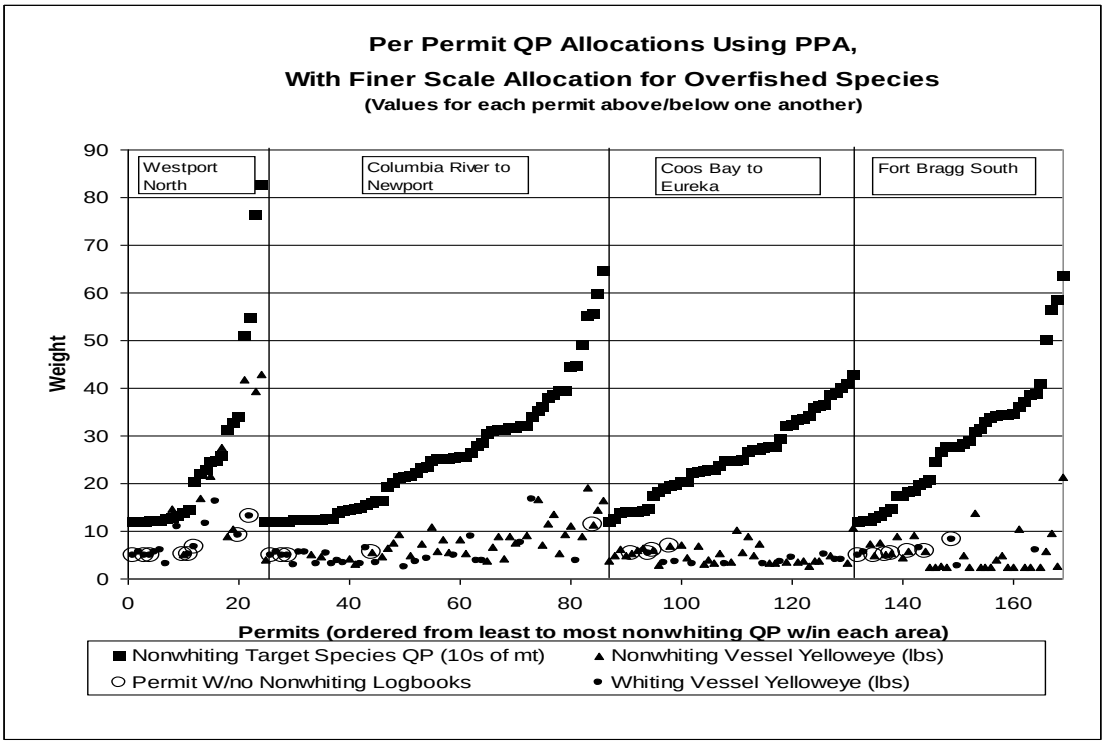


Figure A-79. Per permit allocations of nonwhiting target species and yelloweye QP using 2010 allocations under the Council's PPA (any permit with some shoreside whiting trips was classified as a whiting permit, permit locations assigned based on primary port from 2004 to 2006).

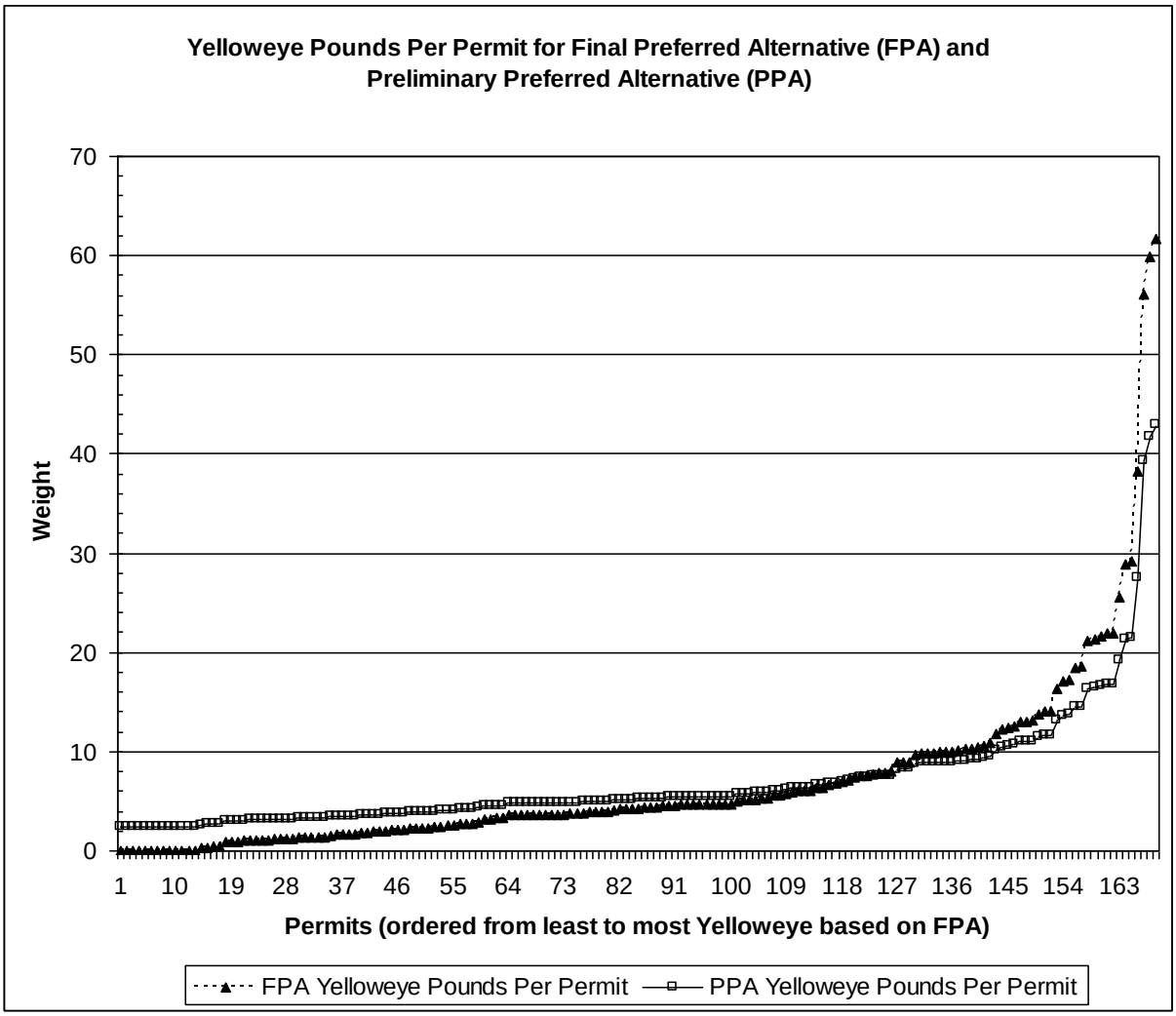


Figure A-80. Per permit allocations of yelloweye QP under the Council's final and PPA (permits are arrayed in the same order for both alternatives).

Area Assignments

- Rationale and Options Considered But Not Included

The assignment of catch area for landings recorded on fish tickets affects the allocation of QS for management units that have geographic subdivisions. Under the final preferred alternative, catch area would be assumed to be the same as the area of landing. This approach is used because, in the past, the catch area has often not been filed out, or when it is filled out, is not believed to have been filled out reliably. The catch area is filled out by the buyer rather than vessel and it is believed that they often assume that the catch area is the same as the area off the port. Catch area data quality will be a concern on tickets going back as far as 1994, the start of the allocation period.

- Interlinked Elements

The area assignment decisions would be most important if all management units have geographic subdivisions. Providing geographic subdivisions for all species was an option in Section A-1.2 that was

not selected as part of the Council's FPA. The FPA provides geographic subdivisions of the IFQ management units only for those species with an existing geographic subdivision in the ABC/OY.

- Analysis

There is unevenness in the data quality for area of catch information across geographic areas, across time, and between buyers. On one hand, landing area provides a reasonable approximation to catch area, resolves missing data aresues, and ensures that everyone is treated the same in the assignment of their landing history to an area. On the other hand, if some vessels have travelled outside of their local area to fish, by not using the area of catch information available, a greater mismatch between the permit's initial allocation and its actual fishing pattern is created than necessary. Use of ports as a proxy for catch areas could also be a complicating factor if logbook data are used to allocate overfished species and the area information from the logbooks does not match the catch area assumed based on the port of landing.

The degree to which the quality of the area of catch data are of concern depends on the species for which there are geographic subdivisions and the degree to which permits cross between areas. The final preferred alternative would create north and south QS for those species for which a north-south subdivision already exists in the ABC/OY table. Table A-68 provides the species that are either subdivided geographically, or managed as parts of different management units depending on the geographic region (e.g., bocaccio is managed separately in the south but managed as part of minor shelf rockfish in the north).

Table A-69. Species for which the OY varies by geographic area.

Species	Geographic Division/Differences in OY
Species with Geographic Subdivisions of OY	
Sablefish	OY split north and south of 36° N
Shortspine Thornyhead	OY split north and south of 34°27' N
Longspine Thornyhead (longspine south is not an IFQ species)	OY split north and south of 34°27' N
Black Rockfish (not an IFQ species)	OY split between WA and OR-CA
Minor Rockfish	.
Nearshore (not an IFQ species group)	OY split north and south of 40°10' N
Shelf	OY split north and south of 40°10' N
Slope	OY split north and south of 40°10' N
Species Managed W/Different Species Groupings North and South	
Bocaccio	Separate OY south of 40°10' N. Part of Minor Shelf Rockfish in the north.
Chilipepper	Separate OY south of 40°10' N. Part of Minor Shelf Rockfish in the north.
Cowcod	Separate OY south of 40°10' N. Part of Minor Shelf Rockfish in the north.
Splitnose	Separate OY south of 40°10' N. Part of Minor Slope Rockfish in the north.
Yellowtail	Separate OY north of 40°10' N. Part of Minor Shelf Rockfish in the south.
Pacific Ocean Perch	Separate OY north of 40°10' N. Part of Minor Slope Rockfish in the south.
Cabezon (not an IFQ species)	Separate OY in California. Part of Other Fish in Oregon and Washington.

Logbook data show that while vessels tend to center their activity around their port of landing they will sometimes travel moderate distances to fishing grounds. Appendix C provides maps showing the distances that vessels tend to travel from their ports of landing. For example, vessels out of Astoria will sometimes fish as far north as Neah Bay. Based on the Appendix C maps and with respect to a latitudinal division at 40°10' north latitude, catch area assignments based on port of landing would not appear to create a substantial deviation from catch area assignments based on ports. There is very little overlap of fishing grounds for vessels coming out of ports to the north and south of 40°10' north latitude. The greatest areas of overlap are between vessels based out of Astoria and Washington catch areas and at the Oregon-California border. For these areas, there are no geographic subdivisions for any

species managed under the scope of the IFQ program). Further south, assigning catch area based on landing port may create some problems for permits of vessels that fished out of Moss Landing (36° 49' north latitude) or Morro Bay 35° 20' north latitude but took their catch south of 36° north latitude (sablefish) or 34° 27' north latitude (thornyheads). If an assignment is made based on port area, catch that actually occurred to south of these lines would be counted to the north.

For those species for which the approach to area of catch will make a difference for some permits, we have displayed the results from the initial allocation using ports to determine area of catch and using area as reported on fish tickets to determine area of catch (Figure A-103 through Figure A-112). For shortspine thornyheads south, the coding used in the catch area field does not allow us to determine whether catch occurred north or south of the dividing line. For this species, port is used to identify area of catch in both methods. For overfished species with area divisions (bocaccio, cowcod, and POP) the allocations are driven by amounts of target species QS and effort distribution, as recorded in logbooks, not the assignment of catch areas as recorded on fish tickets. Only a few of the numerous target species have an area component, and the effect on those species is minor. Therefore, the impact of this decision on the distribution of overfished species QS is nearly imperceptible. For all other species in Table A-68, the approach used makes a relatively minor difference in the permit allocations for most species, the exception being for sablefish south of 34°27 north. However, a single entity owns permits with 60 percent of the relative pounds catch history in the sablefish south area, and another entity accounts for an additional third. Therefore, at the entity level, the difference between these two approaches is relatively minor for all affected species categories. Most of the analysis in the EIS uses the area identifier rather than the port identifier to evaluate catch history. However, based on the results provided here the difference between the two approaches would be of little consequence for policy level decisions.

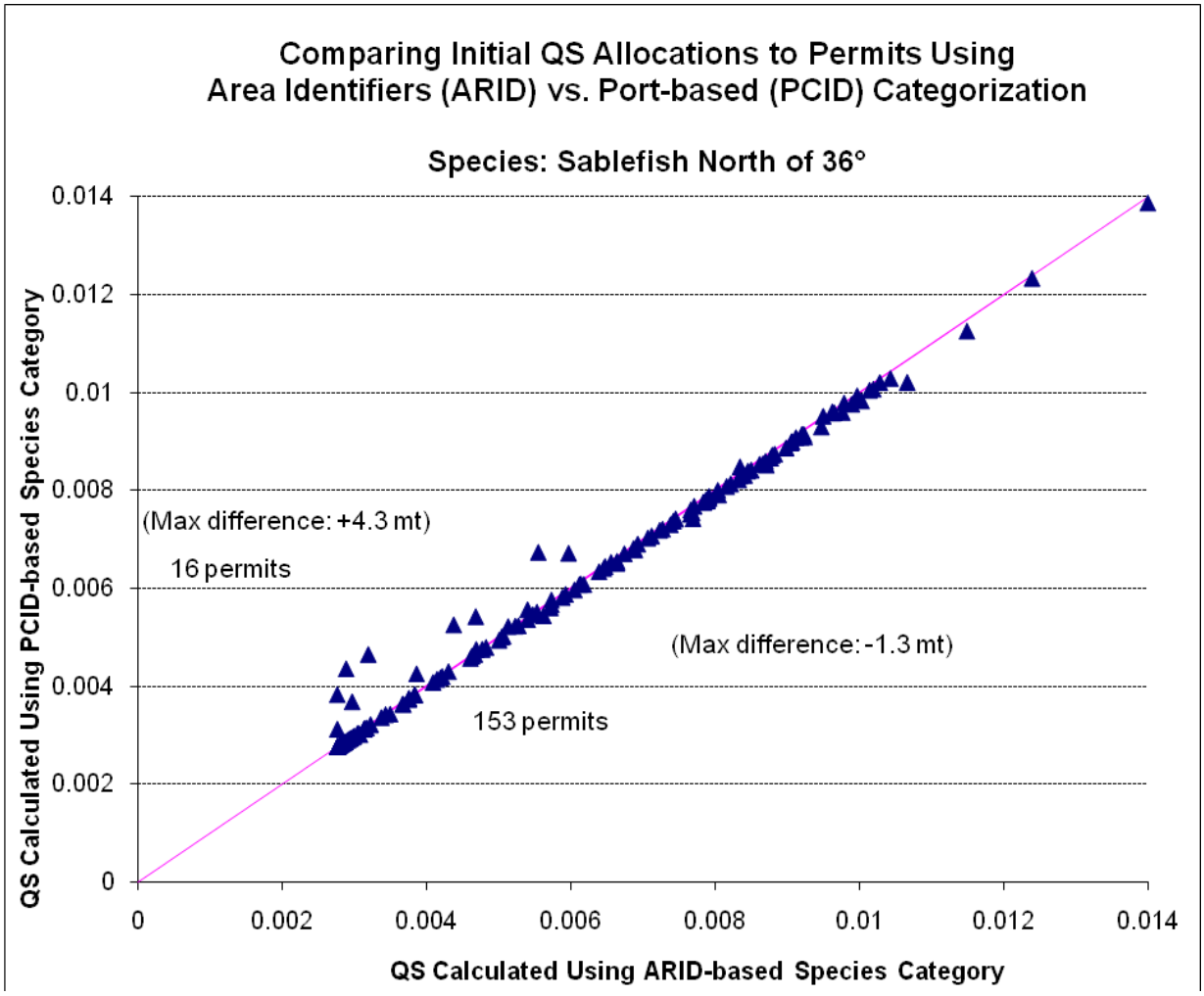


Figure A-81. Comparison of initial allocations of sablefish north QS using port (PCID) to determine area as compared to using area of catch as coded on fish tickets (ARID) to determine area.

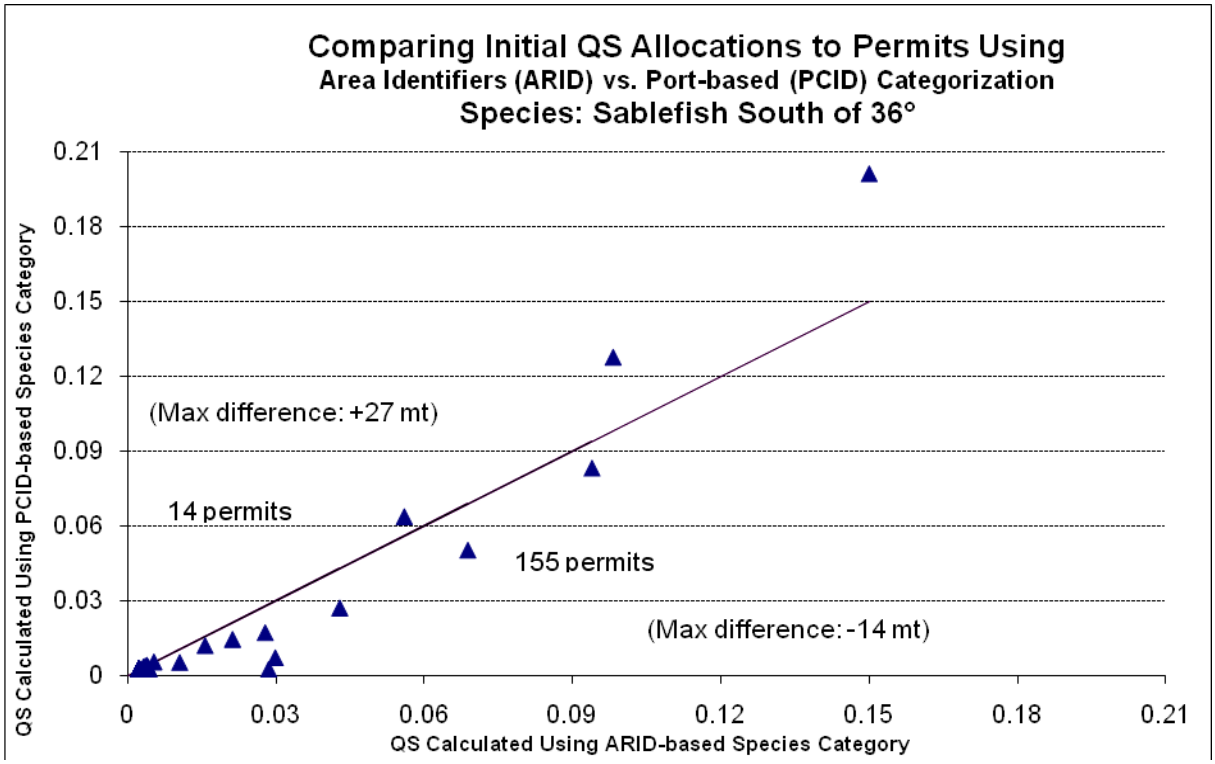


Figure A-82. Comparison of initial allocations of sablefish south QS using port (PCID) to determine area as compared to using area of catch as coded on fish tickets (ARID) to determine area.

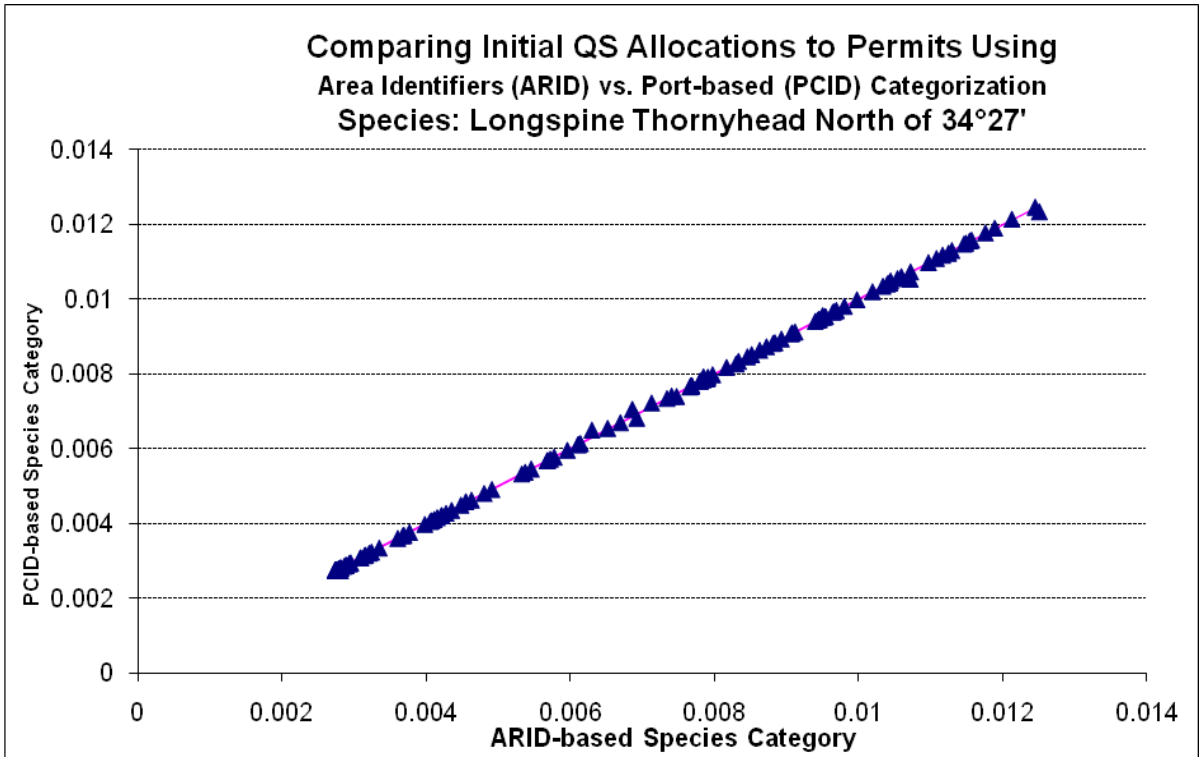


Figure A-83. Comparison of initial allocations of longspine thornyhead north QS using port (PCID) to determine area as compared to using area of catch as coded on fish tickets (ARID) to determine area.

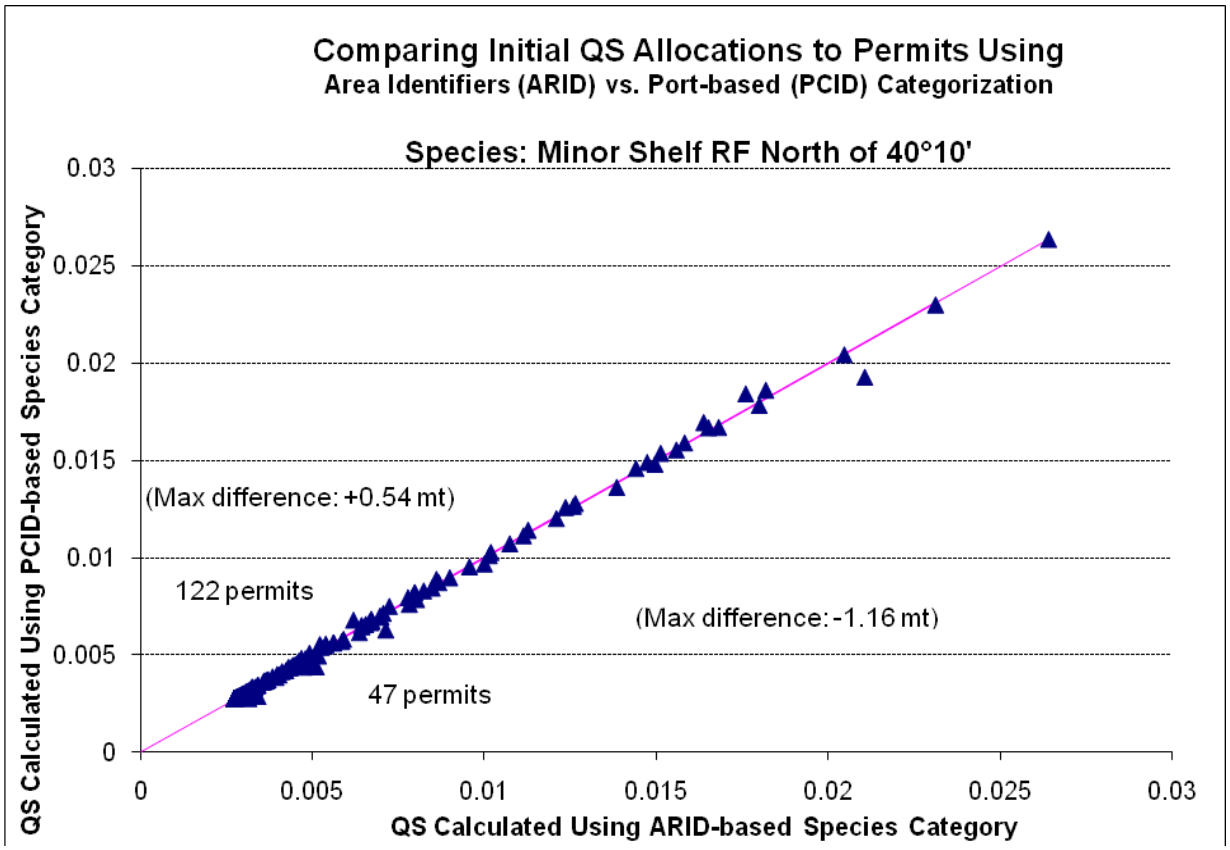


Figure A-84. Comparison of initial allocations of minor shelf rockfish north QS using port (PCID) to determine area as compared to using area of catch as coded on fish tickets (ARID) to determine area.

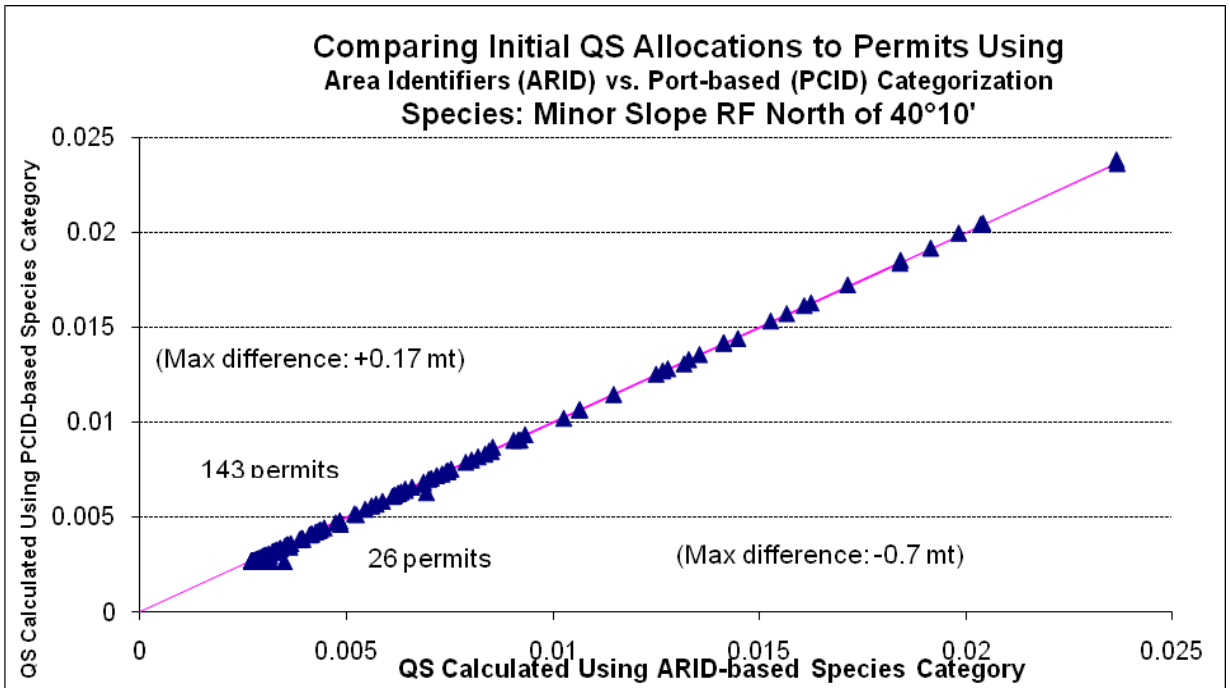


Figure A-85. Comparison of initial allocations of minor slope rockfish north QS using port (PCID) to determine area as compared to using area of catch as coded on fish tickets (ARID) to determine area.

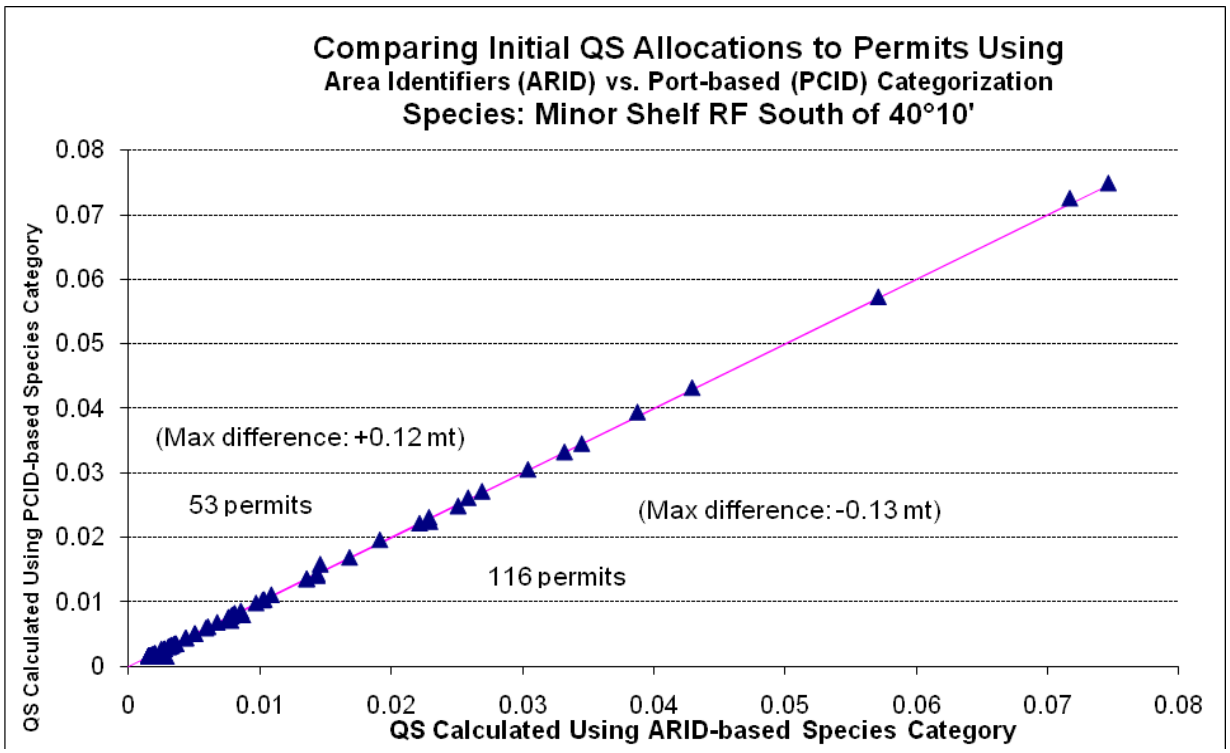


Figure A-86. Comparison of initial allocations of minor shelf rockfish south QS using port (PCID) to determine area as compared to using area of catch as coded on fish tickets (ARID) to determine area.

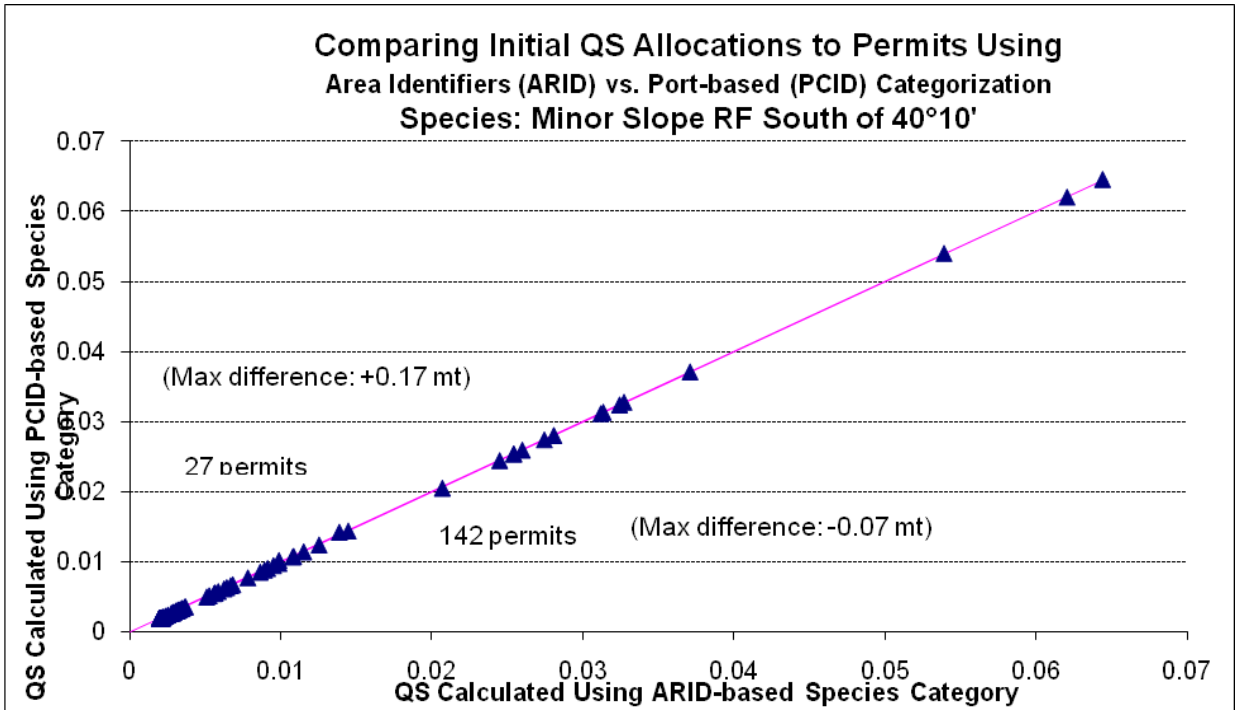


Figure A-87. Comparison of initial allocations of minor slope rockfish south QS using port (PCID) to determine area as compared to using area of catch as coded on fish tickets (ARID) to determine area.

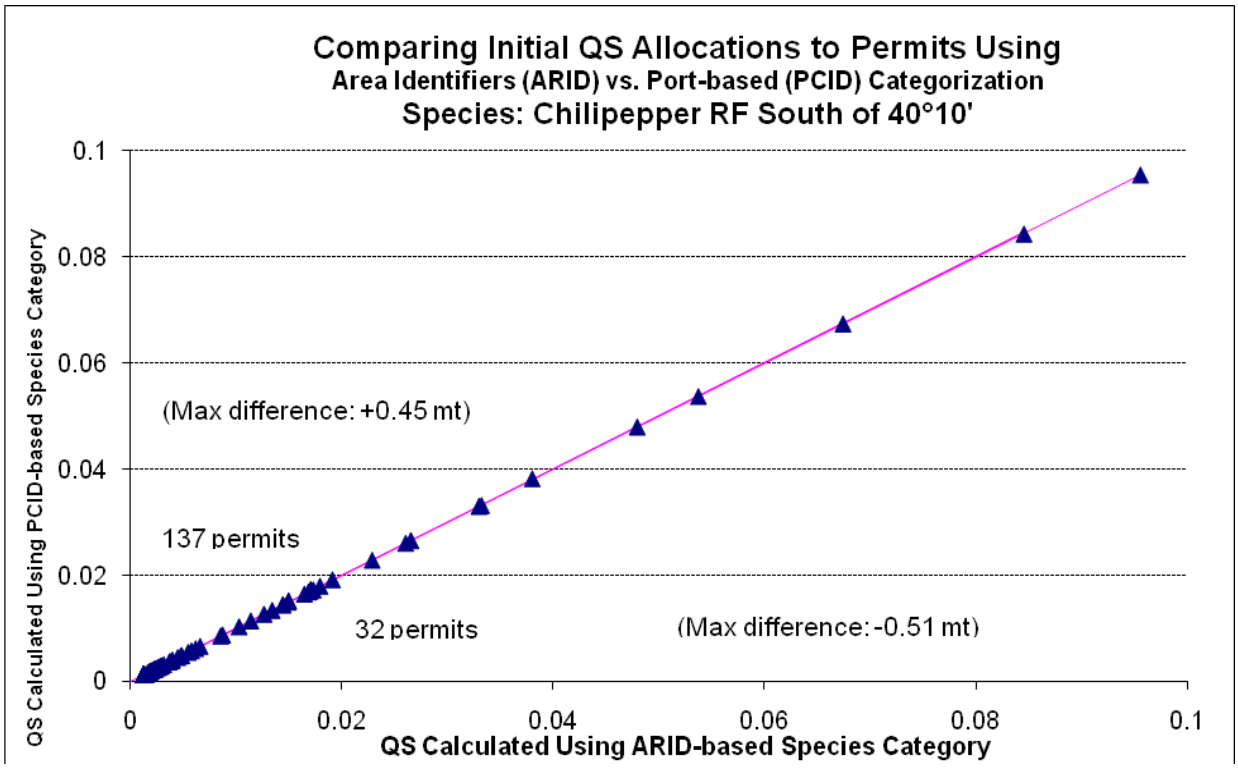


Figure A-88. Comparison of initial allocations of chilipepper QS using port (PCID) to determine area as compared to using area of catch as coded on fish tickets (ARID) to determine area.

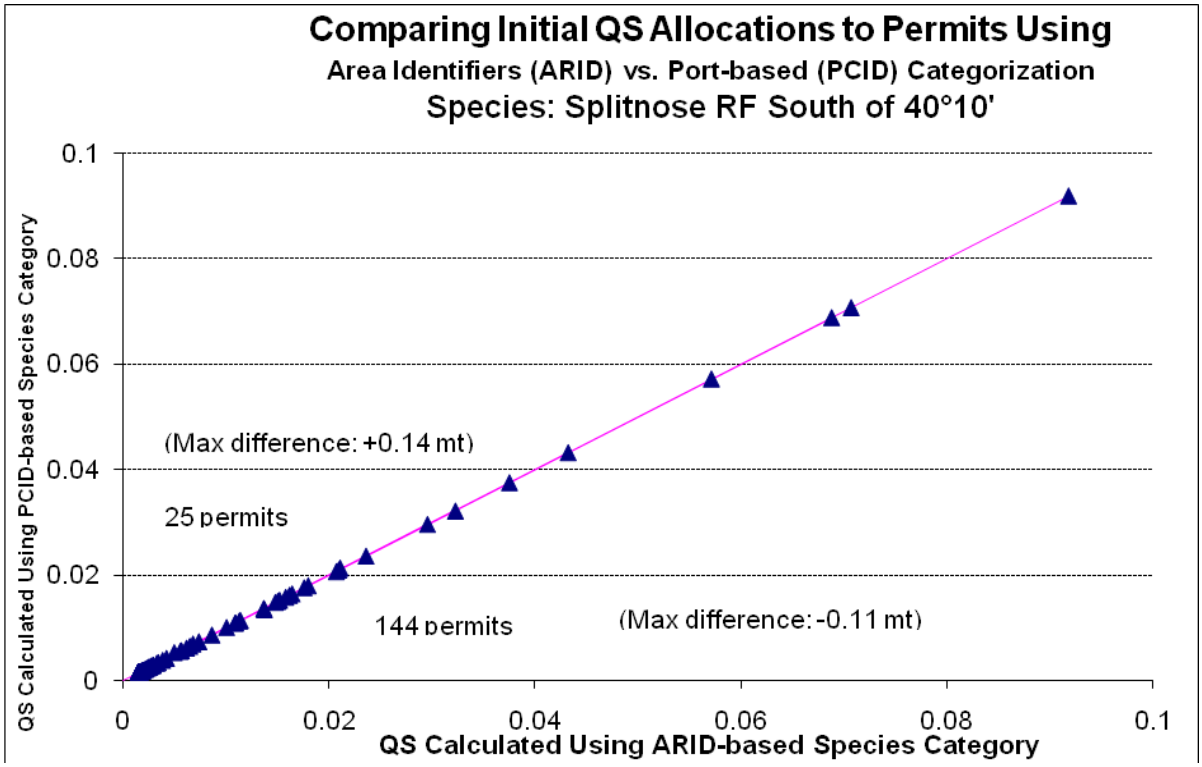


Figure A-89. Comparison of initial allocations of splitnose rockfish QS using port (PCID) to determine area as compared to using area of catch as coded on fish tickets (ARID) to determine area.

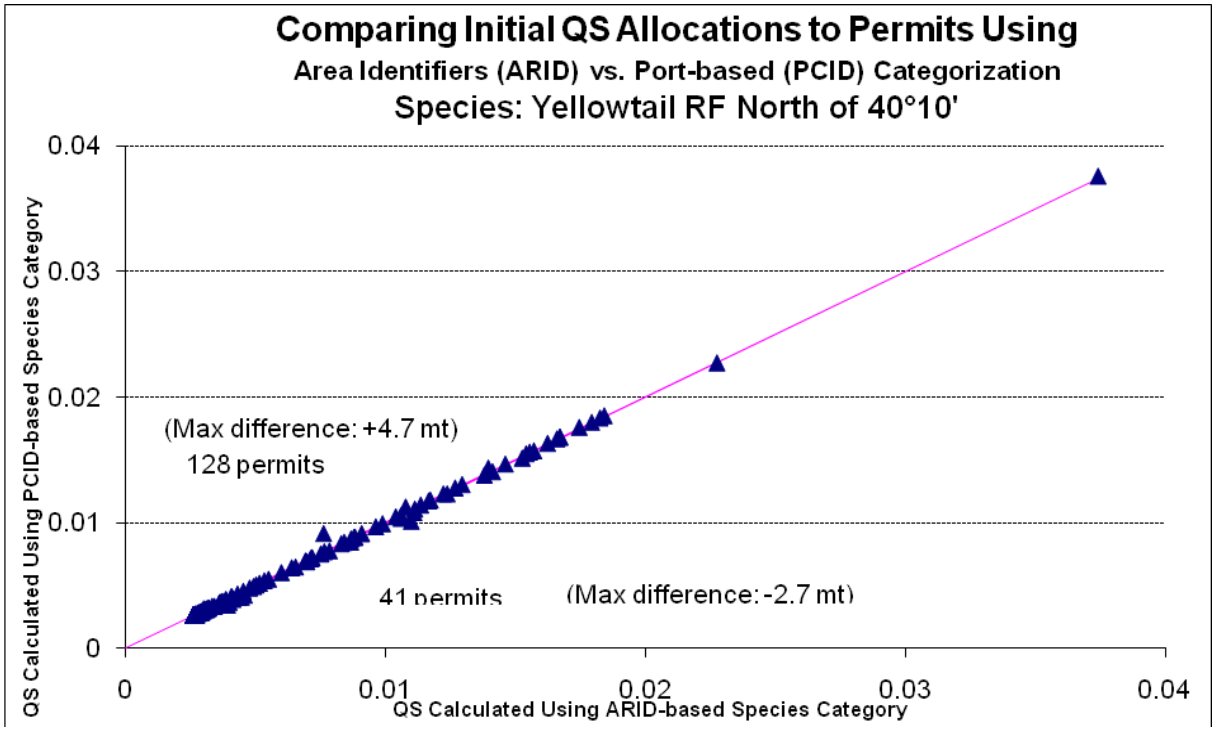


Figure A-90. Comparison of initial allocations of yellowtail rockfish QS using port (PCID) to determine area as compared to using area of catch as coded on fish tickets (ARID) to determine area.

Relative History

- Rationale and Options Considered But Not Included

Relative history is used instead of absolute pounds as a way of taking into account changes in fishing opportunity between years. Using relative history, each permit's history for each year is measured as a share of the fleet total for that year rather than in pounds (absolute history). Under the relative pound approach, harvesters that landed fewer pounds during a year because of low fishing opportunities but still performed as a "highliner" relative to other harvesters in the year will receive the same credit as a harvester that put in relatively similar "highliner" effort when total available harvests were greater. Because of the declining trend in harvest, use of relative history increases the emphasis on history occurring in the later part of the allocation period, (i.e., increases the emphasis on more recent participation).

- Interlinked Elements

The weighting formula results in some very high weighting for some years for rarely caught species (e.g., kelp greenling and overfished species). Additional attention may be needed for the weightings of some of these species depending on whether or not they are included within the scope of the program (Section A-1.1) or an alternative allocation approach is used (application of bycatch rates to target species QS to allocate overfished species). The Council's final FPA excludes some of the rarely caught species that are not overfished and uses a bycatch rate approach for overfished species. Since the bycatch rate approach is used for overfished species, these species will not be affected by the use of the relative history measurement of landings history.

- Analysis

The following are the categories of goals and objectives affected by the decision on whether to use relative history (shares of annual catch) or pounds.

	Related Category of Goals and Objectives										
	Conservation	Net Benefits	Disruption	Excessive Shares	Fairness and Equity	Harvester and Processor Sector Health	Labor	Communities	Small Entities and New Entrants	General Public	Program Performance
		X	X		X	X	X	X			

The relative history approach to allocation bases each permit's QS on its landings history for each year of the allocation period, measured as a proportion relative to the catch of the fleet. The permit's QS is then determined by summing the annual ratios of a permit's catch of a given species in a given year and dividing by the sum of the ratios for all vessels across all years. The effect of this calculation is to weight each year's catch by the ratios displayed in Table A-69. For example, a pound of sablefish caught in 1996 would give a permit about half as much credit toward an allocation as a pound caught in 2003.[60] The ratios between years for some overfished species are very high, more than a hundred to one (2003:1994), however, under the final preferred alternative allocation for these species will be based on bycatch rates applied to target species QS rather than actual landing history for the overfished species. Similarly, there are some very large ratios for species like kelp greenling. Some of these species have not been included in the alternative scope for the program (see Section A-1.1). For selected species, Table A-70 provides the relative weight for a pound of catch each year, examples of three actual catch histories and the differences in allocation that result depending on whether a relative or absolute approach is used. Also shown for each species (grey box) is the difference in weighting between the year given the greatest weight and that given the least weight. For example, for nearshore rockfish a pound caught in 2003 would be the equivalent of 50 pounds caught in 1998.

On one hand, relative history may be considered more fair and equitable because it weighs each vessel's performance each year based on how it did in its competition with the rest of the fleet given the opportunities present that year (its relative effort level). On the other hand, some may view it as most equitable to distribute QS to benefit those with the greatest investment in the fishery; and the amount and distribution of private and community capital involved in the fishery may be more related to total harvests than the proportion of harvest each year. It should also be noted that under a relative weighting scheme, as compared to a straight summing of pounds, catch histories that diverge from the pattern exhibited by the entire fleet tend to be rewarded when determining an initial allocation.

The relative history measure puts a heavier emphasis on more recent landing history because landings have generally declined during the 1994 to 2003 allocation period. This may be consistent with MSA language that encourages consideration of current harvests when making an initial allocation.

[60] While 2003 is the base year used in Table A-69, the choice of which year in the period to use as the base year does not make a difference with respect to illustrating the implicit relative weights).

Increasing the emphasis on more recent years through the mechanism of relative weighting could better reflect the distribution of capital and labor in the fishery. The MSA also encourages consideration of historic harvest, which may also relate to the current distribution of capital in a fishery depending on the particular circumstances of the fishery.

Alignment of the initial allocation to existing patterns of investment and participation in the fishery reduces disruption to labor, capital, the fishing sector, and communities. Reduced disruption implies greater net benefits because there will be less need for transactions to bring the distribution of capital and labor and the distribution of QS into line with one another. There are two issues to be considered, the amount and distribution of investments and whether they are currently used. The amount and distribution of private and community capital involved in the fishery may be more related to total harvests than the proportion of harvest each year. When there is a contraction in production, fixed capital assets that cannot be easily moved to other uses may persist. There has been a recent contraction in the groundfish fishery. Depending on how long the capital persists in a particular use after the investment is made, harvests during more distant years of higher production may have a greater correlation with the current distribution of capital in the fishery than more recent years in which harvest has been lower. During an expansion, recent year history might reflect current distribution but during a contraction recent history is more likely to indicate where existing capital is still in use (and the current distribution of human capital) but less likely to indicate the distribution of all relevant capital. During a contraction, the capital that remains active may be that which is most efficient or otherwise most beneficial to keep in production and, therefore, that which is likely to persist as the fishery is rationalized. Under such circumstances, even if existing capital is distributed in a manner that correlates more with older history, using a QS allocation formula with greater emphasis on recent history may allocate QS to those entities with the assets still in use, e.g., the assets most likely to persist during the initial implementation and rationalization period. Such an allocation might be expected to result in less disruption. As discussed above, because of the recent contraction in the fishery, the relative history approach increases emphasis on recent history, as compared to a straight summing of a permit's total history across all years.

Table A-70. Illustration of relative lb "weights" (sector catch in year 2003 divided by annual catch): 1994 to 2004.

Stocks or Stock Complex	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Lingcod - coast wide	0.04	0.06	0.05	0.05	0.28	0.28	0.91	1.04	0.59	1.00	1.04
N. of 42° (OR & WA)	0.05	0.06	0.05	0.06	0.34	0.36	1.26	1.54	0.73	1.00	1.14
S. of 42° (CA)	0.04	0.04	0.04	0.04	0.16	0.15	0.43	0.46	0.33	1.00	0.78
Pacific Cod	1.26	2.12	2.40	1.77	2.57	3.76	3.80	3.30	1.51	1.00	0.94
Pacific Whiting											
Shoreside Nonwhiting	0.60	0.43	0.46	0.26	0.27	1.17	0.84	1.20	0.77	1.00	2.06
Shoreside Whiting	0.70	0.68	0.62	0.59	0.58	0.61	0.60	0.70	1.12	1.00	0.55
At-Sea Whiting (MS)	0.46	0.79	0.58	0.53	0.52	0.55	0.61	0.73	0.98	1.00	1.08
At-Sea Whiting (CP)	0.48	0.67	0.63	0.58	0.59	0.61	0.61	0.70	1.13	1.00	0.56
Sablefish (Coast wide)	0.66	0.63	0.56	0.63	1.08	0.74	0.86	0.92	1.61	1.00	0.95
N. of 36° (Monterey north)	0.67	0.64	0.57	0.63	1.11	0.73	0.85	0.90	1.61	1.00	0.95
S. of 36° (Conception area)	0.51	0.38	0.36	0.51	0.68	0.94	2.15	2.74	1.59	1.00	0.97
PACIFIC OCEAN PERCH	0.15	0.16	0.16	0.20	0.22	0.25	0.97	0.70	0.89	1.00	1.01
Shortbelly Rockfish	0.01	0.01	0.01	0.00	0.01	0.10	0.01	0.05	3.08	1.00	2.65
WIDOW ROCKFISH	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	1.00	0.46
CANARY ROCKFISH	0.01	0.01	0.01	0.01	0.01	0.01	0.21	0.32	0.18	1.00	1.17
Chilipepper Rockfish	0.01	0.01	0.01	0.00	0.01	0.01	0.02	0.02	0.05	1.00	0.19
BOCACCIO	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	1.00	0.02
Splitnose Rockfish	0.52	0.55	0.37	0.35	0.12	0.73	1.80	1.67	2.70	1.00	0.92
Yellowtail Rockfish	0.02	0.03	0.02	0.08	0.06	0.06	0.04	0.07	0.14	1.00	1.08
Shortspine Thornyhead - coast wide	0.22	0.36	0.44	0.48	0.56	0.93	0.87	1.41	1.00	1.00	1.00
N. of 34°27'	0.21	0.38	0.43	0.46	0.54	0.88	0.96	1.32	1.08	1.00	1.06
S. of 34°27'	0.27	0.32	0.47	0.50	0.62	1.09	0.72	1.67	0.85	1.00	0.90
Longspine Thornyhead - coast wide	0.38	0.29	0.33	0.40	0.70	0.88	1.09	1.37	0.82	1.00	2.15
N. of 34°27'	0.38	0.29	0.33	0.40	0.70	0.88	1.09	1.37	0.82	1.00	2.15
S. of 34°27'	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	E	0.00	0.00
COWCOD	0.00	0.00	E	0.00	0.00	0.00	0.00	0.00	E	0.00	0.00
DARKBLOTCHED	0.10	0.11	0.11	0.10	0.09	0.23	0.33	0.52	0.74	1.00	0.42
YELLOWEYE	0.01	0.01	0.01	0.01	0.03	0.04	0.79	0.49	1.02	1.00	2.93
Black Rockfish - coast wide	0.02	0.10	0.05	0.04	0.01	0.19	0.48	0.93	0.27	1.00	0.37
Black Rockfish (WA)	E	E	0.00	E	E	0.00	0.00	0.00	E	0.00	0.00
Black Rockfish (OR-CA)	0.02	0.15	0.05	0.04	0.01	0.19	0.48	0.93	0.30	1.00	0.37
Minor Rockfish North	0.07	0.09	0.09	0.10	0.10	0.20	0.43	0.45	1.20	1.00	0.69
Nearshore Species	0.40	0.30	12.02	0.94	0.05	1.73	0.76	0.47	0.36	1.00	0.20
Shelf Species	0.02	0.02	0.02	0.02	0.02	0.05	0.36	0.10	0.43	1.00	1.61
Slope Species	0.13	0.18	0.20	0.19	0.29	0.41	0.44	0.94	1.63	1.00	0.64
Minor Rockfish South	0.29	0.27	0.20	0.21	0.23	1.54	1.08	0.88	0.48	1.00	0.79
Nearshore Species	0.11	0.05	0.02	0.03	0.54	0.03	0.98	1.54	0.54	1.00	3.26
Shelf Species	0.02	0.01	0.01	0.01	0.01	0.08	0.09	0.12	0.19	1.00	1.52
Slope Species	0.41	0.37	0.26	0.29	0.33	2.49	1.28	0.97	0.50	1.00	0.78
California scorpionfish	E	0.00	0.00	E	0.00	0.00	0.00	E	E	0.00	0.00
Cabezon (off CA only)	E	0.00	E	0.00	0.00	E	E	E	E	0.00	0.00
Dover Sole	0.86	0.72	0.61	0.74	0.93	0.82	0.85	1.09	1.18	1.00	1.05
English Sole	0.79	0.77	0.76	0.60	0.76	0.96	1.15	0.89	0.76	1.00	0.96
Petrale Sole (coast wide)	1.49	1.22	1.08	1.04	1.33	1.32	1.05	1.09	1.09	1.00	1.02
Arrowtooth Flounder	0.74	1.00	1.06	0.99	0.72	0.43	0.70	0.94	1.11	1.00	0.97
Starry Flounder	0.40	0.58	1.04	0.49	0.55	1.31	1.15	3.96	1.58	1.00	0.24
Other Flatfish	0.68	0.62	0.79	0.81	0.96	0.78	0.97	0.92	0.91	1.00	1.16
Kelp Greenling	0.13	0.01	0.33	0.00	0.35	0.00	0.00	0.85	34.00	1.00	0.00
Spiny Dogfish	0.19	0.55	1.01	0.59	0.49	0.46	0.72	0.59	0.44	1.00	1.65
Other Fish	0.26	0.26	0.30	0.40	0.36	0.70	0.95	0.96	1.22	1.00	2.04

Table A-71. Relative weight of landing history for each year of the allocation period using 2003 as the base year (2003 value = 1.0) and comparative histories and QS allocations using pounds (Abs) and relative history (Rel) for actual permits with histories categorized as strong early, strong late, and consistent.

	Year										QS Allocations		% Change (Relative compared to Absolute)
	'94	'95	'96	'97	'98	'99	'00	'01	'02	'03	Abs	Rel	
Sablefish													
Weight	.66	.63	.56	.63	1.08	.74	.86	.92	1.61	1.00			
Greatest Difference: Relative Credit - 2002 vs. 1996 ==>>									**2.88**				
Permit History	Pounds of Harvest History												
Strong Early	24,065	41,773	60,763	49,192	35,528	56,317	43,925	32,718	0	0	0.49	0.45	-0.08
Strong Late	0	0	0	30	0	1,318	1,872	20,897	15,124	18,694	0.10	.13	0.36
Consistent	2,992	2,344	9,913	8,631	12,169	15,392	7,997	33,450	16,335	19,848	.20	.24	0.18
Lingcod													
Weight	.04	.06	.05	.05	.28	.28	.91	1.04	.05	1.00			
Greatest Difference: Relative Credit - 2001 vs. 1994 ==>>								**26**					
Permit History	Pounds of Harvest History												
Strong Early	2,162	2,969	31,230	72,004	3,143	1,810	715	38	0	0	0.93	0.52	-0.44
Strong Late	109	146	102	94	85	129	134	386	466	2,152	0.06	0.44	6.66
Consistent	5,020	2,789	2,195	3,029	2,321	2,817	1,332	1,011	1,128	2,234	0.21	0.68	2.16
Canary													
Weight	.01	.01	.01	.01	.01	.01	.21	.32	.18	1.00			
Greatest Difference: Relative Credit - 2003 vs. 1994 ==>>										**100**			
Permit History	Pounds of Harvest History												
Strong Early	12,542	10,277	82,980	31,806	33,781	18,020	0	61	-	-	1.79	0.95	-0.47
Strong Late	21	0	0	4	54	164	402	106	398	11	0.01	0.15	1182
Consistent	2,077	2,104	1,957	1,639	3,296	3,659	903	771	479	299	0.16	0.53	228
Kelp Greenling													
Weight	.13	.01	.33	-	.35	-	-	.85	34.00	1.00			
Greatest Difference: Relative Credit - 2002 vs. 1995 ==>>									**3400**				
Permit History	Pounds of Harvest History												
Consistent	.00	.00	.00	.00	.00	.00	.00	.00	1.00	.00	0.03	9.09	35,240
Nearshore Shelf Rockfish													
Weight	0.02	0.02	0.02	0.02	0.02	0.05	0.36	0.1	0.43	1			
Greatest Difference: Relative Credit - 2003 vs. 1995 ==>>										**50**			
Permit History	Pounds of Harvest History												
Strong Early	3,792	11,305	27,646	12,575	10,657	7,486	327	4	-	-	0.57	0.37	-35
Strong Late	51	1	0	3	11	102	181	121	384	105	0.01	0.08	36
Const	4,682	172	315	208	323	585	143	161	764	17	0.06	0.15	18

Allocation Formula Results

In Section A-2.1.1, figures are provided illustrating a number of comparisons of the Council's final and PPA to a variety of allocation formulas and to the distribution of landings among permits in 2004 to 2006 (Figure A-8 through Figure A-21). This information is provided for both processors and harvesters. In the section on Control Percentage Limits on page A-362, information is provided on the number of entities the initial allocation formulas would place over the limits and on initial allocations in comparison to recent and historic vessel activities. Table A-71 shows the effects of the expected geographic distribution of QS in comparison to the distribution of 2004 through 2006 landings, as measured by home office location. Estimates of the initial allocations for QS for all species for each permit have been placed on the Council letter for public reference (with masked permit identifiers) (http://www.pcouncil.org/groundfish/gffmp/gfa20/gfa20progtrack.html#qs).

Table A-72. Distribution of nonwhiting ex-vessel value from 2004 to 2006 compared to distribution of QP value, based on zip codes reported for the businesses that would receive the QS allocations assuming an 80/20 permit/processor split, equal allocation of buyback landing history, and a grandfather clause for initial allocations over the control limits ($ thousands).

	Ex-vessel Value (thousands of dollars)		
	2004-2006 Landings	**QP Distribution**	**Change**
Blain	299	67	-233
Bellingham	2,405	759	-1,646
Anacortes	265	225	-40
Port Townsend	-	0	0
Port Angeles	225	50	-175
Neah Bay	10	52	42
La Push	-	1	1
Grays Harbor	153	317	164
Westport	0	3	3
Willapa bay	339	385	47
Ilwaco	12	82	70
Other Washington and Oregon Inside	7,759	5,653	-2,106
Astoria	2,219	2,300	80
Tillamook	391	514	123
Newport	1,204	2,127	923
Waldport	0	0	0
Florence	28	107	78
Winchester Bay	-	0	0
Coos Bay	1,242	1,990	748
Bandon	93	191	98
Port Orford	81	138	57
Brookings	593	1,019	426
Gold Beach	-	0	0
Crescent City	378	488	110
Trinidad	-	0	0
Eureka	447	375	-72
Fields Landing	297	571	274
Fort Bragg	1,715	1,421	-294
Bodega Bay	180	334	154
San Francisco	1,485	1,755	270
Half Moon Bay	361	819	458
Oakland	0	1	0
Alameda	-	0	0
San Jose	0	9	9
Santa Cruz	162	186	24
Moss Landing	209	285	76
Monterey	795	919	123
Morro Bay	116	204	88
Avila	-	16	16
Other California	-	9	9
Other	6	100	
Total	23,471	23,471	

A-2.1.3.b Permits with Catcher-processor History

❖ *Provisions and Options*

This provision is not applicable to the preferred alternative because the final Council recommendation did not include IFQs for catcher-processors (see Appendix B). The section header is maintained to provide continuity of numbering and cross referencing in various documents generated during this process.

Allocate whiting QS based on permit history[61] for 1994-2003 (do not drop worst years) and using relative history as defined for catcher vessel permits.

For bycatch species (if IFQ is used for bycatch species):

Bycatch Option 1: use history for that species, as it is calculated for whiting

►**Bycatch Option 2:** use the whiting history as a proxy (i.e., allocation will be pro rata based on the whiting allocation).[62]

❖ *Rationale and Options Considered But Not Included*

The allocation methods proposed for catcher-processors differ from those for catcher vessels in that they do not include an equal allocation component or a drop-year provision. The rationales for aspects that are in common with the catcher vessel sector (use of permit history, the 1994 to 2003 allocation period, and use of relative history) are provided in the section on allocation to catcher vessel permits (Section A-2.1.3.a). The drop-year provision was not included because of the absence of a perceived need for consideration of possible hardship circumstances with respect to any of the initial recipients and because of the co-op arrangements under which the fleet has been managed. The equal allocation component was not included mainly because there was not a convenient source for the equal allocation QS. For the catcher vessels, that source was the buyback permits. No catcher-processor permits were bought back; therefore, there was not a similar pool of harvest history from which to draw on for the catcher-processor sector. However, the Council's FPA for catcher processors (a system that helps preserve the voluntary co-op) would default to an IFQ program if the current voluntary co-op system ended. Under such circumstances, IFQ would be allocated equally to all catcher-processor permits.

Since permits with catcher-processor history do not participate in the catcher vessel sector(s), they would not receive QS allocations for any catch history associated with permits that have been combined into catcher-processor permits. In contrast, catcher vessels and permits for catcher vessels move between the shore-based and at-sea whiting fisheries, so such permits are allowed to qualify for initial allocations for both sectors.

❖ *Interlinked Elements*

For catcher vessels and shoreside processors, one of the main elements linked to the initial QS allocation is the accumulation limit and grandfather clause (specifically the QS control limit, Section A-2.2.3.e). The allocations to catcher-processors would not approach the accumulation limit levels that were proposed for whiting; therefore, there would not be an interaction with the accumulation limit provisions.

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[61] Permit history from observer data.

[62] The Council's preliminary preferred alternative included the allocation of bycatch species in the mothership and catcher processor sectors pro rata based on the whiting allocation. These options could come into play if the Council does not go with its preliminary preferred alternative to adopt the co-op alternatives for these two sectors.

❖ Analysis

The allocation of QS to catcher processors would run from 3 percent to 23 percent with 6 of the 10 permits receiving between 7 and 13 percent of the QS allocation. For five of the permits, the allocation would be within 1 percent of their recent 2004 to 2006 average harvest. For the one permit that would receive the most QS, the amount of the allocation would be just over half of its recent year average. For those permits for there would be a substantial decrease, there could be some potential disruption, unless the voluntary co-op is able to continue to operate as a co-op under the IFQ program. Continuation of the co-op could be a challenge because the incentive to co-operate to avoid a race for fish would be gone. Additionally, those receiving the most QS might benefit most from operating on their own and hoping to acquire additional shares at a good price from those less able to operate efficiently. However there may be some cost-saving and co-operation opportunities that might preserve the voluntary co-op program, even under an IFQ system (for example, sharing observer costs).

Table A-73. Allocation to catcher processor permits using 1997 to 2003 landing history (relative history) and no-drop years.

	Catcher Processor Permits									
	CP-1	**CP-2**	**CP-3**	**CP-4**	**CP-5**	**CP-6**	**CP-7**	**CP-8**	**CP-9**	**CP-10**
Quota Share	13%	11%	11%	5%	23%	10%	7%	11%	5%	3%
Hvst Share 2004-2006	12%	11%	4%	10%	40%	9%	7%	2%	4%	0%

A-2.1.3.c Processors (Mothership)

❖ *Provisions and Options*

This provision is not applicable to the preferred alternative because the final Council recommendation did not include IFQs for motherships (see Appendix B). The section header is maintained to provide continuity of numbering and cross referencing in various documents generated during this process.

Allocate whiting QS based on a vessel's processing history for 1997-2003 (do not drop worst years) and using relative history as defined for catcher vessel permits.

For bycatch species (if IFQ is used for bycatch species):

Bycatch Option 1: use history for that species, as it is calculated for whiting

►**Bycatch Option 2:** use the whiting history as a proxy (i.e., allocation will be pro rata based on the whiting allocation). [63]

❖ *Rationale and Options Considered But Not Included*

The allocation methods proposed for motherships differ from that for catcher vessel and catcher-processor permits in the period used for the allocation. Additionally, the mothership formula differs from that for catcher vessel permits and is similar to that for catcher-processors permits in that it does not include an equal allocation component or a drop year provision. The rationales for aspects that are in common with the catcher vessel sector are provided in that section (Section A-2.1.3.a). The rationale for starting in 1997 rather than 1994 is that the allocation among the three whiting sectors did not start until 1997. The drop year provision was not included because of the perception that there was no need for consideration of possible hardship circumstances with respect to any of the four initial recipients. The equal allocation component was not included mainly because there was not a convenient source for the equal allocation QS. For the catcher vessels, that source was the permits bought back in 2003.

❖ *Interlinked Elements*

For catcher vessels and shoreside processors, one of the main elements linked to the initial QS allocation is the accumulation limit and grandfather clause (specifically the QS control limit, Section A-2.2.3.e). The allocations to motherships would not approach the accumulation limit levels that were proposed for whiting; therefore, there would not be an interaction with the accumulation limit provisions.

❖ *Analysis*

For harvesters, the degree to which the initial allocation of QS deviates from the recent landings levels is an indicator of the potential disruption that may occur as a result of the initial allocation. For processors, this is less of an indicator of disruption since processors do not need the QS to purchase groundfish. However, the receipt of QS will affect the profit per pound of fish landed, either through the leverage it provides for processor negotiation with harvesters, or through the additional revenue from the resource rents collected by the QS holder. The degree to which one processor receives more of an allocation relative to its 2004 to 2006 delivery history than another may indicate relative differences

[63] The Council's preliminary preferred alternative included the allocation of bycatch species in the mothership and catcher processor sectors pro rata based on the whiting allocation. These options could come into play if the Council does not go with its preliminary preferred alternative to adopt the co-op alternatives for these two sectors.

in the advantage processors may have compared to one another with respect the collection of rents per unit of product delivered and their relative bargaining advantages.

The allocation of QS to mothership companies would be relatively evenly distributed, running between 4 percent and 6 percent (Table A-73). MS Companies 03 and 06 were active in the early 1990s but do not have any activity during the allocation period. They are effectively screened out by the chosen allocation period; however, they participated in only one or two years, and their participation was at a level substantially lower than for all other motherships during those years and since. Therefore, had the allocation period gone back to 1994, the allocation that would have been received by those entities would have been relatively small. One new mothership entered the fishery after the allocation period and took a very small percentage of the total harvest in one year (MS Company 04). That mothership was included as a participant under the Amendment 15 action that limited participation for motherships. Amendment 15 provided notice that the trawl rationalization program would supersede the limitations on participation provided in Amendment 15.

With respect to the absence of a drop year provision in the allocation formula for motherships, the allocation to one out of the four companies receiving an allocation would have benefited by the inclusion of a drop year provision (i.e., the company was absent from the fishery two years).

Table A-74. Allocation to mothership companies using 1997 to 2003 processing history weighted (relative history) and no drop years.

	Mothership Companies						
	MS Comp 01	**MS Comp 02**	**MS Comp 03**	**MS Comp 04**	**MS Comp 05**	**MS Comp 06**	**MS Comp 07**
Share of QS Allocation to Processors	19%	30%	-	-	21%	-	31%
QS Allocation (20% of all MS Sector QS)	4%	6%	-	-	4%	-	6%
Share of 2004-2006 Average Whiting	32%	29%	-	1%	10%	-	28%
MT (2004-2006 average)	1,626	2,560	-	-	1,757	-	2,610
Average 2004-2006 Harvest	13,526	12,589	-	450	4,258	-	11,939

A-2.1.3.d Processors (Shoreside)

❖ *Provisions and Options*

► The Council's preferred alternative includes only an allocation for whiting taken on whiting trips.

For nonwhiting trips:

- Allocate QS for all species *other than* incidentally-caught overfished species based on the entity's history for the allocation period of 1994-2003 (drop two worst years) and use relative history.
- Allocate QS for incidentally-caught overfished species by considering the same **overfished species** allocation options identified for permits in Section A-2.1.3.a. (*Note: the preliminary preferred option under A-2.1.3.a is* ***Overfished Species Option 2***.)

For whiting trips:

Whiting Option 1: Allocate whiting QS based on the entity's history for the allocation period of 1994-2003 (drop two worst years) and use relative history.

► **Whiting Option 2:** Same as Option 1 but use 1998-2004 as the allocation period.

- If bycatch species are allocated to shoreside processors (not part of the FPA), allocate all species other than whiting by considering the same **bycatch species** allocation options identified for permits in Section A-2.1.3.a (*the preliminary preferred option under A-2.1.3.a is* ***Bycatch Option 2*****)**. *Note: Under A-2.1.1.a, Options 6a and 6b, the Council will decide the allocation of species other than whiting to processors.*

Initial allocations may be constrained by accumulation limits. See Section A-2.2.3.e for a discussion of the limits and divestiture requirements.

❖ *Rationale and Options Considered But Not Included*

The allocation methods proposed for shoreside processors (first receivers) are similar to those that would be used for the catcher vessel permits delivering shoreside. The allocation criteria include use of relative history, the dropping of two worst of landings history, and an allocation period option that runs from 1998 to 2003. The criteria for shoreside processors vary from the catcher vessel options mainly in the shorter allocation period (starting in 1998 instead of 1994), a recent participation requirement (see Section A.2.1.2.c), and an equal allocation element not being included. Additionally, in its FPA the Council recommended that the allocation period and recent participation period for whiting processors be extended to 2004 (no allocation is provided for nonwhiting processors). The rationales for the use of relative history and the dropping of worst years are similar to what is identified for the catcher vessel permits in Section A-2.1.3.a. Equal allocation was not used for processors because of the relatively small amount of QS going to processors and the absence of a pool of "unclaimed" QS from which to draw. For the permit allocation, 91 permits were bought back in 2003, and the harvest history associated with those permits was used to designate a pool of QS that would be allocated equally among all remaining permit holders. The allocation period for processors was part of an industry compromise that brought permit owners and processors together in agreement that 20 percent of the initial allocation of QS should go to processors. The first year in which there was a three-way split of the whiting allocation (shoreside, mothership, and catcher-processor) was 1997. The use of 1998 as the start of the allocation period increases slightly the emphasis on more recent years. The allocation period for processors was extended to 2004 because keeping the date at 2003 was viewed to disadvantage a processor that was present as a participant during the window period but had increased its share of the processing substantially since the close of the original allocation period (2003).

For shoreside processors the method of allocating bycatch species would be applied somewhat differently than for permits, since processors do not have logbooks. The approach would be to apply the average logbook distributions used for the permits delivering to a particular processor, weighted by the amount of catch the processor receives from each of the permits. However, under the Council FPA, this method will not be used because processors are only allocated whiting and are not allocated QS for groundfish bycatch in the whiting fishery.

❖ Interlinked Elements

For catcher vessels and shoreside processors, one of the main elements linked to the initial QS allocation is the accumulation limit and grandfather clause (specifically the QS control limit, Section A-2.2.3.e). While this may have been an issue for shoreside processors if they had received nonwhiting QS (as proposed under the PPA), under the final preferred alternative, shoreside processors would only receive QS for whiting. The allocations to shoreside whiting processors would not approach the accumulation limit levels that were proposed for whiting; therefore, there would not be an interaction with the accumulation limit provisions.

❖ Analysis

While some of the effects of the 20 percent allocation of QS to processers are discussed here, the primary focus of this analysis is not on whether and how much to allocate to processors (see Section A-2.1.1.a), but rather on the initial QS allocation formula and its impacts among the qualified processors (Section A-2.1.2.c for determination of qualified processors based on recent participation).

For harvesters, the degree to which the initial allocation of QS deviates from the recent landings levels is an indicator of the potential disruption that may occur as a result of the initial allocation. Figure A-7 shows the amount of initial nonwhiting QS that would be allocated to processors compared to their recent levels of purchases under the Council's final preferred alternative. Figure A-16 provides similar information for whiting QS compared to whiting purchases. For processors, differences between initial allocation and recent activity are less of an indicator of direct disruption since processors do not need the QS to purchase groundfish. However, the receipt of QS will affect the profit per pound of fish landed, either through the leverage it provides for processor negotiation with harvesters, or through the additional revenue from the resource rents collected by the QS holder. The degree to which one processor receives more of an allocation relative to its 2004 to 2006 delivery history than another may indicate relative differences in the advantage processors may have compared to one another with respect the collection of rents per unit of product delivered and their relative bargaining advantages. If the Council had recommended no allocation to processors, it appears that five processors have permits that would have entitle them to between 0.5 percent and 5 percent of the initial nonwhiting QS allocation (Figure A-113), and one processor has permits that would entitle it to just under 4 percent of the initial whiting QS allocation (upper right-hand graph in Figure A-17). The 20 percent allocation of whiting QS to processors recommended in the Council's final preferred alternative would provide seven processors with amounts of whiting QS in excess of 0.1 percent of the total QS (Figure A-16).

For whiting, the Council chose to use a 1994 to 2004 allocation period over a 1994 to 2003 allocation period. Figure A-115 shows very small differences in the amounts of whiting QS processors receive based on their processing history with an initial allocation period of 1994 to 2003 as compared to one of 1994 to 2004 (points for all processors are on or very close to the 45 degree line that indicates no difference between the to allocation periods).

Another indicator of disruption resulting from the initial allocation formula is the number of entities that have entered the fishery since the allocation period and their levels of participation. While the Council did not recommend an allocation of nonwhiting QS to processors, the Council's PPA provided a 20 percent allocation of nonwhiting QS to processors. Table A-74 and Table A-75 show that 18 new nonwhiting buyers that have entered the fishery since 2003 and that these buyers have purchased less than 1 percent of the total nonwhiting landings in terms of weight and value. The Council's final preferred alternative would provide a 20 percent allocation of whiting QS to processors. With respect to whiting, five new buyers have entered the fishery since 2004 (the end of the whiting QS allocation period for processors), but these buyers have purchased nearly 3 percent of the shoreside whiting landings and about 9 percent of the landings in California (which are much smaller than for Oregon and Washington, Table A-76). With the possible exception of California, it does not appear that there are many post-2004 entrants with significant amounts of landings that will not receive an initial allocation of whiting QS under the IFQ program. It should be noted that there was one new whiting processor entrant in 2004 that does not qualify for a QS allocation because it does not meet the recent participation requirement (which requires delivery receipts in two years). This new entrant was active in California where there was only one other competing purchaser that will qualify for whiting QS. In 2004 and 2006, the deliveries it received were of an amount for it to be classified as a significant competitor within the context of the scale of the California segment of the whiting fishery (about 30 percent of the states' total whiting deliveries).

Table A-75. Comparison of shoreside nonwhiting receivers, 200 to -2006: all receivers versus new entrants with zero history during 1994 to 2003 (mt).

	All Receivers (MT)	New Entrants (Number)	New Entrants (MT)	Share of Total
California	16,383.08	10	46.96	0.29%
Oregon	32,100.75	6	1.49	0.00%
Washington	7,936.47	2	42.58	0.54%
Grand Total	56,420.31	18	91.03	0.16%

Table A-76. Comparison of shoreside nonwhiting receivers, 2004 to 2006: all receivers versus new entrants with zero history during 1994 to 2003 (revenue).

	All Receivers (MT)	New Entrants (Number)	New Entrants (MT)	Share of Total
California	$20,690,595	10	$85,890	0.42%
Oregon	$39,741,747	6	$3,870	0.01%
Washington	$8,118,285	2	$50,612	0.62%
Grand Total	$68,550,627	18	$140,372	0.20%

Table A-77. Comparison of shoreside whiting receivers, 2005 to 2006: all receivers versus new entrants with zero history during 1994 to 2004 (mt).

	All Receivers (MT)	New Entrants (Number)	New Entrants (MT)	Share of Total
California	9,302.69	3	861.24	9.26%
Oregon	122,778.52	2	4,124.02	3.36%
Washington	62,742.81	0	0	0.00%
Grand Total	194,824.02	4*	4,985.26	2.56%

* One new entrant operates in both California and Oregon.

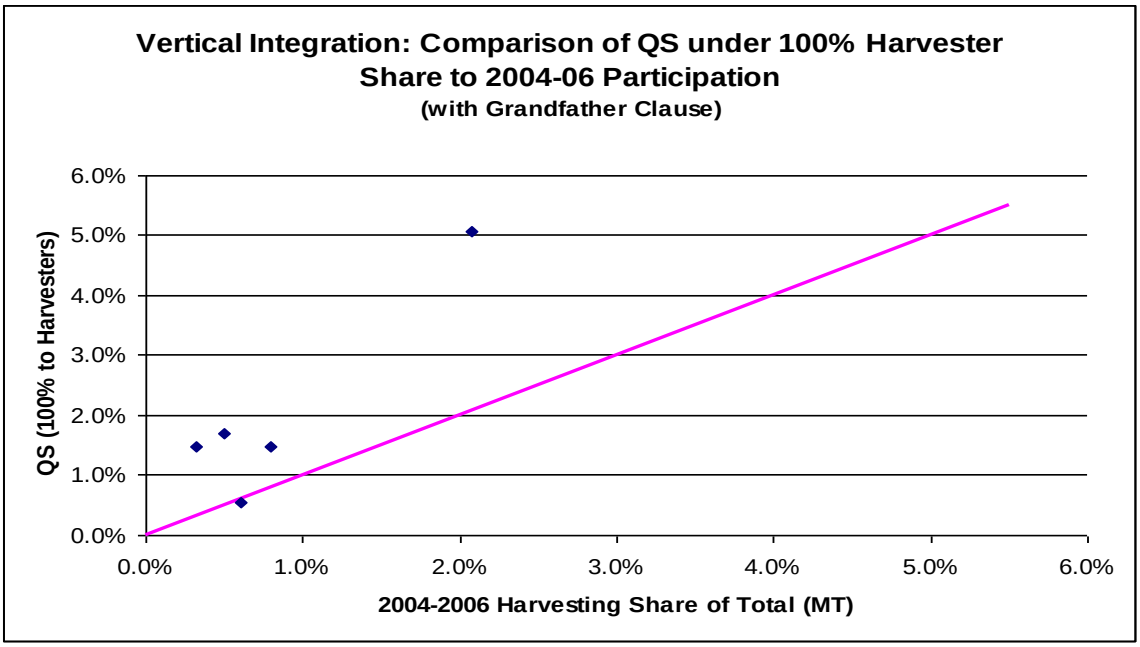
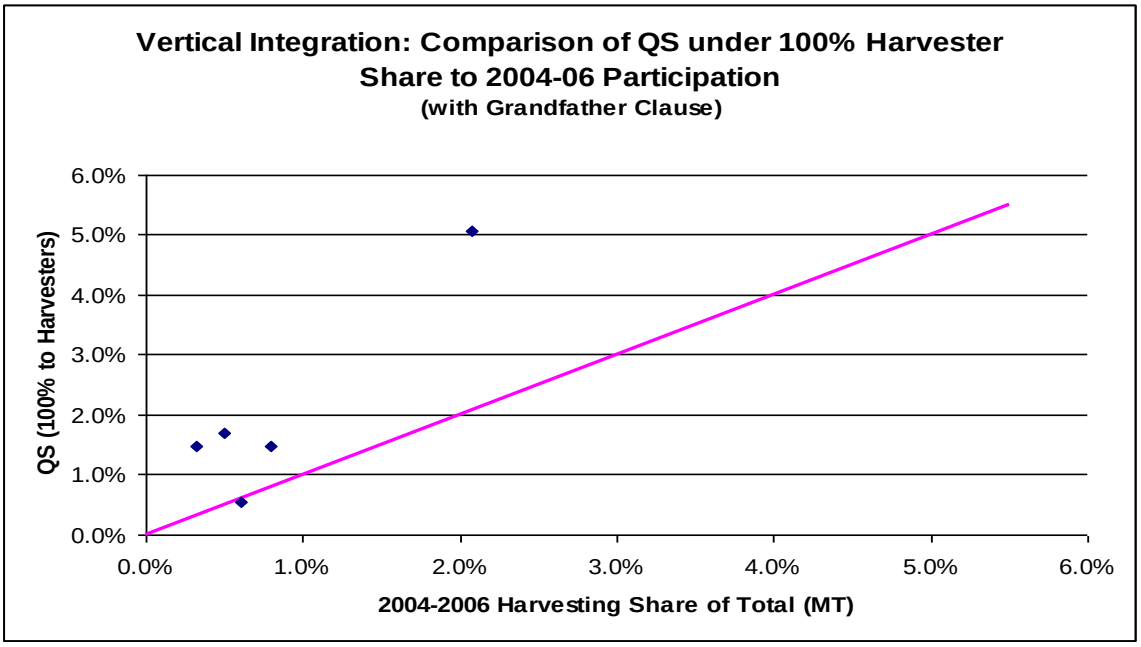


Figure A-91. Vertical integration and nonwhiting QS allocations to processors compared to 2004-2006 history (% of total mt) assuming 100% harvester allocation of QS (no equal allocation element).



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Figure A-92. Vertical integration and nonwhiting QS allocations to processors (harvesting share) compared to 2004 to 2006 harvesting history (% of total mt) assuming 80/20 permit/processor split of QS and an equal allocation element for permits.

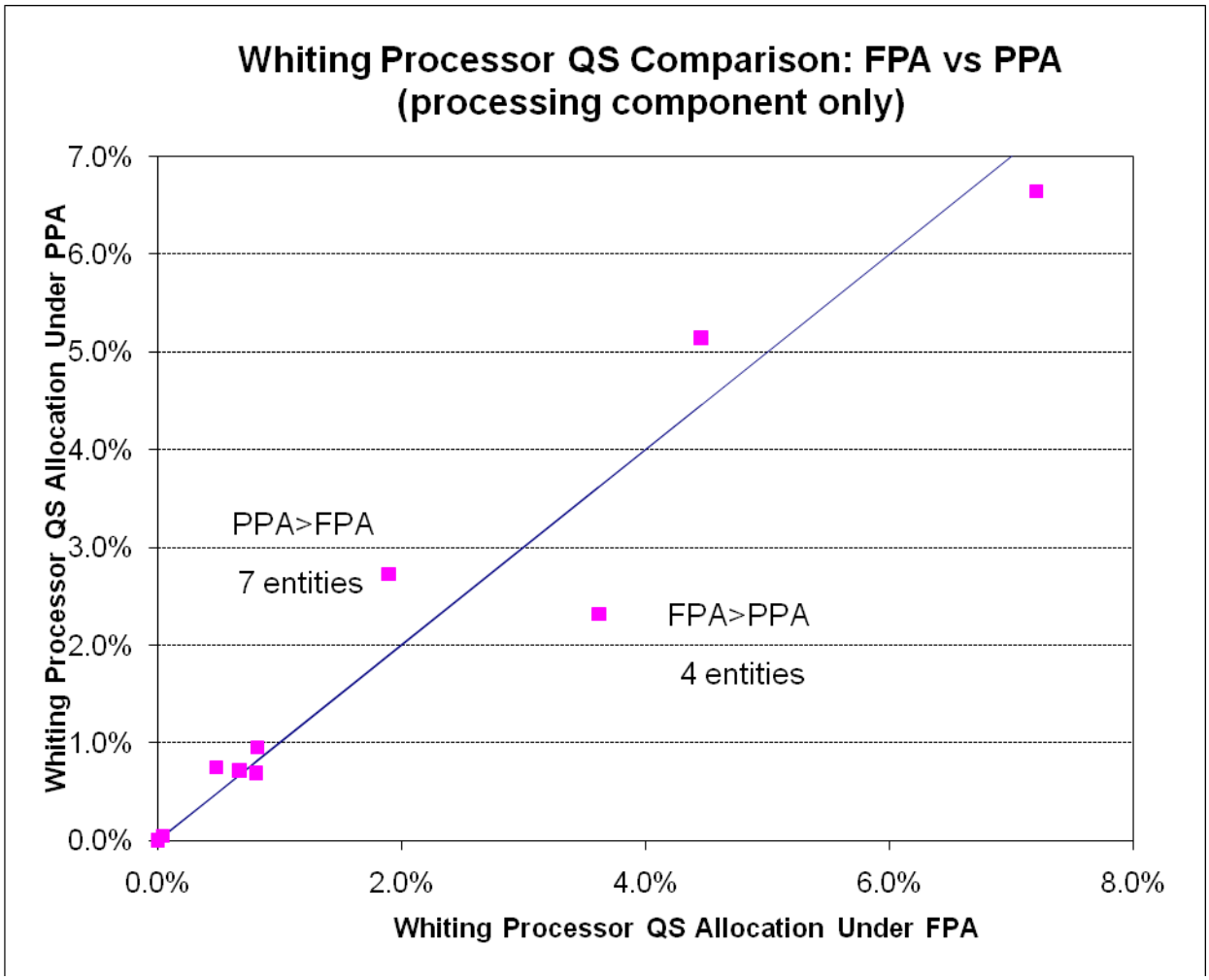


Figure A-93. The allocation from processing history going to each buyer based on the FPA (which uses a 1998 to 2004 allocation period) and the PPA (which uses a 1994 to 2003 allocation period, the only difference between the two alternatives with respect to the whiting QS allocation to processors).

A-2.1.4 History for Combined Permits and Other Exceptional Situations

❖ Provisions and Options

Permit history for combined permits will include the history for all the permits that have been combined. For history occurring when two or more trawl permits were stacked, split the history evenly between the stacked permits. History for illegal landings will not count toward an allocation of QS. Landings made under nonwhiting EFPs that are in excess of the cumulative limits in place for the non-EFP fishery will not count toward an allocation of QS. Compensation fish[64] will not count toward an allocation of QS.

❖ Rationale and Options Considered, But Not Included

Combined Permits – When permits are combined to generate a single permit with a larger size endorsement, and later there is an allocation scheme based on permit history, the question arises as to how to assess the catch history of combined permits. In the past, the catch history of a combined permit has been assessed as the sum of the histories of the combined permits (as it was for the fixed gear sablefish endorsements). The rationale for combining the catch histories is that the resulting permit is for a larger vessel, which may require more fish, and that the person who has combined the permits has likely paid the market value (the value of the harvesting opportunity) represented by the permits being combined. If permit history were not combined, the owner of a permit that has been combined would have to select one of the combined permits to use for catch history, and the fleet as a whole might benefit from any catch history not counted, depending on the allocation scheme being used. Since permits for catcher-processors do not participate in the catcher vessel sector(s), they would not receive catcher vessel history associated with the permits combined into permits large enough for catcher-processors. Hence, they would not be eligible for an initial allocation of QS for the catcher vessel sector(s). In contrast, catcher vessels and permits for catcher vessels move between the shore-based and at-sea whiting fisheries, so such permits are allowed to qualify for initial allocations for both sectors, based on the history of the permits.

Permit Stacking – During the initial allocation period, there was more than one permit registered to a single vessel at the same time, even though such "permit stacking" provided the vessel with no additional harvest opportunities. Nevertheless, while permit stacking was rare, it did occur, and some means is needed to allocate the landing history for the stacking period. A few different approaches were considered, including the following:

1. Associating the landings with the first permit that was on the vessel until such time as the first permit is removed (i.e., there appears to be a transitory period from one permit to another during which there were two permits on the vessel)
2. Associating the landings with the second permit if the first permit was subsequently transferred off the vessel (same transitory situation as described in the first approach)
3. Associating the landings with the first permit if it continues to stay with the vessel after the second permit is removed (i.e., a permit is moved on and off the vessel while the original permit remains)

[64] According to Federal regulations, "*Compensation fishing* means fishing conducted for the purpose of recovering costs associated with resource surveys and scientific studies that support the conservation of species in a fishery, or to provide incentive for participation in such studies. Compensation fishing may include fishing prior to, during, or following such surveys or studies. Compensation fishing shall be conducted under an EFP if the activity would otherwise be prohibited by regulation." [draft FR notice on proposed rule for EFP regs. One published, can cite.]

Unfortunately, it is difficult to know the reasons and circumstances under which two permits were associated with a trawl vessel at the same time. Therefore, an equitable approach appears to be to split the history between the two permits.

Illegal Landings – Rewarding illegal landings with allocation of IFQ is inequitable, on its face.

Landings Under EFPs in Excess of Cumulative Limits and Compensation Fish – In both of these situations, the rest of the fleet did not have the same opportunity to make landings as the EFP and compensation fish vessels. It is proposed that the landings made because of those special opportunities not count toward IFQ as a matter of equity.

❖ *Interlinked Elements*

The decision on how to count landings under these special circumstances will affect the quantities allocated to individuals. Changes in these provisions would not likely necessitate the need for changes in other parts of the program and vice versa.

❖ *Analysis*

Combined Permits – Over the course of the license limitation program, 25 permits were combined (17 of which had some landings history) into 17 permits used for catcher vessels (transactions involving 42 permits), plus 99 permits (37 of which had some landings history) were combined into 10 permits used for catcher-processors (transactions involving a total of 48 permits). Permit combination was taken into account in the initial allocation analysis.

Permit Stacking – There were 13 permit stacking events. An event is defined here as permit stacking occurring sometime during a single year. Two permits stacked on the same vessel across two years would count as two events. There is only one occurrence of the same permits being stacked on the same vessel for more than one year. Of these events, most were of less than one month long (Table A-77). Eleven of the events are depicted in Figure A-116. Of all the events, four involved more than 100,000 pounds of history (the three depicted in Figure A-116 and the one not included in the figure for confidentiality reasons). If permits were stacked and then combined (as occurred in one instance), all of the permit history during the stacked period goes with the permit that resulted from the combination.

Table A-78. Number and duration of stacking events.

Number of Months	Number of Events
1	7
2	1
>5	5

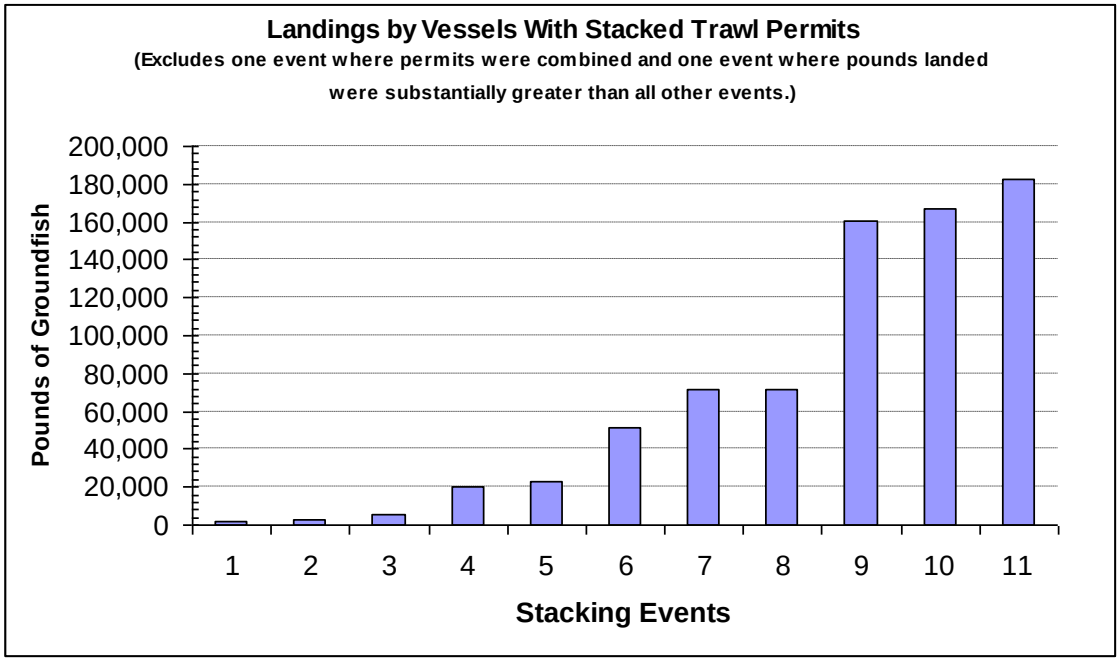


Figure A-94. The amount of allocation period landings that occurred during periods of trawl permit stacking for each of 11 stacking events.

Illegal Landings – Not counting illegal landings is an equity concern about which there is little disagreement. No additional analysis is available. We do not have information about the number or amount of landings that might fall in this category over the allocation period.

Landings under EFPs in Excess of Cumulative Limits and Compensation Fish – The issue argued here is one of equity. Those who say that credit should not be given for EFP landings, including compensation fish, argue that these vessels had opportunities that were not available to other vessels and should not receive additional compensation in the form of an initial allocation of QS. Others argue that had the vessels not been taking part on these special activities, they would have put more effort into other fisheries or groundfish targeting strategies. If they had put their effort into other available groundfish strategies, they would have more landings history, regulations would have been more constraining, and the landings opportunity for other vessels would have been diminished.

A-2.1.5 Initial Issuance Appeals

❖ Provisions and Options

There will be no Council appeals process on the initial issuance of IFQ. NMFS will develop a proposal for an internal appeals process and bring it to the Council for consideration. Only revisions to fish tickets accepted will be those approved by the state. Any proposed revisions to fish tickets should undergo review by state enforcement personnel prior to finalization of the revisions.

❖ Rationale and Options Considered But Not Included

While an administrative appeals process will be provided by NMFS, as required by law and section 303A(c)(1)(I), the Council has not identified any areas of potential that would warrant Council advice. The license limitation program included numerous such grounds for appeal related to hardship and other circumstances and specified that there be an appeals board and Council involvement in the appeals process. Most of these related to initial allocation. The fixed gear sablefish IFQ program (permit stacking) did not include explicit consideration of hardship provisions; most decisions were based on relatively easily determinable facts. This IFQ program does not include hardship provisions. The need for such provisions is avoided, in part, with allocation rules that allow a vessel to drop its two worst years for the initial allocation formula and the long periods covered by such a formula.

One of the judgment calls that may come up on appeal pertains to the attribution of shoreside processing history under Option 3 of Section A-2.1.1.d and the determination of successor in interest where one processing company is acquired by another. The issue to be decided will be determining who processed the fish from a particular landing for those situations in which there is a dispute between the parties.

Another area in which some discretion will be exercised is the classification of fish ticket records for which species remains unspecified, even after the application of species composition information (unspecified flatfish and unspecified rockfish). Unspecified flatfish can be reasonably assigned to the "Other Flatfish" category. Unspecified rockfish are most likely remaining shelf rockfish, but might also be remaining nearshore rockfish (outside the scope of the IFQ program) or remaining slope rockfish. A more accurate determination may be made by considering other species listed on the fish ticket, as well as any logbook data that can be correlated with a particular trip. Judgments made in the application of these ancillary data to determine the correct attribution for unspecified rockfish may be a source of appeal. Data on the extent of this issue are provided in Section A-2.1.3.

The precautionary note regarding changing fish tickets is included in response to rumors that state agency personnel were changing fish tickets at fishermen's requests during the license limitation program implementation without realizing the implications with respect to the license limitation permit issuance process.

❖ Interlinked Elements

The lack of special hardship provisions and a clear allocation formula (A-2.1.3) that take into account hardships by allowing applicants to drop worst years reduce the need for an appeals process involving the Council. If those provisions are changed, the Council might want to revisit the appeals process provision.

Clarity in the definition of processors and processing (Section A-2.1.1.c) will reduce controversy over administrative decisions and possibly the perception of need for Council involvement in appeals.

Allocation of QS based on species and species group information recorded on individual landings records may generate appeals, particularly where some landings remain unidentified due to incompleteness in the species composition information. The other landings-history-based approach available seemed to be to allocate based on aggregates (e.g., allocate all nonwhiting QS based on total landings of nonwhiting groundfish).

After initial allocation, an area of the program in which considerable judgment may be required is the determination of whether control exists to apply control limits. These determinations will likely be based on fact-finding and legal criteria for which the Council and its advisors may not have special expertise. This section, and requirements for appeal listed under the LAP provision of the MSA, address only the need for appeals with respect to initial allocation (MSA 303A(c)(1)(I)).

❖ *Analysis*

The primary objectives affected by the decision on whether or not to involve the Council in the appeals process are those related to equity and program costs.

Exclusion of the Council from any appeals process will not deprive program participants of the opportunity for appeal, but will only exclude the Council from being an advisor in that process. This will reduce program costs. The main reason for involving the Council in the license limitation program process was that there were numerous hardship provisions requiring judgment calls for which industry and Council body expertise were of value in fact finding and evaluation. As an example, a member of the Council appeals panel was able to identify that an aluminum pole that was purported to have been purchased for a gear conversion was of no value as fishing gear, but rather was the kind of pole that would be used for a street light. The panel also assisted fishermen. Since the members of the panel were well educated in the various provisions of the program, they were able to help fishermen identify the relevant facts and better articulate their case. In many cases, this led to the issuance of permits that were initially denied. The Council appeals body, by providing fishermen an opportunity to be heard and assisted, or told "no" by other fishermen, provided a greater sense of equity for the license limitation program.

For the IFQ program, the rules for which judgment calls will be required are substantially less complex than with the license limitation program, so there may be less need for a Council-based appeals process to ensure a sense that the rules have been applied equitably. With respect to processors, determination of who in the marketing chain was the first processor of a particular landing may come up for appeal (under the Council's preferred option of A-2.1.1.d), as well as a determination of the legitimate successor in interest to the history of a particular processing company (where there have been ownership changes). While there may be some complexity around determination of who processed the fish or an evaluation of successor in interest, the rules that are being applied are relatively simple compared to the license limitation program. Under the license limitation program, there were numerous ways program rules might be applied to qualify a particular vessel owner. A vessel owner could qualify directly for an "A" endorsement via a provisional endorsement through criteria related to vessel building or gear conversion, or through a number of different hardship provisions. The situational facts of a particular vessel owner had to be considered with respect to each of the alternative qualification and hardship criteria.

Another main area for appeal may be the categorization of landings records by species for those situations in which the categorization is incomplete, even after application of the species composition information. This will primarily be an issue for unspecified rockfish. Again, while making an appropriate categorization may require the consideration of some complex logbook and fish ticket information, it is simple relative to the IFQ program because there is only a single program rule that is being applied, i.e., the allocation of QS using a formula based on harvest history.

A-2.1.6 Direct Reallocation and Future Allocations after Initial Issuance

❖ Provisions and Options

Reallocation With Change in Overfished Status. When an overfished species is rebuilt or a species becomes overfished there may be a change in the QS allocation within a sector (allocation between sectors is addressed in the ISA process). When a stock becomes rebuilt, the reallocation will be to facilitate the re-establishment of historic target fishing opportunities. When a stock becomes overfished, QS may be reallocated to maintain target fisheries to the degree possible. That change may be based on a person's holding of QS for target species associated with the rebuilt species or other approaches deemed appropriate by the Council.

Reallocation With Changes in Area Management (Changes in management lines are expected to be rare, however, when the occur the following provides for the reallocation of QS in a manner that will give individual QS holders with the same amounts of total QP before and after the line changes.)

Area Subdivision: If at any time after the initial allocation an IFQ management unit is geographically subdivided, those holding QS for the unit being subdivided will receive equal amounts of shares for each of the newly created IFQ management units.

Area Recombination: When two areas are combined, the QS held by individuals in each area will be adjusted proportionally such that (1) the total QS for the area sums to 100 percent, and (2) a person holding QS in the newly created area will receive the same amount of total QP as they would if the areas had not been combined.

Area Line Movement: When a management boundary line is moved, the QS held by individuals in each area will be adjusted proportionally such that they each maintain their same share of the trawl allocation on a coast wide basis (the fishing area may expand or decrease, but the individual's QP for both areas combined wouldn't change because of the change in areas). In order to achieve this end, the holders of QS in the area being reduced will receive QS for the area being expanded, such that the total QP they would be issued will not be reduced as a result of the area reduction.[65] Those holding QS in the area being expanded will have their QS reduced such that the QP they receive in the year of the line movement will not increase as a result of the expansion (nor will it be reduced).

Reallocation With Subdivision of a Species Group: If at any time after the initial allocation an IFQ management unit for a species group is subdivided, those holding QS for the unit being subdivided will receive equal amounts of shares for each of the newly created IFQ management units. For example, if a person holds 1 percent of a species group before the subdivision, that person will hold 1 percent of the QS for each of the groups resulting from the subdivision.

Future Allocation of Groundfish Outside the Scope of the IFQ Program: For the "Other Fish," category of groundfish, if at some time in the future the Council adds it to the IFQ system, the initial allocation would be determined using the same history criteria as was used for other IFQ species (i.e., 1994 to 2003 history), unless otherwise specified by a future Council action.

[65] Unless there is a change in the total OY or other factors affecting trawl allocation for the areas involved, in which case, their change in quota pounds would be proportional to the change in the trawl allocation.

❖ Rationale and Options Considered But Not Included

Overview

The main reason for these provisions is to plan for future changes in the management units that may be needed for conservation of the resource. Reallocation may be appropriate under the following circumstances:

- If there is a broad swing in the amount of a stock that is available for harvest (as may occur when a stock is rebuilt or becomes over fished)
- When a latitudinal management line is added to subdivide a stock, subtracted to combine separate stocks into a larger geographic unit, or changed to better reflect the stock's population biology
- When species that have been grouped together for management are separated out

Additionally, at some future time, there may be a need to allocate QS for species that are currently outside the scope of the IFQ program.

Consideration of provisions to address situations that may be encountered in the future is in line with National Standard 8, which required the Council to provide for variations and contingencies in the fishery resources.

Reallocation with Change in Overfished Status

Situation. As a species moves out of (or into) overfished status, the opportunities for targeting the species may change significantly. A number of overfished species are not currently targeted, but are caught incidentally in other trawl target strategies. When an overfished species is rebuilt, there will often be a sudden and substantial increase in the OY. As these opportunities change, it may be appropriate to consider reallocation of QS within a trawl sector to accommodate directed fishing on the rebuilt species. If it could be developed, a predetermined approach for such reallocation would provide desired regulatory consistency and predictability for industry and government.

Need. One of the primary concerns behind the reallocation of QS when a species is rebuilt relates to equity. Those who in the 1990s relied on certain species that became overfished (and who took their harvest in line with what were believed to be sustainable levels at the time) have had their fishing opportunities (and their share of the catch) reduced to allow for the continuation of other targeting strategies. Those participating in these other strategies needed only relatively small amounts of the overfished species to cover their bycatch. Under the Council's PPA, the initial allocation of QS for these overfished species will be based on the fleet bycatch rates in the current target fisheries. Those who had their fisheries cut back because their target species had become overfished believe that they have sacrificed for the rebuilding and should, therefore, receive a greater share of the harvest once the stock is rebuilt. Further, because they were targeting on the stocks that are being rebuilt, they do not have as much history for some of the other stocks for which QS will be issued. If no adjustment to the allocation is made when a stock is rebuilt, those who hold the stock primarily to cover bycatch will be the ones receiving QP in sufficient quantities to redevelop a targeted fishery on the rebuilt stocks.

Challenge. The main challenge in a post-implementation reallocation of QS for an overfished species will be the trading of the QS that occurs before the species is rebuilt. Initial issuance of overfished species QS will be to permits. Through the rationalization process and new entry and exit, there is likely to be substantial reshuffling of the QS. If the intent is to reallocate the QS to those who

prosecuted the directed fisheries in the mid-1990s, there will need to be a historic link between those harvesters and the ones who are present when the stock becomes rebuilt. The main vehicles available are harvester identity, the vessel, and the permit. Harvester identity (an individual or business entity's history) has not been used an allocation basis in part because the information would be difficult to acquire, and it does not take into account exits and new entries that occur prior to achievement of rebuilt status. The vessel and permit are the other two vehicles available, and the permit is the primary one on which the Council has relied for the QS allocation decisions. Again, by the time of rebuilding, there may be little relationship between the harvesters that own the permits and the types of fisheries in which the permit is employed at the time of rebuilding, and the target fisheries in which the permit participated in the mid-1990s, making it difficult to make a future reallocation to achieve the desired equity outcome.

Considered, but Rejected.

Allowing reallocation through market mechanisms. Under this approach, there would be no direct reallocation. The concern motivating consideration of direct reallocation would not be addressed.

Auction. Under this approach, there would be a direct reallocation through an auction (e.g., upon rebuilding, adjust everyone's QS holdings downward and auction off the remainder). This would prevent those who were given an allocation of overfished species QS to cover their bycatch needs from benefiting from the rebuilding that was facilitated through the reduction of targeting on the overfished species but would not direct the benefits to those who participated in the target fisheries (or to the current holders of their permits).

Issuance of Shadow QS. In anticipation of the difficulties that would be entailed in reallocating QS at a future time based on history, straw man provisions for reallocation upon rebuilding were presented to the GAC at its September 2007 meeting. These provisions were based on the concept of issuing shadow QS for overfished species based on the 1994 to 2003 history of the initial QS recipients. Shadow QS would be held, but would be dormant (no QP would be issued for shadow QS) until the species is rebuilt. At the same time, at the start of the program, incidental catch QS would be issued for the same species based on bycatch rates and the amount of target species QS an entity receives, as is specified in the Council's final preferred alternative. The incidental species QS would become inactive or would expire when the species is rebuilt, and the shadow QS become inactive. A similar straw man proposal was provided for situations in which a currently healthy stock is declared overfished. Under such circumstances, the existing QS would become inactive (shadow QS), and new incidental species QS would be issued to those needing them to cover incidental catch in fisheries targeted on other species. This approach would add some cost and complexity to the start of the program, including the need to track the transfers of shadow QS.

Final Preferred Provision. The approach of the final preferred alternative is to develop the rules for reallocation when a species is rebuilt or becomes overfished at the time they are needed. Provisions for reallocation with change in overfished status have not been developed because of the high degree of circumstance-specific information that will be important in determining an appropriate reallocation. Therefore, at this time, notice is provided that the Council intends to make a reallocation upon rebuilding but the specific means for reallocation have not been identified.

Reallocation with Changes in Area Management and Subdivision of a Species Group

The provisions for reallocation with changes in latitudinal management areas and subdivisions of species groups were initially developed simply as a test to determine the feasibility and impacts of adjusting the management units once the IFQ program is in place. They have been included as program provisions to avoid the need for separate action later and so that all participants are on notice as to the potential changes that may occur to the QS they hold and the management units for which the QS is designated. These changes may affect QS value; therefore, it is helpful to provide advance information about how adjustments will be carried out if they become necessary.

The basic philosophy behind the geographic and species subdivision provisions is that the change should be carried out in such a manner that no one who holds QS will receive fewer pounds after a change than they would have before the change. The provisions may, however, result in the redesignation of an individual's QS such that they end up with some QS for an area in which they do not fish or for species that are of less interest to them.

Future Allocation of Species Currently Outside the Program Scope

There is concern that fishermen may target species not covered by the IFQ program with the intent of establishing history for an allocation of QS for those species if, at a future time, they are brought under the scope of the program. In this regard, the Council was particularly concerned about the "Other Fish" category of groundfish. Of those species outside the scope of the program, this is the only category for which there are some larger amounts of trawl vessel catch. Additionally, some of these species are longer lived and may be more sensitive to fishing pressure. To reduce the incentive for vessels to target the "Other Fish" category, the Council has indicated that it will continue to rely on 1994 to 2003 permit history, unless it makes some other decision in the future. Also suggested for Council consideration were options that would specify future allocation on some basis other than the 1994 to 2003 permit history, but not on permit history occurring after program implementation (e.g., equal allocation or allocation based on an entity's holdings of other types of QS). By choosing the 1994 to 2003 allocation period, the Council signaled that the permits themselves might have some future value with respect to the harvest history that they represent.

❖ *Interlinked Elements*

Of these provisions, the future allocation of species outside the scope of the program is the only one that is specifically linked to other provisions. The need for this provision is created by the Council decision to exclude some species from the IFQ program and, in particular, a species group for which trawl vessels have some more substantial landings.

❖ *Analysis*

Reallocation with Change in Overfished Status

The primary objectives affected with respect to reallocation upon rebuilding relate to equity, net benefits (market certainty, transaction costs), disruption, administrative costs, and complexity. The provisions for reallocation upon rebuilding identify an equity concern but do not identify the means by which that concern will be addressed at some future time. Notice is given that a reallocation may occur. This advance notice will contribute to the perception of equity when the adjustment is made, but, without knowing the mechanism by which it will be carried out, there will be considerable market uncertainty.

Making no reallocation would reduce uncertainty in the market and potential future disruptions, but not address the equity concern. Reallocating through an auction would address the equity concern of those who would view recipients of QS to cover their bycatch needs as receiving an unearned benefit when they are then able to target the rebuilt species. However, an auction would not provide compensation to those who argue that they sacrificed their fisheries to facilitate the rebuilding. The shadow QS approach would address equity concerns and provide market certainty, but would result in trading of shares that have no immediate purpose with respect to management of the fishery, thereby causing an increase in management costs. The approach also increases costs by adding to program complexity.

With respect to reallocation when a species becomes overfished, there is some guidance provided for how the reallocation would be carried out (i.e., as needed to facilitate target fisheries). The concern with respect to conditions that occur when a stock becomes overfished is that targeting healthy stocks be facilitated (addressing objectives related to net benefits, efficiency, sector health, labor, communities, and the general public), and that individuals not take unfair advantage of those who may desperately need QS to cover their incidental take in other fisheries targeted on other groundfish stocks (addressing equity related objectives). The guidance that is provided for action when a stock becomes overfished implies that there may be a reduction in QS for the newly overfished species for those holding QS for that species who do not also hold QS for a target species with which the overfished species is taken incidentally. Those whose QS is revoked will likely request, as an equity issue, that such QS be reinstated when the stock is rebuilt (essentially the same argument that is made now by those who previously lost directed fishing opportunities for overfished species). A concern has also been voiced that if those who target the overfished species are allowed to keep their QS, they might take their small amounts of QS as target rather than providing it for the incidental catch needs of others. While it might occur, such an action (using the overfished species QS as a target) would likely result in a lower profit than if they had sold it to those who need it to cover their incidental catch.

Reallocation with Changes in Area Management and Subdivision of a Species Group

The primary purpose of these provisions is to allow the achievement of conservation objectives while minimizing any adverse effects on net benefits, disruption, equity, sector health, or communities. The primary reason for changing the area or species composition of the management units would be to enhance achievement of conservation objectives. The specification of the exact means by which these benefits would be achieved reduces uncertainty and allows the market to function more efficiently and for businesses to plan for changes. The provisions have been specified in a way that ensures that an entity holding QS will experience the minimum possible change in total fishing opportunities.[66/67] It may, however, result in some temporary dislocation as QS holders could end up with QS for management units outside of their normal fishing area or species that they do not normally catch. Under such circumstances some QS trading may be required which will result in some increase in transaction and administrative costs. Nevertheless, the approach specified here will likely result in the least disruption and most equity possible, while still achieving the conservation objectives. Alternative approaches would require either a data-intense exercise to develop formulas for requalification and reissuance of QS based on recent practices, or relatively arbitrary increases or decreases of entities' QS holdings, which would entail equity issues.

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[66] Line Movement Example: first assume that 50 percent of the trawl allocation for a species is for north of the 40°10' line and 50 percent is for south (i.e., the coast wide trawl allocation is evenly distributed between these two areas). Now assume that a decision is made to move the management line to 38° and that as a result of this movement 70 percent of the QP for the species would be for north of 38° and 30 percent would be for south of 38°. The QS holdings would be adjusted as follows:

> Those persons holding QS for the southern area would continue to hold QS for the new southern area (their QS that previously represented 50 percent of the coast wide OY would be scaled back such that it represents only 30 percent of the coast wide OY).
>
> In addition, those persons would be allocated QS for the new northern area representing 20 percent of the coast wide trawl allocation (they would receive 28.6 percent of the QS for the new northern area (20 percent/70 percent=28.6 percent)). Thus, those holding QS for the south would still hold 50 percent of the coast wide QS (all of the southern 30 percent and 20 percent represented in northern QS). The allocation of northern QS would be made in proportion to their holdings of southern area QS. Those with QS for the expanded northern area would each have their QS reduced by 28.6 percent such that their total QP would remain unchanged.
>
> On an individual basis, if a person holds 1.5 percent of the coast wide trawl allocation through a 3 percent holding of the southern QS, when the adjustment in the latitude line is made, they continue to hold 3 percent of the southern area QS, but it represents only 0.9 percent of the coast wide trawl allocation (3 percent times 30 percent). So they would receive an amount of the northern QS that is equivalent to 0.6 percent of the coast wide allocation. This would bring them back to a total of 1.5 percent of the coast wide allocation. The amount of northern area QS necessary to achieve this would be a little less than 0.9 percent of northern QS (0.9 percent times 70 percent equals about 0.6 percent).

[67] Recombination Example: 50 mt (5 percent) of the trawl allocation is for the Conception area, and 950 mt (95 percent) of the trawl allocation is for latitudinal line 40°10' to the Conception area. An individual who holds 50 percent of the allocation in the Conception area would get 25 mt. Should these areas be combined, that person would receive 2.5 percent of the new 1,000 mt south of 40°10' trawl allocation (50 percent multiplied by 5 percent, i.e., the individual's allocation for the conception area multiplied by the Conception area portion of the new south of 40°10' area)). Similarly, the QS allocation for an individual to the north would be the percent of QS times 95 percent.

Future Allocation of Species Currently Outside the Program Scope

The primary objectives affected with respect to future allocation of a species outside the scope of the program relate to conservations concerns, equity, disruption, net benefits, and administrative costs. The provision adopted by the Council indicates that 1994 to 2003 landings history will be used if, some time in the future, a new species or species group is brought within the scope of the program. The problems entailed by such a provision are similar to those identified for using permit history to reallocate a stock when it becomes rebuilt. Once the QS are issued, QS and permits start changing hands, and there is entry and exit, the relationship between the entities owning the permits, their current activities, and the 1994 to 2003 permit histories will diminish. If, at that time, a stock must be brought into the IFQ program, there is a good likelihood that the permits to which the allocation is given may not be held by those currently targeting the new QS stocks. This could lead to some disruption and dislocation. However, the Council's action also states that some other basis for allocation might be considered. The Council's intent is to avoid creating an incentive for increased targeting on species outside the IFQ program, and the "Other Fish" category of groundfish, in particular. Based on that intent, the industry should expect that if the Council does select some basis other than 1994 to 2003 permit landing history for a future allocation, it is unlikely to select a criterion involving more recent harvest history. Development of an alternative method for allocation would entail some administrative costs. Additionally, the uncertainty about how the allocation would be carried out may dampen significant investment in the harvest or development of markets for species outside the scope of the IFQ program. Under such conditions of uncertainty, it is likely that businesses would plan to recoup any investments they make over a short period on the chance that they may not receive the QS if the species is pulled into the IFQ program. Given the belief that some of the species in these groups may be highly sensitive to exploitation, actions that dampen development of new targeting on those species may be appropriate until stock assessments are available, particularly for dogfish.

A-2.2 Permit/Holding Requirements and Acquisition

A-2.2.1 Permit/IFQ Holding Requirement

❖ *Provisions and Options*

1. Only vessels with limited entry trawl permits are allowed to fish in the trawl IFQ fishery.
2. For a vessel to use QP, the QP must be in the vessel's QP account.
3. All catch a vessel takes on a trip must be covered witH QP within 30 days of the time that data or documentation from the trip shows there is an overage[68] unless the overage is within the limits of the carryover provision (Section A-2.2.2.b), in which case the vessel has 30 days or a reasonable time (to be determined) after the QP are issued for the following year, whichever is greater. [69]
4. For any vessel with an overage (catch not covered by QP), fishing that is within the scope of the IFQ program will be prohibited until the overage is covered, regardless of the amount of the overage. Vessels which have not adequately covered their overage within the time limits specified in paragraph 3, must still cover the overage before resuming fishing, using QP from the following year(s), if necessary. If a vessel covers it overage, but coverage occurs outside the specified time limit (paragraph 3), the vessel may still be cited for a program violation.

   Exception Prohibition Suboption (not selected in preferred alternative): There may be exceptions and additions to the activities which will be prohibited when a vessel has an overage. A vessel with a deficit in its quota pound account would not be prohibited from participating in any of the following fisheries, even if they fall within the scope of the program: salmon troll; HMS troll/surface hook-and-line; Dungeness crab; all other HMS gears, except small mesh gillnet; and CPS purse seine. Additionally, vessels with a QP deficit would be prohibited from participating in state trawl fisheries such as pink shrimp, California halibut, ridgeback prawn, sea cucumber, and small mesh gillnet.
5. For vessels with an overage, the LEP may not be sold or transferred until the deficit is cleared.
6. **"Alternative Compliance Options (all options were rejected in preferred alternative):"**
   Option 1: After two years in deficit, a vessel may resume fishing.
   Option 2: A sliding scale exception would allow a vessel that does not cover its deficit to resume fishing after a period of time. The period of time the vessel would be prohibited from participating in certain fisheries would vary depending on the degree of the uncovered overage. The scale that would be used is still to be developed. [70]
   Option 3: No exceptions to Element 4 of this provision.

❖ *Rationale and Options Considered But Not Included*

The MSA requires that any LAPP do the following:

> (I) Include an effective system for enforcement, monitoring, and management of the program, including the use of observers or electronic monitoring systems.... [MSA 303A(c)(1)(I)]

While the enforcement and monitoring system elements are covered in Section A-2.3, the permit and IFQ holding requirements will have a substantial bearing on the organization and costs of such a system. Therefore, much of the rationale provided here relates to the provision of an effective enforcement and monitoring system.

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[68] Underscored text is a modification made at the April 2010 Council meeting.

[69] QP from a subsequent year may not be accessed until sucH QP have been issued by NMFS.

[70] Example: a minimum of 4 months (120 days) for 100 lbs plus an additional month for every additional 50 pounds of overage (1 mt overage = 44 months)

Element 1 – Trawl Limited Entry Permit Required to Participate

Requiring a LEP for participation is expected to control costs by limiting the number of platforms that must be monitored.

Element 1 option considered, but not included for detailed analysis:

Allowing vessels without trawl permits to participate in the fishery

This option was rejected from consideration because it could dramatically increase the number of vessels in the fishery that would have to be monitored and the number of accounts that would have to be managed. Additionally, there would not be a fixed set of participants in the program, making it more difficult for enforcement to monitor the system. These factors would substantially add to program costs and, absent sufficient additional funding, increase the likelihood that enforcement effort would be diluted.

Element 2 – Vessels Required to Acquire QP

Requiring that QP be placed in a vessel account in order to be used to cover catch is expected to control costs and assist in determining who is responsible for compliance, by linking each landing to one and only one account and responsible party. The holder of that account would be responsible for ensuring that a landing is covered witH QP.

Element 2 option considered, but not included for detailed analysis:

Allowing QP that are not in the vessel's QP account to be used for a vessel's catch

Under this rejected option, for example, a vessel might be able to cover catch witH QP held in a crewmember's account. This option was rejected because it would add to the complexity of the data entry and tracking tasks. Rather than just counting all catch of the vessel against a particular QP account, catch might need to be subdivided and counted against a variety of accounts. Under Element 2, as recommended by the Council, in order to maintain control over the QS/QP, crewmembers would hold QS/QP outside the vessel account until the QP is needed by the vessel and would, at that point, transfer the QP to the vessel (or some other point agreed upon by the vessel and crewmember).

Element 3 – Time Allowed to Cover a Landing (and Minimum Holding Requirement)

The extremes of this provision run from requiring that a vessel have QP to cover its anticipated catch (or hold some minimum amount of QP) prior to departure to allowing a vessel a period after its landing to acquire the QP it needs, specifically 30 days after data are reported that indicate an overage has occurred. The Council's PPA provided a vessel up to 30 days after a landing to cover its catch and was intended to provide the vessel with substantial flexibility (addressing objectives related to efficiency and sector health), as may be needed in a multispecies fishery in which the availability of QP for some species may be relatively limited. Key to the effectiveness of this provision was that the vessel would be prohibited from participating in certain fisheries if it has a negative balance in its QP account (see Element 4). The Council modified the approach at its April 2010 meeting by providing a vessel with 30 days after the time the first data are reported indicating that a catch overage has occurred. The Council felt this approach would be more equitable, flexible, and enforceable since a vessel would not necessarily be demonstrably in violation of the program until data are available indicating that an overage had occurred.

Element 3 options considered, but not included for detailed analysis:

Requiring a vessel to cover its landing witH QP (the following are suboptions)
within 24 hours of the landing
at the time of landing
when it brings the fish on board

Requiring a vessel to have some minimum amount of QP (particularly overfished species) if it is fishing in certain depth strata or hotspots;[71] *including a suboption that would allow the vessel to fulfill that option by participating in a risk sharing pool.*[72]

Requiring a vessel to have some minimum amount of QP before it leaves on a trip.

The first of these options was rejected because of the consequences of the time pressure that it would place on the vessel, potentially encouraging attempts to under-report or put pressure on observers, or forcing the vessel to pay unnecessarily high prices for the QP. The two minimum holding requirement options were rejected because of the difficulty of appropriately specifying the mix of species for which a vessel would be required to hold QP and the need for there to be maximum availability of overfished species, for which the amount of QP available may be quite limited. With respect to this last point, the concern was that QP could end up being unnecessarily tied up by vessels needing it to meet a minimum holding requirement and, therefore, be unavailable to vessels that had encountered the species and needed the QP to cover their catch. Finally, given the strong monitoring and enforcement system, it will be very difficult for a vessel to escape having to cover landings witH QP. Therefore, a minimum holding requirement did not seem necessary.

Element 4 – Fishing Restriction While In Deficit

Element 4 prohibits a vessel from engaging in certain fishing activities if it has a deficit in its account (even if that deficit is within the carryover provision, A-2.2.2-c). Two approaches were considered for designating the time at which a deficit occurred. Under the Council's PPA, the deficit would have been deemed to occur as soon as fish were caught in excess of the vessel's QP balance. The vessel would have been responsible for tracking and accurately estimating its own catch. Under the second approach, a deficit is deemed to occur as soon as the first official data are reported indicating that a deficit has occurred. The second approach starts the fishing prohibition at the same that the Element 3, 30-day clock starts.

Under the first approach (fishing must stop as soon as catch in excess of QP holdings is taken), it would be entirely the vessel's responsibility to avoid fishing with a deficit. A vessel would <u>not</u> be required to refrain from additional fishing while it waited for an official determination of its QP account balance.

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[71] The GMT recommended consideration of a mechanism that would establish a minimum holding requirement to access a certain area. These areas would be defined based on the presence of overfished species and the probability that a trawler would catch them during a fishing trip. This would require that trawlers declare their intent to fish either in the area that requires a minimum holding requirement or outside that area. For example, if trawlers intend to fish in depths shallower than 200 fathoms, a minimum holding requirement for canary and yelloweye rockfish could be required. Vessels could fish deeper without meeting the minimum holding requirement for canary and yelloweye, but would have to meet those minimum holding requirement provisions if they desire to fish shallower than 200 fathoms.

[72] The GMT also recommended consideration of a minimum holding requirement provision that would allow vessels to enter into voluntary pooling agreements in order to reach that minimum holding requirement. This would require that trawlers forming voluntary risk pools register with NMFS. By registering as a member of the risk pool that had an adequate amount of overfished species (an amount that would have to be determined and based in part on the number of participants in the pool), the vessel would be considered in compliance with the minimum holding requirement.

Allowing a vessel to take responsibility for ensuring it is not fishing in deficit reduces the pressure to implement a data system with extremely rapid account resolution turnaround times. This would allow the development of a lower cost data system while at the same time ensuring full monitoring and detection of violations (through 100 percent observer coverage). Under the second approach (a vessel must stop fishing as soon as data are available indicating its catch may have exceeded its account holdings), either a vessel might be required not to resume fishing until data from a trip had been processed, or a vessel might be allowed to start another trip right away but be required to stop as soon as data in the system indicate that it may be in deficit.

One decision required with respect to this element of the program was the scope of the fisheries the vessel would not be able to participate in if it has a deficit. The primary legal concern in specifying the restriction is that any limitations placed on the vessel be necessarily reasonable for effective program design and not an action which would be considered punitive and, therefore, require due process (e.g., an opportunity for a hearing and appeal). A central element to the effective functioning of the program is that a vessel covers its landing witH QP. Therefore, prohibiting a vessel that has not met that condition from participating in the program is a necessary and reasonable result required for an effective program. In contrast, prohibiting participation in fisheries for whicH QP is not required may more likely be considered punitive. On this basis, it is likely that the Council will have to modify the fisheries in which vessels in deficit are allowed to continue to participate so that participation is prohibited and exceptions made only for those fisheries outside the scope of the program. Alternatively, if there are fisheries that are outside the scope of the program specified in A-1.1, but from which the Council believes vessels with a deficit should be excluded, the Council could explore modification of the program scope to incorporate those fisheries.

When the Council took final action in November 2008, there were some fisheries for which a decision was needed as to whether to consider them as part of or outside of the trawl groundfish IFQ program. In particular, the situation of the California halibut fishery had not been clear. Participants in this fishery are considered to be participating in the groundfish trawl fishery if they have a LEP and retain groundfish. Excluding those who do not retain groundfish from the bimonthly cumulative limit rules of the trawl groundfish fishery was feasible when the regulations primarily pertained to landings rather than total catch. The IFQ program requires that all groundfish trawl permitted vessels acquire QP to cover their catch taken with directed commercial groundfish gear. Thus there is no opportunity to avoid the harvest control regulations by discarding groundfish. On this basis, the Council included as part of the PPA an option that would consider the California halibut fishing by LE trawl vessels within the scope of the program (i.e., prohibit California halibut fishing by trawl LE permitted vessels that have a deficit in the QP account). The Council also included in this option all other state water trawl fisheries such as pink shrimp, ridgeback prawn, and sea cucumber trawl, as well as small mesh gillnet. When it took final action under Section A-1.1, the Council clarified that inclusion of California halibut did not cover California halibut gear with a mesh size of greater than 7.5 inches used in state waters.

Element 4 options considered but not included for detailed analysis:

Prohibiting all fishing by a vessel with a deficit in its QP account

This option was rejected because it was viewed to be punitive and, therefore, did not include adequate provisions for due process.

Element 5 – Transfer of Permits Prohibited While In Deficit.

Element 5 is intended to support accountability by ensuring that an individual not be able to dispose of its LEP if it is not in compliance with the program. This provision implies that the processing of any

applications for transfers would have to be delayed until a sufficient time has passed since the vessel's last landing to allow for full resolution of the vessels QP account balance.

Element 5 options considered but not included for detailed analysis:

Prohibiting the sale or transfer of the QS and/or QP in the vessel account

Prohibition of the sale of the QS or QP was rejected because the QS is not assigned to a vessel, and the vessel may have to sell its surplus QP in order to acquire the funds needed to buy the QP to cover the species for which it has a deficit. Additionally, if the vessel is unable to cover its deficit during a particular year, prohibiting the vessel from transferring its surplus QP would be to the detriment of processors, communities, and the general public.

Element 6 – Alternative Compliance Options

Element 6 was intended to provide some alternative avenues for compliance with the program to ensure that the program does not become overly restrictive. Vessels may face a fishery situation in which overfished species are sometimes encountered at very high incidental catch rates on a very random and infrequent basis ("disaster tows") and that the amount of QP available to the fishery may be very limited. Under such circumstances, there is a concern that it may take several years for a vessel to acquire the QP needed to cover an overage. If a vessel is in deficit, even after if it is cited for going beyond the maximum length of time allowed for resolving the deficit (see Element 2), it still must cover the deficit before it resumes participation in the program. Some perceive this as potentially victimizing the fisherman; therefore, these alternative compliance options were developed. Element 6 was not included as part of the final preferred alternative because there was concern it might invite abuse. Fishermen might assess the length of time they would be required to be off the water and time overages to coincide with planned major repairs or transitions to other fisheries.

Element 6 options considered but not included for detailed analysis:

Vessel can continue fishing by voluntarily surrendering QS of other species.

Vessel can continue fishing by voluntarily posting a bond.

Vessel can continue fishing by voluntarily making a payment based on the amount of target species typically associated with the amount of overage species taken (using incidental catch rates) (variation on the deemed value system in New Zealand).

Vessel can continue fishing by voluntarily paying an amount based on the fish on board (similar to the deemed value system in New Zealand).

The payment and surrender options were rejected because they appeared to be punitive (required an action at the vessel's expense that would not be required in the normal course of meeting the objectives of the program). The option of a bond was rejected because it was not apparent that under the MSA the Federal government would have the authority to impose such a requirement.

Related to this element was an option the Council considered for auctioning off QP for overfished species. This option will be discussed at the end of the analysis of Element 6.

❖ *Interlinked Elements*

Element 1 –Trawl Limited Entry Permit Required to Participate

The number of nontrawl vessels able to harvest trawl QS will be constrained by the number of trawl permits not needed after the trawl fleet has consolidated. Thus, if this provision is changed to allow participation in the IFQ program without a trawl permit, there may be a substantial change in the

impacts of the gear switching opportunity provided by the scope of the program (Section A-1.1). This provision parallels the scope of the IFQ program, which covers harvest by LE trawl vessels (as defined by their possession of a limited entry trawl permit).

Element 2 – Vessels Required to Acquire QP

By requiring all QP be deposited to a vessel account in order to be used, this element interacted with the control accumulation limit. Vessel limits were set above the control limits and accumulation limits were originally specified to apply to both the QS and QP. Since a vessel's account would generally be considered under the control of the vessel owner/operator this created a discontinuity, it would be impossible for a vessel to reach the vessel limit without violating the control limit. Therefore, the vessel limits in Section A-2.2.3-e were respecified so that control limits applied only to QS and vessel limits only to QP.

Element 3 – Time Allowed to Cover a Landing (and Minimum Holding Requirement)

The 30-day period a vessel is allowed to cover its landings increases the possibility that the fleet could exceed its annual allocation (but not the multiyear average). The carryover provision provides some mitigation for this risk in that it reduces the incentive for vessels to use all of their QP. This has two closely related effects. First, it increases the probability that some vessel owners will have unused QP at the end of the year, decreasing the probability of an overage on the fleet allocation. Second, those QP may then be available, at the right price, for those with an overage to acquire during the 30-day settle up period. However, the carry-over provision itself creates some possibilities for annual overages. These possibilities are discussed in the section on that provision.

Element 4 – Fishing Restriction While In Deficit

If vessels with a QP deficit can only be restricted from participating in those fisheries that fall within the scope of the program, then there is an interaction between the scope of the program (Section A-1.1) and scope of the prohibition that can be implemented under this element.

The need for a catch and QP tracking system with rapid turn-around times is reduced if vessels are allowed to start on another trip immediately after completion of offloading. This can be achieved either by holding the vessel responsible for fishing while in deficit (even if the deficit has not yet shown up in its account) or by applying the restriction only when the deficit is recorded in the data system (making it legal for the vessel to fish until the deficit shows up in its account).

Element 5 – Transfer of Permits Prohibited While In Deficit.

There are no other provisions in the program that are strongly interlinked with this element.

Element 6 – Alternative Compliance Option

Element 6 does not interact with other provisions of the program, except indirectly through its impacts on other elements of this section. Element 6 may have implications for the effectiveness of those other elements, particularly with respect to meeting conservation objectives over the long term and the strength of the incentives vessels have to ensure that they are able to acquire the QP they need to cover their landings.

❖ Analysis

Element 1 – Trawl Limited Entry Permit Required to Participate

Requiring that a LE trawl permit be held in order for a vessel to participate in the IFQ program has implications for objectives related to conservation; net benefits, program costs, and complexity; and fairness and equity.

By limiting the number of vessels involved in the fishery, this requirement may limit the amount of gear switching that may occur and, therefore, have conservation implications, particularly with respect to habitat impacts. The impacts of gear switching are covered in Section A-1.1 and Section A-7.

If a greater number of vessels were allowed to participate in the fishery, program costs and complexity would increase, and net benefits might decrease, unless all program costs are borne by industry. An unlimited number of vessels would increase the number of accounts to track and could increase the diversity of alternative strategies in which the trawl IFQ is used. This could require the specification of more regulations for how opportunities for the use of trawl IFQs would be mixed with the opportunities provided under the general regulations for nontrawl gears. Most likely it would require a declaration procedure, and vessels would either have to be fishing under the trawl IFQ regulations or the regulations for the gear they use. Vessels fishing under the trawl regulations would have to be in full compliance with those regulations, including requirements to carry observers. The high costs of complying with the program alone might keep the number of participants low, even without the number of vessels being limited by the permit requirement. The number of vessels that participate in the fishery would not be a concern if all costs were privatized and born by the users in proportion to their responsibility for those costs. Under such circumstances, a larger fleet would occur only if that were the most efficient result. The market would allocate the QS out to the most efficient number of participants with the best mix of activities (from an efficiency perspective). However, it is unlikely that all costs will be fully born by the users. On the basis of the anticipated compliance and administrative costs, it is expected that restricting the number of vessels to the number of trawl permits will result in a program with lower total governmental costs.

The LE trawl permit requirement is also viewed to preserve equity with respect to one fleet's ability to access the allocation of another. On one hand, members of the trawl fleet felt that it would be unfair for others to have access to their allocation while they would not be able to access/purchase allocation given to other sectors. On the other hand, if an individual member of the trawl fleet gives its QS to a member of a different fleet, other members of the trawl fleet are not directly harmed so long as all QS holders participate and are responsive to the market for QS/QP (e.g., do not hold on to QS for strategic reasons unrelated to its most efficient use). Even with the LEP requirement, gear switching is allowed, and some nontrawl vessels will likely be able to participate in the trawl sector IFQ program by acquiring permits not needed by the consolidated trawl fleet. However, the ability of other fleets to participate will be limited by the number of surplus permits available after rationalization.

Element 2 – Vessels Required to Acquire QP

Requiring that QP be placed in a vessel account prior to use affects objectives related to conservation, net benefits, program costs, and fairness and equity.

If the QP did not have to be transferred to a vessel account in order to be used, then the data tracking system would have to be set up to allow each landing to be subdivided and counted against a variety of different QP accounts, increasing the costs of the program. Requiring that the QP be transferred to a vessel account breaks the link between the QS holder and the QP (except with respect to vessel owners

owning QS). That link could be preserved but it would require that data be kept to link eacH QP with the QS account from which it was originally issued. The effect on the complexity and cost of the data tracking system would be similar that of not requiring the QP be transferred to the vessel account in order to be used. Therefore, after QP is transferred to a vessel account the QS owners contributing that QP will lose control over it, except as they may be able to otherwise provide through private contract.

Because the QS holder is not held accountable for how the QP is fished and whether an overage is incurred, there is no incentive for the QS holder to ensure that it sells QP to a responsible vessel. A vessel could knowingly harvest an amount of fish that far exceeds the QP it holds in its account, then that vessel could be taken out of the trawl fishery and never cover the overage witH QP. The QS holder that transferred its QP to that vessel would be not be held responsible. Holding the QS liable for overages could increase self-policing within the fishery, but might also raise questions about fairness and equity with respect to the QS holder's responsibility for the vessel's actions.

Setting up a program in which QS holders that do not own vessels are not able to directly use their QP may be viewed as inequitable by some. However, as long as the providers of the QP have been fully compensated for the QP, there appears to be little reason that they should maintain some claim to those QP. If a QS holder, a crewmember for example, wants to retain control of the QP it receives until they are needed by the vessel, Element 3 facilitates that. By providing 30 days for the vessel to cover its landing, the vessel could contract with the crewmember for the QP to be provided as needed after a landing is made, and the crewmember would maintain control over the QP.

Element 3 – Time Allowed to Cover a Landing (and Minimum Holding Requirement)

The provision allowing 30 days to cover a landing has a bearing on objectives related to conservation, net benefits, program costs, sector health, and program performance. The B.C. groundfish trawl fishery allows 30 days; in New Zealand, 15 days are provided; and in Nova Scotia, 45 days are provided (Sanchirico, et al. 2005). The Icelandic system provides three days from the time vessels are notified they have an overage. After three days, the vessel's permit is suspended. Under the Council PPA, the vessel would have been given 30 days to cover its overage from the date of landing, regardless of when data were available indicating an overage had occurred. Additionally, the vessel would have been held responsible for ensuring that it never fished with an overage (see Element 4). Under Element 4, if it were detected that a vessel had fished with a deficit at any time, the vessel would have been subject to a notice of violation. Thus, in a sense it was more restrictive than the Icelandic system, which provides a three-day grace period. However, it was also more liberal in that the vessel could have carried a deficit for up to 30 days without being in violation of the program, so long as during that period it did not take part in any fishing that falls under the scope of the program. Under the Council's final preferred alternative, the vessel would be given 30 days from the time catch data show it may have an overage.

Ability to monitor and enforce this provision will be a major determinant of its impacts. Therefore, we will first discuss the relationship between this provision and monitoring and enforcement with respect to program performance and then look at different requirements and their impacts on other objectives.

- *Monitoring and Enforcement*

The IFQ program will require 100 percent at-sea monitoring (Section A-2.3.1). Complete monitoring is required because the QP is required to cover catch, including discards. QP for some species is likely to be quite expensive (overfished species), while the per-pound value of those species is relatively low;

thus, there will be significant incentive for vessels to discard overfished species if there is not full at-sea monitoring.

A program that requires QP be held at some time prior to offloading would allow a greater opportunity for enforcement activity during fishing or offloading activities. Enforcement officers in the field (USCG at-sea, or state or NMFS agents on the dock) could determine whether the vessel has sufficient QP to cover the fish on board at the time of interception. When violators can be detected and cited in the field, or shortly after a landing, enforcement actions can be taken more efficiently (e.g., the collection of needed evidence), and deterrence is created as information about citations made reaches the fleet rapidly. Thus, providing a 30-day period to acquire QP will make follow-up investigations more difficult, and information about later investigations may be slow to reach the fleet, reducing the deterrence effect of those enforcement actions. However, given the tight monitoring system, field enforcement will not likely increase the frequency with which violations are detected.

With a coverage requirement that provides little or no time after a landing for vessels to acquire the needed QP, if the consequences of the overage are economically significant (as might be the case for an overfished species) the vessel will have incentive to seek to under-report catch. For example, they might have more incentive to interfere with the observers' activities (e.g., discarding fish before the observer has a chance to identify and weigh them), put excessive pressure on observers by questioning the observers' measurements, or by other means. Allowing for delayed resolution of accounts (e.g., 30 days) will somewhat reduce incentives to underreport by providing vessels a longer opportunity to find QP at the lowest available price.

A program that requires some amount of QP be held prior to departing from port would add another rule that would have to be monitored and enforced. Specifying the mix of species that a vessel must have would be difficult, and requiring that vessels hold some minimum amount could reduce QP availability for those who need it. The reduction in QP availability could be a particular problem for overfished species. Under such a rule, it is likely that the species for whicH QP must be held would depend on where the vessel is intending to fish. This would be enforced either during at-sea boardings, or during after-the-fact matching of the vessel's fishing locations to the balances in its account before it departed. Such a requirement would add to program administration and enforcement costs. With strong monitoring of catch, it is not clear that a minimum holding requirement would add anything to encourage compliance and facilitate enforcement.

♦ *Conservation*

The conservation concern is whether this provision will increase the likelihood that the fleet might exceed its allocation of a particular stock and as a consequence all sectors taken together exceed the overall OY. Assuming that vessels fish without all the QP they need for a particular trip, providing a 30-day period to balance the QP account will create a lag time between when the last of the trawl allocation for the year is taken and when the last of the QP disappears from the market. The Council's FPA, which starts the 30-day clock from the point at which data on the overage is reported, rather than the time of landing, potentially creates a somewhat longer lag between catch and the time the QP to cover that catch is removed from the market. The additional lag will be the time it takes for data from a trip to be recorded in the data system. However, the prohibition on fishing for vessels with a deficit, and the high cost of QP when they are in short supply provide substantial disincentives for risky behavior, such as delaying until the last moment the acquisition of needed QP. Additionally, not allowing a vessel with a deficit to fish under the program ensures that over the longer term of a few years the fleet will not, on average, exceed its allocation (this could have changed if Option 1 or 2 of Element 6 had been adopted). The overage and underage aspects of the carryover provision will increase the probability that

the fleet as a whole does not go over its allocation in a particular year since vessels will not face losing QP (up to 10 percent) if they do not fish to the maximum in the current year. The Canadian system allows 30 days to cover an overage and has a carryover provision. There, trawl sector total allowable catches (TACs) are only occasionally taken and rarely exceeded. If that experience holds true for this program, there would appear to be little risk that OY would be exceeded due to vessels catching fish for which they do not have QP and then not being able to acquire the needed QP after landing. However, based on observations of the Canadian experience, the greatest risk in this regard will be for constraining species. If, on an annual basis, the trawl fishery approaches harvest levels that exceed their allocation, the Council will have to ensure that the provisions of the MSA are met with respect to annual catch limits. To do this, the Council may take action in advance or inseason. For example, buffers might be established in advance of the season (see discussion of this issue in the section on carry-overs (Section A-2.2.2-b)). During the season, if fleet catch for a particular species starts approaching the total trawl allocation, and significant amounts of target species QP for the year remain, there may be restrictions on fishing areas, e.g., expansion of the RCAs (Section A-1.3).

With respect to the minimum holding requirement that was considered, in particular for overfished species, the conservation benefits appear to be minimal given strong monitoring provisions and the difficulty in constructing such a requirement for a multispecies fishery. While potentially helpful in ensuring that a vessel could cover its landing of an overfished species, it would not be possible to set such a requirement at a level that would ensure a vessel could cover an unexpectedly high catch rate ("disaster tow"). The requirement could be set well below disaster tow levels, but this could make QP difficult to acquire for vessels that actually need it to cover a disaster tow. Additionally, maintaining the required amounts of minimum holdings would become even more difficult as the season progressed, and vessels used up the QP. If the minimum holding requirement were based on fishing areas or hot spots, it would encourage fishermen to stay out of those areas if they were unable to acquire the needed QP, as might particularly be the case toward the end of the season. However, with the scarcity of overfished species QP such areas could well become de facto closed areas. Given that major overages could result in restrictions on the fleet as a whole, and even lead to a derby atmosphere in the IFQ program, conservation concerns might better be addressed by closing the high bycatch rate areas rather than leave them available for fishermen willing and able to take the risk.

♦ *Economic Effects*

Providing a significant period of time after a landing to cover the catch might result in the following:

- Decrease the average price paid for the QP
- Provide greater business flexibility and increase the availability of QP on the market
- Improve the market function

The less time a vessel has between when it knows the exact composition of its trip and when it has to have the QP to cover that catch, the less time a vessel will have to search for QP at the cheapest price. Vessels in that situation are more likely to pay a higher "spot price" for the QP they need. To avoid paying those higher prices, a vessel is more likely to hold a larger QP inventory on the chance it might need it. This would reduce the amount of QP available on the market and result in even higher spot prices. Conversely, providing a longer time to acquire QP will allow vessels more time to search for the lowest available price and reduce their need to carry an inventory of QP. This would likely improve market function, particularly if markets for some species are relatively thin (meaning the amount of QP available for trade at any time is relatively limited).

In the extreme, a minimum holding requirement would require that a vessel have certain QP in its account before departing on a trip or entering into certain fishing areas (hot spots or depth zones). The

species for which a vessel would be required to hold QP would likely be those for which there are the fewest QP available and the greatest conservation concern (overfished species). As discussed in the section on conservation, requiring vessels to hold those QP on the chance they are needed would reduce their availability to those who have already encountered those species and need them to cover their catch. This would increase the QP price for the already expensive overfished species and may hamper the fleet's ability to take target species. If this provision were structured such that a vessel could meet this minimum holding requirement by entering into a risk pool with other vessels, the minimum holding requirement would likely drive more vessels into such pools. Given that these pools would be voluntary associations, those who had a reputation for encountering high amounts of bycatch or otherwise were not welcome in an association would likely face higher risks and higher costs. Thus, a minimum holding requirement might force those individuals out of the fishery more rapidly.

Element 4 – Fishing Restriction While In Deficit

Prohibiting a vessel from fishing while in deficit may have an impact on objectives related to conservation, net benefits, efficiency, program performance, and equity.

The prohibition on fishing while in deficit is expected to provide an incentive to vessels to cover their QP in a timely manner, including minimizing their risk of being caught in a situation in which they are unable to acquire QP. This strong incentive is expected to mitigate the potential negative effect of the 30-day time lag provided in Element 3 and thereby expected to promote conservation objectives.

Under the PPA, Element 3 would have allowed a vessel to go on another trip immediately upon completion of a landing, without waiting for an official resolution of its QP account balance. However, if, after the account balance had been resolved, it turned out that the vessel had gone fishing with a deficit, the vessel would have been subject to a notice of violation. The two concerns in this regard were the potential for an accounting error on the vessel's part, or an intentional flagrant violation by a vessel that had determined that it no longer wished to continue to participate in the fishery. Under the latter circumstance, a vessel might knowingly make as many trips as possible before the overage balance is detected. However, such activities would still be illegal and subject to prosecution. Because of the vessel monitoring system (VMS) system requirements and the requirements to carry an observer, it is virtually certain that once the vessel's negative balance became known, illegal fishing occurring during the period of that negative balance would be flagged, and a notice of violation would be issued, similar to the situation vessels are in under the current two-month cumulative trip landing limit system. Therefore it was expected that the restriction on fishing while in deficit could be effectively enforced even with the 30-day accounting lag of Element 3 and the allowance for vessels to continue fishing prior to an official determination of their account balance. Under the final preferred alternative, the Council modified the 30-day clock for covering an overage such that it commences once data are available showing that the overage exists. Application of this rationale to the "no fishing while in deficit" provision leads to the implication that a vessel should not be considered in deficit until the information is in the data system showing that a deficit may exist. This then opens a greater opportunity for vessels that suspect they are in deficit to make a last minute dash to catch additional fish before the deficit shows up in the data system, since such fishing would not be a violation of the program. In terms of an impact on conservation, with the tight monitoring and requirement that all overages be covered, there is little chance that a long-term conservation problem could be created by vessels that remain in the fleet, since these vessels would eventually cover their deficits witH QP. The greatest problem would be for vessels planning to leave the fishery; however, the incentive to engage in such last-minute fishing dashes would be minimized to the degree that harsher penalties might be expected for such irresponsible behavior. In addition to potential conservation concerns, last-minute dashes could also create an equity concern to the degree to which the additional fish taken would lead to the need to impose inseason constraints on the rest of the fleet (e.g., depth restrictions to reduce bycatch). The opportunity for last-

minute dashes will depend on the speed with which data on a particular trip are entered into the tracking system and whether vessels are allowed to go on a subsequent trip before all the data from their current trip are entered into the system.

Under the PPA, efficiency and net benefits were expected to be promoted by allowing vessels to estimate QP balances on their own and continue fishing directly after completion of an offload. Such flexibility was expected to reduce vessel operating costs and allow for the development of a catch-QP tracking system that is less costly and has a somewhat slower turnaround, but still performs well enough to meet industry needs. Under the final preferred alternative, the impacts of the no fishing provision will depend on whether vessels are allowed to go out on a subsequent trip prior to the resolution of the balance in their QP account and/or the speed with which data are put into the system. If, immediately after completion of a trip, vessels are allowed to go out on another trip, there will still be substantial flexibility for vessels to reduce operating costs, but irresponsible operators may generate adverse conservation and equity benefits, as described above. On the other hand, if a vessel cannot go out on another trip until data from its last trip are entered into the system, then flexibility would be reduced, and there would likely be pressure for a data system with faster turnaround times, a system that is likely to be more expensive.

Element 5 – Transfer of Permits Prohibited While In Deficit

This provision provides a disincentive for activities that might otherwise compromise conservation objectives. The purpose of prohibiting a vessel with a deficit from transferring its permit is to provide further incentives for a vessel to avoid the deficit and reduced opportunity to abuse the system. In particular, it puts additional assets at risk for a vessel that might decide to flaunt the system and maximize its catch before overages are detected. Thus it increases the vessel's risk exposure if it were to decide to engage in an illegal action. To administratively complement this requirement, no permit transfers would be allowed between the time of a vessel's landing and the time its QP account has been debited for that landing. Because permit values are expected to decline substantially with the imposition of an IFQ program, the disincentive provided by the potential loss of ability to transfer a permit will be lower than might be expected based on current permit values.

The impounding of QS and QP transfers while a vessel is in deficit was also considered. QS is not associated with a vessel, so there is no opportunity to freeze QS account transfers while account balances are being resolved, and the vessel may need its QP to generate revenue to acquire the QP it needs to cover the species for which it has a deficit. Freezing QP would also penalize other vessels by eliminating that QP from availability on the market, potentially increasing market prices.

Element 6 – Alternative Compliance Options

This provision is intended to address objectives related to fairness and equity, efficiency and net benefits, and sector health, but may also affect conservation objectives.

- Conservation

With respect to the conservation objectives, a potential negative impact of this provision is that a vessel, knowing there is a limit to the time it is off the water, might take advantage of this provision by intentionally fishing into a deficit and planning to rely on other fishing activities until such time as the Element 6 exception allows it to resume fishing (e.g., a vessel might fish its QP account into a large deficit, go to Alaska for two years, then return or sell off its permits after the fishing restriction has expired). When a vessel resumes fishing without having ever covered its deficit, then the conservation

objectives will not have been met unless there has been a buffer or some other measure that has kept total harvest within the OY.

The sliding scale option (Option 2) would provide a variable way for determining the amount of time that a vessel would be off the water and may provide some additional equity by being more responsive to particular circumstances, but would not avoid the possibility that fishermen will determine in advance the amount of time they would be off the water and accept that as part of the cost of their overage.

- Fairness, Efficiency, and Sector Health

The fairness and sector health concern is related to the relatively random nature of the encounters with overfished species. Under status quo management, the effect of harvest in excess of what is expected falls to the individual, but also across the entire fleet in the form of inseason reductions in cumulative limits. Additionally, the duration of the direct impact of the unexpected high harvests on vessels and the fleet is limited in that the cumulative limits start over every two months, and the fishery starts over each year with a new OY and fleet allocation. Under the IFQ program, the effect of random occurrences of high bycatch "disaster" tows may fall on a few vessels at a time, and, absent the exceptions provided in this element, the burden of making up for the random occurrences is not relieved at the end of a year. If the occurrence of high bycatch tows is truly random, there could be fairness concerns, as well as concerns about sector health and efficiency of the fishery. A few vessels could end up bearing the burden for a situation that is faced by the fleet as a whole. Further, if a certain number of vessels are sitting out every year waiting to accumulate enougH QP for a particular species in order to re-enter, a larger fleet may result (as an example, if the optimal fleet size is 70, and 7 vessels on average sit out every year, something close to 10 percent more capital might be dedicated to the fishery than is optimal).

Some vessels encountering overfished species may have substantial difficulty acquiring QP to cover their unexpected high bycatch rate because of the expected high cost of the QP. Given the uncertainty surrounding potential catch of overfished species, vessels with unused overfished species QP may withhold those QP from the market to ensure that they can cover their own needs. Vessels holding QP as insurance against a low probability event may create even more of a market shortage and higher prices.

Available information shows that there are more trawl tows that result in zero encounters of relatively rare overfished species (such as yelloweye, Figure A-117) than there are tows where there are substantial quantities. The encounters of overfished species may not affect most of the fleet since more vessels are avoiding them than not, but the implication to the individual who has an encounter may be quite large given the individual accountability of the trawl rationalization program.

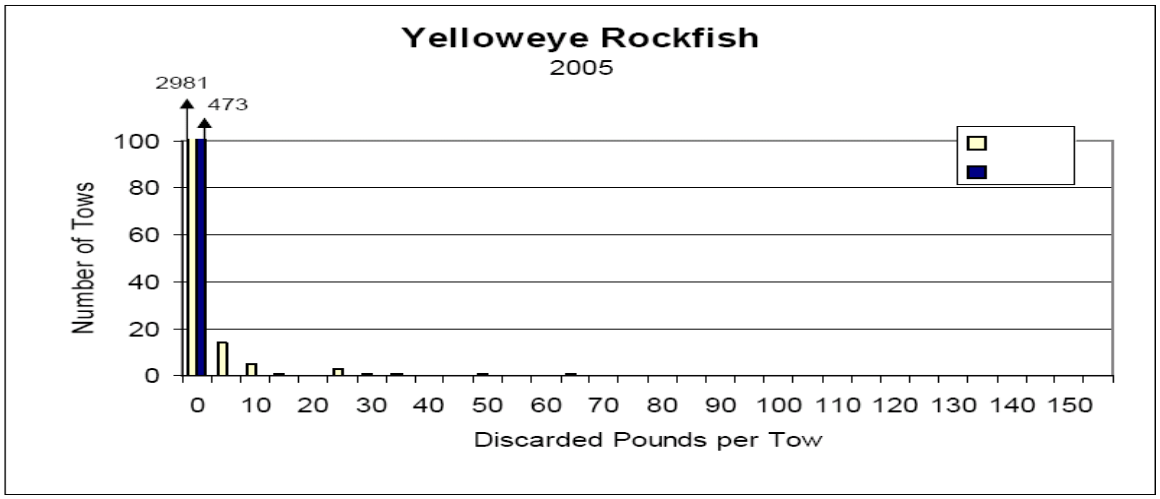


Figure A-95. Observed Discard of Yelloweye Rockfish in the Nonwhiting Trawl Fishery (note: at least one tow occurred in 2004 with > 100 pounds).

To outline the magnitude of the problem, the following scenario was developed. This scenario assumes that the nonwhiting trawl sector will be allocated 0.5 metric tons of yelloweye rockfish and that the number of participants in that fishery consolidates to 60 vessels. This means that there would be approximately three yelloweye rockfish available to each vessel. If each of those vessels intends to hedge against uncertainty by holding on to only one fish, the effect is that approximately 40 percent of the sector allocation is not available for purchase on the market. This reduces the chance that vessels with deficits can cover their catch by purchasing QP, and it increases the cost of purchasing QP because the supply on the market is lower.

	Available Quantity of Yelloweye under Initial Allocation	**Quantity Available on the Market if Hedging Occurs**
Pounds available to the sector	1,102	682
Pounds per vessel	18	11
No. of Fish per Vessel	3	2

The potential for unexpected overages will likely be exacerbated by the rebuilding paradox. The rebuilding paradox has to do with the lag time between when fish become more available to the fishery (more abundant in the catch) and when the increased abundance is detected and OYs appropriately increased. It results in greater than expected harvests. Under an IFQ program, it would mean less QP would be available than might be appropriate given the true stock abundances and encounter rates.

The primary equity and conservation concerns of this provision apply to overfished species that are taken incidentally along with target species. The provision, as currently worded, covers all species. It, therefore, may provide more of an exception than is necessary to address the identified objectives related to fairness and sector health.

To address this concern with respect to overfished species, the Council also considered but rejected the release of overfished species through an IFQ auction. Concern was expressed about the administrative cost and complexity, whether it would ultimately relieve price concerns about overfished species QP, and how vessels would be able to access QP as needed (before auctions occurred).

A-2.2.2 IFQ Annual Issuance

A-2.2.2.a Annual QP Issuance

❖ Provisions and Options

QP will be issued annually to QS holders based on the amount of QS held.[73]
As specified above, QS holders will have to transfer their QP to a vessel account in order for those QP to be used.

❖ Rationale and Policy Issues

Annual issuance of QP is in line with the annual setting of the OYs. Providing the IFQ as shares (QS) rather than absolute poundage provides flexibility so that reallocation is not needed as the OYs or trawl allocations change.

❖ Interlinked Elements

Numerous features of the program rely on this structure of the IFQ privilege (the issuance of QS witH QP issued annually to QS holders). Any change in this basic provision would require substantial reconsideration of numerous provisions and the redevelopment of the IFQ alternative.

❖ Analysis

Issuing IFQ as shares that then entitle the holder to annual harvest privileges (QP) is a means by which the Council "take[s] into account and allow[s] for variations among, and contingencies in, fisheries, fishery resources, and catches," as required by National Standard 6 of the MSA. Alternatives might be to issue IFQ anew each year (eliminating the benefits from long-term planning, increasing program complexity, reducing the opportunity to rationalize the fishery, and substantially increasing program costs) or issue IFQ that is valid across a number of years (increasing program costs and creating equity and reverse allocation issues[74]).

[73] Including QS that an entity received in excess of accumulation limits in place at the time of initial allocation (see Section A-2.2.3.e).

[74] Reverse allocation would be required if some QP have to be recalled because of declines in the amounts of fish available to trawlers for harvest.

A-2.2.2.b Carryover (Surplus or Deficit)

❖ *Provisions and Options*

To the extent allowed by the conservation requirements of the MSA, a carryover allowance will allow **surplus** QP in a vessel's QP account to be carried over from one year to the next or allow a **deficit** in a vessel's QP account for one year to be carried over and covered witH QP from a subsequent year. QP may not be carried over for more than one year.

A vessel with a QP **surplus** at the end of the current year will be able to use that QP in the immediately following year, up to the limit of the carryover allowance (see below). However, if there is a decline in the OY, the amount of QP carried over as a surplus will be reduced in proportion to the reduction in the OY.

A vessel with a QP **deficit** in the current year will be able to cover that deficit witH QP from the following year without incurring a violation if

(1) the amount of QP it needs from the following year is within the carryover allowance (see below), and

(2) the QP are acquired within the time limits specified in A-2.2.1.[75]

Carryover Allowance: There is a limit of up to 10 percent carryover for each species. This applies to both non overfished species and overfished species. The percentage is calculated based on the total pounds (used and unused) in a vessel's QP account for the current year. The percentage used for the carryover provision may be changed during the biennial specifications process. *Note: This provision relates only to carry-over of what is in the vessel's account.*

❖ *Rationale and Options Considered but not Analyzed Further*

In order to understand how the carryover provision would work, it helps to revisit how the distribution and use of QP will work. Before the start of the fishing season and after the OY has been established, the trawl sectors will be allotted apportionments of the OY for each quota-managed species. The trawl sector portion of the OY will be distributed to QS holders. Each QS will be equivalent to a certain poundage for that year for each quota species (poundage will change from year to year if the trawl allocations or OY changes). The QP must then be transferred from the QS holder to a vessel. The QP is then associated with a vessel: the vessel is responsible for any QP overage or underage incurred, because it is at the vessel level where the catch accounting will occur. Any overage or underage is not linked back to the QS, and the QS holder the next year will be allocated 100 percent of the QP associated with the QS. In other words, a QP overage will not be deducted from the original QS holder's future QP. The responsibility for the overage stops with the vessel. The 10 percent allowable carryover for a vessel would be calculated based on all the QP the vessel held (used or unused) in its account for the entire season. "Used" QP is QP a vessel has used to cover catch (it does not include QP that was transferred into and then out of the vessel account).

The term "carryover" in this analysis refers to the vessel's QP that is either in surplus or deficit from one year to the next (it does not apply to QP remaining in the QS holder's account). A carryover provision would allow a vessel to keep a percentage of unfished QP (a surplus of quota pounds) for use the following year. If 90 percent of a vessel's QP is harvested in the first year, then that remaining

[75] Carryover of deficits provides some flexibility to use pounds from a year to cover a deficit from a previous year. Without a carryover provision, a vessel would still have to use pounds in a subsequent year to cover an overage but would incur a violation.

10 percent could be harvested in the second year in addition to whatever QP the vessel acquired in the second year (e.g., acquired from QP issued to QS held by the vessel owner). Conversely, the carryover provision would allow up to 10 percent over-harvest in one year to be covered by QP the vessel acquires in the following year (by QP from the vessel owner's QS or QP acquired from other QS owners). The carryover allowance for a vessel would be 10 percent of the used QP in its account at the end of the 30-day period that it has to cover any overage. Since a vessel must stop fishing as soon as a deficit is recorded, the amount in it account at the end of the 30-day period would be similar to the amount that will be in its account at the end of the year, unless it has been able to resume fishing by covering the overage. If the harvest in a year was equal to 110 percent of the QP in the vessel account, that 10 percent QP overage would be deducted from the following year's QP acquired by that vessel. QP surpluses could not be carried over for more than one year. If a vessel catches more than 10 percent in excess of its QP holding, it would still be required to cover its catch witH QP from a subsequent year, but it would also be subject to penalties for violating provisions of the program.

The Council could have chosen to allow carryover of surplus QP, but not deficit, or provide an asymmetrical carryover provision. An asymmetrical carryover provision is one where the carryover percentages would be different from each other. For example, Iceland allows a 20 percent carryover of a surplus and 5 percent "carry back" of QP to cover an overage (Sanchirico, *et al.* 2005). Additionally, carryover allowances need not be set at a constant level indefinitely. The Council specified the carryover provision to allow for changes to be made as part of the biennial specifications process. These changes might be made based on stock conditions and previous years' experiences.

The Council considered the carryover provision as a means of 1) decreasing the incentive to take the maximum harvest within a year by fishing as close as possible to individual annual limits and, in a multi-species fishery, provide more flexibility for fishermen to fully take the allowable catch on average across years, 2) decreasing the incentive to attempt to underreport when an individual does not have enougH QPs to cover catch, and 3) reducing the need to penalize fishermen for overages (if that overage is within the 10 percent carryover allowance). Additionally, the carryover provision imbues the asset (QPs) with usefulness over a longer timeframe than a single season.

This type of flexibility would be particularly useful in multispecies fisheries. In a multi-species fishery, it is highly likely that not all species will be fully exploited because the catch ratio of species to other species is imperfect.

Applying the QP carryover provision to QP in the vessel account and not at the level of the individual QS holders is expected to result in lower administrative costs than if QS holders were allowed to carry over unused QP. Applying a carryover provision to the QP issued to a particular QS holder would be quite expensive if unused QP had to be tracked back to the QS holder's account. Under such circumstances, instead of tracking just the QP balances in a vessel account, NMFS would also have to track from which accounts the QP was transferred. Further, when catch is taken, in addition to designating species, the vessel would have to designate how to distribute the catch against the QP in its account that comes from various QS holders. This tracking would add a layer of complexity to the tracking and monitoring component of the trawl rationalization program and would increase administrative costs. For this reason, the carryover provision would apply only to QPs held in a vessel account, and the vessel owner, not the original QS owner, would be responsible for any overage/underage occurring on that vessel.

The following options for the carryover allowance were considered but rejected:

- For all species (of which the carryover could be different percentages for overfished than for non-overfished species): 5 percent or 30 percent
- For overfished species only: no carryover

- For QPs that were never transferred to a vessel account: carryover would apply.

The range above and below 10 percent was rejected because of too little benefit (5 percent) or too much risk of overharvesting the fleet's annual limits (30 percent). The option of not having a carryover for overfished species was rejected because it is the overfished species for which the greatest flexibility may be needed. Applying the carryover to QP that was never transferred to a vessel account was rejected to encourage the use of the QP by increasing the incentive to transfer the QP to a vessel account. Ultimately, the Council adopted a provision requiring the transfer of all QP to a vessel account, making the possibility of applying a carryover provision to a QS holder account irrelevant.

To help meet conservation objectives, the Council included in its final recommendation a provision that would proportionally reduce the surplus carryover QP in a vessel account when there is a decline in the OY. For example, if an ABC/OY declines by 50 percent, all carryover QP would be reduced by 50 percent. If someone had 100 QP carried over to the coming year, they would instead have 50 pounds to carryover. Additionally, the Council retained flexibility by allowing the carryover provision to be re-examined and changed during the biennial harvest specifications process, as needed. The net impact of the carryover provision on the fleet's catch of its allocation would not be known until vessels have the opportunity to exercise that provision. Presumably, some harvesters will carry over a surplus and others a deficit. If many vessels carry over a large percentage of the QP for a particular species, then the Council may have to examine the collective effect of the carryover on attainment of conservation objectives and make adjustments to the carryover allowance in future years. While the Council believes that the carryover provision is not likely to result in the fleet exceeding its allocation, there is some chance that a fleet overage could still occur. In the face of this uncertainty, and uncertainty about the other mechanisms that may be in place to ensure fleet overages do not result in harvest in excess of conservation thresholds (e.g., buffers), the Council specified that this provision only be implemented by NMFS to the degree that would be permissible under the conservation requirements of the MSA.

❖ *Interlinked Elements*

Permit/IFQ Holding Requirement – The carryover provision will affect the timeframes in which the enforcement provisions are carried out. In the section on QP holding requirements, an exemption is provided such that a vessel may have a deficit in its QP account and not be in violation of the program, so long as the amount of the deficit does not exceed the carryover provision.

Individual Bycatch Quota – The carryover provision would not apply to IBQ species (Pacific halibut).

❖ *Analysis*

The carryover provision is anticipated to increase individual flexibility for harvesters/vessels and improve sector health. Therefore, the carryover provision affects the achievement of objectives related to MSA National Standard 5 (consider efficiency), Groundfish FMP Goal 2 (maximize the value of the groundfish resource as a whole), and Objective 2 of Amendment 20 (provide for an efficient groundfish fishery).

Conservation	Net Benefits	Disruption	Excessive Shares	Fairness and Equity	Sector Health	Labor	Communities	Small Entities and New Entrants	General Public	Program Performance
	X				X					

This section will focus primarily on the impacts to individual harvesters, links to enforcement issues, collective impacts at a sector level, and market and conservation implications. The carryover provision is related to the sector health goals and objectives. Those effects will be reviewed here in the context of impacts on harvesters (vessels) and sectors.

- Impacts on Individual Harvesters (Vessels) and Enforcement

  - *Carryover of a deficit*

At the start of a season, QPs of varying amounts for various species would be registered to a particular vessel. Once that vessel harvests more pounds of a certain species than the poundage held in the account, the vessel is anticipated to buy QPs from another vessel or QP holder to cover the catch. While midseason quota purchases/transfers can facilitate coverage of catch, as the season progresses there would be fewer QP available for transfer. Near the end of the fishing season, there may be little or no quota available for purchase or lease to cover overages for certain species.

The carryover provision would allow a vessel to avoid a penalty for overages of up to 10 percent of the total QP a vessel holds for a particular species. A vessel could cover a deficit with future QPs until the following year's QPs are calculated, issued to a QS holder, acquired by the vessel, and placed in a vessel account.

Counting the catch against the following year's QP provides flexibility while still holding the vessel accountable for exceeding its QP holdings. The carryover allowance reduces the incentive for vessels to attempt unmonitored discarding (NRC 1999), and is, therefore, a useful provision for both management and enforcement. Despite the carryover allowance, a vessel is still not allowed to continue to fish under the IFQ program if it has a deficit in its account (Section A-2.2.1).

Some vessels may choose to view the quota poundage in their accounts plus the 10 percent overage allowance (carryover of a deficit) as their target harvest amount. However, this would require fishing close to the point where penalties would be incurred for overages and would risk going beyond the 10 percent carryover. Hitting the 10 percent overage exactly would be made particularly difficult by the requirement that a vessel must stop fishing as soon as it has a deficit for any of the species covered by the IFQ program. If a vessel would want to fish into its allowance for a deficit carryover, it would have to fish as close as it could to the amount of QP it holds and then target an amount for its next tow that would take it over its QP holdings but not risk going over those holdings by more than 10 percent

(unless it was relatively certain it could go to the market to acquire additional QP to cover an overage of more than 10 percent). For those wishing to avoid penalties, the carryover provision provides the vessel with a cushion – to attempt to fully harvest each year's QPs without incurring penalties from small overages or business losses from leaving fish "on the table."

With no carryover provision, vessels could attempt to utilize QP fully by transferring QP among themselves. Full utilization of their QP portfolio would likely be achieved through a combination of their own harvest and the sale of QP to vessels needing it to fill out a trip. However, unless the QP market is highly liquid, and the transfer costs are low, it is likely that not all QP for all species will be harvested. Given limited QP liquidity and transfer costs, the carryover provision provides the harvester with some additional flexibility to more fully utilize their QP allocation without transferring QP to others. This provision is most likely to come into play at the end of the fishing season when there may not be enough quota to cover the catch of the various mixes of species either in an individual's account or on the quota market. The advantage that vessels would gain from being able to hold QP over from one year to the next creates a disadvantage to vessels looking to acquire QP to cover their catch. Absent the carryover provision, it would be more likely that vessels with surplus QP would release those QP onto the market. With a carryover provision, they are more likely to hold onto surplus QP for use in the following year.

Any overage one year reduces the QP available to the vessel in the following year. Thus, the advantage a vessel might gain if it fished at the 110 percent level the first year would be at the cost of lost flexibility in all future years until such time as the vessel had an underage. Table A-78 shows an example for a series of years of harvest for a vessel that acquires 100 pounds of QP each year and makes use of the overage provision. In the first year of the series (2011), a 10 percent overage is shown, and the vessel harvests 110 pounds. In the following year (2012), it acquired 100 pounds, but 10 pounds must go to pay back the 2011 debt, so it can only harvest 90 pounds, unless it acquires more than 100 pounds in 2012 or chooses to incur another overage. In this example, the vessel does not incur another overage in 2012. However, in 2013, it repeats the 2012 season with a 10-pound overage, taking a total of 110 pounds, and in 2014 it pays back the 2013 overage, but also incurs a 10 percent overage for the second year in a row. In 2014, the vessel's harvest is limited to 99 pounds. The vessel can continue to acquire 100 pounds a year and catch close to 100 pounds a year indefinitely (as illustrated for 2014 through 2016) making use of the carryover provision, but it will not be able harvest more than about 100 pounds until such time as it has a year in which it harvests substantially less than the 100 pounds it acquires each year (or until it acquires more than 100 pounds in order to pay back its deficit).

Table A-79. Example—carryover of QP overage.

	2011	2012	2013	2014	2014	2015
QP Acquired by the Vessel During the Year	100 lbs.	100 lbs	100 lbs.	100 lbs	100 lbs	100 lbs
QP Available for Use in the Year	100 lbs	90 lbs (100 – 10)	100 lbs	90 lbs (100 – 10)	91 lbs (100 –9)	90.9 lbs (100 –9.1)
Overage	10%	0%	10%	10%	10%	10%
QP debits for year (catch for the year)	110 lbs.	90 lbs.	110 lbs.	99 lbs.	100.1 lbs.	99.99 lbs.

♦ *Carryover of a Surplus*

Vessels with unused QPs from one year would be able to use those QPs, up to 10 percent of that vessel's total QPs, in the following year. The 10 percent unused QP is applied to the vessel account and

would not go to the QS holder. If the OY for a species should be reduced (due to a point of concern or other inseason stock issue), the individual carryover percentage would also be reduced by the same proportion to help achieve the conservation of that species while still providing flexibility to the harvester. This reduction would equally affect all vessels that carried over a surplus of QP. Vessels will know before the end of one year if there will be a reduction in the following year. Anticipation of a reduction in OY could create an incentive for vessels to use up QP before the end of the year rather than carrying over a surplus and having that surplus reduced as a result of the OY reduction.

Because this is a multispecies fishery, it is likely that for any single vessel several species would be under-harvested in any particular year, and, as a result, there would be carryover of a QP surplus. Allowing a vessel to carry over a portion of its unused QPs from one year to the next would decrease the incentive for the vessel to attempt to take its full QP holdings and hence decrease the risk of exceeding those QP holdings. By increasing the probability that a vessel will have surplus QP in its account and the likely size of those surpluses, the provision allowing carryover of a surplus may help balance out the carryover of deficits such that the fleet as a whole does not exceed its annual allocation and that groundfish conservation objectives are met.

The carryover provision would not allow pounds to be carried over for more than one year. Underages could not be allowed to accumulate across many years, such that potential harvest might far exceed the target in some future year. Like Table , Table provides an example for a vessel that acquires 100 pounds of QP every year; however, in this case, the vessel is mainly making use of the provision that allows it to carry over an underage. In the first year (2011), the vessel takes only 90 pounds and, therefore, has 10 pounds left over. In the second year, it also makes use of the carryover provision, acquires 100 pounds, taking 10 pounds of QP from the previous year, and leaving 10 pounds unused. Its total harvest in the second year is 100 pounds. Because overages cannot be carried over for more than one year, it cannot accumulate more than 110 QP in its account (unless it increases its annual acquisitions to more than 100 pounds). In this example, the vessel uses its entire QP balance in 2014, runs a surplus in 2015, then uses its surplus in 2016 and runs a deficit, using QP from 2017.

Table A-80. Example—carryover of unused QP.

	2011	**2012**	**2013**	**2014**	**2015**	**2016**
QP Acquired by the Vessel During the Year	100 lbs.	100 lbs	100 lbs.	100 lbs	100 lbs	100 lbs
QP Available for Use in the Year	100 lbs	110 lbs (100 + 10)	110 lbs (100 + 10)	110 lbs (100 + 10)	100 lbs	110 lbs (100 + 10)
Unused QP	10% of 2011 QP acquisitions	10% of 2012 QP acquisitions	10% of 2013 QP acquisitions	0%	10% of 2015 QP acquisitions	-10% of 2016 QP acquisitions (fishes on 2017 QP)
QP debits for year (catch for the year)	90 lbs.	100 lbs.	100 lbs.	110 lbs.	90 lbs.	120 lbs.

QP not associated with a vessel would be zeroed out at the end of the year (e.g., QP held by a crew member, processor or community that have not been transferred to a vessel would not be carried over). In order for a surplus to be eligible to carry over to the following year, the QP would have to be transferred to a vessel's account. As discussed in the section on rationale, this creates an incentive to transfer QP to vessel accounts. Additionally, when the Council took final action, it decided to require that all QP be transferred to a vessel account during the year.

- Impacts on Trawl Sectors

♦ *Effect on Total Harvest*

In any particular year, the trawl sector could collectively harvest either more or less than its sector allocation for a species, if enough vessels use the carryover provision in the same way (i.e., many carry over a surplus or many carry over a deficit). If the collective result is that the sector as a whole carries over a surplus QP, this could result in underharvest of the ABC/OY in one year, and a carryover of a surplus can become an amount in excess of the sector allocation in the following year, if the fleet takes its full allocation plus the carryover. This possibility will have to be integrated with the future FMP amendment for establishing annual catch limits (see below – Effect on Flexibility). However, it may also develop as a onetime deferral of harvest, as has occurred to a certain degree for some species in the B.C. trawl fishery. In the B.C. trawl fishery, harvesters consistently carry over QPs for many species from one year to the next. Often, it is as much as 30 percent. This means that for those species about 70 percent of the current year's groundfish is harvested (rather than the full allocation), and 30 percent of the previous year's allocation (the surplus carried over) is also harvested. If the same behavior occurs in the west coast trawl fishery, as much as 10 percent of some species may go unharvested in the first year only; in each subsequent year, that 10 percent would be harvested in the next year along with 90 percent of the current year's QSs. In other words, 100 percent of the ABC/OY trawl allocation would be taken in year 2 and beyond, although the allocation would come out of two different years.

♦ *Effect on Flexibility*

MSA specifies an annual catch limit that cannot be exceeded in any given year without invoking the "overfishing" label. However, the groundfish FMP has not yet been amended to comply with the annual catch limit requirements. Conceivably, the FMP amendment to address ACL could contain buffers or multi-year nuances that would allow the carry-over provision to function on a year-to-year basis while not violating annual limits. Any carryover amount would either have to be under the annual catch limit to keep the fishery in compliance with the MSA, or the FMP amended to show how the carryover of any underage or overage meets the conservation and rebuilding targets without causing overfishing. Those species that currently have an OY set equal to the ABC and that are predominantly caught in the trawl fishery might be especially problematic and include the following:

Species with OY set to ABC
Yellowtail rockfish
Shortbelly rockfish
Black rockfish (WA and OR/CA)
English sole
Arrowtooth flounder

For overfished species, OYs are set below ABCs and harvest in excess of the OY might be allowed in a single year but not on average, so long as the rebuilding plans are revised to take into account the potential overage and ensure that rebuilding targets are not compromised.

A carryover provision might help address the problem created by the rebuilding paradox, depending on how quickly science and management are able to catch up with conditions on the grounds. Under the rebuilding paradox, the lag between when a stock makes rebuilding progress and the adjustment of management restrictions to reflect the increased biomass creates a situation in which fishermen encounter a rebuilding stock at higher rates before management measures can be relaxed based on the stock's improved health. Under such circumstances, the need for QP to cover overfished stocks that are

caught incidentally will increase prior to the time catch limits are increased to accommodate increased retention. This mismatch between management measures and conditions on the grounds would create a shortage of QP. Some of that shortage might be covered by fishing on a subsequent year's QP, however, unless OYs are increased in the following year, the deficit fishing in a current year will reduce supply in a subsequent. This fluctuation in supply will impact markets, as described in the following section.

- Impacts on Market Conditions

Carryover provisions affect the markets through two related mechanisms: the nature of the QP as a commodity and the amount of QP supply available in a year.

In terms of the nature of the QP commodity, without a carryover, the value of the QP goes to zero at the end of the year. Thus, at the end of the year, there would be no incentive to hold on to unused QP, and all QP would likely be released into the market. With a carryover, up to 10 percent of the QP will have some value for use in the following year. In particular, for overfished species that may be high-priced and relatively unavailable, even if the end of year prices are very high, vessels may hold on to overfished species QP as insurance against the consequences of a disaster tow in the following year (see the analysis on Element 6 in Section A-2.2.1, for additional discussion of this issue). Thus, with a carryover, those witH QP that could be sold would have more to lose buy selling the QP than if the QP expired at the end of the year; with a carryover, the sale of QP will entail the loss of opportunity for its future use, while, without a carryover, sale of unneeded QP would not entail any lost opportunity with respect to its use in the following year. Whether the price is higher or lower as a result of this change in the nature of the commodity will depend on the balance between the effect of the carryover on nature of the commodity and its effect on the total supply of QP at particular points in time.

The other main market implication of a carryover provision is its effect on variability in the short-term supply or short-term price fluctuations. As an example, the opportunity to cover QP overages witH QP from a following year increases the total QP available in the first year, but any increase in the amount consumed in one year will result in a decreased availability the following year (across all years there is not a net increase in the total supply). Thus, with a carryover, there may be a wider swing in the total amount of QP that may be available to the market in any particular year.

- Impacts on Conservation of the Resource

Without a carryover provision, any fish that are unharvested one year would remain to contribute to biomass, but the underage would be accounted for in stock assessments, and some subsequent increase in allowable catches would be expected.

Carryover provisions might also have some biological risks and potential benefits. One benefit is that vessels may be more likely to choose to avoid harvesting 10 percent of certain species, thereby giving themselves a buffer in the following year against accidental or unanticipated catch. Under such circumstances, some of the fish are left in the water a year longer, allowing them to continue to contribute to biomass. Without a carryover provision, vessels would be trying to fish as close as they could to their maximum allowable harvests without incurring a violation. On the other hand, if fish are removed earlier through fishing on QP from a subsequent year, there may be an increment of adverse impact on biomass. However, either way, because carryovers are limited to one year, and a surplus or overage one year simply either increases or decreases what can be harvested in the subsequent year, and because of the generally long-lived nature of the groundfish species, relative to achievement of target harvests under status quo management, the impacts of a carryover provision on stock conditions are not

expected to be significant. On average, the annual targets for removals and harvest thresholds such as ABCs will not be exceeded; at worst, there is a onetime advance or delay in 10 percent of the harvest. For overfished species, meeting the annual targets on average and the onetime advance or delay may be permissible if the policies are taken into account in the rebuilding plans.

This concept of hitting the target harvest amounts "on average" is complementary to the OY concept. The OY is a target to be achieved over the long term. One exception is for rebuilding species where the OY is a hard cap that should not be exceeded in a given year, unless accounted for in the rebuilding plan. If the carryover provision is applied to rebuilding species QP, as indicated, rebuilding plans may have to be amended. For healthier groundfish stocks (where OY is set below ABC), there may be more management flexibility to allow OY overages so long as the OY is achieved on average. Whether the carryover provision is appropriate for a particular stock will depend on whether the OY is set below the ABC and, for overfished species, on whether the carryover provision is accounted for in the rebuilding plan. Currently, there are only three nonoverfished species that are covered by the final scope of the IFQ program and for which the OY is set equal to the ABC: yellowtail rockfish, English sole, and arrowtooth flounder (for all other species, the OY is set below the ABC, creating an opportunity to use the carryover provision without violating MSA standards).

Managing the trawl fishery by achieving the OY "on average" could also be facilitated by creating a buffer for the trawl sector, a general buffer to cover overage by any sector (including trawl), or a two-year or a multi-year OY/ABC. These considerations must comply with the MSA and will be explored further during the development and analysis of Amendment 23 - Annual Catch Limits (ACL) for the groundfish fishery. At one extreme, to achieve the needed buffer, the OY could be set far enough below the ABC to accommodate the possibility of all vessels harvesting in a single year the 10 percent carryover from the prior year, plus all the QP for the current year, plus the 10 percent overage to be deducted from the following year. That would be one extreme. The other extreme would be that all vessels under-harvested all species each year by 10 percent and never sought to harvest the surplus of QP in the following year, creating a 10 percent surplus in the first year, but taking the target amount of harvest in each subsequent year (90 percent plus 10 percent carryover from the previous year). It is likely that neither extreme will be the actual situation, although all possibilities will be analyzed in the ACL FMP amendment. In addition, stock life history characteristics[76] should be considered, as well as a strategy for incorporating new stock assessment information in the middle of a management period. While an OY could be set for a multi-year period, QPs would be issued annually. The GMT suggested that the carryover QP could be reduced by the same percentage that the OY is reduced to address the concern that the carryover has the potential to be detrimental to stock management if there is a substantial reduction in OY from one year to the next. In the B.C. program, managers reserve the right to retract or alter the carryover QP if necessary for conservation purposes. The Council included in the final preferred alternative the ability to reduce the individual carryover of surplus QP by the same percentage as the OY is reduced for that species, as well as adjusting the carryover through the biennial harvest specifications process.

● Other IFQ Programs with a Carryover Provision

Several domestic and foreign IFQ programs utilize a carryover tool to provide increased flexibility to individual harvesters and allow for various fishing strategies. Typically, QPs carry over for only one

[76] Faster growing stocks with shorter mean generation times and fewer age classes should probably be managed with shorter OY periods. The most constraining rockfish stocks on the west coast (i.e., cowcod, canary, and yelloweye rockfish) have many age classes in their populations and might be better managed with longer OY periods. Factors such as mean generation time and recruitment variability may be important considerations in selecting a risk-averse multiyear OY period.

year due to administrative/tracking burdens and biological risks of extending carried over QP for several years.

Some carryover provisions are symmetrical where the percentage that can be carried over or carried back is the same. For example, the Southeast Australia trawl fishery has a symmetrical carryover provision, which started at 10 percent and later increased to 20 percent.

Iceland has an asymmetrical provision where a 20 percent underage can be carried over, but only a 5 percent overage carried forward. In the Icelandic management program, about 60 percent of harvesters carry over a surplus while only about 10 percent carry over a deficit (Sanchirico, *et al.* 2005). A general pattern in QS management programs is that the carryover provision for a surplus is used to a greater degree and to a larger volume than the carryover provision for a deficit.

Nova Scotia had a graduated carryover schedule that depended on the total overage amount. As the total overage amount grew, the greater the number of next year's QP it would take to cover one pound of overage. For example, if the overage was in excess of 20 tons, three QP from the next season would be carried back to cover one QP of overage. However, due to a court case that deemed those graduated ratios as overly punitive, the Nova Scotia program has since reverted to a one-to-one ratio.

New Zealand no longer has a 10 percent carry-back provision, and now overages must either be covered by purchasing QP within the same fishing season/year, or by making a payment based on the deemed value of the overage.

The North Pacific region of the U.S. has a number of IFQ, cooperative, and rationalization programs, but only one has a carryover provision. The halibut and sablefish IFQ program, the first to be developed in the North Pacific, has a 10 percent carryover provision for both surplus and deficit quota. All subsequent rationalization programs in Alaska, including pollock cooperatives, Community Development Quota, crab rationalization, rockfish pilot program, and the head and gut trawl catcher/processor LAPP, do not have carryover provisions. Applying the carryover/under to halibut/sablefish QS has proven difficult to implement. In the halibut/sablefish regulations, the carryover provision is required to follow the QS. Because QS and QP can change hands many times throughout the year, it is not simple to follow the QS, determine how they are fished, and then deduct or add on carryover pounds to the following year's QS. Furthermore, the carryover/under calculation is not done until the TAC is established by IPHC in late January, which delays the ability of fishermen to sell QS because they are not able to tell the buyer exactly how many surplus or deficit QPs are tied to the QS until close to the start of the season. The administrative burden of the carryover provision in halibut/sablefish is high, due to the structure of the carryover provision and the timing of the catch reporting and annual quota issuance. This IFQ program is specifically designed to avoid the need to track QP back to QS holders, and, for that reason, the carryover provisions only apply to QP in a vessel account.

The groundfish trawl fishery in British Columbia has similar species and gear types to the U.S. west coast groundfish LE trawl fishery. The British Columbia individual vessel quota (IVQ) program has a symmetrical 30 percent carryover provision for most species. Anecdotal accounts report that most harvesters attempt to carryover the full 30 percent each year for many species. Species with low TACs have low or no overage allowances. If catch exceeds the allowed overage, QP must be obtained to match the catch overage within 30 days or before the next fishing trip. Until the catch overage is covered by the QP in the fishing area where the overage occurred, the fisherman is restricted to mid-water trawl fishing for the remainder of the fishing year.

In the B.C. system, anyone owning a vessel license is allowed to carry over a surplus or deficit up to 30 percent of pounds held.[77] In the instance where catch exceeds the allowed carryover of a deficit, catch can be retained, but the revenue from that catch must be relinquished to the Canadian Groundfish Research and Conservation Society, an organization that conducts research for the benefit of the fishery. The Society is responsible for securing the monies owed. In addition, the pounds of fish caught in excess of the overage allowance are deducted from next year's allocation. The B.C. experience has been that penalties for violations of carry-back provisions have only been assessed twice in the past seven years. The British Columbia Groundfish Trawl Management Plan can be accessed through: http://www-ops2.pac.dfo-mpo.gc.ca/xnet/content/.

The following table indicates that the B.C. fleet under-harvested targets far more often than they exceeded targets. The number of TACs exceeded and the amount by which they were exceeded are significantly lower in the last three years, as compared to the first three years of the program.

Table A-81. British Columbia Groundfish Total Allowable Catch Overages.

Fishing Year	Number of TACs	Number Exceeded	TACs Exceeded - Species (Percent Over)
'97-'98	54	3	Silvergray Rockfish, Area 5C/D (3.34%) Pacific Ocean Perch, Area 5E (1.04%) Roughey Rockfish, Coast wide (10.30%)
'98-'99	52	5	Yellowtail Rockfish, Rest of Coast (0.11%) Silvergray Rockfish, Area 5C/D (2.62%) Pacific Ocean Perch, Area 5E (4.79%) Pacific Hake, Coast wide (7.72%) Pacific Hake, Joint Venture (10.33%)
'99-'00	52	5	Yellowtail Rockfish, Area 3C (5.40%) Yellowtail Rockfish, Rest of Coast (3.61%) Silvergray Rockfish, Area 5E (3.12%) Pacific Ocean Perch, Area 5E (3.65%) Pacific Hake, Joint Venture (4.00%)
'00-'01	53	2	Yellowtail Rockfish, Rest of Coast (4.78%) Pacific Ocean Perch, Area 5E (2.92%)
'01-'02	53	2	Yellowtail Rockfish, Rest of Coast (0.77%) Pacific Ocean Perch, Area 5E (2.92%)
'02-'03	54	1	Yellowtail Rockfish Area 3C (0.87%)
'03-'04	54	3	Silvergray Rockfish, Area 5E (7.80%) Pacific Ocean Perch, Area 5E (2.43%) Sablefish, coast wide (8.32%)
'04-'05	55	2	Silvergray Rockfish, Area 5A/B (1.24%) Pacific Ocean Perch, Area 5E (10.86%)
'05-'06	56	1	Pacific Ocean Perch, Area 5E (4.00%)
'06-'07	58	1	Pacific Ocean Perch, Area 3C (11.13%)

Source: http://www-ops2.pac.dfo-mpo.gc.ca/xnet/content/Groundfish/GFTrawl/GfTrawlInfo.htm

The TACs are adjusted each year based on the previous year's overage or underage. Thus the yellowtail rockfish TAC that was exceeded in the 2002 to 2003 fishing year had been reduced by an amount equal to 2.92 percent of the 2001 to 2002 TAC (if the 2002 to 2003 TAC had not been adjusted downward due to the previous year's overage, the harvest would have been within the unadjusted 2002 to 2003 TAC).

[77] Overages are set lower for some species including hake (15 percent), Pacific cod in certain areas (0 percent), and halibut (15 percent underage, 0 percent overage) to safeguard against an undesirable deviation from the TAC.

Because there is 100 percent observer coverage in the Canadian system, the small percent overage estimates are more likely to reflect actual overages than would be the case if such an estimate were derived for the current U.S. west coast bottom trawl fishery.

Social Benefits versus Net Economic Benefit Trade-Off

This section summarizes the effect of the carryover provision by looking at it from the perspective of the impacts of not having a carryover provision.

Without the carryover provision, the following would occur:

- There would be less flexibility, and it would be more difficult for harvesters to take all of their own QP without risking overages and penalties. Alternatively, they may reap some benefit from most of their QP and avoid the risk if, as they reach their limits, they sell their left over QP rather than trying to harvest it.
- If there are more overages, more penalties would have to be imposed. There would be associated enforcement and administrative costs with these other penalties.
- There would be a downward influence on the end-of-year QP price due to their expiration at the end of the year (no one would hold on to QP in anticipation of being able to use them in the following year).
- Supply of QP in a year would be more consistent because QP could not be moved between years. [With a carryover, more QP made available on the market and used one year would mean less available on the market in the subsequent year. Greater fluctuation in supply would tend to influence more price fluctuation, with prices being lower some years and higher others.]
- Adjustments to OYs, trawl allocations, buffers, and rebuilding plans would not be required to keep the system in compliance with the MSA.
- Any surplus QP from one year would not be taken in the next year and would be left to contribute to ecosystem processes.

A-2.2.2.c Quota Share Use-or-Lose Provisions

❖ *Provisions and Options*

This section was deleted from the final preferred alternative but the numbering is being maintained as a placeholder so as not to change section numbering and corresponding references in the analysis. Since the Council spent a considerable amount of time considering this issue, the rationale for its action and analysis is preserved here.

Before its deletion, the provision was as follows:

None. The need for this provision will be evaluated as part of the program review process, and the provision could be added later, if necessary.

❖ *Rationale and Policy Issues*

A use-or-lose provision would require that QS (converted to QP) be actively fished within some time period or the QS would have to be surrendered (possibly to be reallocated). While there was a strong desire to include methods to ensure that available QP would be used, no use-or-lose provision was included in the IFQ alternative because of effectiveness and tracking and monitoring obstacles. In the PPA, despite there being no use-or-lose provisions, the section was left in as a signal of the Council's strong concern about this issue and intent to evaluate it during the five-year review process. At that time, based on program performance, it would reconsider whether the administrative costs of such a provision would be worth bearing. When it adopted its final preferred alternative, the Council decided not to highlight this issue over others that would be evaluated during the review process. Therefore, it directed that this section be removed.

Concerns motivating consideration of this provision stem from a desire to ensure that one of the primary Council goals for the groundfish fishery is met: full utilization within biological constraints. A use-or-lose provision would prevent the reservation of quota by persons who may not use it for a variety of reasons including withholding QP for key species in order to exert market leverage, or withholding QP to impose more restrictive conservation measures than those determined by the Council and NMFS to be necessary to achieve OY levels. Nonuse of QS/QP may adversely affect objectives for the IFQ program related to net benefits and efficiency, fairness and equity, sector health, labor opportunities, community benefits, impacts on small entities, and new entrants. While the Council has not adopted a use-or-lose provision at this time, it is the Council's intent that the Federal government, acting under the authority of the MSA, not abdicate its role in determining the appropriate level of removals.

A number of use-or-lose provisions were considered for inclusion in the current program, but were rejected because of tracking costs; absent an adequate tracking program, it would be easy to evade the use-or-lose provision. For example:

- Use-or-lose Provision: Require a minimum amount of QS/QP usage to retain ownership (e.g., some minimum poundage landed within x number of years to keep active status), otherwise the QS is revoked and redistributed (e.g., the QS could be divided among the active participants proportionally to their QS holdings, allocated to new entrants, crewmembers, etc.). Time periods considered included use in at least one in three years and in at least three in five years.

In deciding not to pursue development of a use-or-lose provision at this time it was noted that the accumulation limit provision would make it somewhat more difficult for a single entity to acquire and not use significant amounts of QS/QP. However, there was still some concern that multiple entities

might acquire QS/QP and withhold use in concert with one another. It was also noted that once the program is in place it may become more difficult to add a use-or-lose provision.

❖ *Interlinked Elements*

There are certain provisions of the program that make the use-or-lose provision more of a concern than it might otherwise be. One of these is the rule on who is eligible to own, which is specified so as to include many who do not have direct links to the fishery. It had been suggested that this provision might be narrowed to reduce that concern. The TIQC recommended achieving the intent of a use-or-lose provision by adding a new provision to the IFQ alternative that requires that all QSs be assigned to a vessel with a LEP. The rationale was that while it would not require the vessel to fish that quota, the need to obtain cooperation from the vessel owner in order to own and withhold shares could still serve as a partial, though not insurmountable, deterrent. There was also mention of including processors in the group eligible to own QS. However, this recommendation would run counter to a significant feature of the program, the facilitation participation by crew and communities though QS ownership.

Also making the need for a use-or-lose provision a concern is the question of whether the QS control limits will be effectively enforced.

While a use-or-lose provision penalizes non use, a carryover provision for underages (Section A-2.2.2-b) would be designed to accommodate non use. If both use-or-lose and carryover provisions are included in the program, nonuse threshold levels for the use-or-lose provision would have to be set to accommodate carryover provisions. Carryover provisions may be an important part of an effective IFQ program because in a multispecies fishery, catching almost 100 percent of all QP without exceeding some QP holdings would likely be impossible.

To encourage use, the Council added a provision requiring that all QP be transferred to a vessel in the year for which they are issued.

❖ *Analysis*

The use-or-lose provision affects conservation and socio-economic objectives (e.g., efficiency, sector health and communities).

These will be covered in the following sections:

- Likelihood of Nonuse
- Conservation
- General Socioeconomic Objectives
- Program Costs and Effectiveness
- Experiences in Other Programs

● Likelihood of Non Use

The concern that entities might acquire and hold significant amount of QS is partially mitigated by the control accumulation limits, if they can be effectively enforced and depending on how entity and control are defined; for example, whether several entities working separately for the same purpose (perhaps to drive up market prices, limit a competitor's business, or reduce total fishing impacts) would be considered to control the QS in aggregate and, therefore, be in violation of the control limits. With respect to attempts to drive up prices by restricting the market, in a typical production situation, an

entity attempting to manipulate the market would benefit both from reduced production costs and increased price of their output. Unlike the typical production control situations, it costs the QP holders virtually nothing to "produce" their product in a given year (the QP); there are no variable costs of production. Further, the amount QP holders produce is predetermined by their QS holding. With no "cost savings" from withholding production, the price increase they receive for what they sell must be enough to offset the normal market price of the QP withheld. Additionally, even if, despite accumulation limits, someone is able to effectively exert some control over QP market prices, it is likely that, by the end of the year, it will be in that individual's financial interest to release nearly all of its QP rather than earn zero revenue on the portion of its QP inventory that expires at year end. This reduces the likelihood that there will be nonuse motivated by the intent to control market prices will occur. On the other hand, in certain circumstances, it might be possible for an entity like a processor to gain advantage by withholding QS to adversely affect a competitor. For example, if a processor held substantial amounts of QS that it used for vessels from which it received deliveries, and if over a period of time those vessels had been able to avoid a key bycatch species (such as an overfished species), rather than selling the QP to further increase its revenue, that processor might withhold its unneeded QP from the market if it could gain advantage by adversely affecting a competitor's production and profits. Another concern regarding the possibility that significant amounts of QS/QP might be withheld from the fishery is that a number of entities might acquire QS and withhold QP with the intent of reducing fishing related environmental impacts.

- Conservation

Nonuse of QS (i.e., not using the associated QP) would decrease mortality, which could benefit the resource if the Council and NMFS have allowed harvests in excess of that which is advisable. If the harvest levels are appropriately set with respect to conservation objectives, the environmental effect of the reduced protein production would depend on the food sources to which people turn as an alternative to fish protein and the relative impacts of producing that food as compared to the fish protein.

A use-or-lose provision could increase impacts on the stock if it encouraged the vessel to harvest fish and discard them, just to use their QP and avoid QS forfeiture. This might occur if the provisions required harvest of amounts that are more than a commercial vessel would normally take (given species availability and market conditions). If a use-or-lose provision is eventually developed, certain species might be exempted, such as those that are under a rebuilding plan or for which the Council might otherwise specify a special precautionary status.

- General Socioeconomic Objectives

In general, the socioeconomic objectives of the program require that groundfish be harvested at sustainable levels that also meet other conservation objectives, such as rebuilding. Any actions that withhold QP and reduce harvest to below those levels is likely to diminish the achievement of socio-economic objectives. If it turns out that a use-or-lose provision is unnecessary, having deferred its creation will have been socially and economically beneficial in reducing the complexity of the IFQ program and implementation costs. On the other hand, if problems develop, and such a provision is needed, it may be more costly to implement at a later time because it will involve the disruption of existing expectations and practices.

- Program Costs and Effectiveness

The main reason for not developing a use-or-lose provision was the heavy cost that would be entailed in tracking QP usage back to the QS accounts for which they were originally issued and tracking QS

transfers between accounts, combined with the potential for relatively easy circumvention. For a vessel using QP from multiple QS accounts the data system would have to track the QS account from which the QP originated. Moreover, since QS can be traded among accounts from one year to the next, in order to avoid circumvention of the intent of the use-or-lose provision individual amounts of specific QS would have to be tracked. For example, if QS has not been used and will be subject to revocation if not used in the following year, the system would have to be set up to prevent avoidance of the use-or-lose provision through simply moving of the QS into a different account. The needed tracking system would be analogous to tracking the particular dollars used in a purchase back to the assets which originally generated them, only more difficult because of the need to also track the movement of divisible and fungible assets associated with those particular dollars as those assets moved among owners. Even if a full blown tracking system were developed, it could still be subject to circumvention given that QS are fungible, and a person withholding QS that are about to expire due to nonuse could simply sell them into the market and use the funds to purchase recently used QS.

The cost of such a program might be diminished if the number of participants were more limited than what is currently allowed under the eligibility provision. Additionally, costs of QP tracking might be reduced by a somewhat different rendering of the provision, such that, rather than tracking the QP to a QS account, (1) only the QP is tracked, (2) all QP must be transferred from a the QS holder directly to a vessel account before the end of the year, (3) any entity not meeting the lose-or-lose provision requirements would be responsible for submitting the required amount of QS for forfeiture from whatever source it could acquire it. Specifically, for example, any vessel account that does not use at least a certain percent (say 75 percent) of its QP holdings (aggregated across all species) in two successive years must forfeit the QS equivalent to one half of the unused QP for the average mix of species that went unused. This approach would keep the current eligibility rules for owning/holding QS/QP, but would ensure that QP is transferred to a vessel and avoid the need to track the QP back to its source QS. It would not entirely prevent circumvention of the provision, but circumvention would require the cooperation of more than one vessel.

- Experiences in Other Programs

The following describes experiences in two Canadian programs that did not start out with use-or-lose provisions (B.C. has implemented one more recently). One of the reasons this issue has been less of a concern for either the B.C. or Nova Scotia fishery is the qualification requirements that quota purchasers must meet. These requirements (e.g., vessel ownership) make speculative activity or ownership without harvesting more expensive and difficult.

British Columbia - There have not been any use-or-lose provisions or other design elements implemented to discourage underutilization of QP. However, there are design elements that became active in April 2005 to help prevent speculative activity and "armchair fishermen." In April, quota owners were required to harvest 25 percent of groundfish equivalent (GFE) or they would lose that 25 percent minus the rollover allowance. This will increase to 40 percent after three years and last for four years. In addition, the number of permanent reallocations (quota transfers) will be restricted to two over each of those periods of time. Purchase of quota by environmental groups that would not harvest what they owned has never been a big concern.

Nova Scotia - There are no use-or-lose provisions or other design elements implemented to discourage underutilization of QPs. Currently, there are "armchair fishermen." Approximately one-third of the "fleet" (100 out of 350 quota owners) leases out all of their pounds each year to other fishermen.

Note: In order for an entity to hold pounds and not harvest them, the entity would have to either purchase quota or purchase pounds each year. In order to purchase quota or pounds, the entity would have to own a groundfish license for the IVQ fishery. To own a groundfish license, a license holder has to be a full-time fisherman. This is defined as a person with two years of experience fishing for seven months each year. The Nova Scotia fishery representatives contacted believe that the expense to hire a fisherman not to fish would be significant.

A-2.2.2.d Entry Level Opportunities

❖ *Provisions and Options*

Under the MSA, the Council is required to consider entry level fishermen, small vessel owners, and crew members, and in particular the possible allocation of a portion of the annual harvest to individuals falling in those categories. No special provisions have been identified for analysis, given that new entry is addressed indirectly by allowing crew, captains and others to acquire QS in small increments.

❖ *Rationale and Policy Issues*

Section 303A(c)(5)(C) of the MSA requires that in developing a LAPP, the Council do the following:

> Include measures to assist, when necessary and appropriate, entry level and small vessel owner-operators, captains, crew, and fishing communities through set-asides of harvesting allocations, including providing privileges, which may include set-asides or allocations of harvesting privileges, or economic assistance in the purchase of quota [78]

The MSA requires that the Council consider, and, <u>if appropriate</u>, provide additional measures to benefit the named groups. The Council has considered these groups, and certain other elements of the program have been designed with impacts on these groups in mind, including the following:

1. Allocating based on the history of the permit, allowing new entrants to receive a greater initial allocation than they would if the allocation were based just on their personal history in the fishery (Section A-2.1.1).
2. Including an equal allocation component as part of the initial allocation formula for permits, this will benefit historically smaller producers (Section A-2.1.3).
3. Not including a minimum holding requirement provision; this might be more difficult for smaller vessels to comply with than larger vessels (A-2.2.1).
4. Specifying a broad class of eligible owners that includes crews and fishing communities (Section A-2.2.3.a).
5. Specifying that the QS/QP be highly divisible so as to facilitate the acquisition of QS/QP in small increments by crewmembers, those who have just entered the fishery, and operators of small vessels (Section A-2.2.3.d).
6. Including provisions for a set-aside, as needed, to support an AMP that may be used at some future time to address community concerns or create other incentives to benefit the groups listed in 303A(c)(5)(C) or for other purposes (Section A-3)

The TIQC also debated and reported to the Council options for a loan program and a provision that would allocate shares forfeited through a use-or-lose provision to new entrants. The TIQC did not recommend that the Council adopt the loan program because the rationalization program already has high costs, and the program would act as a subsidy that might drive up QS prices. The use-or-lose provision was not included as part of the package because of implementation obstacles. The TIQC also noted that providing a central lien registry would facilitate obtaining financing by increasing security in the collateral, reducing risk and, therefore, lower interest rates. This would benefit new entrants. Such a registry, while required by the MSA, has not been implemented.

[78] An **Assisted Purchase Program** may be developed to aid in financing quota purchase by small vessel fishermen and first-time purchase by entry-level fishermen (MSA – 303A(g)(1)).

❖ Interlinked Elements

The section on rationale contains of list of provisions that were considered adequate to address the concerns about entry level opportunities. If those provisions are modified, consideration should be given as to whether the provisions are still considered to adequately address the congressional direction provided in MSA 303A(c)(5)(C).

❖ Analysis

Much of the focus in developing the program is on the impacts of those who are currently in the industry and who will benefit from receiving an initial allocation of QS. Those individuals will be in an economically stronger situation. The value of the QS they receive will be a stream of resource-related rents (additional profits). Because of the infusion of wealth provided by the QS, they will likely be in an economically better position to bear the brunt of increasing fuel prices, program costs, and, if it should occur, declines in the available harvest. As holders of the QS, they will also accrue the benefits that occur from factors that increase the value in the fishery.

However, over the long term, the constituents of the commercial fishery who come before the Council will be those who at one time or another have been new entrants. New entrants who choose to own QS will have paid an amount for their QS based on the best projections of future profits after taking into account expected fuel prices and other production costs, including observer costs, expected ex-vessel prices for raw fish, expected harvest levels, and, significantly, the cost of the QS. If it turns out that costs are greater than expected or revenue is less than expected, they will not have the same revenue buffer initial QS recipients have. Under such circumstances, a new entrant may experience below-normal levels of profit, possibly even similar to those seen in the status quo fishery. At the same time, if costs are lower or revenues higher, they will experience a higher than expected return that will not be dissipated by increased competition. Thus, the IFQ program provides some expectation of more stable profits even for second-generation participants who choose to own QS. However, second-generation participants need not necessarily take on the risk of QS ownership.

The need to acquire quota will add to costs for second-generation owners, as compared to those who came before. In addition to paying for the physical capital (vessel, etc.) they will have to acquire QP each year and may choose to do so by making a capital investment in QS (by acquiring QS). By owning their own QS, they would control their risk with respect to changing QP prices. However, by holding their own QS, they will bear risk and reward from the changing value of the QS asset (increases, if there is a trend toward higher vessel costs or lower revenue, or decreases if conditions move in the other direction). If there were not an IFQ program, entering the fishery would require less of an investment, but revenues would likely be lower. Assuming that all extra profits (resource rents) under status quo are dissipated, the fishery would have similar downside risks, but less upside potential as compared to a fishery managed with IFQs. Upside potential would be lower under status quo because higher than expected profits would likely be dissipated by increased competition. If harvesters enter the fishery and chooses not to acquire QS, but rather to lease QP, the capital investment will be lower, they will not risk the potential decline in value of the asset they purchase, they will have a more limited benefit from any long-term improvement in economic conditions in the fishery, and, if they are able to be competitive, will fish at a normal profit level througH QP they buy during the season or are provided by processors. [Note: a normal profit implies zero economic profit but sufficient profit to compensate for their investment.]

No specific provision is provided here, but there are a number of provisions in other parts of the program that address the concern of MSA 303A(c)(5)(C). The impact of those provisions on entry level, crew, small entity, and community opportunities are discussed in the sections on those other provisions.

A-2.2.3 IFQ Transfer Rules

A-2.2.3.a Eligible to Own or Hold

❖ *Provisions and Options*

► No person can acquire QSs or QPs other than 1) a United States citizen, 2) a permanent resident alien, or 3) a corporation, partnership, or other entity established under the laws of the United States or any State, that is eligible to own and control a U.S. fishing vessel with a fishery endorsement pursuant to 46 USC 12113 (general fishery endorsement requirements and 75 percent citizenship requirement for entities). However, there is an exception for any entity that owns a mothership that participated in the West Coast groundfish fishery during the allocation period and is eligible to own or control that U.S. fishing vessel with a fishery endorsement pursuant to sections 203(g) and 213(g) of the AFA.

> Previous language: "Those eligible to own QS/QP will be restricted to (i) any person or entity eligible to own and control a US fishing vessel with a fishery endorsement pursuant to 46 USC 12108 (general fishery endorsement requirements) and 12102(c) (75 percent citizenship requirement for entities) and (ii) any person or entity that owns a mothership that participated in the West Coast groundfish fishery during the allocation period and is eligible to own or control that US fishing vessel with a fishery endorsement pursuant to sections 203(g) and 213(g) of the AFA."

❖ *Rationale and Policy Issues*

Section A-2.2.1 dealt with who receives an initial allocation. Here the issue is "Who is allowed to acquire QS/QP in the future?"

The Council's policy intent for the permit system on which the trawl rationalization program is built (the Amendment 6 license limitation program) is to require that an entity must be eligible to own a U.S. documented fishing vessel in order to hold a permit. It is important to note that actual vessel ownership is not required, only eligibility to own a vessel. In developing the ownership eligibility provision for the IFQ program, the Council's intent was similar, i.e., to allow those eligible to own a U.S. documented fishing vessel (i.e., to own a permit under the Amendment 6 program) to own QS. In developing language to implement its intent, the Council checked the MSA provisions on who should be restricted from holding a LAP (QS/QP), and the NMFS LE program website has forms indicating who is eligible to own a LEP in the current permit system. On the basis of the latter information, the Council included legal resident aliens in its specification of those eligible to hold QS/QP. Additionally, the Council provided an exception to provide certain foreign entities with an opportunity to hold QS/QP based on their status under the AFA and participation as a mothership owner in the west coast at-sea whiting sector.

The following are some of the intents for this provision that were identified by the TIQC during the first stages of the provision's development (related categories of objectives are in parenthesis; see Chapter 6 for a full description of the objectives):

- Allowing current participants to continue (minimizing disruption)
- Limiting foreign ownership (national net economic benefits)
- Preventing absentee ownership (sector health, communities)
- Preventing ownership by interests who might leave the QS unused (net benefits, sector health, labor, communities)

- Providing entry level opportunity for crewmembers (labor)
- Providing opportunity for community participation (communities)

The new LAPP program provisions of MSA Section 303A restrict those allowed to own QS/QP to a particular set of individuals:

> IN GENERAL.—Any LAPP ... shall—
> (D) prohibit any person other than a United States citizen, a corporation, partnership or other entity established under the laws of the United States or any State,[79] or a permanent resident alien that meets the eligibility and participation requirements established in the program from acquiring a privilege to harvest fish, **including** any person that acquires a LAP solely for the purpose of perfecting or realizing on a security interest in such privilege." (MSA, 303A(c)(1)(D), emphasis added)

In other words, the Council may allow any of the entities listed in 303A(c)(1)(D) to hold QS/QP, or a subset of those entities, but it may not allow anyone not on the list to hold QS/QP. For example, the Council could make a more restrictive eligibility provision by prohibiting corporate ownership or restricting QS ownership to vessel owners but it could not allow a foreign corporation to hold QS/QP.

According to a preliminary determination by NMFS, in the last phrase of 303A(c)(1)(D), "including" refers to being included among those allowed to acquire privileges (as opposed to being included among those who are prohibited from acquiring QS/QP). This last phrase refers to banks or other lenders that might accept the QS/QP as collateral for a loan. The Council language would allow banks and lenders to hold QS/QP, and to be consistent with 303A(c)(1)(D), these entities would need to be established under the laws of the United States or any state.

Another requirement with respect to who is eligible to own QS/QP specifies that those who substantially participate be authorized to acquire QS/QP. The definition of those who substantially participate is left to the Council.

> (5) ALLOCATION.—In developing a LAPP to harvest fish a Council or the Secretary shall—
> . . . .
> (E) authorize LAPs to harvest fish to be held, acquired, used by or issued under the system to persons who substantially participate in the fishery, including in a specified sector of such fishery, as specified by the Council. (MSA, 303A(c)(5)(E))

The Council eligibility provision is intended to include all of those who are presently substantial participants in harvesting activities, and the Council did not opt to further define "substantially participate." The first criterion of the Council's eligibility provision, (i), is intended to ensure that almost all who currently participate as harvesters would be allowed to continue, minimizing disruption while limiting new foreign entry. The current participants that might not be covered by the first criterion are those foreign entities that have participated in the ownership of motherships in the whiting fishery. The criterion of the second part, (ii), was added with the intention of including those entities that have

[79] The definition of "person" under the MSA means "any individual (whether or not a citizen or national of the United States), any corporation, partnership, association, or other entity (whether or not organized or existing under the laws of any State), and any Federal, State, local, or foreign government or any entity of any such government." (MSA, 3(36)). The persons allowed in section 303A(c)(1)(D) are a subset of this broader definition of person (MSA, 3(36). The broader definition includes persons not organized under the laws of the United States or any state. The persons prohibited from QS/QP ownership in 303A(c)(1)(D) include those not so organized.

participated on the west coast and may not have been covered by the first criterion, i.e., entities that include foreign interests and participated in the at-sea mothership sector would be allowed to hold QS/QP. More specifically, the second criterion includes entities with some foreign control that own a west coast mothership and received an exemption to the requirements of 12102(c) under Section 203(g) or 213(g) of the AFA (see discussion below regarding foreign operators). Since the Council criteria allows QS/QP ownership by those who currently participate as vessel owners, any participant who is eligible to own a U.S. documented fishing vessel, and, via the AFA exception, all owners of vessels active in the at-sea whiting sector, it might, therefore, be considered consistent with MSA 303A(c)(5)(E) to authorize participation by substantial participants. Those who do not own vessels but might be able to acquire QS/QP include, for example, shoreside processors, crewmembers, and communities. Additionally, the Council QS/QP eligibility criteria go further than MSA 303A(c)(5)(E) by allowing QS/QP ownership by, for example, those who may wish to hold IFQ to control the way in which the QS/QP is used (e.g., members of conservation organizations), individual members of the general public, those with security interest in the IFQ (e.g., a lender), and any other person (including business entities such as corporations), so long as those entities are eligible to own a U.S. documented fishing vessel.

While intentionally broad, the scope of the Council's eligibility provision is not intended to extend beyond that of MSA 303(c)(1)(D). The MSA allows foreign controlled entities organized under state or Federal laws to hold QS/QP. In that regard, the Council provision is more restrictive in that it prohibits most foreign holding of QS, as is permissible under the MSA. With respect to the requirement that entities not organized under state or Federal laws be excluded from QS/QP ownership, the Council's criterion requiring eligibility to own a U.S. documented fishing vessel was believed to be implicitly compliant because entities must be organized under state or Federal laws in order to be eligible to own a U.S. documented fishing vessel. However, to be certain that compliance was clear, the Council added to its language an explicit statement that a partnership or corporation must be organized under Federal or state law.

It should be noted that the AFA exception within the Council's eligibility provision is intended to apply to the entities in their entirety and not to the individual ownership interests that make up the entity. In other words, if a foreign entity has partial ownership of a company that controls a U.S. fishing vessel and that company has an exemption under the AFA, it is only the company that would be able to own the QS/QP. The foreign entity's participation in the AFA exempted company would not allow the foreign entity on its own acquire QS/QP.

The Council considered an option that would not allow any foreign controlled entities to control QS/QP (i.e., requiring that all entities be eligible to own U.S. documented fishing vessels). This option was rejected because it could not be determined that it would not eliminate some current participants from QS/QP ownership. The Council also considered restricting ownership to stakeholders, including owners and lessees of LEPs or vessels, skippers/crew, processors, buyers, and communities. This option was rejected (1) because of the increased cost associated with development and monitoring of the qualifying requirements for each of these groups and (2) because simple group eligibility requirements that might be easy and less costly to implement would also be easy to circumvent.

Also considered were more extreme restrictions, e.g., allowing only LEP holders to own IFQ. It was believed that such a restriction would reduce program costs by substantially reducing the number of QS/QP holders, make it more likely that QS/QP owners would be community members (make absentee ownership less likely), and make it more likely that QS/QP would be used. The substantially smaller number of potential owners might also increase the feasibility of tracking QP to the owner of the QS for which the QP was issued, facilitating implementation of a use-or-lose provision (see Section A-2.2.2.c).

At the same time, there are considerable social and equity benefits from an ownership eligibility scope that includes crewmembers, communities, and processors.

❖ *Interlinked Elements*

The main direct interdependency between the provisions for eligibility to own or hold and others is with the initial allocation criteria. Specifically, those eligible to own QS must include those eligible for an initial allocation. Mothership Option 2 of Section A-2.1.1.d would allocation QS to the bareboat charter operators of motherships. The language of the second part (ii) of the eligibility criteria was adjusted to cover both owners and operators of motherships.

❖ *Analysis*

The following are the categories of goals and objectives affected by the decision on eligibility to own and the section in which each are addressed.

Section	Related Category of Goals and Objectives (see Chapter 6 for detailed description)										
	Conservation	**Net Benefits**	**Disruption**	**Excessive Shares**	**Fairness and Equity**	**Harvester and Processor Sector Health**	**Labor**	**Communities**	**Small Entities and New Entrants**	**General Public**	**Program Performance**
Conservation and Social Impacts	X							X			X
Net Benefits and Disruption		X	X								
Sector Health						X					
Labor and New Entrants (Labor)						X			X	X	
Communities								X			
Small Vessels and New Entrants (Harvesters)									X		X
Program Performance											X

- Conservation and Social Impacts

The Council eligibility recommendation allows a very broad class of entities to own QS based on an assumption that this will lead to the highest value use of the resource within conservation limits. The broad class of individuals allowed to own QS includes conservation organizations. Conservation organizations or others who strongly believe that the Federal management system is allowing too much harvest could acquire QS and hold the QP for those shares off the market, leaving some of the available catch unharvested. However, it is also the Council's intent that the Federal government, acting under the authority of the MSA, not abdicate its role in determining the appropriate level of removals for meeting conservation objectives. Private interests withholding QP would frustrate the intent of Federal policy that is to allow for an optimum sustained yield and provide social and economic benefits from the fishery. As a result, impacts on the human environmental would change, increasing or decreasing, depending on the impacts associated with the protein sources consumers turn to as a substitute for west coast groundfish. On the other hand, if the Federal policy has not been set appropriately or is not

sufficiently risk averse, a private entity choosing to hold QP back could improve conservation. While allowing a broad ownership class, the Council has indicated that if the intent of the Federal harvest policies are being frustrated it may create a use-or-lose provision at some future time (Section A-2.2.2.c). Adaptive response of this sort would mitigate possible adverse impacts that could result from nonuse of amounts of the resources that is available within harvest constraints.

The limitation of foreign ownership may have some conservation and social benefits. If multinational corporations are not dependent on a particular coastal community or ecosystem and are able to rotate their resource extraction activities from one locale to another, they may have less concern about the long-term sustainability of fisheries in any one nation and less concern about localized effects of harvest activities. As compared to domestic firms, they may also be somewhat more independent of the influence of local and national politics. The ocean fisheries are managed as a trust for the people of the nation. The interest of the people, as expressed by their state and Federal governments through such laws as the MSA, National Marine Sanctuaries Act, and California's Marine Life Protection Act, goes far beyond the economic benefits that might accrue from sustainable removals of the resource. While the laws of a state and nation constrain behavior for domestic and international firms alike, conduct in line with general social values often goes beyond what is strictly required by the letter of the law. While it is possible that an international firm may act more strongly based on local ethics and values than a domestic firm, a firm run by domestic interests may be more likely to act within the local ethics than an international firm simply because more of the decisions will be determined by individuals from the domestic culture.

- Net Benefits and Disruption

It is believed that the greatest benefits would be achieved by providing QS/QP ownership opportunity to a very broad group. Specifying broad eligibility criteria that encompass those who value the resource to different degrees for different reasons would encourage the distribution of QS/QP in a manner that maximizes net benefits over the long run. Net benefits would be enhanced by an active QS/QP market with participation by all of those who may have some reason to value QS/QP. However, net benefits may be less than might otherwise be achieved if, as a result of the broad eligibility requirements, those who are likely to withhold QS/QP from the fishery gain control of the QS/QP. As described in the section on conservation and social impacts, the Council is aware of this possible outcome and will evaluate nonuse as part of future reviews and revision of the program.

In the rationale above, we described the Council's intent to minimize disruption of current practices by allowing ownership of QS/QP by all who currently participate as harvesters or by using mothership vessels in the at-sea whiting fishery, including those with foreign ownership interests. The language developed to achieve this end focuses on those individuals eligible to own a U.S. documented fishing vessel, including some who achieve that eligibility under exemption provisions of the AFA. The AFA exemptions incorporated into the Council eligibility provisions refer to Section 12113 (Chapter 46 of the U.S. Code). This section requires 75 percent domestic ownership and prohibits the chartering of a vessel by any entity that has some foreign ownership. The exemption of 203(g) appears to apply to both those entities eligible to *own* the vessels under 203(g) and those entities eligible to *operate* the vessels under 203(g). Section 213(g) is a catch all that provides an exemption to the AFA for any other entity that owns a vessel as of July 24, 2001, as necessary to comply with international treaty. As pointed out by the NRC (NRC 1999) (pg. 211) because of foreign ownership interest in the existing fishery, limitations on foreign ownership could be problematic and discriminate against U.S. co-owners and investors. The language of the eligibility provision was intended to be sufficiently broad to cover all participants, including processors, however, any shore based processing company that is more than 25 percent foreign owned or controlled may not be eligible to own QS/QP. We do not know whether

there are any shore based processors that do not meet the eligibility. Also bearing on the issue of foreign ownership are current trends toward the liberalization of direct foreign investment worldwide. Net benefits are generally addressed from a national perspective. On that basis, the limitation on foreign participation will likely ensure that a greater proportion of the fishery benefits accrue to citizens of this nation, as compared to a system that allows more foreign ownership. On the other hand, if foreign participation were allowed as part of general trade liberalization and if trade liberalization has a positive overall effect on total benefits that accrue to U.S. citizens, then allowing foreign ownership as part of that broader policy might generate greater domestic economic benefits.

Three motherships participate in the west coast whiting fishery and come under the exceptions provided under Section 203(g) of the AFA. Of these, at least one was believed to be operated by a company with substantial foreign ownership, although the ownership structure may have changed since the provisions were first developed.

- Sector Health

While the initial allocation would be split between harvesters and processors, over time, the eligibility provisions will allow for all of the QS to migrate to the hands of harvesters or all of it to processors (or to any other group that is able to acquire it through transfers). In the event that an extreme distribution occurs, one sector may be able to exert market power over the other and adversely affect the health of a sector. In contrast, the B.C. IVQ program allows only those who own vessels to hold QS. The Council considered a provision that would have restricted QS/QP ownership to those in the harvesting sector. If only harvesters are allowed to own QS/QP, harvesters (and processors who own vessels) could be at an advantage over other entities. There are provisions in the B.C. program intended to prevent the exclusive harvester ownership of QS from allowing harvesters to take unfair advantage of processors. Specifically the groundfish development quota (GDQ) system was designed to encourage harvesters to remain in their relationships with domestic processors. The program under consideration here, while it would not start out by restricting QS ownership to one side or the other, allows it to develop over time. Because it is not starting out with a one-sided restriction, it is also not starting out with a compensating mechanism for a one-sided distribution. If QS migrates to the hands of one group over time, the AMP would provide an opportunity to compensate for effects on the health of the adversely impacted sector.

The broad ownership eligibility criteria also allow ownership of QS/QP by entities that may acquire it and withhold it from use. This is discussed in the sections on conservation and net benefits. Such withholding of harvest opportunity would adversely affect sector health.

- Labor and New Entrants (Labor)

The eligibility criteria have been specified broadly to allow crewmembers or processing plant employees to own QS. QS/QP eligibility provides laborers a way to incrementally acquire capital assets in the fishery. The ability to acquire some capital and then accumulate wealth both from their wages and from capital ownership may allow them more rapidly to accumulate the assets they need to enter the fishery as business operators. With respect to the opportunity to incrementally become owners of capital, what applies to laborers within the industry also applies to others outside the industry looking to enter. The value of the QS/QP to those who wish to sell it and leave the fishery will be sustained, in part, by those interested in and able to enter the fishery. However, those employees that are not citizens of the U.S., not resident aliens, or not otherwise eligible would not be allowed to own QS/QP.

- Communities

It is believed likely that more benefits will flow to communities if foreign and absentee ownership is limited. Allowing the potential for entities to acquire QS/QP and withhold them from use could adversely impact communities. Of these, the Council's provision only limits foreign ownership. Absentee ownership and QS/QP withholding is not limited at this time.

Making sure that communities themselves are eligible to own QS/QP is one way the Council takes into account the needs of communities. QS/QP eligibility allows communities who so desire to increase security over their economic base, to acquire QS/QP. Under the eligibility provision, a community could, for example, acquire QS/QP and auction the QP off each year to those willing to commit the most matching QP for delivery to that community. With respect to allowing communities an opportunity to participate, the NRC study notes that some communities may be heavily dependent on fishing for social, cultural, and economic values and/or are lacking in alternative economic opportunities; and recommends that Councils be permitted to "authorize communities to purchase, hold, manage and sell IFQs" (NRC 1999) (pg. 206). The GAO notes the following: "The easiest and most direct way to help protect communities under an IFQ program is to allow the communities themselves to hold QS" GAO-04-277. In addition to allowing communities to own or hold QS and QP, CFAs may be developed in conjunction with the trawl rationalization program as a trailing amendment. Presumably, CFAs would be eligible to hold QS/QP for an express purpose benefitting communities, such as community stability, sustainability, and avoidance of economic vulnerability.

- Small Vessels and New Entrants (Vessels)

Again, the broadly specified group of those eligible to acquire QS/QP (combined with the divisibility of the QS/QP into small units, Section A-2.2.3.d) facilitates incremental acquisition and participation by small vessels and new entrants.

- Program Performance

Program cost would be minimized with a very restrictive limit on those eligible to own QS/QP because there would be fewer QS/QP accounts to track. Allowing only those with LEPs to own QS/QP would be one such option. This would limit the number of entities eligible to hold QS/QP to just fewer than 170. The very broad provision that is currently specified would allow for a large number of QS/QP accounts and would require the transfer of QP from QS holders into vessel accounts in order to be used. Depending on the groups to which an allocation will be made, as well as recent participation criteria, there might be 200 processors alone that would qualify for an initial allocation. The greater number of accounts and transactions would add to program costs. An intermediate approach would allow a class of fishery stakeholders to qualify broader than just those who hold LEPs but more limited than under the current provision. However, this intermediate approach could be more costly to implement because of the need to determine and track the criteria for membership in the various classes of stakeholders. While simple low cost criteria might be designed, such criteria are likely to be relatively easy to circumvent, making the program ineffective with respect to limiting the class of those who own QS. For example, if status as a crewmember were required, a simple low cost requirement would be that to own QS/QP, a person would have to hold a crew license.[80] However, most U.S. citizens could get a

[80] Even if a qualifying class is "licensed crewmembers," there is not consistent licensing of crewmembers or other means of crew identification among the states. Therefore, some consistent system would need to be developed to identify members in this class.

crew license without actually working as a crewmember. Therefore, to make this an effective barrier, some other provisions would be needed such as having worked as a crewmember for a certain period. The need to process documentation on crew hours and enforce the provision would add substantially to the program costs. Similar results would be expected for simple versions of processor, buyer, or community participation requirements.

A-2.2.3.b Transfers and Leasing

❖ *Provisions and Options*

QS/QP will be transferable and transfers must be registered with NMFS. NMFS will not differentiate between a transfer for a lease and a permanent transfer.[81]

Each year, all QP must be transferred to a vessel account. A penalty for not meeting this transfer requirement has not been recommended; however, this requirement is intended to encourage its availability for use by the fleet.

QP can only be transferred into vessel accounts. Once in a vessel account QP can be transferred from one vessel account to another.

❖ *Rationale and Policy Issues*

QS/QP transferability is key to the conservation, economic, and social benefits described in Chapter 4. These benefits include the rationalization of the fleet that is expected to increase efficiency and allow the industry to support 100 percent observer coverage (with the attendant conservation benefits), the ability of crewmembers to acquire QS and enter the fishery as owners, and the opportunity for communities to acquire QS and increase their control over their economic base.

- Leasing

Consideration was given to limiting leases of both QS and QP. Each year, QP will be issued to those holding QS and be valid for that year (with some exception for the carry-over provision, Section A-2.2.2.b). The sale of QP might be considered an annual lease of the QS privilege; however, such transactions are not considered a lease for the purpose of this discussion. Here, a lease with respect to QS refers to a temporary but multiyear transfer of the QS from one entity to another. For the period of the lease, the entity with which the QS is registered would receive the annual QP. For QP, a lease would be considered the temporary transfer of QP from one entity to another, within the period over which the QP is valid. Such a temporary transfer would be of limited utility, because, once it is used, the QP cannot be returned to the lessor. A QP lease might be useful if there were some a minimum amount of QP a vessel might have to have before it left port. Under such circumstances, a vessel might lease QP for species it needed, but did not expect to encounter, and then return the unused QS at the end of the trip (presumably paying a premium if they were, in fact, used). While it has been considered, a minimum holding requirement is not part of the Council's PPA.

Leasing might be prohibited in order to reduce opportunities for absentee ownership; however, such prohibitions would be difficult to enforce. Entities might easily establish private arrangements for the transfer of QS and execute those contracts through transfers with NMFS that are registered as permanent. For the same reason, the decision was made not to register lease transfers distinctly from sale transfers because it is not necessary.

Another reason for not tracking leasing is the cost and complexity it might add to the program. There is no specification in the IFQ program that the source of any QS or QP transfers will be tracked over time (i.e., like money, QS and QP will be interchangeable ([fungible]; one will not be distinguished from another, except based on who holds it at the time). This is particularly important with respect to the QP.

[81] QS may be transferred on a temporary basis through private contract (leased), but NMFS will not track lease transfers differently than any other transfer.

QP will be transferred to a single account (see Section A-2.2.1), and, once in the account, QP from various sources will not be differentiated from one another. This is expected to simplify program administration substantially compared to systems in which individuals are allowed to retain control over the QP and fish them from a vessel.

Leases can be established entirely through private contract, and there appears to be little need to incur the added costs that would be entailed in tracking leased quota separate from permanent transfers. However, for the purpose of data collection and interpretation, NMFS may have to request information on whether a QS transfer is a sale or lease and, if a lease, the duration of the transfer. NMFS will be collecting information on payments for QS transfers to evaluate program impacts. Without knowing whether a particular transaction is a lease or sale, it will be difficult to interpret and use the QS price data.

- Mandatory Transfer to Vessel Accounts

The Council was concerned about the potential for absentee ownership and nonuse of QS. A major concern has been that nongovernmental organizations or others might acquire QS and withhold it from the fishery. There is also a history in other systems of some small amounts of quota simply going unused from one year to the next, despite the opportunity cost of nonuse (e.g., Alaska sablefish and halibut IFQ). However, the Council did not want to substantially restrict ownership because of administrative expenses such a restriction would entail, the desire to provide for crewmember and community ownership of QS, and the difficulty of doing so effectively. Additionally, design of an effective use-or-lose provision was problematic (see Appendix A section on use-or-lose provision). As one step in the direction of ensuring that QP would end up in the hands of fishermen who would use it, the Council included in its provisions a mandatory requirement that all QP be transferred to a vessel during the year in which it was issued.

- Allowing QP To Be Transferred Only to Vessel Accounts

The Council developed control limits that apply to QS and vessel limits that apply to QP and set vessel limits above control limits to allow greater vessel efficiency and to provide room on vessels for QP owned by crewmembers, communities, processors, etc. However, in establishing these rules, a situation was created in which there was no restriction on the amount of QP an entity could stockpile during the year. To address this concern, and reinforce its desire to tie QS as tightly as possible to vessels, the Council specified that once issued, transfer of QP would be allowed only to and among vessels.[82]

❖ *Interlinked Elements*

Transferability is a key aspect of many provisions of the IFQ program. Without it, significant program redesign would be required. NMFS will consider all transfers permanent, and individuals will rely on private contracts to execute lease agreements. While this feature may alter the effects of the grandfather clause associated with the accumulation limits (as described in the following analysis), there are no direct interdependencies between the leasing and accumulation limit grandfather clause provisions.

[82] The Council could not tie QS directly to vessels because of its desire to allow for QS ownership by crewmembers, communities, processors, and others while maintaining a cost-effective program. Tying the nonvessel QS/QP to a vessel creates tracking and monitoring challenges that are costly to address. See the section on permit/IFQ holding requirements.

❖ *Analysis*

As noted in the rationale, QS/QP transferability is the key to performance of the program with respect to conservation, economic, and social goals and objectives. The mechanisms by which these objectives are addressed through transferability are described in Chapter 4. Transferability is necessary for the rationalization of the fleet that is expected to increase efficiency and allow the industry to support 100 percent observer coverage (with the attendant conservation benefits), the ability of crewmembers to acquire QS incrementally to enter the fishery as owners, and the opportunity for communities to acquire QS and increase their control over their economic base.

- Leasing

♦ *Net Benefits and Sector Strength*

A leasing prohibition was considered and could be attempted to reduce the likelihood of absentee ownership, increasing the likelihood that QS will be held and controlled by active members of the fishery. However, such a prohibition, if it could be effectively enforced, would reduce the flexibility businesses have in organizing their activities. For example, a harvester either would have to acquire and pay the full value of the QS, or purchase QP on an annual basis. There would be no intermediate positions through which a harvester might acquire QS at a lower cost on a shorter-term basis. Less flexibility implies lost efficiency opportunities and diminished sector strength, compared to what might otherwise be achieved. For these reasons, there is no prohibition on leasing.

♦ *Program Performance*

There is no requirement that lease transactions be registered, as distinct from sales transactions. By not registering lease transfers, there is expected to be some saving of administrative costs. Additionally, if formal leasing were registered, it would extend the life of the accumulation limit grandfather clause. Individuals would be able to benefit from longer-term divestiture of QS via lease mechanisms without reducing the total amount of QS they are able to hold under the accumulation limit grandfather clause (assuming there is such a clause, and the clause is not modified to specify that a lease would be considered the same as a sale). By not prohibiting and not requiring registration of leases, the program is simpler than it would have otherwise been.

- Mandatory Transfer to Vessel Accounts

The provision requiring mandatory transfer to vessel accounts may affect objectives related to conservation net benefits, harvester and processor sector health, labor, communities, small entrants and new entrants, the general public, and program performance. All of the objectives related to economic performance will be discussed together (all objectives the conservation and program performance objectives).

♦ *Conservation*

Conservation may be affected by this provision's impact on total harvest. Ultimately, any impact will depend on how effective the measure is (see program effectiveness). Under status quo, the Council sets target harvest levels and establishes the regulations intended to achieve them. Those targets will then be harvested if the market conditions (e.g., fuel costs, ex-vessel prices) and technical relationships (e.g., the relation between the mix of species in the catch and the species limits) allow. This is because the

harvest opportunities are open to all vessels, and no one permitted vessel may exclude the activities of another permitted vessel. Under an IFQ program, an entity may hold IFQ and exclude others from accessing that harvest. A major concern has been that nongovernmental organizations or others might acquire QS and withhold it from the fishery to implement an alternative conclusion regarding the appropriate balance between harvest and risk to the stock and ecosystem. Reducing harvest to below identified optimum levels could move the ocean stocks and ecosystem more toward an unexploited condition, depending on how reduction in groundfish stock harvest balances with human induced changes in other parts of the ocean ecosystem. This would further the "preservation" aspect of conservation with respect to the ocean environment. The net effect on the global environment depends on how people respond to reduced availability of fish protein. Increased reliance on animal protein sources from feedlots could have an adverse effect, while increased reliance on soybean or other protein sources might have a positive effect, depending on the relative resource and energy consumption of fishing operations as compared to farming and ranching operations. Conservation also has meaning relative to the preservation of renewable resources for the purpose of ongoing current and future use.

♦ *Economic Performance*

As mentioned under the assessment of the conservation impact, the OYs and allocations for the fishery are set based on a best assessment of an appropriate balance between preservation and harvest. Given that the fishery management agencies have appropriately identified an appropriate balance, any reduction in harvest will diminish short- and long-term economic performance of the fishery. A reduction in harvest would adversely impact net benefits, the health of the harvester and processor sector, payments to labor, income for coastal communities, opportunities for new entrants and small entities, and the protein and benefits received by the general public for appropriate use of a public resource. The reduction would benefit the segment of the public that places an existence value on the resource (where that existence is defined not just in terms of its presence or absence, but rather its existence at higher biomass levels that then would be provided through fishery agency management). The required transfer of QP to a vessel is intended to encourage full harvest at sustainable levels, as determined by fishery management agencies.

♦ *Program Performance*

The effectiveness of this provision will depend on its impacts on two types of behavior. One is the withholding of QP to reduce harvest intentionally, and the second is the withholding of harvest due to inattention to what might be considered best business practices, nonvessel owners with QS ignoring the opportunity to sell the QP for revenue.

With respect to the withholding of QP to reduce harvest intentionally, effectiveness of the provision will depend on whether the costs of circumvention are enough to discourage such circumvention. There are a number of ways this provision might be circumvented. They include(1) acquiring a LE trawl permit, placing it on a low-cost vessel, and transferring QP to that vessel account; (2) acquiring a LE trawl permit, enlisting or paying a nongroundfish harvester to allow the permit to be registered to its vessel, and transferring QP to that vessel account; and (3) paying a vessel with a permit to receive, but not use, QP. For any particular vessel, the amount of QP that could be "parked" in a particular vessel account would be limited by vessel accumulation limits. Whether the costs that would be related to these strategies are enough to discourage the activities will depend on the importance that some entities place on nonuse of the QS. It should also be noted that there is no time during the year by which transfers must be completed. Therefore, someone intent on withholding QP could wait until the last day of the year to effect the transfer.

With respect to leaving QP unused and ignoring revenue opportunity, for the Alaska IFQ programs where this behavior is reported, those entities that do not transfer their QP to vessels have relatively small amounts of quota in most cases. Under such a circumstance, it may be that incurring the transaction costs are not worth what is earned from the transfer. Nevertheless, the quota that has routinely gone unused in Alaska has created controversy there, and action is being undertaken to discourage such practices. This provision would force such transfers, ensuring some opportunity for the fleet to harvest all of the available QP.

- Allowing QP To Be Transferred Only to Vessel Accounts

The effect of prohibiting QP transfers other than those directly to and between vessel accounts will be mainly indirect through more effective achievement of the intent of the accumulation limits (described above in the section on the rationale for this provision). Such restrictions may have some minor effect on net benefits by restricting the types of business arrangements through whicH QP are moved through markets. Because of the fishery's multispecies nature and variability in the species mix caught on each trip, it will be difficult to hold the right mix of QP; as the season progresses, it is likely that information on potential buyers, sellers, and prices will be valuable. Such information is essential to the type of well functioning markets that lead to efficient outcomes. Given the value of that information, some entrepreneurs may set themselves up as QP brokers. Brokers provide information and transactions services, but never take ownership of the QP. Broker operations would not be restricted by this provision. Another type of entity that might otherwise be active in the market would be QP traders/distributors. Like brokers, traders provide a market service to those wishing to buy and sell quota. However, quota traders earn profits by taking on some of the risk through their possession of the QP. A QP seller needing funds and unable to find a buyer wanting the type of QP he has might find a trader/distributor willing to buy his quota immediately at a better price than the seller could get in the market at that moment. The price, however, might be lower than he might otherwise receive some other time or with a longer search. By buying the QP and taking on the risk of QP ownership, the trader/distributor provides the seller with a risk sharing and financial service that a broker would not provide. It is uncertain whether this type of trading/distributing operation would come into being in the absence of this transfer restriction. However, if such businesses would have come into existence, it would be because the service they provide would be of value to individuals and the effective functioning of the market. This provision will prevent that type of business service from developing, possibly reducing net benefits.

A-2.2.3.c Temporary Transfer Prohibition

❖ *Provisions and Options*

NMFS may establish temporary prohibitions on the transfer of QS, as necessary to facilitate program administration.

►**Option:** QS will not be transferred in
SubOption 1: the first year
►SubOption 2: the first two years
of the program (QP will be transferable)

❖ *Rationale and Policy Issues*

Two types of temporary transfer prohibitions are covered in this provision:

(1) An annual QS transfer suspension for administrative necessity
(2) A QS trading moratorium at the start of the program to provide an adjustment period

The Council's final preferred option allows NMFS to establish temporary prohibitions on the transfer of QS at the end of the year if administratively necessary. Such a prohibition might be needed to allow accounts to be resolved before QP is issued to the QS accounts for the following year.

An initial moratorium on trading of QS is proposed to allow initial recipients to develop a better understanding of the IFQ system and the trading prices before they make permanent trades. A number of members of the Council family traveled to New Zealand to learn about their program. They reported to the Council that many of the New Zealanders stated that if they could do it again they would have started with a trading moratorium to be in place while participants developed a better understanding of the value of the QS. This provision will keep industry members from making decisions based on fear or lack of understanding of how the system will function.

This initial moratorium will also provide an opportunity to make needed adjustments to the program before QS trading starts to occur. For example, there may still be appeals in progress when the program starts. As those appeals are resolved, the amount of QS an individual has received may change based on the issuance of additional QS to another entity. On one hand, this might be partially resolved by the issuance of QS in some unit other than a percentage. On the other hand, regardless of the units used for the QS, the issuance of additional QS will change the harvest represented by QS already issued. If QS trading has already occurred, the issuance of additional QS may cause some disruption if the prices paid did not fully anticipate the amount that would be issued through appeals. Another example is the potential need to adjust accumulation limits, particularly control limits. During the first years of the program, QP trading will likely provide some indication of the amount of consolidation that is likely to occur and the impacts of that consolidation. If it becomes apparent that accumulation limits are too high, it will be easier to implement downward adjustments before QS trading has started.

While the Council saw these benefits, it also recognized that the prohibition might slow down the generation of benefits, though it was noted that consolidation could still occur during the QS moratorium through the transfer of QP.

NMFS will be overloaded in the first year, and industry should be protected from making decisions based on fear or a lack of understanding regarding how the system will function. There should be a period over which prices are established, and transfer of QP would be allowed. NMFS concurred, citing both the major change that would be entailed in an IFQ program and industry-voiced regrets about quick transfers that occurred early in the implementation of the New Zealand system.

In the process of developing the options and reaching its conclusion, the Council also considered and rejected an option for a two-year moratorium. Ultimately, the Council believed that a two-year period would be of value, both for the industry to become familiar with the program and to provide some opportunity, if necessary, to adjust the program before QS trading begins.

❖ *Interlinked Elements*

There are no direct dependency links between this provision and the effective function of other provisions, except as may be determined in the future with respect to the need for suspension of QS trading at the end of each year to facilitate program administration. There is also a link to the ease with which adjustments may be made to the program in its first two years, particularly with respect to accumulation limits, as described in the above rationale.

❖ *Analysis*

The following are the categories of goals and objectives affected by the decisions on temporary transfer prohibitions.

Section	Related Category of Goals and Objectives										
	Conservation	Net Benefits	Disruption	Excessive Shares	Fairness and Equity	Harvester and Processor Sector Health	Labor	Communities	Small Entities and New Entrants	General Public	Program Performance
Moratorium -- Establishing Market Prices and Adjustments		X	X		X	X					
Moratorium – Delayed Benefits		X				X					
Moratorium -- Effectiveness of the Moratorium					X						X
Moratorium – Administrative Costs										X	X
Annual Trading Suspension		X	X			X				X	X

- Moratorium — Establishing Market Prices

The moratorium is being proposed primarily because it is believed that it will assist QS holders in trading at fair market prices. Most economic literature assumes an established and known market price; little attention is given to how prices are established for entirely new commodities and how institutional arrangements (i.e., the rules of the market in which the commodity is traded) might affect the process by which the prices are established (Anderson 2004). Anderson (2004) experimentally demonstrated that in a market for a new commodity, in which both sellers and buyers advertise their bid and sale prices and trade at will, there is likely to be a high degree of price volatility, and the typical price pattern will be one of price bubble and collapse (technically termed a "double auction"). In such a system, the price one pays is affected more by when one decides to buy than the actual value of the commodity being purchased, thus bringing up concerns about inequities and disruption. It was further demonstrated that early trades would not necessarily result in the transfer of the commodity to the more efficient

producers, thus adversely affecting net benefits and sector health. Comparisons were made to other types of market structures (institutions), and results indicated that a period of leasing prior to free trading tended to stabilize prices and result in prices that are more likely to conform to the actual value of the commodity. Over the long term, appropriate market prices will likely develop regardless of the market structure created to support development of the market; however, the amount of disruption, inequity, and inefficiency encountered during the transition period will vary depending on the structures provided.

The proposed moratorium on QS trading would essentially establish a period of leasing (a time during which only the annual harvest privilege, the QP, could be traded). Based on Anderson (2004), we would expect this to be beneficial for the reasons described in the above paragraph. Lease prices (QP prices) may be helpful to the fishermen in determining the appropriate sale price for the QS in that there should be a relationship between the sale price for the QP and the stream of revenue one would expect from holding the QS and leasing the QP out each year. The Council considered two moratorium options; a one-year, and a two-year moratorium. The difference between the two can be evaluated in terms of the additional information that participants might learn in the second year of the moratorium and the costs to industry from the delay in the start of the period of full transferability. QP prices will likely vary through the first year of the program in response to the changes in knowledge about the trading prices, changing mixes in the catch that occur during the year, and shortages or surpluses that become apparent as the fishery moves through the year. As the participants move through the year, they will begin to understand the value of the QP. It will not be until after the year is over, however, that they will be able to start evaluating what might have been a reasonable price for QP for an entire year. The second year will provide some information on the annual lease prices for QP for an entire year, based on knowledge of the seasonal value of the QP in the previous year. Thus, there is an increment of knowledge to be gained in the second year that is qualitatively different from the first year (i.e., first-year prices are more likely to be based on seasonal demand, while the prices that QP trade for at the start of the second year are more likely to be based on an assessment of the value of the QP across the entire year). The question then is what is the cost of this additional increment of knowledge? First, it may delay QS holders' ability to adjust their QS holdings to the appropriate mix for their businesses (see section on moratorium effectiveness). This will extend the period of uncertainty, make it more difficult to plan, and extend the duration of the transition period. Second, during the period of the moratorium, there will likely be a greater number of transfers of QP, increasing both transaction and program administrative costs. The equal allocation provision will likely ensure that every year, almost every participant will have some allocation for a geographic area outside its normal range of operation that will have to be transferred to those who operate in a different geographic area.

In order for the QS trading moratorium period to be most effective in helping to establish QS market prices, it would be useful for the QP prices to be publically available (see Section A-2.3.2).

- Moratorium — Effectiveness of the Moratorium

While it is hoped that the moratorium will inhibit those who might otherwise transfer QS from doing so, there is little that would prevent QS holders from circumventing the moratorium by signing contracts for the annual transfer of QP to the buyers until the QS transfer moratorium expires and then transferring the QS themselves after the moratorium expires. The moratorium will send a strong message that extreme caution should be exercised in the early transfer of QS, but it will not prevent the effective commitment to a permanent transfer of QS by those determined to do so.

- Moratorium — Delayed Benefits

While QP trading will occur in the first two years of the program and will facilitate consolidation, to the degree that the moratorium is effective, some vessel consolidation and exit may be delayed because of uncertainty about the ultimate QS prices and the harvester's ability to acquire them. To the degree that consolidation is delayed, industry's ability to pay for program costs may be diminished. Higher vessel operation costs could reduce the price that vessels are willing to pay for QP, as compared to a situation in which QS trading was allowed, and consolidation occurred more rapidly.

- Moratorium — Administrative Costs

During the period of the moratorium, there will likely be more transfers of QP than if there is not a moratorium. Once the moratorium ends, there will likely be a period when the number of QS transfers intensifies, perhaps catching up to the number that would have occurred in the absence of the moratorium. Thus, overall administrative costs during the transition period will likely be higher with a moratorium than without.

- Annual Trading Suspension

An annual trading suspension of QS may be implemented, as necessary, to facilitate program administration. Such a short-term suspension might not significantly constrain transactions during the suspension, since nothing would prevent the signing of contracts for the QS during the suspension, with final execution of the contract occurring at the end of the suspension. Under such contracts, it is likely that, when the end-of-year suspension is over, both the QS and QP for the coming year could be transferred from the seller to the buyer. During the QS suspension, the trading of QP would continue to be allowed so as not to interfere with a harvesters' ability to cover their catch.

Depending on the nature of the administrative challenges that a suspension might help address, there may be approaches available that would not require the freezing of QS transfers. For example, suppose it appeared desirable to have a 45-day prohibition on transfers between November 1 and December 15 to determine the QS accounts to whicH QP should be issued for the following year. An alternative might be to issue QP to the holders of QS for a year based on QS account ownership as of November 1. It could be left to private contract for buyers to secure the separate transfer of the attendant QP with respect to transfers of QS occurring after November 1. On one hand, this would put less of a constraint on the market. On the other hand, it might increase administrative costs by increasing the number of transfers of QP independent of QS (any transfers of QS between November 1 and the time the QP are issued would have to be followed up with a transfer of the corresponding QP from the QS seller to the QS buyer, once the QP are issued).

A-2.2.3.d Divisibility

❖ Provisions and Options

QS will be highly divisible and the QP will be transferred in whole pound units (i.e., fractions of a pound could not be transferred).

❖ Rationale and Policy Issues

Blocking shares into indivisible units has been used in other programs to achieve social objectives (such as the west coast fixed gear sablefish tier system and sablefish and halibut IFQ programs in the north Pacific in which QS were blocked). In the north Pacific sablefish and halibut IFQ programs, some shares are blocked, and holders of unblocked QS are limited in their ability to acquire the blocked QS.[83] This is done to preserve small vessel opportunities. However, for this fishery, the divisibility is needed not only to allow vessels to achieve the most efficient scales of operation, but also to allow vessels to achieve the QP mixes needed to match the species mixes encountered in the catch, catch mixes that vary from tow to tow. Because of the need to matcH QP with variable species mixes in the catch and the desire to provide opportunities for new entrants to acquire QS in small increments, little consideration was given to the blocking of shares into larger units and maximum divisibility is emphasized.

QS divisibility might vary by species, but should probably be small enough to allow the transfer of single pounds.

❖ Interlinked Elements

Second to transferability, a high degree of divisibility is central to the IFQ program's ability to achieve many of its goals and objectives. If this provision is changed, a number of other program features would have to be reconsidered, particularly those related to accommodation of new entrants.

❖ Analysis

Divisibility is important with respect to efficiency, sector health, and labor, new entry, and small vessel opportunities. The reduction in flexibility that would result from reduced divisibility may decrease the per pound value of the quota.[84] This reduction in the value of the QS would reflect lost efficiency and reduced net benefits. Requiring that shares trade in larger units would make it more difficult to enter through incremental investments. These results might be somewhat different in a system that included both highly divisible and blocked shares, such as that in the NPFMC sablefish and halibut IFQ program.

[83] The NPFMC restricted the number of these blocks that a person could hold in an area. If the person held any unblocked QS in an area, they could only hold one block of QS for the area. If the person did not hold unblocked QS for an area, then the person could hold up to two blocks for that area. The objective of these blocking rules was to preserve a portion of the QS for the fleet of small part-time operators (Dinneford, *et al.* 1997).

[84] As an example, in the north Pacific, the 1996 average lease price for blocked QS was $0.88 per pound of IFQ, and the average lease price for unblocked QS was $0.97 per pound of IFQ when calculated over all areas and vessel categories (Dinneford, *et al.* 1997).

A-2.2.3.e Accumulation Limits (Vessel and Control)

❖ *Provisions and Options*

This provision restricts the amount of QS and QP that may be held. Three types of accumulation limits are included, control limits, vessel limits, and an unused QP limit for vessels. The control limit would apply to QS; the vessel limit would cap the total amount of QP that may be registered to a single vessel during the year, and would cover both the vessels used and unused QP. Under this limit, a vessel could not have more QPs registered for the vessel than a predetermined percentage of the QP pool. The unused QP limit for vessels would cap the amount of unused QP in a vessel's account.

Limits[85] may vary by species/species group, areas, and sector. See Table A-82, Table A-83, and Table A-84 for the percentage options that were considered for the accumulation limit levels and the Council's final recommendations. The vessel unused QP limits may be revisited in the first biennial specifications process after implementation of the program.

Vessel Use Limit (Vessel Limit): A limit on the total QP that may be registered for a single vessel during the year. This element will mean that a vessel could not have more used and unused QPs registered for the vessel than a predetermined percentage of the QP pool.

► **Option: Vessel Unused QP Limit:** A limit on the amount of unused QP that may be registered to the vessel at any time. As QP are used, permit owners may replenish their QP accounts up to the vessel unused QP limit. This limit applies only for overfished species and Pacific halibut.

QS Control Limit:[86] A person, individually or collectively, may not control QS in excess of the specified limit (unless exempted by the grandfather clause). QS controlled by a person shall include those registered to that person, plus those controlled by other entities in which the person has a direct or indirect ownership interest, as well as shares that the person controls through other means.[87] The calculation of QS controlled by a person will follow the "individual and collective" rule.

> Individual and Collective Rule: The QS that counts toward a person's accumulation limit will include 1) the QS or QP owned by them, and 2) a portion of the QS owned by any entity in which that person has an interest. The person's share of interest in that entity will determine the portion of that entity's QS that counts toward the person's limit.[88]

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85 In this section, the term "permit" was changed to "vessel" to be consistent with Section A-2.1.3, which indicates that QP go into vessel accounts, not permit accounts. The term "own or control" was shortened to "control" for simplicity. Control includes ownership.

86 In the preliminary preferred alternative, and prior to revisions made in the spring of 2009, the control limit applied to both QS and QP. This was changed so that the vessel limit could be set greater than the control limit. Further explanation of this change is provided in the rationale.

87 It is the Council's intent that control limits should not constrain the formation of risk pools to help the fishermen deal with overfished species constraints, as long as the pools do not undermine the effectiveness of the accumulation limits. A risk pool is one in which two or more people enter into an agreement whereby if one person does not have the QP it needs, the others would agree to provide the QP, if they have them. Whether these kinds of agreements are informal or formal, they may begin to constitute control as other considerations and conditions are added to the agreements. It is the Council's intent to allow for these pooling agreements, so long as they do not become control.

88 For example, if a person has a 50 percent ownership interest in that entity, then 50 percent of the QS owned by that entity will count against the individual's accumulation limit unless it is otherwise determined that the individual has effective control of a greater or lesser amount.

Grandfather Clause and Divestiture:

Option 1: A grandfather clause will apply to (1) vessel accumulation limits and (2) control accumulation limits. This clause allows a person, if initially allocated QS in amounts in excess of the cap, to maintain ownership of the QS. The grandfather clause will expire with a change in ownership[89] of the QS. If the owner divests some of the QS, the owner may not reacquire QS or QP until the owner is under the cap. Once under the cap, the grandfather clause expires and additional QS or QP may be acquired but not in excess of the control caps.

Option 2: Same as Option 1 but the maximum allowed under the grandfather clause will be twice the vessel accumulation limit.

Option 3: There will not be a grandfather clause and there will be no opportunity to receive QS and divest of it.

►**Option 4:** There will not be a grandfather clause for the control limits, however, an adjustment period is provided through the following divestiture rules. QS will be issued for amounts in excess of aggregate and species control limits only for holders of permits transferred by November 8, 2008, if such transfers have been registered with NMFS by November 30, 2008. The holder of any permit transferred after that time will be eligible to receive an initial allocation for that permit of only those QS that are within the aggregate and individual species control limits. Anyone who qualifies for an initial allocation of QS in excess of the control limits will be allowed to receive that allocation but required to divest themselves of that excess QS sometime during years 3 and 4 of the IFQ program (the two years after the QS transfer moratorium specified in Section A-2.2.3.c). Holders of QS in excess of the limits may receive and use the QP associated with that excess, up to the time their divestiture is completed. However, QP for year 5 of the program will not be issued for QS held in excess of the limits. At the end of year 4, any QS still held in excess of the species or aggregate limits in place at the time of the initial QS allocation will be revoked and redistributed to the remainder of the QS holders in proportion to their QS holdings. No compensation will be due for any revoked shares. Divestiture transfers will be allowed in accordance with the provisions established here and the transfer rules and processes implemented by NMFS. Permit transfers will not be limited or required by the divestiture provision.

Calculation of Aggregate Nonwhiting QS Holdings: To determining how much aggregate nonwhiting QS an entity holds, an entity's QS for each species will be converted to pounds. This conversion will always be conducted using the trawl allocations applied to the 2010 OYs, until such time as the Council recommends otherwise. Specifically, each entity's QS for each species will be multiplied by the shoreside trawl allocation for that species. The entity's pounds for all nonwhiting species will then be summed and divided by the shoreside trawl allocation of all nonwhiting species to get the entity's share of the aggregate nonwhiting trawl quota.

Note: Absent guidance otherwise, Options 2 and 3 would be implemented in such a manner as to not alter other provisions of the program. Specifically, QS that is not allocated because of the limit or absence of the grandfather clause will be distributed to other eligible recipients in a manner that maintains the distribution among groups specified in A-2.1.1 and based on the allocation formulas specified in A-2.1.3.

❖ *Rationale and Options Considered, But Not Included*

There is a tension between allowing a sufficient accumulation to improve the efficiencies of harvesting activities and preventing levels of accumulation that could result in a variety of adverse economic and social effects. Excessive accumulation of the control of IFQ can result in changes in the structure of the fishing industry and communities and, in the extreme, possibly reduce net economic benefits (in the unlikely event that those accumulating QS alter total production). While some IFQ programs rely solely

[89] **Change in Ownership definition:** For the purpose of the grandfather clause, ownership of a legal entity is defined to change with the addition of a new member to the corporation, partnership, or other legal entity. Members may leave without causing the grandfather clause to expire for that entity.

on antitrust law to prevent excessive concentration of shares, experience has shown this not sufficient to prevent problems resulting from excessive concentration of IFQ (NRC 1999) (pg. 209). The NRC also notes that concentration limits may not be very effective if ways can be found to circumvent them.

National Standard 4 of the MSA has always required the consideration of excessive shares:

> (4) Conservation and management measures shall not discriminate between residents of different States. If it becomes necessary to allocate or assign fishing privileges among various United States fishermen, such allocation shall be (A) fair and equitable to all such fishermen; (B) reasonably calculated to promote conservation; and (C) *carried out in such manner that no particular individual, corporation, or other entity acquires an excessive share of such privilege.* [Emphasis added]

Additionally, the reauthorized MSA requires that accumulation limits be established within a limited-access privilege program.

> (5) ALLOCATION. — In developing a LAPP to harvest fish the Council or secretary shall—
> (D) ensure that LAP holders do not acquire an excessive share of the total LAPs in the program by—
> (i) establishing a maximum share, expressed as a percentage of the total LAPs, that a LAP holder is permitted to hold, acquire, or use; and
> (ii) establishing any other limitations or measures necessary to prevent an inequitable concentration of LAPs.

There are a number of policy choices associated with the specification of accumulation limits.

1. Should there be a vessel limit (production level limits: vessel or permit limit)?
2. Should there be a control or ownership limit?
3. How should control be defined and what scope of control relationships should be considered? Should both QS and QP count against the limits?
4. Should there be a grandfather clause and is there a need for a control date?
5. If there is no grandfather clause, what should be done with QS that is not allocated to entities because the allocation would exceed the accumulation limit?
6. At what levels should the limits be set?
7. How should aggregate limits be applied as the trawl allocation changes?

Each of these policy choices will be discussed in the following sections along with other options considered but rejected.

Table A-82. Page numbers for sections on accumulations limit rationale and analysis.

	Rationale	Analysis
Vessel Limit (Production Level Limit: Vessel or Permit)	A-287	A-336
Vessel Unused QP Limit	A-288	A-339
QS Control Limit	A-288	A-340
The QS Control Rule and Included Scope of Control Relationships	A-289	A-342
Grandfather Clause, Divestiture and Cut-off Date	A-296	A-346
Percentages for Limits	A-301	A-352
Calculation of the Aggregate	A-335	A-370

♦ *Vessel Limit (Production Level Limit: Vessel or Permit)*

The vessel would limit the total amount of QP a vessel could use each year (both the used and unused QP in the vessel account). Permit limits were considered as an alternative to vessel limits, but rejected.

This section includes the following:

- The reason for including a vessel limit
- The contrast of a vessel limit with a permit limit

The following section covers a different kind of vessel limit: the vessel unused QP limit.

The Council's final preferred alternative contains a vessel limit. The vessel limit applies at the level of the production unit (as compared to the control limit, which does not directly restrict the amount of fish used on a vessel). The vessel limit would be intended to achieve the following:

- Ensure that there is at least some minimum number of fishing vessels in the fleet to support more job positions and the purchase of more equipment, supplies, and support from fishing communities
- Increase the likelihood that harvest would be geographically dispersed
- Serve as a back up to the control limit (control limits may be difficult to monitor and enforce)

The Council is balancing the need to address these objectives with the risk that restrictive vessel limits may decrease potential efficiency gains from consolidation.

A grandfather clause was considered for the control limits and for vessel limits, but was not developed for the vessel limits. On a share of catch basis, vessel limits were set above the maximum historic catches of any individual vessel.[90]

A permit accumulation limit was considered as an alternative to a vessel limit. In order for a permit limit to achieve an effect similar to the vessel limit, there would have to be a prohibition on the stacking of permits and on the rotation of permits through a single vessel. Without such limits on stacking and rotation, the permit based limit would function more like a control limit in that it would not affect the number of vessels in the fleet.[91] The vessel-based limit is simpler than the permit limit because there is no need for provisions related to limiting the stacking or rotation of permits.

[90] A grandfather clause for the vessel limits would present certain implementation challenges. The accumulation limit grandfather clause is generally structured to allow entities to maintain QS they receive in excess of the accumulation limits, but does not address a grandfather level for QP used on a vessel. The grandfather clause would be intended to facilitate initial allocations. QS are issued as part of the initial allocation. QP are not issued until later in the implementation process. Additionally, QS are issued to entities that own permits, not to vessels. Therefore, there is no direct permanent link between a particular permit and vessel. If the Council wanted to grandfather vessels in at certain production levels, an additional provision would be needed to establish the grandfather levels for vessels. A simple approach would be to set the vessel's grandfather level to the amount of QS received for the permit associated with the vessel. A few other decisions would also be needed: the conditions under which the vessel grandfather clause expires (e.g., whether the clause expires with a change in ownership of the permit or vessel) and whether one vessel may be substituted for another without the grandfather clause expiring (i.e., whether the vessel grandfather exemption stays with the vessel or transfers with the permit).

[91] Relative to the vessel-based limit, the permit-based limit would simplify implementation of a grandfather clause because the grandfather clause provisions can be easily applied to the permit: the grandfather level would be determined based on the permit's allocation of QS, and the grandfather clause would expire with a change in ownership of the permit (vessels could be replaced through the transfer of a permit without having the grandfather clause expire).

♦ *Vessel Unused QP Limit*

The Council developed an unused QP limit for incidentally caught overfished species. Under the unused QP approach, a vessel is limited in the amount of unused QP it may hold in its account at any one time, but is potentially free to acquire as much additional QP as is necessary to cover its actual catch of overfished species. The utility of this approach depends on the substantial incentives that vessels have to avoid overfished species: (1) the amount of overfished species QP available will be quite limited, particularly for certain species and, therefore, very expensive to acquire; (2) any overfished species the vessel does not need can be sold, likely at a high price. Absent these incentives to avoid overfished species, the unused QP approach would not work because it would effectively provide no cap on the amount of the species a vessel catches.

Two specific reasons have been identified for considering the unused QP approach:

1. **The Difficulty of Choosing the Right Limit for Incidentally Caught Overfished Species.** An overly constraining vessel QP limit for overfished species could prevent a vessel from accessing its target species QP. Because of variability in bycatch rates along the coast and across different fishing strategies, it is very difficult to pick one QP limit for overfished species that would be large enough to accommodate needs in every geographic area and strategy without providing limits substantially in excess of that needed for others.
2. **Facilitating the Choice of a Lower Limit.** A vessel unused QP limit would not restrict the total amount of overfished species QP a vessel could access to cover the incidental catch taken with its target species. Therefore, the vessel limit could be set at a lower level without constraining vessel's catch of target species (assuming the vessel is able to acquire additional overfished species QP on the market as needed). A lower vessel limit may help maintain QP availability in the market by reducing the opportunity for vessels to sequester overfished species in their accounts on the chance they might need it to cover an unexpectedly high bycatch rate.

The rationale for use of the unused QP approach is discussed further below in the section on the rationale for setting the percentages for the control and vessel limits.

♦ *QS Control Limit*

In this section, we address the following:

- Reasons for having a control limit and reasons for having a control limit instead of an ownership limit
- Rationale regarding whether there should be different control limits for different types of entities

A limit on the amount of QS an entity would be allowed to control is proposed to address requirements of the MSA and a number of goals and objectives. Control limits could achieve the following:

- Contribute to efficiency if the control limits are set at a level that prevents the exertion of market power without constraining operation sizes to below the most efficient levels (MSA – National Standard 5, Groundfish FMP Goal 2 and Objective 7, Amendment 20 Objective 2 and 6)
- Prevent the accumulation of excessive shares (MSA – National Standard 5, 303(c)(5)(B)(ii), 303(A)(c)(5)(D), Amendment 20 Constraint 6)
- Contribute to sector health (Amendment 20, Objectives 2 and 6)

- Help to geographically disperse harvest and landings to the benefit of communities (MSA – National Standard 8, 202A(c)(5)(B); Groundfish FMP Objective 16; Amendment 20 Objective 5 and Constraint 3)
- Contribute to fairness and equity (MSA – National Standard 4(a), 3030(c)(5)(A); Amendment 20 constraint 5);

Please see Table 6-1 for additional description of the referenced guidance.

Consideration was given to relying solely on antitrust laws to address concerns about excessive shares; however, the level of aggregation required to establish the anticompetitive behaviors that are of antitrust concern may be substantially greater than the levels of aggregation that trigger concerns about fairness and equity, geographic distribution, communities, or sector health.

The Council also considered having an ownership limit and a control limit. The term "owner" is used to designate the person with whom the QS is registered through NMFS. In general, *control* includes both the control exerted through ownership of the QS and the control exerted by the ability to direct the use of QS. To address the stated objectives, a limit is needed on the amount of control. A separate ownership limit that is a subset of a control limit would serve little purpose and would add to the complexity of the regulations. Therefore, the Council decided there should be a control limit that subsumes ownership.

Another question to be addressed with respect to the QS control limit is whether there should be different types of control limits for different types of entities (e.g., control limits for harvesters that are different than control limits for crewmembers, processors, or communities). In particular, processors have argued that they should have greater control limits because they handle larger volumes of product. It has also been argued the communities should have larger control limits to address the needs of their entire fleet and that harvester cooperatives should have greater limits to form risk management pools and take advantage of other benefits that may flow from the formation of harvester cooperatives.

When discussed by the TIQC, there were two reasons that setting up different control limit for different groups was rejected. First, the differential limits could be circumvented if an entity would be able to make some simple adjustments and qualify as the type of entity that has the highest accumulation limit. For example, if processor limits would be substantially higher than harvester limits, then harvesting companies might make adjustments that allow them to qualify as a processor (e.g., acquire a processing license and process a small amount of fish or take on a minority processor interest). The second reason for not having different control limit levels for different types of entities was that control limits are less of a direct impediment to operations of other entities, as compared to harvesters. Thus, there did not appear to be a need to provide higher control limits for other groups. However, the Council has expressed its intent to consider a special higher limit for CFAs to facilitate groups of QS holders working together. This would occur as part of a trailing amendment. The rationale would be that these higher limits are needed to allow certain types of group activities that advance Council goals and objectives for the fishery and which would not be possible or as effectively carried out without the higher limits.

♦ *The QS Control Rule and Included Scope of Control Relationships*

The control rule and specification of its scope will affect goals and objectives through its impact on the effectiveness of the limits on control. Control may be exerted directly or indirectly.

PARSING THE QS CONTROL RULE

The full control rule is as follows:

> **Control Limit:** A person, individually or collectively, may not control QS in excess of the specified limit (unless exempted by the grandfather clause). QS controlled by a person shall include those registered to that person, plus those controlled by other entities in which the person has a direct or indirect ownership interest, as well as shares that the person controls through other means. The calculation of QS controlled by a person will follow the "individual and collective" rule:
>
> > Individual and Collective Rule: The QS that counts toward a person's accumulation limit will include (1) the QS owned by them, and 2) a portion of the QS owned by any entity in which that person has an interest. The person's share of interest in that entity will determine the portion of that entity's QS that counts toward the person's limit.[92]

We will now review a number of the key aspects of this rule.

QS Control Limit: A person, individually or collectively . . .

This definition applies to all legal persons, whether they are individuals, partnerships, corporations or other legal entities. By including all legal persons within the scope of the rule (rather than just individuals), this specification acknowledges the abilities of individuals to use partnerships, corporations, and other legal entities to exert control, or for these other types of legal entities, to exert collective control.

Where an individual or group of individuals have collectively formed a legal entity, the individual's influence over the collective legal entity will be taken into account in assessing the control exerted by the individual. Ownership is only one type of influence. The exact formula used to determine the total amount of QS a person controls through ownership is specified below in the "individual and collective rule." This specification will make it more difficult for an individual to circumvent the control cap by exerting influence over a number of different legal entities (e.g., partnerships or corporations).

QS Control Limit: . . . QS controlled by a person . . .

The Council considered applying the control limit to both the QS and QP controlled by a person. However, in order to balance efficiency objectives that require the concentration of harvest on fewer vessels with social objectives related to maintaining a broad distribution of benefits from QS control/ownership, the Council determined that it would be desirable to set the vessel limits at a higher level than the control limits. This created a conflict in that if the control limits applied to QP, and a person was considered to control QP placed on its vessel, then there would be no way to reach the vessel limit without violating the control limit.[93] The Council, therefore, modified the definition of

[92] For example, if a person has a 50 percent ownership interest in that entity, then 50 percent of the QS owned by that entity will count against the individual's accumulation limit.

[93] The possibility that QP might be used on a vessel without placing the QP under control of the owner was discussed. However, this adds complexity both to the tracking of the QP and to the process for crediting catch against QP. For vessels with more QP than the control limit, catch would have to be counted against each of the separate accounts held for the vessel. In addition to adding to the complexity of the tracking system, it would also add a source for error and disagreement and raise questions regarding who is responsible for the various accounts on the vessel. Adding more accounts to the vessel would also require consideration of how

control to exclude explicit control of QP. Not counting QP against the control limit may make it easier for an individual to use indirect methods to exert control without being detected. For example, an individual might use side contracts to acquire QP issued each year for particular QS. Depending on other aspects of the agreement by which the transfers are made, even though the control limit would not apply to QP, a determination could be made that the entity is effectively controlling the QS that is behind the QP. Thus, while a person's control of QP would not automatically be counted toward the control limit, its control of QP could indicate that it also controls the underlying QS. Again, whether the entity acquiring the QP actually controls the underlying QS would largely depend on the circumstances under which the QP are acquired and other aspects of the relationship between the persons receiving and providing the QP.

QS Control Limit . . . shall include those registered to that person . . .

All QS registered with NMFS under the person's name would count against that person's accumulation limit. This language intentionally uses the word "include" so as not to exclude counting QS against a person's limit, even though it is not registered to the person.

QS Control Limit: . . . plus those controlled by other entities in which the person has a direct or indirect ownership interest . . .

The mention of indirect ownership provided here sets up the definition for application of the "Individual and Collective Rule." Indirect ownership might include ownership through intermediary entities, e.g., if Individual A participates in a partnership that has an ownership interest in a corporation that owns or controls QS, some portion of the QS that corporation owns or controls would count against Individual A's limit.

QS Control Limit: . . . as well as shares that the person controls through other means. . .

This language makes it explicit that the term "control" covers means of control beyond ownership. Ultimately, the evaluation of control depends only partially on direct ownership of QS or ownership of some other entity that owns the QS; i.e., one entity may have no direct ownership in another entity or its QS, but still be found to exert control over that other entity and/or the QS it holds.

QS Control Limit. . . The calculation of QS or QP controlled by a person will follow the "individual and collective" rule:

> Individual and Collective Rule: The QS or QP that counts toward a person's accumulation limit will include (1) the QS or QP owned by them, and 2) a portion of the QS or QP owned by any entity in which that person has an interest. The person's share of interest in that entity will determine the portion of that entity's QS or QP that counts toward the person's limit.

This language provides definition and a formula for assessing control through ownership. Note that this rule applies only for the purpose of determining amounts controlled through ownership

the carryover provisions would be applied (which, to this point, have been based on the QP in the vessel account). An assumed constraint in the design of the program has been that once QP are issued for the year we would not track their source. They would be treated similar to bank accounts in that only the total amounts in an account are relevant, not the source of the QP.

and does not cover or restrict the consideration of control through other means in determining the total amount of QS an entity controls. For example, if it was determined that a person who was a partial owner in a corporation effectively exerted complete control over the disposition of QS held by that corporation, all of the QS owned by that corporation might be counted against that person in an evaluation of the "shares that the person controls through other means," depending on case specific circumstances.

OWNERSHIP CALCULATIONS (DOWNSTREAM AND UPSTREAM ACCOUNTING)

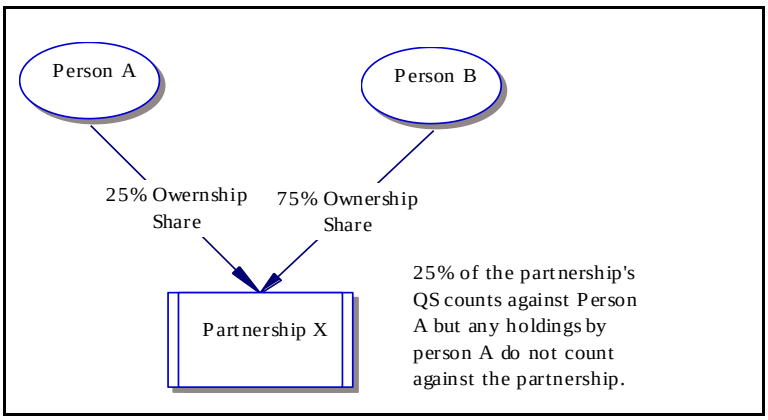


Figure A-96. Downstream accounting for control through ownership.

Under the individual and collective rule, persons are considered to control legal entities, but legal entities are not considered to control persons who control the legal entity. The QS owned by downstream entities counts against control limits of upstream owners, but the QS ownership of upstream owners does not automatically count against the QS of downstream entities. For example, in Figure A-118, a portion of the downstream partnership's QS (Partnership X) would count against Person A, but Person A is upstream of the partnership, and any QS owned by Person A separately from the partnership would not automatically count against the downstream partnership.

Consideration was given to automatically counting against an entity all shares owned by individuals who have some ownership in that entity (upstream accounting). Under such a rule, the control limits could become rapidly over-restrictive because the QS of individuals with only a very distant ownership relationship to a particular entity would still count against that entity. Figure A-119 diagrams an example of partnership QS accounting for a rule under which there is only downstream accounting (QS owned by a partner does not count toward the partnership's QS). Figure A-120 diagrams the same relationships for a rule under which there is both downstream and upstream accounting (QS owned by a partner does count toward the partnership's QS). In these figures, the QS owned by an entity is provided in the diamond shapes, and the entities are represented in circles (individuals) or squares (partnerships). The percent of a partnership a person controls is indicated in the arrows pointing to that partnership. The amount of QS counted against an entity is provided in parentheses in the square or circle. In these examples, Persons A, B, and C are individuals. Persons A, B, or C could also be partnerships, corporations, or other legal entities, in which case there would be additional boxes showing the upstream individuals who owned those entities.

Under the downstream accounting illustrated in Figure A-119, Person A is considered to have ownership over 0.75 percent of the QS (Person A's own 0.5 percent and 25 percent of partnership X's 1 percent QS). Person B is considered to own 1 percent of the QS (75 percent of Partnership X's 1 percent QS and 50 percent of Partnership Y's 0.5 percent QS). Person C is considered to own 0.25 percent of the QS (50 percent of Partnership Y's QS). Note that this method and these illustrations are only for determination of control through ownership. For example, it might be determined that

Person B controls all of the QS of Partnership X because of Person B's 75 percent interest in Partnership X.

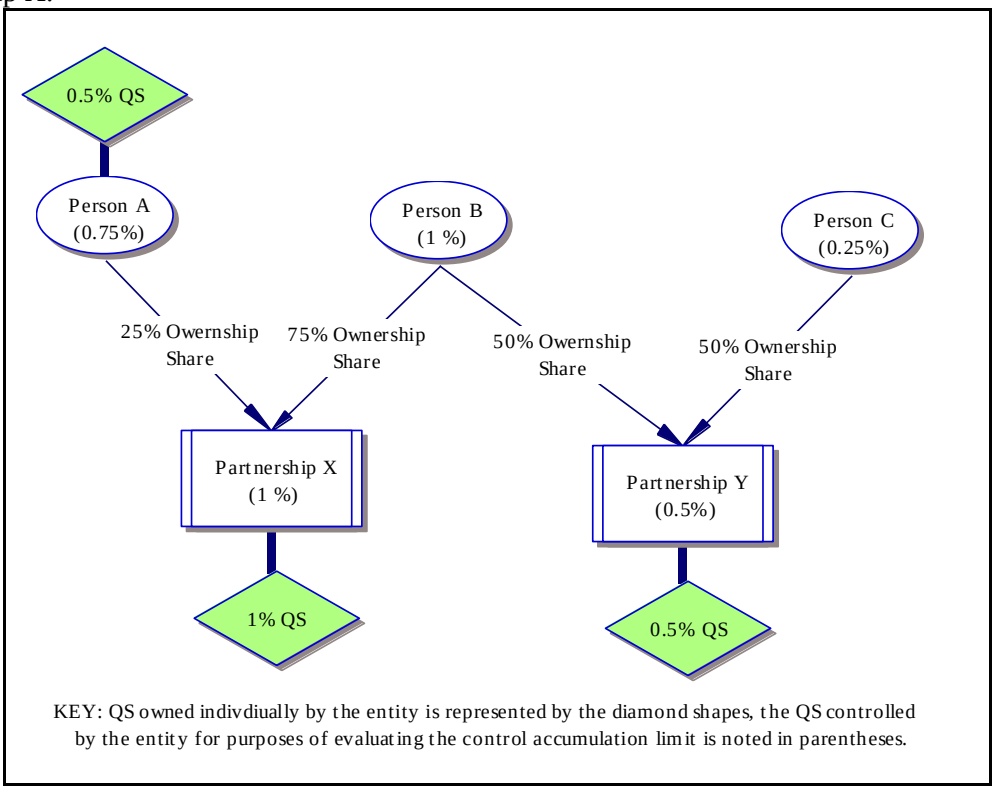
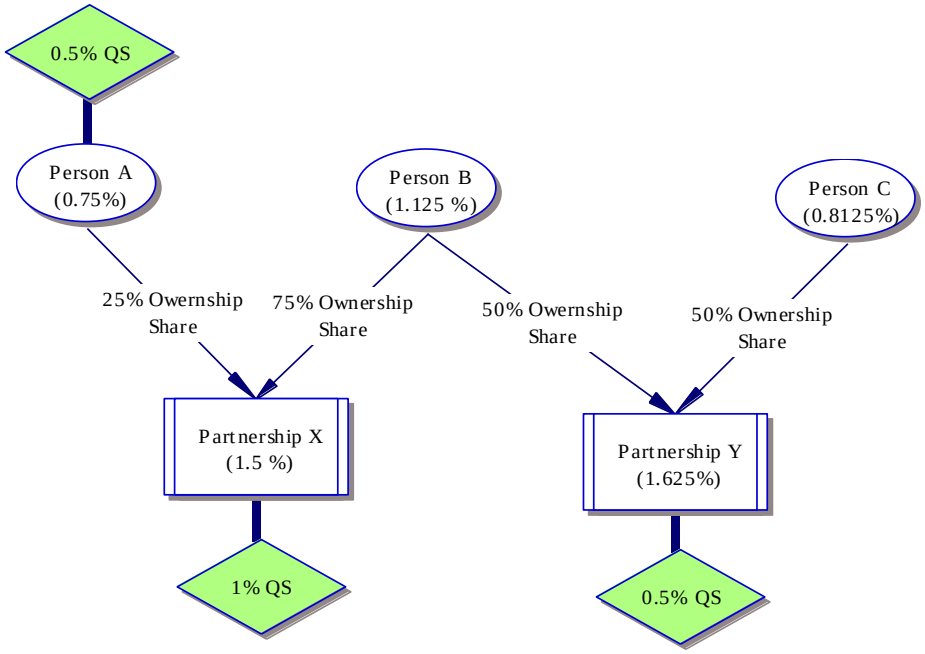


Figure A-97. QS accounting if the QS owned by a partner does not count toward the partnership's QS (downstream accounting only).

As compared to downstream-only accounting, the impact of upstream and downstream accounting illustrated in Figure A-120 is most marked for Partnership Y and Person C. For these two entities, the QS attributed to them more than doubles. Because all of Person A's QS counts against Partnership X, Partnership X has 1.5 percent QS and Person B's 75 percent interest in Partnership X is counted as giving him control over 1.125 percent QS (of which 0.375 percent is that which Person A owns on his own). The QS Person B controls then counts against Partnership Y, which increases that partnership's QS to 1.625 percent (of which 0.375 percent is that which Person A owns on his own, and 0.75 percent is that held by Partnership X). Figure A-120 shows only a partial accounting for upstream ownership. For a full accounting, Person B's ownership of Partnership Y would be counted against Partnership X, increasing Partnership X's QS holdings by 0.25 percent to 1.75 percent. This would then increase Person A's holdings by 0.675 percent (25 percent of 0.25 percent) to 0.8175 percent. Thus, the full effect of upstream accounting is to increase both the extent of the constraint and the complexity of the accounting.

The decision on the downstream/upstream accounting aspect of the control rule draws a balance between a "cascading effect" that may unfairly restrict a person based on the actions of a distantly related entities (Persons A and C in Figure A-120) and the opportunity for an entity to circumvent the limits by a chaining together a number of partnerships that work cooperatively to control QS in excess of limits. It is at this point that the portion of the rule that includes "as well as shares that the person controls through other means" becomes important. Even under a rule that does not automatically count upstream ownership control of QS against limits for downstream entities, if it were determined that upstream ownership and the chaining together of entities was being used to circumvent QS control

limits, such control would still be considered a violation of the limit. Such situations would be evaluated on a case-by-case basis.



KEY: QS owned indivdiually by the entity is represented by the diamond shapes, the QS controlled by the entity for purposes of evaluating the control accumulation limit is noted in parentheses.

Figure A-98. QS accounting if the QS owned by a partner does count toward the partnership's QS (upstream and downstream accounting) (Note: Partnership X's and Person A's QS have not been fully adjusted to account for Person B's separate ownership of Partnership Y. See text for discussion).

An alternative specification of the control rule could count the QS/QP owned by a partner against all entities owned by that partner but not against the other owners of those entities. Under such a rule, in Figure A-120, Partnership X would still be considered to control 1.5 percent of the QS, but Person B would be considered to control only 0.75 percent of the QS (as in Figure A-119), and Partnership Y and Person C would also be unaffected by Person A's ownership of QS (also as in Figure A-119). As compared to a downstream-only rule, this would make it somewhat more difficult to circumvent control limits by chaining entities together, but would not eliminate the problem and would add complexity to the control rule.

Another version of the calculation for the individual and collective rule would have counted 100 percent of the QS held by any entity against each owner of that entity, regardless of the owner's share of ownership. A variation on this approach would count 100 percent of the QS held by an entity against each owner who has at least a 10 percent interest in the entity. Under such an approach, in Figure A-119, Person A would be considered to control 1.5 percent QS. This approach, while making it more difficult to exert covert control over QS, would also constrain a person's ability to participate in multiple partnerships or corporations, or to hold QS and participate in fishing separately from the partnership or corporation in which it also participates. The net effect of the 100 percent approach would likely be to fragment the ownership in the fishery into more distinct units than may now be the case.

From the above discussion, it is apparent that in specifying the control rule, the Council is balancing the following:

- Complexity
- Unintended constraints on business arrangements due to the cascading effect of a more broadly specified control rule
- The effectiveness of the control rule as evaluated based on ownership information alone
- The need and cost of enforcing abuses through investigation of control exerted by means not captured under the rules for evaluating control through ownership

IMPLEMENTATION OF THE CONTROL RULE

In implementing the QS control limit, NMFS would provide a regulatory definition of the Council's intent. With respect to the interpretation of "otherwise controls," the following is the regulatory interpretation that was provided for similar policy language for the North Pacific crab rationalization program[94] *(Note: minor revisions have been made to these examples so that they can be better understood in the context of the IFQ Alternative):*

a) The person has the right to direct, or does direct, the business of the entity to which the QS are registered.
b) The person has the right to direct, or does direct, the delivery of groundfish harvested under a permit registered to a different person/entity.
c) The person has the right in the ordinary course of business to limit the actions of or replace, or does limit or replace, the chief executive officer, a majority of the board of directors, any general partner, or any person serving in a management capacity of the entity to which the QS is registered.
d) The person has the right to direct, or does direct, the transfer of QS.
e) The person, through loan covenants, has the right to restrict, or does restrict, the day-to-day business activities and management policies of the entity to which the QS is registered.
f) The person has the right to control, or does control. the management of, or to be a controlling factor in, the entity to which the QS is registered.
g) The person has the right to cause, or does cause, the sale of QS.
h) The person absorbs all of the costs and normal business risks associated with ownership and operation of the entity to which the QS is registered.
i) The person has the ability through any other means whatsoever to control the entity to which the QS is registered.

The catchall phrase at the end of the definition, "shares that the person controls through other means," restricts ways to circumvent the accumulation limit, but also presents questions as to how the definition should be interpreted in its implementation. Examples include the questions below:

- *If someone is a crewmember of a vessel or a cutting line employee for a processor, should the shares owned by that person be considered within the control of the harvesting/processing company?*
- *If someone is a vessel captain or a plant manager, should the shares owned by that person be considered within the control of the harvesting/processing company?*
- *If someone leases the vessel/facility to the harvesting/processing business, should the harvesting/processing business be considered under that person's control?*
  If there is only one processor in the port, should that processor be considered to control the harvesting operations (and use of quota) of vessels in that port?

[94] NMFS based its examples on the indices used for determining impermissible control by a noncitizen of a U.S. fishing vessel under MARAD regulations at (46 CFR 356.11)

Ultimately, the evaluation of a possible accumulation limit violation would be based on specific situational facts.

♦ *Grandfather Clause, Divestiture, and Cut-off Date*

Grandfather Clause and Divestiture:

Option 1: A grandfather clause will apply to (1) vessel accumulation limits and (2) control accumulation limits. This clause allows a person, if initially allocated QS in amounts in excess of the cap, to maintain ownership of the QS. The grandfather clause will expire with a change in ownership[95] of the QS. If the owner divests some of the QS, the owner may not reacquire QS or QP until the owner is under the cap. Once under the cap, the grandfather clause expires and additional QS or QP may be acquired but not in excess of the control caps.

Option 2: Same as Option 1 but the maximum allowed under the grandfather clause will be twice the vessel accumulation limit.

Option 3: There will not be a grandfather clause and there will be no opportunity to receive QS and divest of it.

►**Option 4:** There will not be a grandfather clause for the control limits, however, an adjustment period is provided through the following divestiture rules. QS will be issued for amounts in excess of aggregate and species control limits only for holders of permits transferred by November 8, 2008, if such transfers have been registered with NMFS by November 30, 2008. The holder of any permit transferred after that time will be eligible to receive an initial allocation for that permit of only those QS that are within the aggregate and individual species control limits. Anyone who qualifies for an initial allocation of QS in excess of the control limits will be allowed to receive that allocation but required to divest themselves of that excess QS sometime during years 3 and 4 of the IFQ program (the two years after the QS transfer moratorium specified in Section A-2.2.3.c). Holders of QS in excess of the limits may receive and use the QP associated with that excess, up to the time their divestiture is completed. However, QP for year 5 of the program will not be issued for QS held in excess of the limits. At the end of year 4, any QS still held in excess of the species or aggregate limits in place at the time of the initial QS allocation will be revoked and redistributed to the remainder of the QS holders in proportion to their QS holdings. No compensation will be due for any revoked shares. Divestiture transfers will be allowed in accordance with the provisions established here and the transfer rules and processes implemented by NMFS. Permit transfers will not be limited or required by the divestiture provision.

There are a number of significant choices within this element. The first is whether to have a grandfather clause (Option 1 or 2 vs. Option 3 or 4) and, if so, the level of the grandfather clause (Option 1 vs. Option 2). If there is no grandfather clause, then a choice is required regarding whether the QS that would be issued in excess of accumulation limits will instead be distributed to all of those under the limits (Option 3), or whether the QS will be issued in accord with the formula and provide those receiving amounts in excess of the accumulation limits an opportunity to divest (Option 4). If there is a grandfather clause or opportunity to divest, will there be a cutoff date beyond which any additional permits acquired will not entitle an initial recipient to receive QS in excess of accumulation limits under any circumstances (Options, 1, 2, and 4)? If there is no grandfather clause, and no opportunity to divest (Option 3), then there is a choice on the order in which the accumulation limits are applied. [96] The order will affect the mix of species an entity receives as part of its initial allocation. Finally is a question as to

[95] Change in Ownership definition: For the purpose of the grandfather clause, ownership of a legal entity is defined to change with the addition of a new member to the corporation, partnership, or other legal entity. Members may leave without causing the grandfather clause to expire for that entity.

[96] Additionally, the order of application of the limits will affect the species mix of the QS issued to any entity that acquires an additional permit after the November 8, 2008, control date, whether or not that acquisition butts the entity over the accumulation limit.

whether the grandfather clause should be applied to vessels. The following subsections take up each of these topics in the order presented here.

GRANDFATHER CLAUSE

The primary purpose of a grandfather clause (Option 1) would be to reduce disruption in the transition to a new program. Fairness and equity are also concerns. The MSA mandates that in order to ensure a fair and equitable initial allocation, the Council consider current and historical harvests in the fishery and participation of fishing communities, employment (harvesting and processing), investment, and dependence. After considering these factors, a broad scope of actions is available for the Council. One possible response is the adoption of a grandfather clause (Option 1). Option 2 would provide a result that is intermediary between the choice of no grandfather clause and a grandfather clause (i.e., a grandfather clause that is capped at twice the QS control limit. On one hand, a grandfather clause could be appropriate if the Council determines there are certain past or existing practices that would not be allowed under a new program, but believes that those practices should not be immediately disrupted. On the other hand, a grandfather clause could delay the full effect and benefit from the program and could create a class of participants with an advantage over other participants. These types of tradeoffs are taken into account in the Council's development of its recommendations.

In addition to the disruption issue, the question of a grandfather clause pits a number of fairness and equity questions against one another. If there is no grandfather clause, and accumulation limits are below what is needed for some highliners to take their historic harvest levels, is it fair that some entities should have their historic practices disrupted (particularly given that the one of the purposes of rationalization is to reduce capital in the fishery and increase efficiency)? If there is a grandfather clause, is it fair that some entities should have advantages over others and that many of those who will benefit from the program will have to wait for the full benefits until the grandfather provisions expire? Finally, there is a fairness question associated with issues of advance notice and the impacts of not having a grandfather clause on those who would receive QS in excess of limits because they have acquired permits during the Council's deliberations on trawl rationalization. This last issue will be discussed below in the section on cutoff dates.

The Council decided that it would not recommend a grandfather clause for those who would otherwise receive an initial QS allocation in excess of limits. The tradeoff in the impacts of this decision was based on the level at which the Council chose to set the QS control limits. These limits were set such that it was not expected that any single permit (or whiting processor) would receive an initial allocation of QS in excess of limits. Therefore, the absence of a grandfather clause would not be expected to impact the ability of such entities to receive the QS that would go to them under the allocation formula. Owners of multiple permits could be adversely impacted in terms of their initial allocations; however, this would not disrupt their ability to continue to operate multiple vessels if they so desires. The result of the QS control limits and absence of a grandfather clause mean that such owners will have to acquire QP from other QS owners each year, rather than relying on QS they own. This result addresses Council concerns about ensuring that there is not excessive accumulation of QS (that the benefits of QS ownership are distributed), while at the same time allowing the generation of efficiency benefits from permitting larger-scale operations. Limiting distribution of QS to maximum levels that reflect that needed by individual permits is expected to better maintain the social character of the industry and its relationship to the communities in which the fleet operates. This result might also have been achieved with a grandfather clause as initial recipients of amounts in excess of limits retire from QS ownership; however, without a grandfather clause the result is achieved earlier in the program. In summary, the absence of a grandfather clause does not constrain the initial allocation to single-permit owners and processors that do not own permits, will not prevent those operating multiple vessels from continuing to do so by relying on QP available from other QS owners, maintains levels of QS ownership aggregation that are expected to be less disruptive to the historic character of the industry and its relationship to communities, and achieves that end earlier than would be the case if there were a grandfather clause.

DISPOSITION OF AMOUNTS IN EXCESS OF LIMITS

In the absence of a grandfather clause, a decision is needed as to the disposition of the QS that would otherwise go to those who would receive QS in excess of control limits. The Council formally considered two options, distribution of that QS to those under the QS limits (Option 3) and allowing those who would receive QS in excess of the limits to receive that QS, but requiring them to divest themselves of the QS within a certain time period (Option 4). There are also other possibilities for disposition of the excess amounts. For example, those amounts could have been redistributed in auctions, through a lottery, or to CFAs. One of the main concerns in moving to a trawl rationalization program is to achieve the move while minimizing disruptive effects and considering recent and historical harvests. In general, because of the averaging effects inherent in most allocation formulas, many participants do not receive amounts sufficient to support their existing activities. This is particularly true with respect to the larger producers (see Section 2.1.3). Therefore, disposition of excess back to the existing operations helps reduce disruption and accounts for recent and historic participation. Options 3 and 4 achieve this end in different ways. Option 3 reallocates the excess back to those who are under the limits in proportion to the allocations they receive under the allocation formula. Option 4 allows those who qualify for that excess to receive an initial capital gain from the initial allocation, but not the long-term security that comes from being able to hold the QS to support their fishery-related operations.[97]

The Council adopted the divestiture provision of Option 4, in part because there had been some confusion in the industry as to whether the November 6, 2003, control date applied to fishing activities or to other activities as well (such as the acquisition of additional permits). Because of this confusion, a number of entities had invested in additional permits anticipating that they would receive benefits from the initial allocations. With respect to fairness and equity, there are two groups to consider, those that chose to buy permits after 2003, and those that did not make that choice. The divestiture provision was viewed as fair to both. It is fair to those who did buy additional permits after that time by allowing them partially to recapture their investment by being given the QS and QP; it is also fair to those who did not additional permits. Divestiture recognizes the decisions being made by those on both sides of this issue.

The following provides some of the rationale for specific elements of the divestiture provision. The November 8, 2008, cutoff for permit acquisition is based on the date on which the Council took its final action making it clear that there would not be a grandfather clause. Since contracts for permit sales may have been signed before that date, but the sales not registered with NMFS until afterward, November 30 was established as a cutoff date for the registration of the sale with NMFS. The Council felt it reasonable to expect that anyone who qualifies for QS in excess of limits based on permits acquired after that date would have had sufficient notice of the risks entailed in their acquisition. Those with QS in excess of limits are allowed to receive QP for their excess QS until they divest because of concern about impacts on the community, the need to avoid major disruptions, and to provide supply to the markets. Absent this provision, the QP associated with the excess would have been redistributed to QS holders throughout the coast in proportion to the amount of QS they hold below the limits. This is more likely to maintain the fishing activity within the community. Further, there is an expectation that some of those who will be forced to divest of their QS will do so in a way that maintains the QS in the local communities. The two-year QS transfer moratorium will apply to those receiving QS in excess of limits. This will allow market prices to develop for QP. Well-developed QP market prices will provide better information for determining the appropriate prices for sale of QS once the moratorium is over. Additionally, during this two-year period, the Council will be considering developing some special provisions for CFA and, in particular, a provision that may provide such associations with higher trip limits. Providing the opportunity for divestiture, but requiring two years before transfers occur, will

[97] The Option 3 redistribution approach could be used in the unlikely event that someone has acquired a permit after November 8, 2008, and that permit puts them over the QS control limits. Under such circumstances, the divestiture option would not apply.

allow the Council to complete such work and determine whether there will be special provisions that may encourage or allow the transfer of QS in amounts in excess of QS control limits to CFAs. After QS trading starts (at the end of the first two years of the program), holders of excess QS would be provided two years (years three and four of the program) to complete their divestiture or forfeit their QS back to NMFS for redistribution. This period of time was considered reasonable, particularly for the purposes of allowing QS market and market prices to be established and to allow CFAs to form and be available to receive QS divestitures (if the special opportunities are eventually provided for CFAs). In anticipation of the possibility that the QS control limits might be increased prior to the time divestiture is completed, the Council specified that the control limits to be applied are those that are in place at the time of initial allocation. This was done to discourage anyone from delaying divestiture of QS in hopes that the QS control limits might be increased and to avoid providing an additional benefit that those below the limits would not have (the benefit of having received an initial allocation in excess of the initial set of QS control limits).

CUTOFF DATE

The above discussion of the divesture provision also covers the November 8, 2009, cutoff date. A control date was published that had the effect of providing fishery participants with advance notice that activities they undertook after that date might not be acknowledged in provisions of the trawl rationalization program under development. In particular, the control date announcement expressed concern that fishermen not increase their fishing activities in order to qualify for more fish. If there is a grandfather clause or no grandfather clause, but a divestiture provision, the question arises regarding whether activities occurring after the control date (in particular, the acquisition of additional permits) should entitle an applicant to a greater allocation. In this regard, there were those who stated that it was not clear that the control date applied to anything more than fishing. They argued that allocations resulting from permit accumulation after the control date should be grandfathered in or they should be allowed to receive the QS and divest themselves of it. As indicated above, ultimately the Council agreed that the control date was not clear regarding whether it would apply to the acquisition of additional permits. This issue is discussed further in the analysis.

APPLICATION OF THE GRANDFATHER CLAUSE TO VESSELS

In the preliminary draft, EIS there was discussion regarding the need for a grandfather clause for vessels. In taking its final action, the Council set vessel QP usage limits well above the shares of harvest that any one vessel had taken in recent years and did not apply control limits to vessels. For these reasons, there was no further work on the development of a grandfather clause for vessels. The preliminary draft EIS covers some of the challenges that would be entailed in developing a grandfather clause for vessels. Some of these challenges are summarized above in the section on vessel limits.

CHOICE ON THE ORDER OF APPLICATION OF QS CONTROL LIMITS

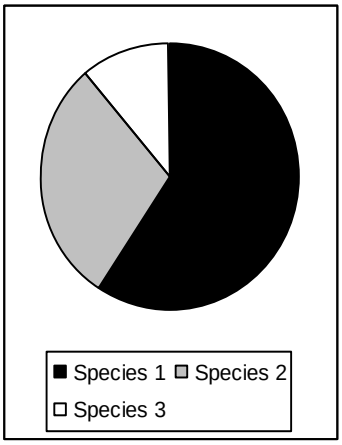
If there is no grandfather clause and no opportunity for divestiture, the species mix of the allocations to entities that would otherwise be over the QS control limits will depend on the order in which the accumulation limits are applied (this could also be true for any entity that, after November 2008, acquires a permit that would result in it receiving an initial allocation in excess of control limits). If the species accumulation limits are applied before the aggregate limits, it is more likely that the ratios will deviate from those that would have occurred in the presence of a grandfather clause. Table A-90 contains a hypothetical three-species example for a single permit scheduled to receive 6.9 percent of the QS if there is no grandfather clause and an aggregate of 3 percent if there is a grandfather clause. The following are the limits applied for each species and the relative size of the OY for each species.

	Accumulation Limits	Relative Weight of OY for Each Species
Species 1	5%	2
Species 2	2%	1
Species 3	3%	0.5
Aggregate Limit	3%	

The first graph contained within Table A-90 shows the allocations to the permit in the presence of a grandfather clause. The second graph shows what happens for the same permit when there is no grandfather clause and the allocations are brought within control limits by first applying the species limit. In this example, when the species limit is applied first, QS Species 2 is cut back by 50 percent (from 0.04 to 0.02). After the species are brought under the accumulation limits, all species are reduced proportionally by another 20 percent to bring the total holdings within the aggregate limit (Species 2 is reduced from 0.02 to 0.16). The third graph shows what happens when the aggregate limit is applied first. All species are cut back by about 50 percent, after which the additional reduction needed to bring Species 2 under the species accumulation limit is only 1 percent. After reducing Species 2 to bring it within the individual species limit, the permit has been reduced to a level below the 3 percent cap so Species 1 and 3 can be increased. The resulting graphs from the two approaches to applying the control limits can be compared to the first graph to see which most closely matches the original species mix. From that, it can be seen that application of the aggregate limit first results in a species mix that better matches the original species mix than application of the species limit first. One objective in developing the QS allocation formulas has been to provide initial recipients with a mix of species that matches their need for prosecuting their fisheries.

Table A-83. Illustration of the effect of the order in which individual species accumulation limits and aggregate groundfish accumulation limits are applied to limit initial QS allocations (Graphs show the proportion of QS for a single entity with QS allocations for three species under three different scenarios).

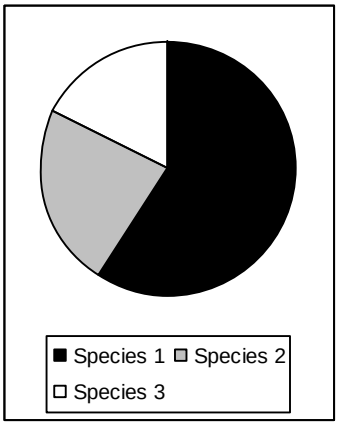
Grandfather Clause



Total QS: 6.9%

QS Species 1 = 8%
QS Species 2 = 4%
QS Species 3 = 1.5%

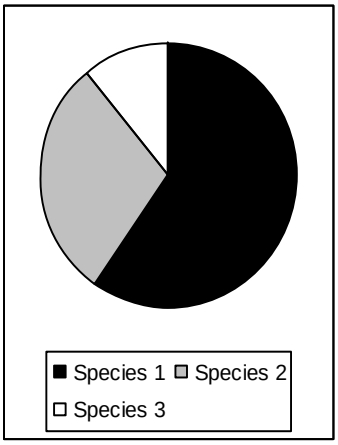
No Grandfather Clause, Species Limits Applied First



Total QS: 3% (weighted total)

QS Species 1 = 4.1%
QS Species 2 = 1.6%
QS Species 3 = 1.2%

No Grandfather Clause, Aggregate Limits Applied First



Total QS: 3% (weighted total)

QS Species 1 = 4%
QS Species 2 = 2%
QS Species 3 = 0.8%

♦ *Percentages for Limits*

The Council's preferred set of control and vessel limits is identified in Table A-82. As highlighted at the start of this section, the task of arriving at these preferred limits a balancing the social objectives behind control and vessel limits against the economic objectives at the center of the rationalization program. In particular, the Council attempted to identify percentage limits that would be low enough to prevent excessive control and use of QS/QP, while at the same time, high enough not to interfere with the objectives of providing for improved operational flexibility for the fleet and a viable, profitable, and efficient groundfish fishery.

The Council's accumulation limits are aimed at more than just preventing market power or other anticompetitive situations from developing in the fishery. The Council views accumulation limits as important tools to use in balancing its broad, and often competing, social, economic, and conservation objectives for the fishery. This broader scope is what Congress seemingly contemplated with section 303A(c)(5)(D) of the MSA. In that provision, Congress chose to use the terms "excessive share" and "inequitable concentration" without defining them and without reference to the Federal antitrust laws or to economic theory. When Congress uses terms without accompanying definitions, the intended meaning comes from the ordinary sense of the words as read within the context of the overall purpose of the statute. Looking to the ordinary meanings of "excessive" and "inequitable" within the context of the MSA national standards and LAPP provisions, it seems clear that Congress granted the Council considerable discretion to determine the levels of quota ownership and usage that would be unreasonable, unnecessary, or unfair considering the Council's overall management objectives for the fishery. This interpretation is consistent with NMFS' nonregulatory guidance on the technical design and use of catch share or LAPPs .

Throughout consideration of control and vessel limits, the Council and its advisors recognized the inexact nature of identifying specific percentage limits for each management unit species. Information on current and historical levels of ownership and control in the harvesting and processing sectors of the fishery is incomplete, as is our understanding of future harvesting efficiency in the trawl fleet. Even with more complete information, there are no analytical methods for pinpointing precise thresholds above which limits become excessive or inequitable. Rather, the process of arriving at percentage limits involved an imprecise balancing of management objectives that left much to the policy discretion of the Council. The task proved especially complex for the nonwhiting trawl fishery because of the many species encountered, the interactions between those species, and the regional diversity in fishing strategies and mix of species for which there is a market.

To help delineate the upper boundaries above which control and use become excessive and the lower boundaries below which limits constrained operational flexibility and efficiency, the Council and its advisory bodies considered several criteria that included the following:

- The initial allocations of QS at the permit and entity level to establish the expected range of starting points in the fishery
- Recent and past levels of vessel performance as an indication of what level of harvest vessels may need to achieve profitability
- The minimum fleet size possible or minimum number of vessels needed to harvest the full trawl allocation for a given species of limits[98]

[98] The minimum number is calculated by dividing the percentage limit into 100 and then adding one vessel or owner for any remainder. For example, the minimum number of vessels needed to harvest a species that was subject to a vessel limit of 3 percent would be 34 (100 ÷ 3 = 33 1/3). Of course, this minimum would be achieved only if participants acquired QS/QP up to the limit. As discussed more below, the more likely result will involve a distribution of QS/QP ownership and usage where only a limited percentage of participants hold

- The minimum number of entities that could control all the harvest in the fishery in comparison to the number of entities that may need some quota to cover catch, including incidental catch
- The maximum amount of revenue a single entity or vessel might receive under a given set of vessel limits

The TIQC developed the first suite of accumulation limits using relatively simple rules focused on past vessel performance. [99] Nonwhiting limits were based on aggregate average catches per permit during the period 1994 to 2003, which was used to allocate QS. Limits for shoreside and at sea whiting were based on the knowledge and recommendations of whiting industry members present at the TIQC meetings. Whiting, as discussed below, was treated differently from the nonwhiting fishery because it is a single-species target fishery with a smaller fleet.

In September 2007, the GAC reviewed the TIQC's initial recommendations and added three options for the Council's consideration (Table A-83). The GAC's options were also based on relatively simple rules using past vessel performance. The GAC's Option 1 would have set control limits at the maximum landings history shares of non-buyback permits for each species, i.e., the 1994 to 2003 average of each nonbuyback permit's annual landings divided by the annual landings of all non buyback permits with an upper limit of 5 percent for all nonwhiting species except for English sole and the Other Flatfish management unit. Option 2 would have set the control limits at 1.5 times the percentages from Option 1. Option 3 was identical to Option 2 for all nonwhiting groundfish control limits except that the aggregate nonwhiting limit would be set at 3 percent. The GAC focused on the 1994 to 2003 period because it matched the window period used for initial allocation of QS and on nonbuyback permits only because those permits represent the performance of vessels most likely to operate in the TIQ program. The intent of Option 1 was to develop caps that were generally above the amounts of QS that will be allocated to most permits based on their history during the qualifying period. Options 2 and 3 were set at levels above Option 1 to explore the effects of higher limit levels. The GAC paid particular attention to the maximum fleet consolidation level, or minimum fleet size, permitted by a particular accumulation limit. For whiting, the GAC followed the GAC recommendations for the purpose of continuing to explore the appropriate level for the limits. The TIQC had recommended exploration of a wide spread of limits for the shoreside, mothership, and catcher-processor fisheries. The low end of the proposed range of limits for the shoreside whiting fishery (10 percent) matched with the maximum 1994 to 2003 landings history shares of nonbuyback permits (i.e., the same data used for the nonwhiting fishery).

QS/QP at the highest level allowed by the accumulation limits.

[99] The first option developed by the TIQC. The limits may vary by species/species group, areas, and sector (see table below).

Sector	Own-or-control Accumulation Limits	Permit Use Limit
Shoreside nonwhiting	All groundfish: 1.5%, 2.1%, 3%, or 5% Individual species: sablefish, 1.7%; Dover sole, 1.95%; Petrale sole, 3.0%; English sole, 7.0%; sanddabs, 27.6%; other flatfish, 9.1%; longspine thornyhead, 2.1%; shortspine thornyhead, 2.0%; widow rockfish, 3.6%; yellowtail rockfish, 3.5%; canary rockfish, 6.0%; and other Sebastes, 6.6%	Double the own-or-control limits
Shoreside whiting	5%, 10%, or 15%.	7.5%, 10%, or 12%
Mothership whiting	10%, 15%, or 25%	20%, 30%, or 50%
Catcher-processor	50%, 55%, or 60%	65%, 70%, or 75%
Whiting sectors combined	15%, 25%, or 40%	25%, 40%, or 50%

Table A-84. Control and vessel limit options: Council preferred alternative.

Species Category	Vessel Limit (Vessel Use Limit)	Vessel Unused QP Limit	QS Control Lim
Nonwhiting Groundfish Species	3.2%		2.7%
Lingcod - coast wide	3.8%		2.5%
Pacific Cod	20.0%		12.0%
Pacific whiting (shoreside)	15.0%		10.0%
Pacific whiting (mothership)	30.0%		20.0%
Sablefish			
N. of 36° (Monterey north)	4.5%		3.0%
S. of 36° (Conception area)	15.0%		10.0%
PACIFIC OCEAN PERCH	6.0%	4.0%	4.0%
WIDOW ROCKFISH *	8.5%	5.1%	5.1%
CANARY ROCKFISH	10.0%	4.4%	4.4%
Chilipepper Rockfish	15.0%		10.0%
BOCACCIO	15.4%	13.2%	13.2%
Splitnose Rockfish	15.0%		10.0%
Yellowtail Rockfish	7.5%		5.0%
Shortspine Thornyhead			
N. of 34°27'	9.0%		6.0%
S. of 34°27'	9.0%		6.0%
Longspine Thornyhead			
N. of 34°27'	9.0%		6.0%
COWCOD	17.7%	17.7%	17.7%
DARKBLOTCHED	6.8%	4.5%	4.5%
YELLOWEYE	11.4%	5.7%	5.7%
Minor Rockfish North			
Shelf Species	7.5%		5.0%
Slope Species	7.5%		5.0%
Minor Rockfish South			
Shelf Species	13.5%		9.0%
Slope Species	9.0%		6.0%
Dover sole	3.9%		2.6%
English Sole	7.5%		5.0%
Petrale Sole	4.5%		3.0%
Arrowtooth Flounder	20.0%		10.0%
Starry Flounder	20.0%		10.0%
Other Flatfish	15.0%		10.0%
Other Fish	7.5%		5.0%
Pacific Halibut	14.4%	5.4%	5.4%

* If widow rockfish is rebuilt before initial allocation of QS, the vessel limit will be set at limit will be 1.5 times the control limit

Table A-85 Control cap and vessel cap options to define QS/QP accumulation limits in the IFQ Program Alternatives.

Stock	Option 1		Option 2		Option 3*	
	Control Cap (%)	Vessel Cap (%)	Control Cap (%)	Vessel Cap (%)	Control Cap (%)	Vessel Cap (%)
All nonwhiting groundfish (in aggregate)	1.5	3.0	2.2	4.4	3.0	6.0
Lingcod - coast wide	5	10	7.5	15		
N. of 42° N (OR & WA)	5	10	7.5	15		
S. of 42° N (CA)	5	10	7.5	15		
Pacific Cod	5	10	7.5	15		
Pacific Whiting			0	0		
Shoreside Sector	10	15	15	22.5	25	37.5
Mothership Sector	10	25	15	37.5	25	50
Catcher Processors	50	65	55	70	60	75
All Whiting Sectors Combined	15	25	22.5	37.5	40	50
Sablefish (Coast wide)	1.9	3.8	2.9	5.7		
N. of 36° N (Monterey north)	2	6.2	3	9.3		
S. of 36° N (Conception area)	5	6.2	7.5	9.3		
PACIFIC OCEAN PERCH	5	6.2	7.5	9.3		
Shortbelly Rockfish	5	6.2	7.5	9.3		
WIDOW ROCKFISH	3.4	6.8	5.1	10.2		
CANARY ROCKFISH	5	10	7.5	15		
Chilipepper Rockfish	5	10	7.5	15		
BOCACCIO	5	10	7.5	15		
Splitnose Rockfish	5	10	7.5	15		
Yellowtail Rockfish	5	10	7.5	15		
Shortspine Thornyhead - coast wide	3.1	6.2	4.7	9.3		
Shortspine Thornyhead - N. of 34°27' N	4.8	9.6	7.2	14.4		
Shortspine Thornyhead - S. of 34°27' N	4.7	9.4	7.1	14.1		
Longspine Thornyhead - coast wide	2	4	3	6		
Longspine Thornyhead - N. of 34°27' N	2	4	3	6		
Longspine Thornyhead - S. of 34°27' N	5	10	7.5	15		
COWCOD - Conception and Monterey	5	10	7.5	15		
DARKBLOTCHED	5	10	7.5	15		
YELLOWEYE	5	10	7.5	15		
Black Rockfish	5	10	7.5	15		
Black Rockfish (WA)	5	10	7.5	15		
Black Rockfish (OR-CA)	5	10	7.5	15		
Minor Rockfish North	5	10	7.5	15		
Nearshore Species	5	10	7.5	15		
Shelf Species	4	8	6	12		
Slope Species	5	10	7.5	15		
Minor Rockfish South	5	10	7.5	15		
Nearshore Species	5	10	7.5	15		
Shelf Species	5	10	7.5	15		
Slope Species	5	10	7.5	15		
California scorpionfish	5	10	7.5	15		
Cabezon (off CA only)	5	10	7.5	15		
Dover Sole	1.8	3.6	2.7	5.4		
English Sole	10	20	15	30		
Petrale Sole (coast wide)	2.9	5.8	4.4	8.7		
Arrowtooth Flounder	5	10	7.5	15		
Starry Flounder	5	10	7.5	15		
Other Flatfish	10	20	15	30		
Other Fish	5	10	7.5	15		

* Same as Option 2 except for the values indicated below.

For all three original GAC options, the vessel limits would have been set at double the control cap amount, except for whiting. The recommendations for whiting vessel limits differed from the recommendations for nonwhiting vessel limits in that the whiting vessel limits were set at 1.5 times the control caps (again based on recommendations first developed by the TIQC). In general, the GAC recommended setting vessel limits higher than the accumulation limits in order to accomplish the following::

- Allow for potential efficiency gains that may result from the aggregation of catch on fewer vessels, while maintaining a tighter limit on control.
- Provide an opportunity for crewmembers and vessel operators to use their QS on the vessel for which they work.

As explained above in the discussion on the control rule, the GAC envisioned that vessel limits greater than control limits made it possible for QP to be used on a vessel without that QP necessarily counting to the control limit of the vessel owner.

The Council reviewed the GAC's options at the November 2007 meeting and adopted them into the trawl rationalization alternatives for analysis.[100] Analysis of the three options was first presented to the GAC in May 2008. After reviewing that analysis, the GAC requested that the TIQC review the options and make a recommendation to the Council for consideration in June 2008.[101] The TIQC reviewed the analysis and offered corrections and modifications to the whiting limits but did not recommend a particular option.[102] The TIQC recommended reevaluation of the limit, for overfished species like widow rockfish in particular, if the Council were to recommend that shoreside whiting and nonwhiting be combined into a single sector. Taking the TIQC's recommendations into account, the Council adopted all three GAC options, with the TIQC's corrections and modifications, into the PPA for public review and analysis in the preliminary DEIS.[103]

The GAC again considered accumulation limits options, together with the full trawl rationalization PPA, in October 2008. Although the GAC acknowledged the importance of control and vessel limits and the necessity of including them in the program, the committee members were unable to recommend a single option.[104] The GAC did request additional tables, which Council staff presented to the Council in November 2008.[105] In consideration of this additional analysis, and the GAC's inability to produce a recommend set of limits, the Council signaled its intent to include accumulation limits in the program but recommended that the limits be further development and analyzed in a trailing action.[106]

That trailing consideration began, again with the GAC, in January 2009. The GAC reviewed the existing options and recommended two new options, described below. The Council arrived at preferred alternative for target species control and vessel limits at the March 2009 meeting and for overfished species and halibut IBQ in June 2009. The Council's deliberations on target species and overfished species are described separately.

[100] PFMC, November 2007 Meeting Minutes (http://www.pcouncil.org/minutes/2007/Final_November07_minutes.pdf).
[101] PFMC, June 2008 Briefing Book, Agenda Item F.6.c, GAC Report.
[102] PFMC, June 2008 Briefing Book, Agenda Item F.6.d, TIQC Report.
[103] PFMC, June 2008 Meeting Minutes (http://www.pcouncil.org/minutes/2008/Final_June08_minutes.pdf)
[104] PFMC, November 2008 Briefing Book, Agenda Item F.3.e, GAC Report.
[105] PFMC, November 2008 Briefing Book, Agenda Item F.3.c, Additional Analysis; and Supplemental Additional Analysis (2).
[106] PFMC, November 2008 Meeting Minutes (http://www.pcouncil.org/minutes/2008/Final_November08_minutes.pdf).

Table A-86. March 2009 GAP recommendations together with GMT, GAC and Existing options and other information used to develop the GAP recommendations.

	Existing Option 1		Existing Option 2		GAC Option 1[a]		GAC Option 2		GMT	GAP Recommendation[b]		Maximums Historic and Initial QS Allocation			
Species Category	Vess Lim	Cntrl Lim	Vess Lim	Cntrl Lim	Vess Lim	Cntrl Lim	Vess Lim	Cntrl Lim	Control Limits Identified in GMT Report	GAP Vessel Limit Option	GAP Control Limit Option	Max Annual Share of Trawl Fleet Allocation ''04-'06	Max Initial Permit QS Allocations	Max Annual Share of Trawl Fleet Landings '94-'03	Max Annual Share of Trawl Fleet Landings '04-'06
Nonwhiting Groundfish Species	3.0%	1.5%	4.4%	2.2%	2.0%	1.0%	3.0%	1.5%		**None**	**2.7%**	1.8%	1.6%	4.1%	4.9%
Lingcod - coast wide	10.0 %	5.0%	15.0 %	7.5%	3.6%	1.8%	4.4%	2.2%		**3.8%**	**2.5%**	1.1%	2.2%	9.0%	3.7%
Pacific Cod	10.0 %	5.0%	15.0 %	7.5%	12.8%	6.4%	12.0 %	6.0%	20.0%	**20.0%**	**12.0%**	7.2%	10.0%	22.7%	21.1%
Pacific whiting (shoreside)	20.0 %	10.0 %	22.5 %	15.0%	15.0%	10.0%	15.0 %	10.0 %		**10.0%**	**15.0%**	6.9%	8.6%	9.1%	7.3%
Sablefish															
N. of 36° (Monterey north)	4.0%	2.0%	6.0%	***3.0%***	2.0%	1.0%	***3.0%***	1.5%	3.0%	**4.5%**	**3.0%**	4.3%	1.4%	2.4%	5.7%
S. of 36° (Conception area)	10.0 %	5.0%	15.0 %	7.5%	20.0%	10.0%	20.0 %	10.0 %		**15.0%**	**10%**	22.0%	15.0%	38.4%	60.3%
PACIFIC OCEAN PERCH	10.0 %	5.0%	15.0 %	7.5%	5.4%	2.7%	7.4%	3.7%		**3.3%**	**3.3%**	3.1%	3.0%	7.3%	10.1%
WIDOW ROCKFISH	6.8%	3.4%	10.2 %	5.1%	9.0%	4.5%	12.0 %	6.0%		**2.5%**	**2.5%**	6.7%	5.4%	28.7%	31.9%
CANARY ROCKFISH	10.0 %	5.0%	15.0 %	7.5%	7.0%	3.5%	7.6%	3.8%		**5.2%**	**5.2%**	0.0%	2.8%	12.6%	45.7%
Chilipepper Rockfish	***10.0 %***	5.0%	15.0 %	7.5%	12.4%	6.2%	20.0 %	***10.0 %***	10.0%	**15.0%**	**10.0%**	0.5%	9.6%	46.8%	26.5%
BOCACCIO	10.0 %	5.0%	15.0 %	7.5%	20.0%	10.0%	20.0 %	10.0 %			**15.0%**	0.0%	12.4%	78.9%	53.4%
Splitnose Rockfish	***10.0 %***	5.0%	15.0 %	7.5%	***11.4%***	5.7%	20.0 %	***10.0 %***	10.0%	**15.0%**	**10.0%**	8.5%	9.2%	19.9%	26.9%
Yellowtail Rockfish	10.0 %	***5.0%***	15.0 %	7.5%	***5.6%***	2.8%	10.4 %	***5.2%***	5.0%	**7.5%**	**5.0%**	0.7%	3.7%	9.9%	11.5%
Shortspine Thornyhead															
N. of 34°27'	***9.6%***	4.8%	14.4 %	***7.2%***	2.6%	1.3%	4.4%	2.2%	6%-10%	**9.0%**	**6.0%**	4.0%	1.9%	5.0%	8.7%
S. of 34°27'	9.4%	4.7%	14.2 %	7.1%	8.4%	4.2%	17.6 %	8.8%		**9.0%**	**6.0%**		3.3%	7.0%	16.0%
Longspine Thornyhead															
N. of 34°27'	4.0%	2.0%	***6.0%***	3.0%	2.8%	1.4%	4.4%	2.2%	6%-10%	**9.0%**	**6.0%**	2.0%	1.3%	2.0%	8.7%
COWCOD	10.0 %	5.0%	15.0 %	7.5%	20.0%	10.0%	0.0%	0.0%		**20.0%**	**20.0%**	0.0%	44.4%	100.0%	0.0%
DARKBLOTCHED	10.0 %	5.0%	15.0 %	7.5%	4.0%	2.0%	6.2%	3.1%		**2.0%**	**2.0%**	3.7%	4.4%	15.8%	5.6%
YELLOWEYE	10.0 %	5.0%	15.0 %	7.5%	18.8%	9.4%	20.0 %	10.0 %		**5.2%**	**5.2%**	0.0%	6.0%	35.8%	35.5%

Table A-85 cont. March 2009 GAP recommendations together with GMT, GAC and Existing options and other information used to develop the GAP recommendations.

	Existing Option 1		Existing Option 2		GAC Option 1[c]		GAC Option 2		GMT	GAP Recommendation[d]		Maximums Historic and Initial QS Allocation			
Species Category	Vess Lim	Cntrl Lim	Vess Lim	Cntrl Lim	Vess Lim	Cntrl Lim	Vess Lim	Cntrl Lim	Control Limits Identified in GMT Report	GAP Vessel Limit Option	GAP Control Limit Option	Max Annual Share of Trawl Fleet Allocation '04-'06	Max Initial Permit QS Allocations	Max Annual Share of Trawl Fleet Landings '94-'03	Max Annual Share of Trawl Fleet Landings '04-'06
Minor Rockfish North															
Shelf Species	8.0%	4.0%	12.0 %	6.0%	5.8%	2.9%	4.4%	2.2%		**7.5%**	**5.0%**	3.1%	2.6%	30.6%	49.1%
Slope Species	***10.0 %***	***5.0%***	15.0 %	***7.5%***	4.0%	2.0%	***6.0%***	3.0%	6%-10%	**7.5%**	**5.0%**	3.5%	2.4%	11.9%	15.7%
Minor Rockfish South															
Shelf Species	10.0 %	5.0%	15.0 %	7.5%	12.2%	6.1%	20.0 %	10.0 %		**13.5%**	**9.0%**	1.7%	7.5%	46.6%	30.9%
Slope Species	***10.0 %***	***5.0%***	15.0 %	***7.5%***	11.6%	***5.8%***	20.0 %	***10.0 %***	6%-10%	**13.5%**	**9.0%**	12.1%	6.4%	24.8%	21.7%
Dover sole (total)	3.6%	1.8%	***5.4%***	2.7%	2.2%	1.1%	3.2%	1.6%	5%+	**3.9%**	**2.6%**	5.7%	1.3%	2.0%	5.6%
English Sole	20.0 %	10.0 %	30.0 %	15.0%	3.0%	1.5%	**5.2%**	2.6%	5%+	**7.5%**	**5.0%**	2.3%	3.5%	13.9%	7.7%
Petrale Sole	5.8%	**2.9%**	8.8%	4.4%	**2.8%**	1.4%	4.6%	2.3%	3%	**4.5%**	**3.0%**	5.9%	1.7%	6.2%	8.0%
Arrowtooth Flounder	***10.0 %***	5.0%	***15.0 %***	7.5%	3.8%	1.9%	6.4%	3.2%	10%+	**20.0%**	**10.0%**	8.3%	6.2%	25.5%	19.1%
Starry Flounder	***10.0 %***	5.0%	***15.0 %***	7.5%	***20.0%***	***10.0%***	***11.0 %***	5.5%	10%+	**30.0%**	**15.0%**	8.3%	30.5%	65.7%	54.5%
Other Flatfish	***20.0 %***	***10.0 %***	***30.0 %***	***15.0%***	2.6%	1.3%	4.0%	2.0%	10%+	**15.0%**	**10.0%**	1.6%	9.2%	16.4%	8.1%
Other Fish	10.0 %	5.0%	15.0 %	7.5%	5.0%	2.5%	18.0 %	9.0%		**7.5%**	**5%**	1.5%	3.9%	10.2%	21.3%

[a] Under the GAC option, the numbers provided for overfished species are for reference only and not part of the GAC option.
[b] The GAP recommended overfished species control limits equal to the maximum initial allocations to an individual permit. Values provided here for overfished species are based on the maximum allocation estimates available at the March 2009 Council meeting. With a single shoreside sector, the allocations would include QS for shoreside whiting and nonwhiting trips. The allocations for QS for whiting trips were not included in the calculation of the maximums for overfished species.

[c] Under the GAC option, the numbers provided for overfished species are for reference only and not part of the GAC option.
[d] The GAP recommended overfished species control limits equal to the maximum initial allocations to an individual permit. Values provided here for overfished species are based on the maximum allocation estimates available at the March 2009 Council meeting. With a single shoreside sector, the allocations would include QS for shoreside whiting and nonwhiting trips. The allocations for QS for whiting trips were not included in the calculation of the maximums for overfished species.

TARGET SPECIES

The Council's March 2009 deliberations on final preferred control and vessel limits for target species centered on the June 2008 PPA, the two new January 2009 options from the GAC (Table A-84), new analysis from the GMT and Council staff on key nonwhiting target stocks, and recommendations and rationale from the GAP.[107]

The GAC's January 2009 options were intended to create a broader range of control and vessel limits for the Council's consideration. Whereas the existing three options for setting control limits were based on the maximum landings values for each species, the GAC's January 2009 options focused on 90th percentile values. The first option would set control limits at the 90th percentile level from the 1994 to 2003 window for each species, effectively bracketing the top 10 percent of annual landings when evaluated together with the existing option 1. The second January 2009 option focused on 90th percentile landings during 2004 to 2006 to give the Council a more recent period for comparison. Both options would set the vessel limits at twice the control limits and include a maximum cap of 10 percent for control limits and 20 percent for vessel limits. The GAC also requested that the GMT review the two new options in time for review at the March 2009 meeting.

The GMT responded to the GAC's request with a suggested framework approach for setting control and vessel limits for the primary nonwhiting target stocks. The approach did not cover whiting, overfished species, or nontarget stocks like lingcod. In summary, the GMT's framework suggested that the Council do the following:

- Focus on a "one vessel, one owner" scenario as a starting point and way of evaluating control limits in terms of harvesting operations.
- Use ex-vessel revenues to gauge what might constitute an "excessive share" or "inequitable concentration" of quota, and on the other hand, what might be overly constraining on vessel operations.
- Consider the regional diversity in target strategies and geographic distribution of each species.
- Identify maximum potential revenues associated with accumulation limits based on regionally important target strategy "bundles" and landings in the fishery (2004 to 2006).
- Consider the market importance substitutability of each species to judge its susceptibility to control.
- Use sablefish and Petrale sole, the two key economic target stocks in the nonwhiting trawl fishery, as benchmarks to set control and vessel limits for the remaining target species.
- Set limits for target species higher than the GAC recommended options to provide for operational flexibility and increased harvesting efficiency among regions and target strategies.
- Employ a relatively small aggregate groundfish control and vessel limits to counter the effect of the relatively higher species limits.

In developing recommendations based on this framework, the GMT first looked at the level of revenue that might be necessary to sustain an efficient operation after the fleet consolidation expected under a trawl rationalization program. A recent study (Lian, *et al.* 2008) of the status quo fleet found that most vessels merely generated enough revenue to cover costs (including a reasonable return on investment) and pay wages without generating an appreciable additional profit (see discussion in Chapter 4). This same study indicated that under a fully rationalized fishery the nonwhiting fleet could consolidate to between 40 and 50 vessels, with the average vessel generating gross revenues on the order of $700,000, compared to a status quo value that is closer to $200,000 (Figure A-121).

[107] PFMC, March 2009 Briefing Book, Agenda Item G.4.b; GAC Report; GMT Report; Supplemental GAP Report; and NMFS Report.

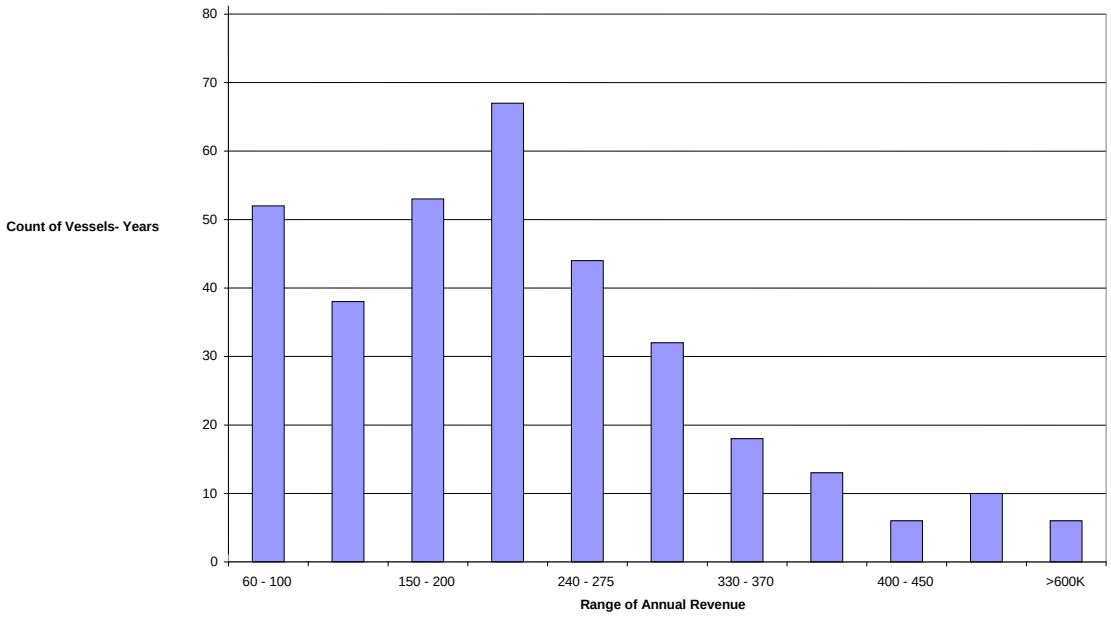


Figure A-99. Count of Vessel-Year Combinations by Annual Revenue Category (2004 - 2006).

The nonwhiting fishery involves considerable diversity in vessels, target strategies, and markets with some species like Petrale sole and sablefish being important to everyone, and other species, like arrowtooth flounder, important only to relatively few vessels. To help the Council identify limits that would most likely accommodate the variety of fishing strategies and opportunities that exist within and across regions, the GMT looked at the species mixes caught by the top three vessels in each region of the coast and identified accumulation limits for the bundles of species targeted by those vessels. These limits were aimed at allowing harvesting entities in each region of the coast to earn at least the $700,000 gross ex-vessel revenue estimate from Lian, et al., 2008.

At the same time, the GMT noted that establishing a suite of species-specific limits intended to accommodate this level of potential ex-vessel revenues in each region would result in limits that could allow for substantially higher levels of consolidation than would be possible under the Council's PPA and the GAC's January 2009 options. Considering the strong preference for accumulation limits that would prevent excessive control and usage expressed by the Council, GAC, GAP, and TIQC, the GMT stressed the aggregate control and vessel nonwhiting groundfish limits as the key means of providing harvesting flexibility among regions and target strategies while maintaining a strong policy against consolidation in quota ownership and usage. Figure A-122 illustrates the expected maximum revenue opportunity by region, depending on the level at which the aggregate limit is set and assuming the suite of individual species accumulation limits developed by the GMT (Table A-84).

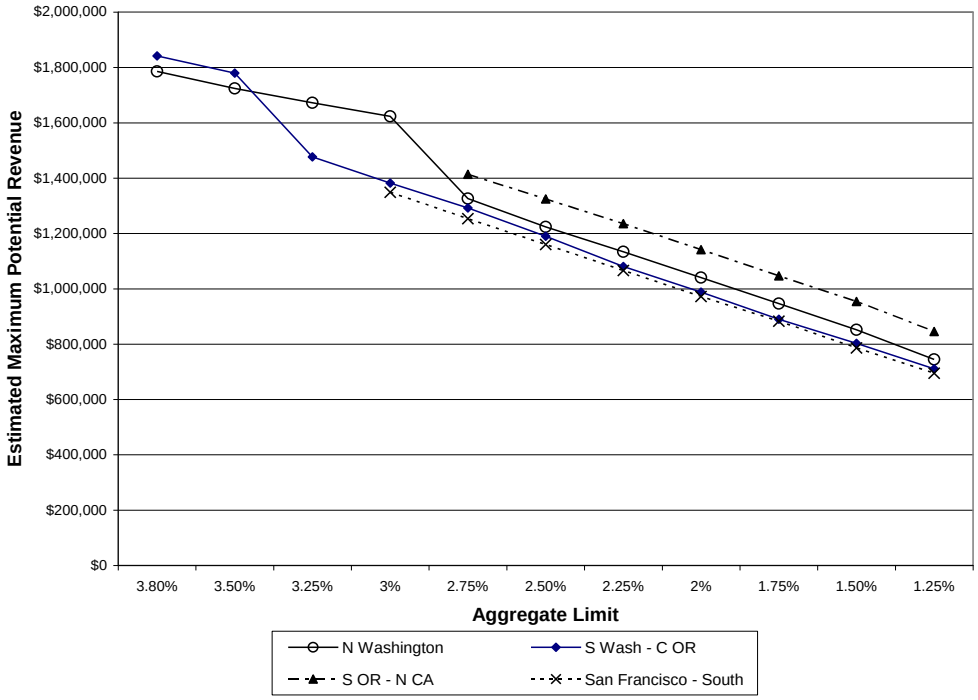


Figure A-100. Estimated maximum potential revenue by regional target strategy and aggregate control limit.

For its recommendations for non-overfished species QS control and vessel accumulation limits, the Council relied principally on the GAP recommendations for the suite of limits it used in the preferred alternative. The GAP had developed its recommendations and rationale taking into account all previous options and analyses, including the suggest framework approach developed by the GMT. The GAP recommendations were focused on accommodating vessel operations for all species at levels that would be at least as great as those identified in the GMT's report, with the exception of Dover sole. Because of Dover sole's market importance and wide spread occurrence in the catch of many vessels, the GAP recommended a limit of 3.9 percent compared to the GMT suggested limit of 5 percent or higher. In addition, the GAP recommendations varied from the GMT on one major principal. The GMT report was based on a principal that each vessel should be able to achieve the target revenue level while relying on QS controlled by the vessel. The GAP approach was to set limits that would allow a vessel to achieve the identified target levels but not necessarily using QP from its own QS. For example, the GMT recommended a Pacific cod control limit of 20 percent. The GAP recommended that the vessel QP limit be set at 20 percent, but that the QS control limit be set at 12 percent. Thus, in order to achieve the revenue and efficiency level that would be accommodated by the 20 percent limit, a vessel will have to rely on QP acquired from other entities. The GAP recommendation was based on concern about excessive consolidation of control for a particular species and the ability of the entities that controlled that species to control not only the targeting for that species, but the harvest of other target species with which that particular species would show up as incidental catch. Based on the GMT analysis, the GAP recommended an aggregate nonwhiting control limit of 2.7 percent. This would accommodate a fairly high level of consolidation (down to as few as about 38 entities controlling QS) and would allow entities to control QS representing up to well over a million dollars of annual ex-vessel revenue (as indicated in Figure A-122).

In general, in developing its recommendations for control limits the GAP used as a starting point the maximum initial QS share allocation to permits and checked that level to ensure that in most cases the

resulting control limit or vessel limit would accommodate the maximum recent share of landings taken by any single vessel in recent years (Table A-84). For many species, the GAP recommended allowing for some growth above the maximum initial allocations to facilitate the desired improvements in harvesting efficiency and in some cases to accommodate recent levels of harvest levels. However, they also went lower than the general approach in situations where a catch of a species was widely distributed along the coast and important to a number of different trawl strategies, as recommended by the GMT with respect to Petrale and sablefish. They did not want to take a chance on one entity developing excess concentration that could potentially affect the entire coast. Occasionally, in the opposite situation, they went somewhat higher when the fishery was very limited geographically. This was also in line with the GMT approach. In these situations, the effect of the concentration would be limited to a smaller geographic area, and they did not believe there was any possibility for expansion of the local fishery to other areas along the coast. Table A-85 provides the GAP recommendation on each species and its rationale. This table also covers GAP recommendations on overfished species. In March 2009, when the Council adopted its final recommendations for non-overfished species, the Council did not adopt the GAP recommendations on overfished species. The limits for overfished species were adopted at a later meeting, as discussed in the following section.

In adopting its preferred QS control and vessel QP limits for non-overfished species, the Council noted that, in general, the ranges of percentages in the accumulation limit options had been relatively consistent since the first set of options was adopted by the Council for analysis at its November 2007 meeting (Table A-83). It was also noted that there will never be perfect information but the Council can still develop a good rationale for setting the accumulation limits while fully recognizing this limitation. In adopting the GAP recommendation, the Council noted its agreement with the rationale provided and indicated that where the GAP recommendations differed from the GMT recommendations, the GAP recommendations were lower (or the GMT had no recommendations). In that regard, the Council deviated from the GAP recommendations for only two species. Starry flounder was the only species for which the GAP recommended a control limit (15 percent) substantially higher than the control limit recommended by the GMT (10 percent). For starry flounder, the Council went with the control limit recommended by the GMT. Additionally, for slope rockfish south, while the GAP recommendation (9 percent) was within the range recommended by the GMT (6 percent to 10 percent), the Council was more comfortable going with the lower end of the GMT's range (6 percent). Neither the GMT nor the GAP provided a recommendation for the aggregate nonwhiting vessel limit. The Council followed the standard approach used for individual species and recommended an aggregate nonwhiting vessel limit of 1.5 times the control limit. The aggregate nonwhiting vessel limit of 3.8 percent could theoretically allow the fleet to shrink to as few as 27 vessels while still taking the entire trawl allocation (or fewer if some of the trawl allocation goes unharvested). However, while the opportunity to trade QP makes it feasible for ownership of QS to contract to as few as 38 entities, it would be very difficult for 27 vessels to take the mix of species necessary such that they could take full advantage of the available harvest opportunities. Lian et al. project an optimum fleet size of 40 to 50 vessels. The fleet size would not be expected to shrink to less than optimum levels.

For shoreside whiting, the Council chose a 10 percent control limit over a higher limit because the 10 percent control limit accommodated the initial allocations and because of concern that a control limit above that (combined with an even higher vessel limit) could concentrate harvest among too few entities and vessels, leaving some coastal plants without enough vessels to maintain operations. Higher limits were set for the mothership co-op program (20 percent ownership and 30 percent usage) because the processing facilities are not tied to coastal communities, and fewer vessels are required to service the motherships.

Table A-87. GAC rationale for recommendations provided to and adopted by the Council (with the exception of overfished species).

Species	Vessel use limit	Control limit	Rationale for limits	Vessel/ Control Ratio (1.5:1.0) (+ =Yes)	Control Limit Greater than (+ =Yes)		In line with GMT Report (+ =Yes)
					Max vessel share of annual fleet landings ('04-'06)	Max Initial Permit QS Allocation	
Pacific Whiting	15.0%	10.0%	Similar to GAC recommendation	+	+	+	
Lingcod	3.8%	2.5%	Limits relatively low because it is a coast-wide species, the catch of which is widely distributed among the fleet.	+	+	+	
Pacific cod	20.0%	12.0%	Higher vessel limits because the distribution is geographically limited, participants few, and opportunities intermittent. Keep the control limits down to prevent excess control. On this basis, provide vessel limits that are greater than the 1.5 to 1 ratio used for other species.	**0**	+	+	
Sablefish N	4.5%	3.0%	Control limit lower than max share because of high dependence on a coast wide basis. Vessel limit is high enough to allow the vessel to achieve the recent maximum share of allocation.	+	**0**	+	+
Sablefish S	15.0%	10.0%	Underutilized; very few vessels operating there now. Potential for gear switching. 10% control limit, in line with GAC 90th percentile recommendation.	+	**0**	**0**	
POP	3.3%	3.3%	*Overfished species rationale.	+	+	+	
WIDOW	2.5%	2.5%	*Overfished species rationale.	+	+	+	
CANARY	5.2%	5.2%	*Overfished species rationale.	+	+	+	
Chilipepper	15.0%	10.0%	On the higher end because it is taken in a smaller area, it s not a coast-wide fishery, and it is under harvested. Similar to GAC recommendations.	+	+	+	+
BOCCACIO	15.0%	15.0%	*Overfished species rationale.				
Splitnose	15.0%	10.0%	Rationale similar to chilipepper.	+	+	+	+
Yellowtail	7.5%	5.0%	Control limit quite a bit higher than initial allocation because it has not been fully utilized in recent years. However, limits should not be too large because the stock is widely distributed and is used in a lot of strategies along the coast.	+	+	+	+

Table A-86 cont. GAC rationale for recommendations provided to and adopted by the Council (with the exception of overfished species).

Species	Vessel use limit	Control limit	Rationale for limits	Vessel/ Control Ratio (1.5:1.0) (+ =Yes)	Control Limit Greater than (+ =Yes)		In line with GMT Report (+ =Yes)
					Max vessel share of annual fleet landings ('04-'06)	Max Initial Permit QS Allocation	
Shortspine N	9.0%	6.0%	Control limits somewhat higher than for Dover and sablefish, for example, because it is underutilized, but at the same time there is need to maintain widespread availability to provide opportunity for many vessels over the majority of the coast.	+	+	+	+
Shortspine S	9.0%	6.0%	The same as limits set for other thornyheads.	+	**0**	+	+
Longspine N	9.0%	6.0%	Similar to shortspine in the north.	+	+	+	+
COWCOD	20.0%	20.0%	*Overfished species rationale.				
DARKBLOTCHED	2.0%	2.0%	*Overfished species rationale.				
YELLOWEYE	5.2%	5.2%	*Overfished species rationale.				
Shelf Rockfish N	7.5%	5.0%	Control limit is twice the maximum initial allocation because the stock has been substantially underutilized in recent years. [Note: While the control limit is less than what is in the GMT report, the vessel limit is in the report's range.]	+	+	+	
Slope Rockfish N	7.5%	5.0%	Rationale similar to shelf.	+	+	+	
Shelf Rockfish S	13.5%	9.0%	South, limits slightly higher than northern rockfish because of fewer vessels participating.	+	+	+	
Slope Rockfish S	13.5%	9.0%	Rationale similar to shelf.	+	**0**	+	
Dover sole	3.9%	2.6%	Lower limit than for many species, because it is widely distributed and caught by many vessels. A large control limit would create opportunities for a few vessels with a relatively lower amount of QS to completely supply the limited market. Even though relatively lower, the control limit is still over twice the maximum initial allocation.	+	**0**	+	
English sole	7.5%	5.0%	Similar to Dover sole (widespread and soft markets) but it is underutilized and more important to a small subset of the fleet (beach boats). Therefore, the limits are larger.	+	+	+	
Petrale sole	4.5%	3.0%	The control limit is similar to sablefish and in line with the GMT report. The limit would constrain the maximum share; however, this maximum occurred in a year in which the OY was exceeded. Similar to sablefish.	+	**0**	+	+

Table A-86 cont. GAC rationale for recommendations provided to and adopted by the Council (with the exception of overfished species).

Species	Vessel use limit	Control limit	Rationale for limits	Vessel/ Control Ratio (1.5:1.0) (+ =Yes)	Control Limit Greater than (+ =Yes)		In line with GMT Report (+ =Yes)
					Max vessel share of annual fleet landings ('04-'06)	Max Initial Permit QS Allocation	
Arrowtooth	20.0%	10.0%	A larger vessel limit is needed because of the smaller number of vessels involved in the fishery and need to allow for expansion of harvest on this underutilized species. Similar to Pacific cod, a control limits is needed that is lower than what is would be if the standard 1.5:1.0 ratio is applied.	**0**	+	+	+
Starry Flounder	30.0%	15.0%	Higher limits because it is one of the fisheries with the lowest number of participants. However, control limit is lower than the maximum initial allocation (30%) because that level would not accommodate enough of the beach draggers.	**0**	+	**0**	
Other Flatfish	15.0%	10.0%	This is a catchall category, which includes sanddabs, rex sole, and true turbots. It has a fairly large aggregate OY. However, a larger control limit is recommended because of the need to specialize in single species within the complex.	+	+	+	
Other Fish	7.5%	5.0%	Lower end of the range of limits because this is a catchall category that everyone might need a little of.	+	+	+	

* Rationale for overfished species control and vessel limits: (1) Control limits are set at the maximum initial allocation under the formula adopted by the Council at this meeting. Of all the species, it is most important to minimize the chance of excessive control of the overfished species QS. The maximum initial allocation level is a reasonable level at which to set the control limit for this purpose. (2) There is significant incentive for vessels to avoid overfished species. The proposed rules for applying the vessel limits will allow any vessel to cover its catch regardless of the level at which the vessel limit is set, if it can find the QP to do it. Therefore, it is recommended that the vessel limit be set at the control limit.

OVERFISHED SPECIES AND HALIBUT IBQ

General Considerations

In March 2009, the Council adopted the GAP recommended accumulation limits levels for overfished species but maintained them as preliminary preferred options. For halibut, the Council adopted a range of options for consideration. The GMT had highlighted reasons why the Council might wish to approach accumulation limits for overfished species differently than target species and raised questions about some of the Council's preliminary choices for overfished species limits.[108] Furthermore, the GAP's recommendations, which the Council used as a basis for its motion, were based on the concept that vessel limits for overfished species would only apply to unused QP with no cumulative limit on annual usage.[109] The Council had not included the unused QP approach when it adopted the limits recommended by the GAP. The GMT had just conceived of this unused QP concept during the meeting

[108] PFMC, March 2009 Briefing Book, Agenda Item G.4.b, Supplemental GMT Report and Supplemental GMT Report 2.

[109] PFMC, March 2009 Briefing Book, Agenda Item G.4.b, Supplemental GAP Report (see footnote).

and had advised the Council that it be scrutinized further before final action was taken. Based on the GMT comments and concerns, the Council maintained the overfished species limit options as preliminary rather than final and requested additional analysis for consideration at the June 2009 meeting.

Three major characteristics of incidentally harvested overfished species (OFS) and halibut (H) (OFS and H bycatch) in the shoreside trawl fisheries ultimately guided the Council in identifying final preferred control and vessel limits for overfished species and halibut IBQ: (1) OFS and H bycatch constrains the harvest of healthy stocks, (2) OFS and H bycatch rates are uncertain, and (3) for target species the incentive is to use QP but for OFS and H taken incidentally the incentive is to avoid the bycatch and conserve QP. In this section, the term bycatch will be used to refer to overfished species and halibut taken incidentally in the groundfish fishery, whether they are retained or discarded. This use of the term varies from the definition of bycatch in the MSA. The MSA uses the term bycatch to refer only to that incidental catch which is discarded.

The first major characteristic to consider is that OFS and H bycatch constrains the harvest of healthy groundfish target stocks. Although individual accountability of the trawl rationalization program is expected to improve individual, and hence fleet, performance in the fishery with respect to OFS and H bycatch, OFS and H are expected to remain scarce relative to healthy target stocks for the near future. OFS and H QP will, therefore, be scarce inputs for harvesting in the rationalized trawl fishery. For some vessels prosecuting certain target strategies in certain regions, QP for particular OFS and H will essentially nonsubstitutable because bycatch will be unavoidable. For example, it will not likely be possible to trawl on the continental shelf, or to target whiting in depths shallower than 150 fathoms, in areas north of 40º 10' N latitude without having the QP to cover incidental catch of canary rockfish. Figure A-123 is a basic, conceptual representation of this point with the diagonal line marking the natural encounter rate between some individual or complex of target species and another species or complex of species that is incidentally encountered as bycatch while targeting those species. Because some rate of encounter will be unavoidable for any given level of target species QP harvested, vessels will need some corresponding amount of bycatcH QP. In the conceptual example provided in Figure 1, vessels would need bycatcH QP at $*B$ in order to harvest at the $*T$ level. This conceptual example assumes that the bycatch rate is fixed and constant. Variability of the bycatch rate will be discussed in the following section.

The importance of OFS and H QS/QP in the trawl rationalization program, and hence its value, will derive from this function as an input. The price fishery participants are willing to pay for OFS and H QP will be related to the target species to which the QP provides access, or more specifically, to the ex-vessel revenue that those target species generate. Harvesters may be able to earn some revenue from the sale of the incidentally caught OFS themselves, yet this revenue could be trivial compared to what the QP is worth in terms of target species revenues. For halibut IBQ, its value will derive exclusively from the value of the target species with which it co-occurs because halibut are a prohibited species that cannot be retained or sold.

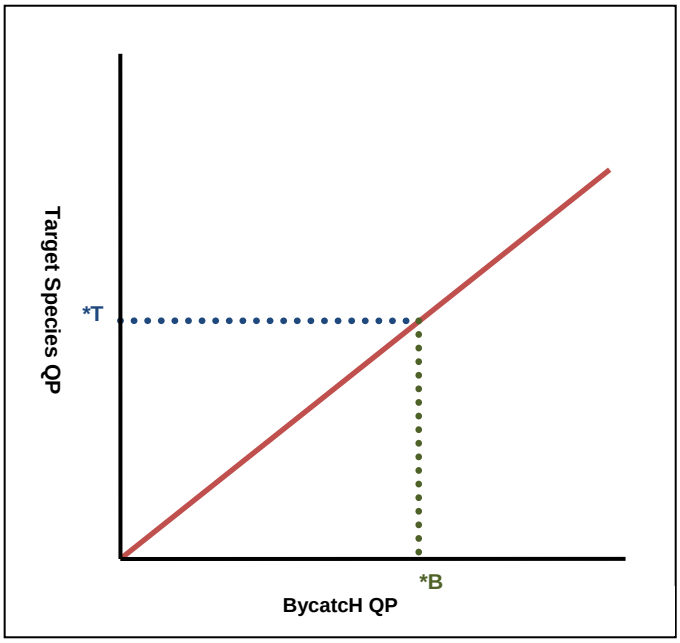


Figure A-101. Conceptual relationship between target and OFS and H bycatch species QP in the TIQ fishery. The diagonal line represents the natural encounter rate between the two species, i.e., the amount of bycatcH QP that a vessel will need to harvest a given amount of target species.

A few implications follow from this first characteristic. Most basically, given that OFS and H QP will be needed to access target species QP, the Council sought to match control and vessel limits for individual bycatch species to the limits for the target species with which they co-occur. That is, the Council sought to set OFS and H quota control and vessel limits high enough to give harvesting operations a reasonable chance at harvesting their target species limits. OFS and H limits that were set too low would unreasonably cap the amount of target stocks that could be harvested by a vessel and would be an overall forced inefficiency on the fleet.

The second implication, somewhat countervailing to the first, arises from the lack of substitutability and relative scarcity of OFS and H QP. Every harvesting operation will need some amount of QP for OFS and H, yet there will not be enough available for everyone to fully harvest their target species holdings. Those that own OFS and H QS, or have other means of directing the use of OFS and H QP, could, therefore, exert considerable bargaining leverage over the fishery. Given that the QS/QP for certain OFS and H will essentially be nonsubstitutable in some cases,[110] concerns about control are as high or higher than for the most economically important targets stocks, such as Petrale sole and sablefish. Again, given that harvesters and processors participate in multiple fisheries on the Pacific coast and in Alaska, that leverage could conceivably extend beyond just activities in the shoreside trawl fisheries. For example, QP for OFS and H might be made available to a vessel contingent on considerations for deliveries in another fishery, such as Dungeness crab.

In consideration of the scarcity and limiting nature of bycatch, the Council's basic approach to setting control and vessel limits was to set them high enough to give harvesting operations a reasonable chance of harvesting the target species limits, yet at the same time, low enough to minimize the risks of allowing entities to gain unacceptable control. Given the central importance of OFS and H bycatch in the fishery, the acceptable margin between limits that are too constraining and those that create

[110] QPs for Dover sole are economically substitutable because if a Dover sole QP is not available (or available in only small quantities), a vessel might earn revenue by targeting on Petrale instead of Dover sole. QP for canary rockfish may not be substitutable because it is needed regardless of the target species that is targeted.

unacceptable levels of control appeared to be much narrower for OFS and H accumulation limits than for target species.

The second major characteristic of OFS and H bycatch is that it is uncertain. This uncertainty, deriving from our limited ability to observe discards and the natural variation in bycatch encounter rates, affected the Council's ability to identify the percentage limits that that best balanced harvest opportunity and concerns about control. The uncertainty of OFS and H bycatch will also be a significant factor influencing fishing and trading behavior in the rationalized trawl fishery.

The best available information on annual bycatch rates in the nonwhiting fishery come from the West Coast Groundfish Observer Program. The WCGOP places observers on board nonwhiting trawl vessels to measure bycatch and discards with a target sampling rate of 20 percent of the annual nonwhiting trawl landings (NMFS, 2006 1700 /id). The bycatch rates produced by the WCGOP are critical for status quo management and have proven effective at assisting the Council with maintaining bycatch within acceptable levels. Yet, as with all statistical estimates, the WCGOP bycatch rates are subject to variation. The estimates used for status quo management are averaged across years and aggregated over all vessels operating in relatively large areas. The "true" bycatch rate varies between vessels, areas, and years meaning that the particular experience of an individual vessel could depend on when, where and how it fishes and could be considerably different from a different vessel operating in the same area. Even with perfect information about current bycatch rates, ratios between target species catch and bycatch are variable at any given time and change over time together with the factors that influence the encounter rate (e.g., fish abundance, ocean conditions, fishing gears and strategies). Fishing strategies, for one, are expected to change in the rationalized trawl fishery under the influence of individual accountability for total catch. The WCGOP rates, although the best available information on bycatch, are, therefore, not necessarily representative of what vessels will experience in the rationalized trawl fishery.

Natural variation in bycatch rates also means that setting control and vessel limits based on an average rate, no matter how precise or unbiased the estimate of that average, would create a situation where some harvesters experience bycatch rates above the average. This point is illustrated in Figure A-124, which represents the same conceptual relationship as in Figure A-123 yet with a variable encounter rate between the target and OFS and H bycatch species. The vertical line at *B represents the average or mean encounter rate and the lines at B_{upper} and B_{lower} mark the tails of the hypothetical probability distribution. In this Figure 2 example, to access target stocks at the QP amount marked by the horizontal line at *T, some vessels would end up needing QP near the B_{lower} level while others may encounter amounts closer to the B_{upper}. Figure A-124 can represent the variability in bycatch experienced at the level of a tow or trip or over the course of the fishing year for an individual vessel. It can also represent the different bycatch encounter rates experienced across vessels and operators, seasons and areas, and between years.

As described in detail below, there are some species in the fishery for which a single trawl tow can bring up a significant percentage of the OFS and H bycatcH QP.[111] Fishery managers have referred to these types of bycatch events as "lightning strikes" because of their relatively low probability of occurrence and large magnitude of the catch. Under status quo management, lightning strike tows in the whiting fisheries have contributed to early closures of the fishery in 2007 and 2008. In the trawl rationalization program, a single lighting strike tow of certain OFS and H species could conceivably place a vessel over the vessel limit. For other species, such risks exist more on the scale of the fishing year because it would take multiple "B_{upper}" type tows or trips to put a vessel in jeopardy. The Council is relying on the individual accountability of the trawl rationalization program to push vessels to change their fishing behavior, minimizing their risk of lightning strikes and lowering their individual average bycatch rates.

[111] See also section A-2.2.1 for a discussion of how a "lightning strike" bycatch event can place an individual in an overage situation.

However, the nature of trawl fishing is such that harvesters only have so much control over what they catch. Even the most skilled and experienced vessel operators cannot be expected to completely eliminate randomness from bycatch.

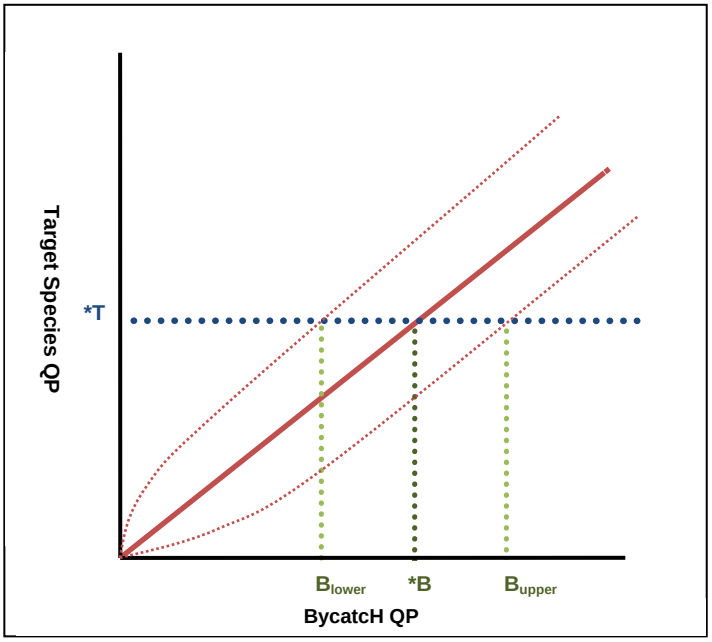


Figure A-102. The same conceptual relationship shown above in Figure A-113 yet with a range of natural encounter rates meant to illustrate the uncertainty and variation involved with bycatch. The amount of bycatch needed to harvest a given amount of target species will vary between vessels, areas, years, etc. For and individual vessel, the rate will vary between tows, trips, and years.

This uncertainty, randomness, and risk involved with bycatch will influence the behavior of harvesters in the trawl rationalization program and the dynamics of the OFS and H QS/QP market. Harvesting operations will have imperfect information about their annual bycatch needs and a perception of risk that they face from high bycatch. This then creates an incentive for harvesting operations to hold onto or acquire enough OFS and H QS/QP to cover their perceived risk. The OFS and H QS/QP would not be needed unless the bycatch is actually encountered, yet in a climate where most in the fishery are uncertain and concerned, harvesters may have little confidence that OFS and H QP would be available on the market at a reasonable price when needed. Therefore, if the control limits are set high enough to permit harvesting operations to cover their perceived margin of risk, then those allocated or with the means of to acquire QS up to the limit may be less likely to sell or lease their QS/QP except at a premium until they gain a better understanding of their OFS and H bycatch needs. This potential chilling effect on market trading is not too dissimilar to the uncertain conditions affecting consumer spending and bank lending in the global financial crisis and recession that existed at the time of the Council's consideration of these limits. Additionally, if harvesting operations are able to cover their margin of risk on their own, then they might be less likely to cooperate with others in risk pools or other arrangements.[112] The tradability of QS/QP will be the main engine of improved harvesting efficiency. Conditions that hamper the trading or cooperative sharing of OFS and H QS/QP could, therefore, be detrimental to the performance of the trawl rationalization program.

[112] For more analysis of the relationship between control limits and risk pools, *see* p. 5-7 of PFMC, June 2009 Briefing Book, Agenda Item E.11.b, GMT Report.

Therefore, as with the first characteristic, the uncertainty of bycatch creates countervailing dynamics to consider in the setting of accumulation limits. The Council looked to set accumulation limits high enough to allow some flexibility for the low probability, high-magnitude bycatch events, yet at the same time, not so high as to reduce quota trading and cooperation between harvesters.

The third major characteristic of bycatch is that the incentives created by the IFQ system are somewhat different than for target stocks, particularly when it comes to the use of QP. Put simply, there is no purpose of using OFS and H QP other than to access target stocks, thereby generating revenue.

Vessel limits are, in effect, a secondary rationing mechanism for QP with the trawl rationalization program itself as the primary mechanism ("IFQ mechanism"). The Council included this secondary rationing mechanism as a measure against the fleet consolidation that will result from the pure market-based rationing of the trawl rationalization program. As detailed in Chapter 4 of this FEIS, the IFQ mechanism is expected to drive those harvesters able to operate most profitably to acquire QP up to their vessels' optimal harvesting capacity. As vessels that are more efficient acquire QP from the less efficient, the fleet consolidates towards some optimal fleet size. Yet, this optimal fleet size is only optimal in terms of harvesting efficiency and may be too small to be considered optimal in light of the Council's other management objectives for the fishery. The vessel limits were thus included in the program in case the IFQ optimal fleet size is undesirably small.

For OFS and H, the IFQ mechanism also creates an incentive for harvesters to acquire an optimal amount of QP. However, there is a key difference in that the optimal amount of OFS and H QP is a direct function of the optimal amount of target species. As discussed above, OFS and H QP will function as an input in the fishery rationalized under an IFQ program, or in other words, as a cost of harvesting. As with all profit-seeking enterprises, harvesters will seek to minimize costs and maximize revenues. The optimal level of OFS and H QP can thus be thought of as the amount that allows vessels to access their target species and no more. The market is expected to set a high price for OFS and H QP, and in turn, there will be a high opportunity cost to using OFS and H QP inefficiently. In a well functioning QP market where each harvesting operation has sufficient information about its OFS and H need, the IFQ mechanism would ration OFS and H QP efficiently, and vessel limits on the use of OFS and H QP would be unnecessary because the Council's policy objectives on fleet size would be achieved solely by the vessel limits placed on target stocks. In other words, in a well functioning market vessel limits on bycatch would be redundant to those on target species.

Figure A-125 illustrates this concept with the horizontal line I representing the vessel limit on target species QP. Again, if the simple diagonal line from Figure A-123 represents the ratio or natural encounter rate between the target and bycatch stock for a particular vessel, that vessel would need OFS and H QP at the *B level in order to harvest the target species vessel limit. In such a scenario, a vessel limit set at *B (vertical line B) or higher (e.g., vertical line C) would, therefore, have no impact to the vessel. If Figure A-125 represents the fleet in aggregate, a vessel limit set at *B or higher would have no influence on fleet consolidation above what is accomplished by the target species vessel limit I. On the other hand, if the Council were to set the vessel limit below *B, the vessel would be prevented from harvesting the full target species limit. In the Figure A-125 example, a vessel QP limit for a bycatch species set at vertical line A would create a de facto target species limit depicted by horizontal line II. Over the aggregate, a vessel QP limit for a bycatch species set below the average encounter rate would be expected to allow less fleet consolidation than contemplated by the Council's target species vessel limit. In sum, in this simplistic example the limit on the amount of QP a vessel is allowed to have to cover OFS and H bycatch either has no effect on fleet consolidation, or it permits less consolidation than desired.

Vessel limits for OFS and H may be redundant in a well functioning, simple IFQ fishery, yet the same cannot realistically be said for shoreside trawl fisheries. For the reasons highlighted above in the discussion of the first two major characteristics of bycatch uncertainty, it would be unreasonable to

assume that the QS/QP market will function optimally, especially in the early years of the program. QS/QP to cover OFS and H could be so scarce and limiting on harvest that many harvesters will be unable to achieve target species vessel limits. Variability in bycatch rates means that harvesters would likely hold on to OFS and H QP on the chance that they might need it. Further, some may see acquisition of OFS and H QP in excess of their needs as a means to capture profits for groundfish, and possibly nongroundfish, harvest of vessels needed the OFS and H QP. The OFS and H vessel limits may be more influential on the number of vessels operating in the fishery than the target species vessel limits. In addition, as discussed above in the section on target species, the Council did not set vessel limits for target species envisioning that the limit would result in some precise fleet size. Instead, the Council, in its best judgment, attempted to set vessel limits at a level that best balanced the need for individual harvesting efficiency and the desire to minimize the risk of over consolidation in the fleet. The interaction between target species vessel limits and vessel limits for OFS and H cannot be represented by the conceptual diagrams shown in this section; the multispecies, regionally diverse, shoreside trawl fishery is just too complex for the Council and its advisors to predict the effect of any one particular vessel limit. The Council, therefore, included limits on the use of OFS and H QP not just because of their effect on fleet consolidation, but also to promote the overall social, economic, and conservation goals and objectives of the trawl rationalization program. Nonetheless, the fundamental point to make related to this third major characteristic of bycatch is that IFQ mechanism creates a strong disincentive against inefficient use of QP. Further implications of this disincentive are explored below in the context of the unused QP limit.

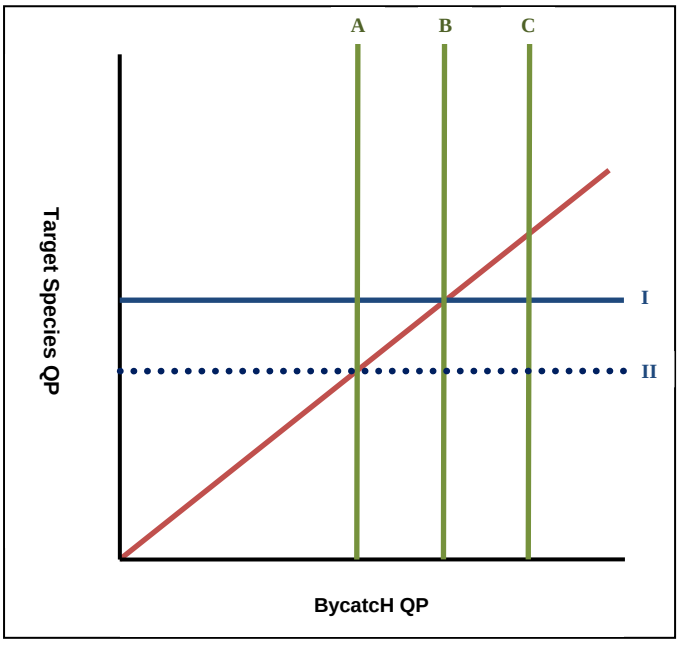


Figure A-103. Same conceptual relationship as in Figure A-113 with a vessel limit on target species marked by the solid horizontal line *I* and three possible vessel limits on bycatcH QP depicted by the three vertical lines *A*, *B*, and *C*. The dotted horizontal line, *II*, represents the effective target species limit that would result if the bycatch vessel limit were set at vertical line *A*.

Approach for Setting Control Limits for Overfished Species and Halibut

The Council set its preferred control limits for overfished species and halibut IBQ at the level of the estimated maximum initial allocation to an individual permit.[113] The Council determined that this method appropriately matched the control limit for a particular overfished species to those for co-occurring target species while also keeping limits low enough to minimize issues of control.

The initial allocation formulas for overfished species and halibut IBQ is described in detail in section A-2.1.3.a and Appendix C. The most important feature of the formulas for analysis of control limits is that they are based on WCGOP bycatch rates and designed to accommodate current spatial fishing patterns in the fishery. For overfished species QS, the initial allocation formula applies area-specific WCGOP bycatch rates for each overfished species to the target species QS allocated to each permit, with the appropriate area-specific bycatch rate assigned to a permit based on the permit's logbooks. The formula for halibut IBQ is structured similarly, except that it uses a broader area stratification and applies the WCGOP bycatch rates only to each permit's allocation of arrowtooth flounder and Petrale sole, the two species most closely associated with Pacific halibut.[114] The estimated maximum initial allocation for a particular species is, therefore, made to a permit with a relatively high initial allocation of target species and a record of fishing in an area where the WCGOP bycatch rate for that species is also relatively high. For example, the maximum initial allocation of halibut IBQ is made to a permit receiving substantial amounts of arrowtooth flounder and Petrale sole and with history operating in an area where the WCGOP rates predict halibut to be abundant.

The GAP believed that of all the species in the trawl fishery it was most important to minimize the chance of excessive control of the OFS and H QS.[115] In its reports to the Council at the March and June 2009 meetings, the GAP recommended the maximum initial allocation level is a reasonable level at which to set the QS control limit for such a purpose.

In a June 2009 report, the GMT team noted that the approach's use of area-based bycatch rates and permit-specific logbook was the most reasonable method of those considered for identifying control limits that would accommodate expected bycatch needs across the different target strategies and regions of the coast. [116] That same report noted that, although the maximum initial allocation approach would set control limits for many species above the expected need of the vast majority of fishery participants, the control limits would still be expected to encourage cooperative risk pooling among vessels operating in regions of the highest bycatch species abundance, which are the areas where such arrangements will be needed most.[117]

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[113] The Council could only set the control limit based on the *estimated* maximum initial allocation to individual permits because the final initial allocation will not be known until NMFS freezes the database and issues the QP. However, permit-level allocations are not expected to change substantially from what was estimated in this analysis.

[114] For more explanation, *see* Appendix C and PFMC, June 2009 Briefing Book, Agenda Item E.11.a, Attachment 1, Issue Summary and Analysis: Accumulation Limits, Divestiture and Related Provisions.

[115] PFMC, March 2009 Briefing Book, Agenda Item G.4.b, Supplemental NMFS Report.

[116] PFMC, June 2009 Briefing Book, Agenda Item E.11.b, GMT Report.

[117] An overfished species or halibut control limit that is set high relative to the amount needed for target species would allow an individual harvester to acquire enough QS to cover a reasonable range of its expected bycatch need, leaving it with a low likelihood of need to acquire overfished species or halibut bycatcH QP during the fishing year. A control limit that is closer to the average vessel need (for a vessel that has the maximum amount of QS for target species) leaves harvesters in a position where there is a greater probability that they will have to acquire overfished species or halibut QP during the year. This, then, might encourage those entities to enter into risk sharing pools with other harvesters.

The Council was confident in this method's ability to produce control limits that are not unduly constraining on an entity's ability to control the OFS and H QS needed to access target species because the limits are based on the best available information on the expected need of large producers operating in areas where bycatch is most abundant. In other words, the control limits set at the maximum initial allocation should only be constraining to those harvesting operations that own QS at or close to the target species control limits and that wish to operate in areas where bycatch rates are high. Those owners harvesting below the level allowed by the target species, or in areas where lower bycatch rates can be achieved, should not be constrained by the control limits.

The Council was also confident that the method would produce control limits that minimized the ability of entities to exert unwanted control over the fishery because the maximum initial allocation used to set the control limit is at the permit-level and not the entity-level. As discussed elsewhere in this FEIS, permit-level allocations are most representative of the operation of a single vessel. Entities wishing to operate multiple vessels using only the QS they control will have to do so by achieving a lower bycatch rate than that on which the rate used to produce the control limit is based. Likewise, entities receiving an initial allocation of OFS and H QS at or near the control limit will also have to improve upon their bycatch performance if they wish to increase their target species harvest to the levels allowed by the target species control and vessel limits. Overall, the Council's final preferred control limits will make it difficult for entities to control more OFS and H QS than needed by a single vessel operating in areas where bycatch is most needed.

The Council's control limits for overfished species and halibut IBQ are discussed on a species-by-species basis below.

The Unused QP Limit and General Approach to Vessel Limits for Overfished Species and Halibut IBQ

For overfished species and halibut, the Council's final preferred alternative includes both a vessel QP limit and a limit on unused QP in a vessel account. For these species, the Council set the unused QP limit equal to the control limit and identified vessel limits for each species based on the GMT and Council staff analysis of bycatch patterns in the status quo fishery.

The vessel limit and unused QP limit were originally considered as alternative approaches for governing bycatcH QP with both having apparent advantages and disadvantages. Further analysis and consideration between March and June 2009 revealed that the two concepts could be complementary. In light of the central importance of bycatch, the Council believed its management objectives would be best served by employing both in the trawl rationalization program.

The central challenge with OFS and H QP is, again, to prevent excessive use and counterproductive holding of QP while also providing individuals with some flexibility for unexpected bycatch performance. Identifying limits that would accomplish both objectives proved especially difficult because of the many factors and countervailing dynamics discussed above.

The first method considered by the Council and its advisors was to set vessel limits above the control limits. This would allow harvesting operations to acquire QP above what could be derived from the QS allowed under the control limit via the market or some cooperative arrangement like a risk pool.

The major disadvantage to this approach is that higher vessel limits would allow entities to acquire and hold more QP in their vessel accounts than what is contemplated by the control limits. The GMT used canary rockfish to illustrate the potential implications of this in a June 2009 report.[118] To accommodate

[118] PFMC, June 2009 Briefing Book, Agenda Item E.11.b, Supplemental GMT Report 2.

rare but likely bycatch of canary rockfish, the GMT recommended setting the vessel limit at 10 percent. Few vessels would encounter canary bycatch of this magnitude, yet the vessel limit would allow any entity to acquire and place up to 10 percent in a vessel account. This raised concerns, particularly with the GAP, that the benefit of providing flexibility to the relatively few vessels that might need higher vessel limits in any given year might be outweighed by the overall risks to the fishery associated with allowing QP to be held in higher concentrations on fewer vessels. These risks, outlined in more detail above, include potentially less QP on the market for those that need it to cover actual catch and entities exerting control over other fishery participants by directing the use of substantial amounts of QP.

The GMT originally conceived of the unused QP limit concept because it would only allow entities to acquire QP above the control limit if needed and because it would eliminate the need to identify specific vessel limits that best balanced the need for flexibility and concerns over control.[119] The unused QP limit instead relies on the QP market to regulate individual use. Vessels that encountered OFS and H would be allowed to replenish their QP accounts back to the unused QP limit thereby providing flexibility to cover any bycatch overage as long as the QP was available from other fishery participants. The price of acquiring the additional QP would be set by the market, and as highlighted above, the cost of acquiring QP could be substantial.

The major disadvantage to the unused QP limit was that it places no ultimate limit on use of OFS and H QP. The GAP was not concerned by this, believing instead that the unused QP limit would improve functioning of the QP market, and in turn, that the QP market incentives would be enough to prevent fishermen from engaging in a strategy that relies on serial replenishment of OFS and H QP. The unused QP approach would allow harvesters to cover bycatch overages as long as the QP was available. However, the QP would have to be obtained through the market at potentially high cost or through a cooperative arrangement where the ability of would be limited. The GAP was most concerned with the potential issues of control and QP availability associated with the higher vessel limit approach. The GAP endorsed the unused QP limit concept in March 2009 and reiterated its support during the Council's final consideration of accumulation limits in June 2009.

The Council recognized the market forces at play, yet remained concerned that, under the unused QP approach, the lack of an upper limit on bycatcH QP would weaken the incentive, even if marginally so, and send the wrong message to fishery participants about the necessity of improved bycatch performance to the success of the trawl rationalization program. Bycatch is so limiting in the fishery that unreasonable use of QP by a small number of actors could have negative impacts, including less overall harvest and fewer vessels operating in the fishery. For this reason, although the Council accepted the GAP's recommendation and rationale for employing the unused QP limit, it also capped cumulative annual usage with the vessel limits analyzed by the GMT and discussed below species-by-species.

Another concern that has been expressed regarding the unused QP limit concept was that it might induce early season fishing activity by vessels concerned about the availability and price of OFS and H QP later in the year. The degree to which this issue is a concern depends on the degree to which there is seasonality in the price of bycatcH QP. Theoretically, the anticipation of higher prices later in the year should be self-dampening. Those with OFS and H QP anticipating higher prices later in the year will be more likely to hold QP to sell late in the year. This dynamic will tend to make more QP available then, reducing the degree of the price rise. If enough people hold out hoping for a higher price, in the extreme there could be a late season glut and reduction in price. At the other extreme, if enough fishermen fish early in order to use their OFS and H QP and make room to acquire more, the early season demand will rise, increasing early season OFS and H QP prices. Together, these two dynamics would be expected to flatten out the initial expectation of a price swing during the year. In systems such as the New Zealand

[119] PFMC, March 2009 Briefing Book, Agenda Item G.4.b, Supplemental GMT Report.

system, where there are constraining species in a multispecies fishery, strong late season increases in price are not typical. The Council will monitor patterns in fishing activity and QP trading early in the trawl rationalization program and revisit the unused QP limit if necessary.

Development of Specific Limits for Overfished Species and Halibut IBQ

This section describes how the general approaches to setting control and vessel limits were applied to each overfished species and halibut. The analysis detailed below was presented to the Council by the GMT and Council staff in June 2009.[120] The figures describing the distribution of QS initial allocations for each species are also discussed above in Section A-2.1.3.a. Discussion of the different bycatch characteristics of each species is based on observations from the WCGOP, monitoring of the shoreside whiting fishery, and the GMT and Council staff's experience managing the status quo trawl fisheries. Control and vessel limits are equated to pounds of fish using 2010 OYs and Amendment 21 ISAs or status quo sector catch proportions for species not included in Amendment 21 ("2010 catch scenario"). Again, the actual pounds associated with QS/QP could be considerably different at the start of the trawl rationalization program because stock abundance, and our understanding of stock status, changes over time. Likewise, the amount QP deriving from QS will undoubtedly fluctuate throughout the trawl rationalization program from biennial cycle to biennial cycle, and in some cases, from year to year. Given the uncertainty in the data and questions about how fishing behavior and bycatch rates and needs might change, the Council recommended that vessel limits for overfished species and halibut IBQ be reviewed during the first biennial management process after implementation of the trawl rationalization program.

Yelloweye Rockfish

The maximum initial allocation of QS for yelloweye rockfish is 5.7 percent. Under the current shoreside trawl catch of 0.6 mt per year, this would equate to 75 pounds of fish. As the distribution in Figure A-126 shows, only a few entities that operate in the areas of highest yelloweye abundance would be expected to need this amount of yelloweye to access their target QS holdings.

Although most harvesting operations should be more than accommodated by the control limit, the Council also recognized that a single trawl tow can bring up enough yelloweye to put vessels at jeopardy. The WCGOP data includes discard events of yelloweye rockfish as large as at least 150 pounds, which under catch levels, would represent 11 percent of the QP, or almost twice what would be allowed by the control limit.

The Council also recognized that a vessel experiencing a tow of this magnitude would almost certainly encounter additional yelloweye during the year. The Council, therefore, chose to set the vessel limit at 15 percent, which would equate to 200 pounds under a shoreside trawl allocation of 0.6 mt.

[120] PFMC, June 2009 Briefing Book, Agenda Item E.11.a, Attachment 1 Issue Summary and Analysis: Accumulation Limits, Divestiture and Related Provisions; and Agenda Item E.11.b, GMT Report

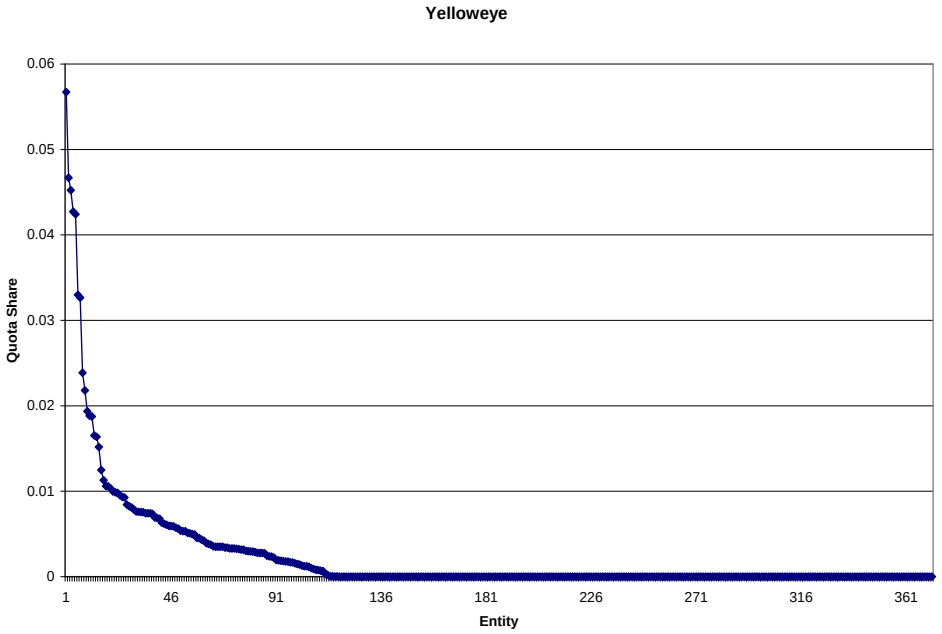


Figure A-104. Estimated distribution of yelloweye rockfish QS to individual vessel permits and processing entities.

Canary Rockfish

Canary rockfish is one of the most important bycatch stocks in the shoreside trawl fisheries. The canary rockfish initial allocation plots are fairly similar to those for yelloweye in that a handful of receive initial allocations that are noticeably larger than others. The highest initial allocation of canary rockfish is 4.4 percent, which at existing catch levels, would equate to 1,571 pounds of canary in the 2010 catch scenario. Canary rockfish are also highly important in the whiting fishery; thus, the initial allocation is a product of the weighted average of the whiting and nonwhiting initial allocation formulas. The Council, therefore, expects that a control limit of 4.4 percent will adequately meet the needs of harvesting entities that have prosecuted both whiting and nonwhiting strategies under the status quo.

In November 2009, the Council revised its final preferred alternative with respect to the allocation of canary rockfish. Before the revision, canary would have been allocated entirely based on the bycatch method, which applies a permit's logbooks to fleet bycatch rates and the permit's initial allocation of target species QS. The revision made was to allocate 45 percent of the canary rockfish equally among all permit holders (amount based on the amount of canary landed by the permits that were bought back). As a result of this revision, the maximum initial allocation was reduced from 4.4 percent to 3.8 percent. However, this reduction does not alter the rationale for setting a canary control limit at 4.4 percent. The revision to the allocation formula was based on the lack of an initial allocation provided to certain ports along the coast. The accumulation limits are "one size fits all" for the entire coast, and they govern not just the initial allocation, but the amount of canary that an entity will be able to control over the long term. Therefore, it is important that the individual species limits be set in proportion to the target species limits. Without an equal allocation element for overfished species, the maximum allocation of canary (4.4 percent) was driven by the allocations of target species to individual entities and the application of logbook and bycatch rates to those target species allocation. Changing the allocation formula for canary to include an equal allocation element does not alter the balance between the target species QS accumulation limits and the best estimates of the corresponding amounts of canary QS needed. Therefore, despite the revised method for making an initial allocation of QS, it continues to be

appropriate, based the control limit on the balance between the target species QS and the need for canary as determined entirely by permit logs and bycatch rates. No adjustment is needed in response to the revision made to the canary allocation formula.

Canary rockfish have also been caught in lightning strike tows of considerable magnitude. Available data from the WCGOP shows that discard events of canary have occurred as large as at least 150 pounds. These data are truncated at 150 pounds, meaning larger events may have occurred. Data from the Washington Arrowtooth Flounder EFP show that some vessels incidentally caught as much as 1,000 pounds of canary over the year. This EFP was conducted under conditions similar to a rationalized fishery and in an area where canary are relatively abundant. Shoreside whiting vessels have also encountered nearly 1,000 pounds of canary rockfish during the 2004 to 2007 seasons. The Council, therefore, chose to set the vessel limit at 10 percent, to accommodate vessels that participate in both the whiting and nonwhiting target strategies. At current catch levels, this would permit vessels to use roughly 2,000 pounds of canary QP over the year.

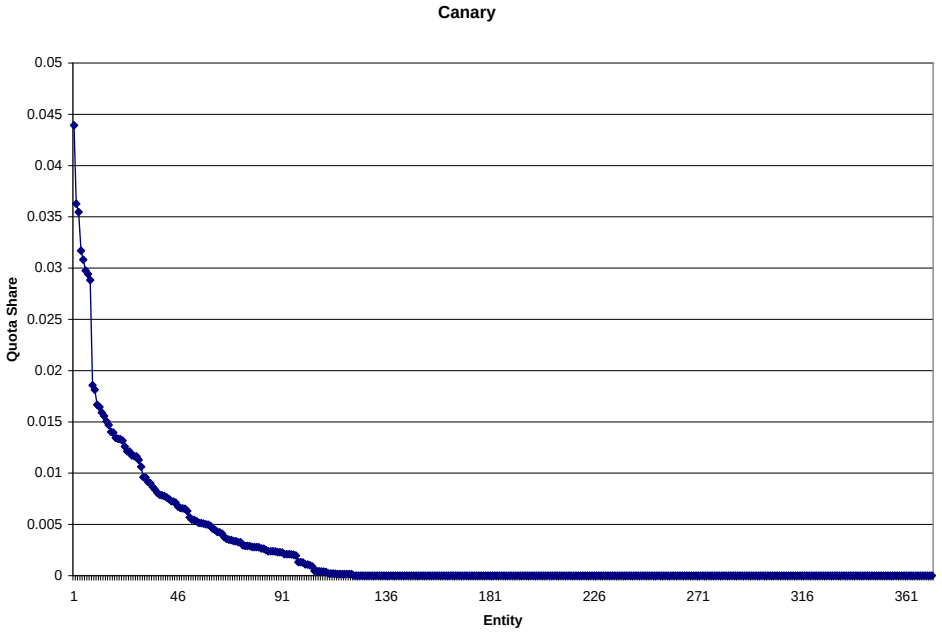


Figure A-105. Estimated distribution of canary rockfish QS to individual vessel permits and processing entities.

Darkblotched Rockfish

Darkblotched rockfish are also allocated based on the nonwhiting and whiting allocation formulas. The highest initial allocation is expected to be 4.5 percent, which equates to 25,000 pounds of fish scenario. Darkblotched rockfish do not appear to create the same "disaster tow" risk as canary and yelloweye. This may be attributable to the fact that darkblotched aggregate to a lesser degree than other types of rockfish (Parker, pers. comm., 2005). Without the same concern about lightning strike catch events, the Council chose to set the vessel limit for darkblotched rockfish at 1.5 times the control limit, or 6.8 percent, using the convention used for most nonwhiting target stocks.

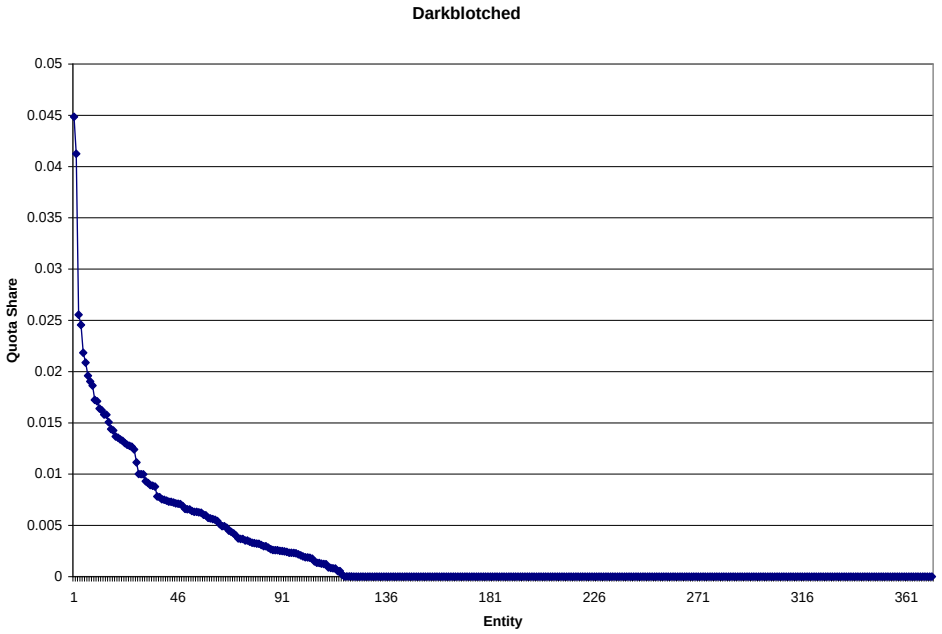


Figure A-106. Estimated distribution of inital allocation of darkblotched rockfish QS to individual vessel permits and processing entities.

Pacific Ocean Perch

The maximum initial allocation of Pacific Ocean perch is estimated to be four percent. This percentage equates to 14,374 pounds of fish in the 2010 catch scenario. Pacific Ocean perch are similar to darkblotched rockfish in that they are less subject to lightning strike tows. The Council, therefore, chose to set the vessel limit at 1.5 times the control limit or six percent.

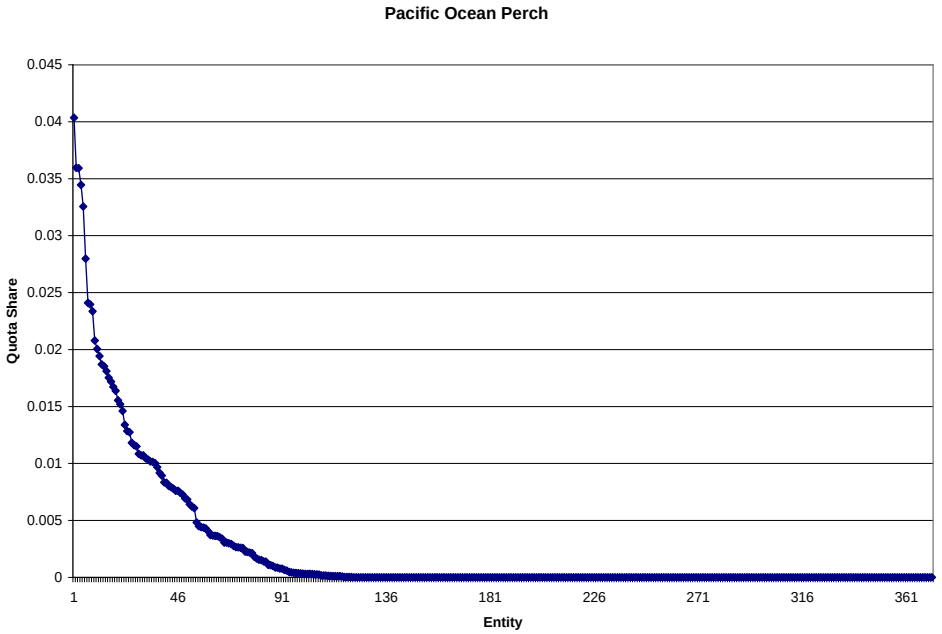


Figure A-107. Estimated distribution of initial allocation of Pacific ocean perch QS to individual vessel permits and processing entities.

Bocaccio

Even more so than for yelloweye and canary, the initial allocation bycatch formula results in a highly skewed distribution of QS with some entities receiving amounts that are orders of magnitude larger than others. The estimated maximum allocation of bocaccio is 13.2 percent. Under the 2010 catch scenario, this percentage would equate to 3,579 pounds of fish.

The Council considered this number closely because it is large compared to other overfished species. At the suggestion of the GMT, the Council also considered disregarding the highest allocation amounts and setting the control limit at 8 percent. However, given that bocaccio is highly constraining to a relatively small geographic area, the Council believed 13.2 percent was an appropriate control limit. The Council did not believe the percentage was so high as to raise concerns over excessive market control or to justify a deviation from the methodology used for the other overfished rockfish stocks. In addition, the Council also noted that few vessels are likely to operate in the area where the overfished bocaccio stock is encountered in large numbers and that larger control limits were natural in such circumstances.

With few trawl vessels operating in southern areas, the WCGOP data are more limited for bocaccio than for other species. The available WCGOP data do record individual discard events as large as at least 150 pounds, yet, as with canary, the data are truncated, and larger catch events may have occurred. West coast research landings have taken more than 4,000 pounds of bocaccio on a single trip in recent years. Under current shoreside trawl catch levels, 4,000 pounds of bocaccio equate roughly to 16 percent of the QP. However, given that research data are not reflective of commercial fishing practices, the Council did not believe vessel limits should accommodate unintended catch of this magnitude. Instead, the Council chose to set the vessel limit at 15.4 percent, which would permit vessels an additional 2,000 pounds above what is permitted by the control limit under current shoreside trawl catch levels.

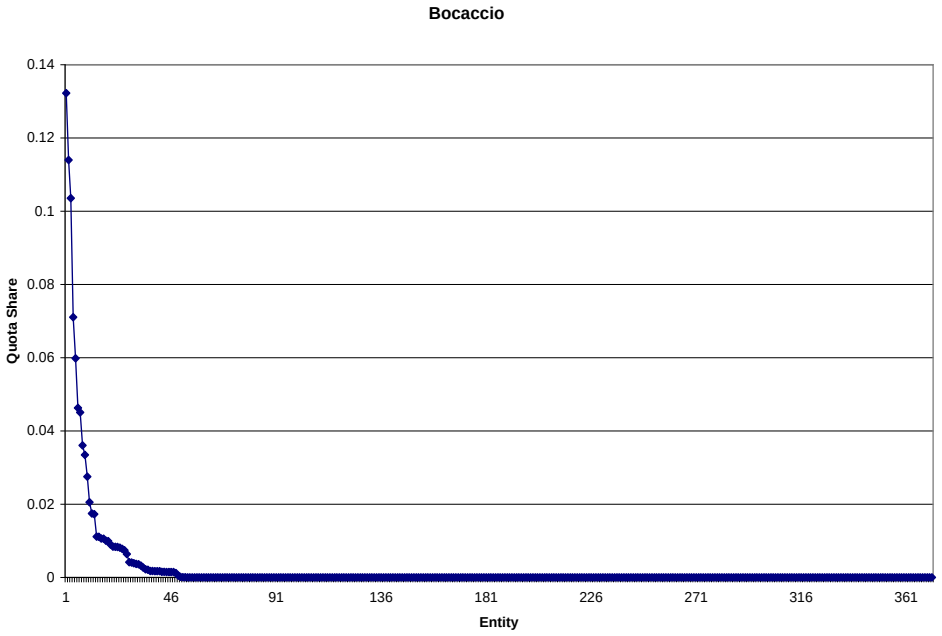


Figure A-108. Estimated distribution of initial allocation of bocaccio QS to individual vessel permits and processing entities.

Cowcod

Cowcod raised similar concerns as bocaccio as it is also highly constraining to the trawl fleet in a relatively concentrated area in the south. The bycatch rate allocation again results in a few entities receiving initial allocations of cowcod QS that are orders of magnitude larger than most others, with the maximum initial allocation estimated to be 17.7 percent. As with bocaccio, the Council determined that this was an appropriate control limit despite being high relative to other species because of the small number of vessels expected to fish in areas where cowcod are encountered. Like yelloweye, cowcod is relatively rare with 17.7 percent translating into only 507 pounds of fish under current shoreside trawl catch levels.

The WCGOP data are also limited for cowcod because of the few trawl vessels operating from ports in the south in recent years. However, the available observer data again indicate that some encounters of cowcod have exceeded 150 pounds. Yet the data also show that most of the larger cowcod discard events have been less than 100 pounds. Based on this information, the Council determined that the 507 pounds of fish allowed by the control limit was sufficient to protect vessels from unexpected cowcod bycatch events and, therefore, set the vessel limit equal to the control limit.

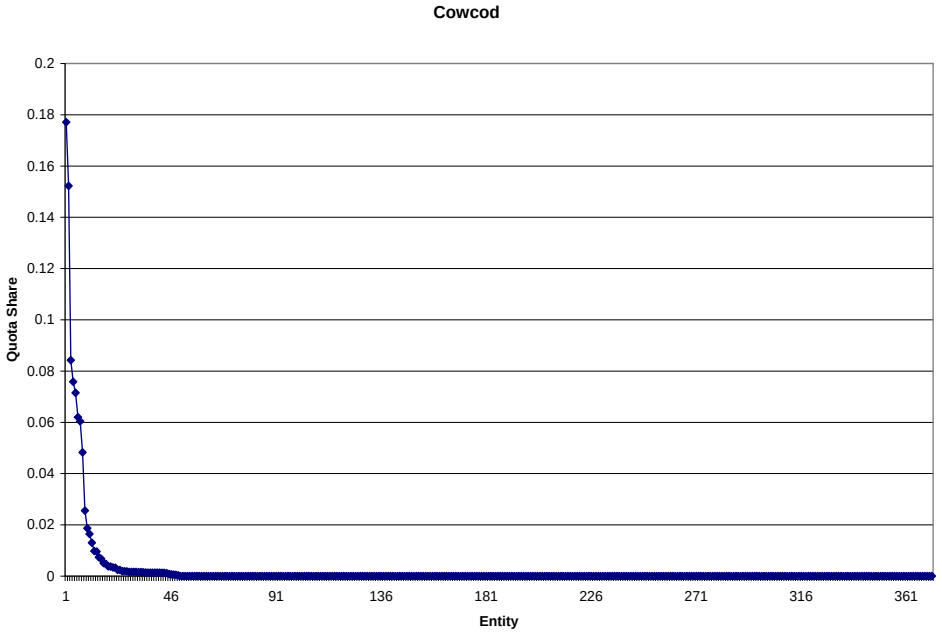


Figure A-109. Estimated distribution of initial allocation of cowcod QS to individual vessel permits and processing entities.

Widow Rockfish

Widow rockfish are caught by both whiting and nonwhiting vessels, although they have become particularly important to whiting vessels under rebuilding. The maximum initial allocation of widow rockfish produced by the whiting and nonwhiting bycatch allocation formulas is estimated to be 5.1 percent. This percentage would equate to 33,000 pounds of fish under the 2010 catch scenario.

In recent years, individual shoreside whiting vessels have encountered the largest lightning strike catches of widow, with some tows bringing up more than 20 metric tons of fish. Under the 2010 catch scenario, 20 mt would equate to nearly 7 percent of the QP. Most vessels, however, have not encountered catch evens of this magnitude. In consideration of the whiting data, the GMT

recommended 10 mt as a reasonable margin for large bycatch events. The Council accepted the GMT's recommendation and set the vessel limit at 8.5 percent, which amounts to 54,989 pounds under the 2010 catch scenario.

The Council also recognized the possibility that widow rockfish could be declared rebuilt by the start of the trawl rationalization program. In the scenario that the stock is rebuilt, the Council recommended setting the vessel limit at 1.5 times the control limit in line with the convention used for most nonwhiting target stocks. The Council chose to maintain the 5.1 percent control limit under either scenario. The overall amount available to the shoreside trawl sectors could be four times higher than what is available under rebuilding, meaning the control limit of 5.1 percent could represent more than 130,000 pounds of widow. Based on the widow rockfish stock assessment adopted by the Council at the September 2009 meeting, widow will not be rebuilt before the 2011/2012 management period.

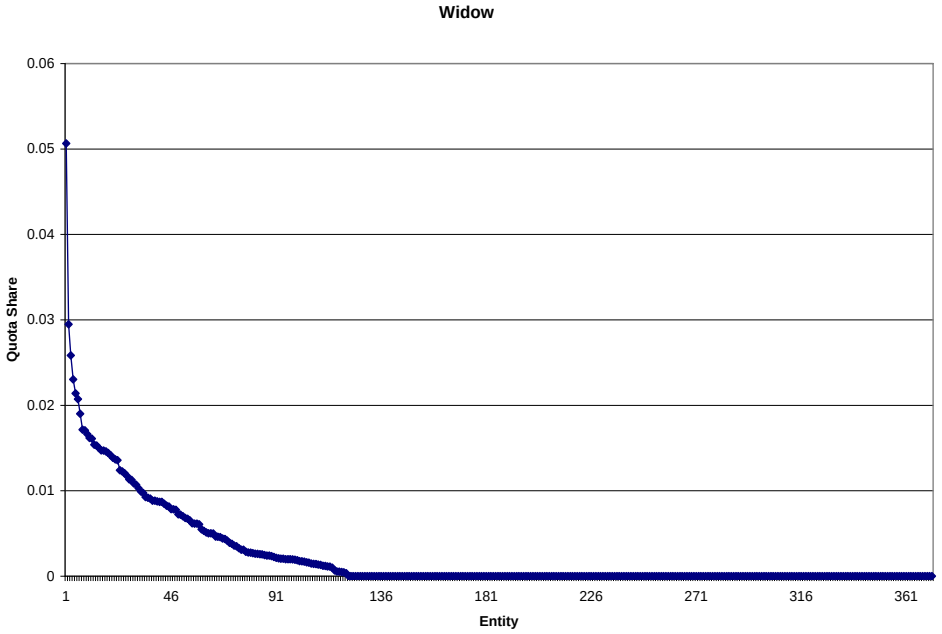


Figure A-110. Estimated distribution of initial allocation of widow QS to individual vessel permits and processing entities.

Pacific Halibut

Pacific halibut is not overfished, yet allowable levels of trawl bycatch could potentially constrain trawl targeting of flatfish, primarily arrowtooth flounder and Petrale sole, depending on the status of the stock and available harvest in the PFMC management area. In addition, halibut is a prohibited species in the groundfish trawl fisheries that cannot be retained or sold. For this reason, the Council has signaled its intention to progressively limit the trawl take of halibut in the future to allow for more catch by the recreational and commercial hook and line sectors.

The expected maximum initial IBQ-QS allocation to a single permit is 5.4 percent. Figure A-133 shows the strong relationship between halibut IBQ and allocations of Petrale sole and arrowtooth flounder. Analysis of this relationship between arrowtooth flounder and Petrale sole was presented first to the GAC in May 2009, then to the Council in June.[121] The Council established the control limit at this

[121] PFMC, June 2009 Briefing Book, Agenda Item E.11.a, Attachment 1 Issue Summary and Analysis: Accumulation Limits, Divestiture and Related Provisions.

maximum initial allocation level despite setting control limits that were 60 percent higher for Petrale sole and 75 percent higher for arrowtooth flounder than the maximum initial allocations of those species. Harvesting operations that want to operate using only their own QS will have to better the bycatch rate used in the initial allocation formula to achieve the higher harvest levels allowed by the control limits.

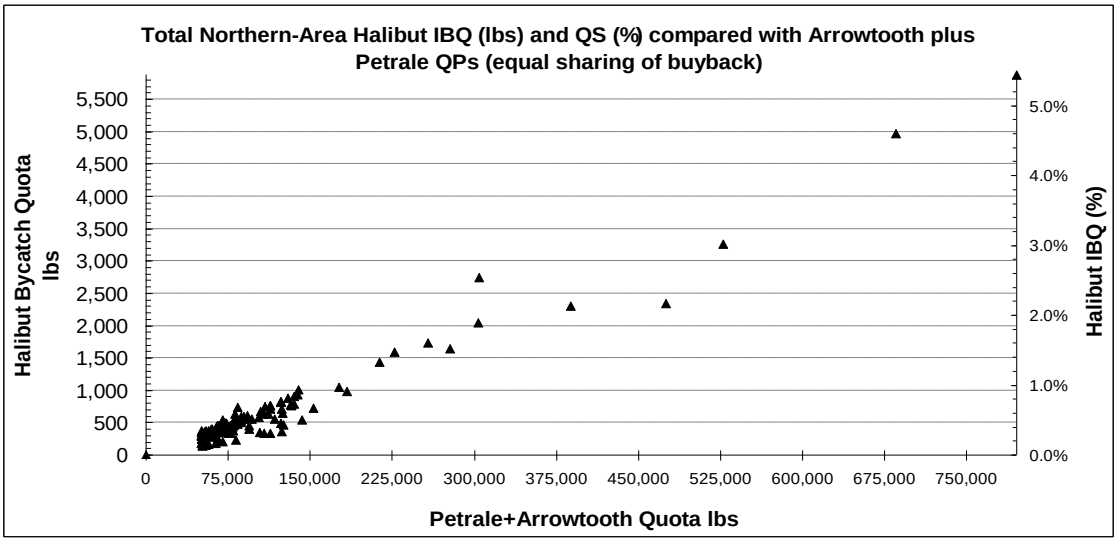


Figure A-111. Amount of halibut IBQ QPs (left vertical axis) and QSs (right vertical axis) by permit (permits are arrayed from the smallest to greatest based on amount of Petrale sole and arrowtootH QPs allocated assuming 2006 OY levels.

The Council also relied on an analysis of Petrale sole and arrowtooth flounder bycatch ratios in setting vessel limits for halibut IBQ. Based on 2008 CEY for halibut and OYs for Petrale and arrowtooth, the Council evaluated halibut IBQ vessel limits by using the following methods:

1. Calculating the maximum pounds of a target species that can be harvested for each target species vessel limit
2. Evaluating the amount of halibut that might be needed to achieve that target species catch
3. Determining the percent of the total trawl bycatch represented the pounds of halibut needed

Because the allowable harvest for halibut is set by the International Pacific Halibut Commission, the evaluation did not use the 2010 catch scenario, but instead used 2008 OYs for Petrale and arrowtooth, with the available halibut IBQ determined based on applying the Council's Amendment 21 trawl halibut bycatch formula to the 2008 halibut total Constant Exploitation Yield (CEY) (Table A-86).

The first calculation determined the pounds represented by each vessel limit, provided in the first two columns of Table A-87. Second, the WCGOP bycatch data were applied to determine an amount of halibut needed, with a range of rates considered (Table A-88). Bycatch rates were originally reported by the observer program in round pounds of legal and sublegal halibut catch per round pound of arrowtooth and Petrale catch, but were then converted to account for discard survival and measurement in dressed weight (Table A-88). Figure A-134 and Figure A-135 illustrate the degree of variation in the bycatch rates observed for halibut.

Full harvest of the 2008 arrowtooth and Petrale OYs would require average bycatch to be reduced to 0.006 pounds per pound of target species. At this assumed rate, a halibut vessel limit set at 1.4 percent

would allow full harvest of the Petrale limit, and a halibut vessel limit set at 14 percent would allow full harvest of the arrowtooth limit. At the lowest average bycatch rate in the WCGOP data of 0.17, the halibut IBQ vessel limit would have to be 3.8 percent to fully harvest the Petrale vessel limit and 39.2 percent to fully harvest the arrowtooth vessel limit (Table A-87).

In light of this analysis, the Council established the vessel limit at 14 percent following the rationale recommended by the GAC.[122] This is the level that would permit harvest of the full vessel limit for either arrowtooth or Petrale sole by vessels able to achieved the halibut bycatch mortality rate of 0.006 pounds of legal and sublegal halibut per pound of arrowtooth or Petrale. Data from the Washington EFP fisheries suggest that such reductions in halibut bycatch rates may be achievable.

Table A-88. OYs and halibut mortality limits based on 2008 fishery conditions.

2008 Halibut Mortality Limits (Trawl)	**Pounds (thousands)**
a. Total 2008 CEY (Legals)	940
b. Trawl Bycatch Calculation: 15 percent of CEY	141
c. Trawl Bycatch Mortality Max (not more than 130,000)	130
d. The greater of b and c = amount available for legal and sublegal trawl bycatch (dressed weight total mortality)	130
e. Set-aside for South of 40 10 (5 mt) and At-sea (5 mt)	22
f. **Trawl Halibut IBQ**	108
2008 OYs	
Petrale OY	5,509
Arrowtooth OY	12,787
Petrale + Arrowtooth	18,296
2008 Catch	
Petrale OY	4,873
Arrowtooth OY	5,887
Petrale + Arrowtooth	10,761

[122] PFMC, June 2009 Briefing Book, Agenda Item E.11.b, GAC Report: GAC Recommendations on Accumulation Limits, Divestiture and Related Matters.

Table A-89. Target species vessel limits and halibut needed to take those limits based on various assumed bycatch rates.

	Vessel Limit	Vessel Limit (thous pounds)	Assumed Lbs Halibut Mortality (Mty) /Target Species LB Caught	Halibut Mty Needed to Take Vessel Limit (thous pounds)	Halibut Needed as % of Available Halibut
Petrale	4.5%	248			
Minimum average bycatch rate strata			0.017	4	3.8%
Closest to midpoint average bycatch rate strata			0.039	10	8.9%
Maximum average bycatch rate strata			0.065	16	14.8%
Average bycatch rate to achieve full target species harvest a/ b/			0.006	1	1.4%
Arrowtooth	20.0%	2,557			
Minimum average bycatch rate strata			0.017	42	39.2%
Closest to midpoint average bycatch rate strata			0.039	99	91.5%
Maximum average bycatch rate strata			0.065	165	153.0%
Average bycatch rate to achieve full target species harvest a/ b/			0.006	15	14.0%
Total					
Total halibut required to take maximum vessel limits of Petrale and arrowtooth using assumed average bycatch mortality rate b/			0.006	16	15.4%

a/ The rate of 0.006 represents the bycatch mortality rate that would have to be achieved for the fleet to take the entire Petrale and arrowtooth harvest in 2008. It is the total halibut that would have been available based on the Council's Amendment 21 recommendations (108,000 pounds) divided by the total Petrale and arrowtooth available (18,296,000 pounds).

b/ If a rate of 0.006 is achieved, then a vessel would require the percent of the total trawl halibut IBQ indicated in the last column in order to take the vessel limits for this target species. The last rows of the table (total) show the amount of halibut a vessel would need in order to take the vessel limit for both Petrale and arrowtooth.

Table A-90. Observer program halibut bycatch rates by strata ((legal plus sublegal halibut lbs)/(Petrale + arrowtooth lb)) (2003-2006).

	North-South Area Strata	Depth Strata	
		<115 Fm	>115 FM
Catch Round	North of 47°05' N Lat	0.117	0.061
Discard Mortality (dressed wt)		0.065	0.034
Catch Round	South of 47°05' N Lat	0.07	0.03
Discard Mortality (dressed wt)		0.039	0.017

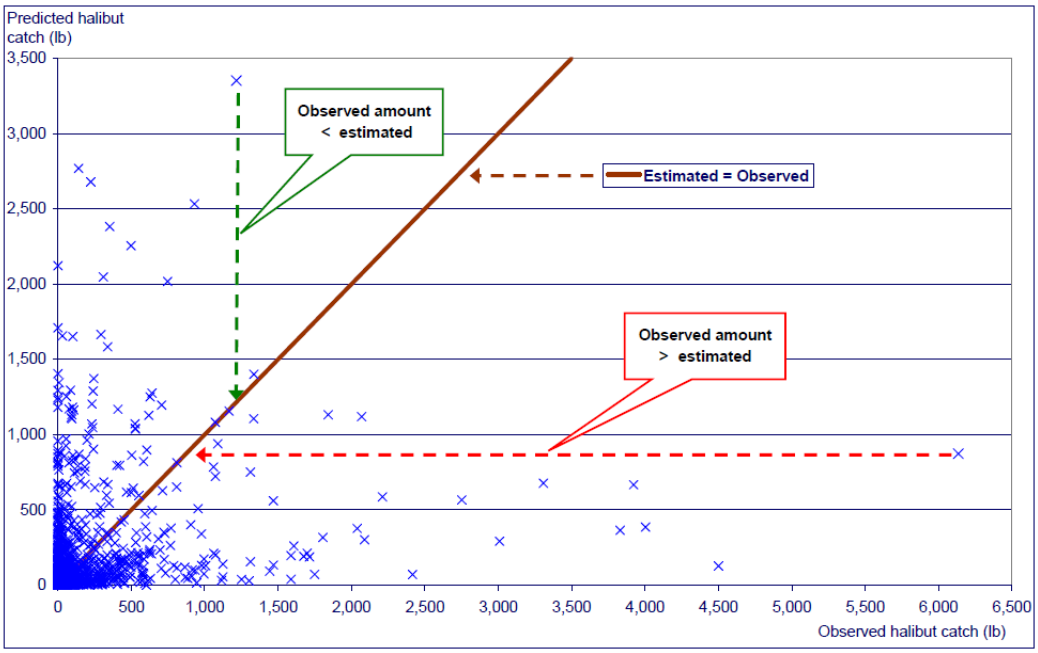


Figure A-112. Plot of observed vs. predicted Pacific halibut catch, using the mean stratum rate of Pacific halibut pounds per pound of Petrale sole and arrowtooth flounder caught in the area north of 47.5º N. lat. in depths less than 115 fathoms.

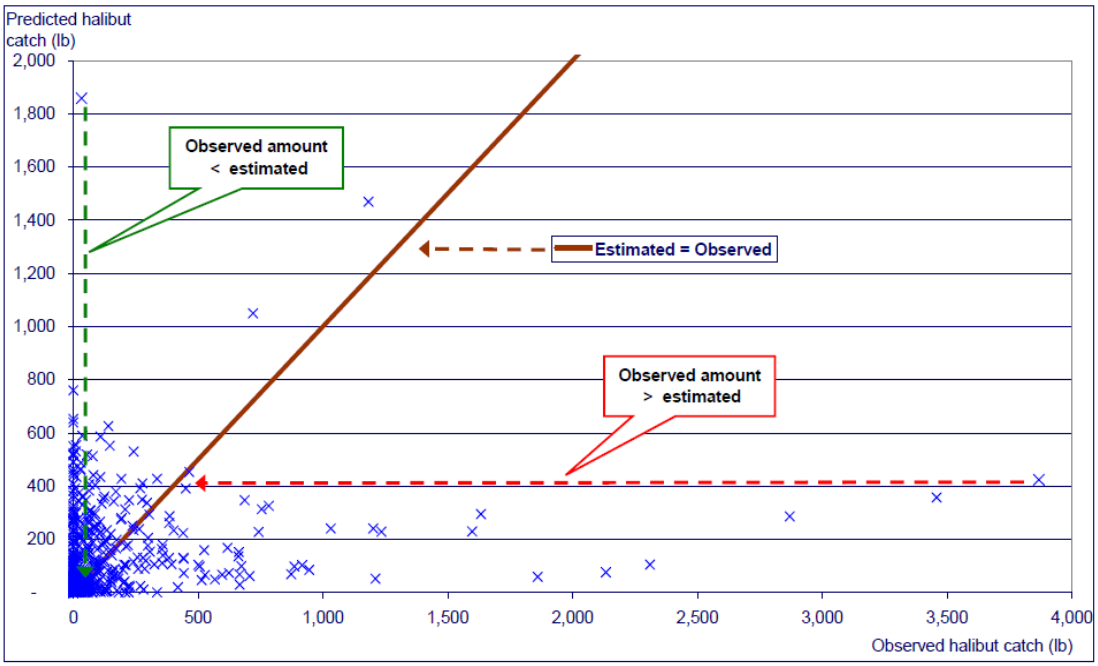


Figure A-113. Plot of observed vs. predicted Pacific halibut catch using the mean stratum rate of Pacific halibut pounds per pound of Petrale sole and arrowtooth flounder caught in the area north of 47.5º N. lat. in depths greater than 115 fathoms.

♦ *Calculation of the Aggregate*

Calculation of Aggregate Nonwhiting QS Holdings: To determining how much aggregate nonwhiting QS an entity holds, an entity's QS for each species will be converted to pounds. This conversion will always be conducted using the trawl allocations applied to the 2010 OYs, until such time as the Council recommends otherwise. Specifically, each entity's QS for each species will be multiplied by the shoreside trawl allocation for that species. The entity's pounds for all nonwhiting species will then be summed and divided by the shoreside trawl allocation of all nonwhiting species to get the entity's share of the aggregate nonwhiting trawl quota.

The control limits apply to each individual species, and there is an aggregate limit for all nonwhiting species. Increases or decreases in the OYs for individual species would not affect a QS owner's standing relative to being above or below the QS control limit for an individual species. However, an entity's aggregate QS holdings would be calculated by converting QS to QP and determining the entity's share of the total QP for all nonwhiting species. If this were done based on each year's trawl allocation, a change in the OY for an individual species could push someone who is close the aggregate nonwhiting limit above it, as is explained in the following paragraph. Because of concern that a person's aggregate QS holdings would fluctuate with changes in the OY, the Council decided to establish a more stable approach for this calculation. Under this approach, the method of calculating QS will be fixed until explicitly changed by the Council. This method anticipates using the trawl allocations coming out of the Amendment 21 process and applying those allocations to the 2010 OYs to determine a weighting for the QS of each species.

Example of Calculating the Aggregate and Effects of OY Changes. An entity's aggregate nonwhiting QS is evaluated by weighting the QS of each species using the expected trawl allocations and summing the results. Under this approach, for example, if the trawl allocation of Dover sole is 10,000 mt, and the trawl allocation of Pacific cod is 1,000 mt, then an individual who holds 1 percent of the Dover sole QS and 2 percent of the Pacific cod QS would hold QS for 120 mt of a total 11,000 mt (1.09 percent of the combined Dover sole and Pacific cod QS). In this example, either an increase in the Pacific cod OY or a decrease in the Dover sole OY would increase the combined QS holdings, as illustrated in the following table.

Table A-91. Example calculations showing how increases or decreases in the OY (represented as changes in the amounts allocated to the trawl fishery) may increase an entity's aggregate holdings.

	Trawl Allocation	Entity's QS Holdings	Entities QP
Starting point for the trawl allocation and entity's holdings (aggregate holdings 1.09%).			
Dover Sole	10,000 mt	1%	100 mt
Pacific cod	1,000 mt	2%	20 mt
Aggregate	11,000 mt	**1.09%** (120/11,000)	120 mt
Entity's aggregate increases with an **increase** in Pacific Cod OY (from 1.09% to 1.13%)			
Dover Sole	10,000 mt	1%	100 mt
Pacific cod	1,500 mt	2%	30 mt
Aggregate	11,500 mt	**1.13%** (130/11,500)	130 mt
Entity's aggregate increases with a **decrease** in Dover sole OY (from 1.09% to 1.17%)			
Dover sole	5,000 mt	1%	50 mt
Pacific cod	1,000 mt	2%	20 mt
Aggregate	6,000 mt	**1.17%** (70/6,000)	70 mt

The Council considered two methods for calculating an entity's nonwhiting aggregate QS in a manner that would hold a person's aggregate nonwhiting QS constant.

Under one method, **QS for all species would be weighted the same.** For example, the aggregate holdings of someone with 2 percent of the Dover sole QS and 1 percent of the Pacific cod QS would be the average (1.5 percent of the combined Dover sole and Pacific Cod QS). This would provide a more stable system and make it easier for QS holders to determine their aggregate. There would be no need to deal with situations in which QS holders are forced over the aggregate limit through no action of their own. However, there was also some reason to believe it could distort QS markets, putting a premium on the QS and participation in those strategies that require fewer different types of QS.

Under the method adopted by the Council, **relative weights of the QS for each species would be set at a certain point in time, but would be changed only through direct Council action** (i.e., would not automatically change whenever the OY or trawl allocation changes). This would provide a hybrid that uses the relative weighting system while providing the stability of the equal weighting approach. Such an approach is expected to reduce the frequency with which QS holders are faced with an externally imposed change in their aggregate holdings, but the approach would still require QS holders to multiply their shares of each IFQ management unit by a factor to determine their aggregate holdings.

❖ *Interlinked Elements*

The accumulation limits and decisions on the grandfather clause will have a strong but indirect impact on the results of the allocation formulas. The allocation formulas do not directly rely on provisions of the accumulation limits.

The vessel QP limits and unused QP approach rely heavily on the restriction that allows QP to be transferred only from QS holder accounts directly to vessel accounts (i.e., prohibits the transfer of QP anywhere other than to and among vessel accounts). Without such a requirement, once QP are issued at the start of the year, an entity could acquire addition QP in amounts exceeding both the QS control and the vessel limits.

❖ *Analysis*

The analysis of the accumulation limits is subdivided into sections that parallel the sections used to describe the rational for the limits (see Table A-80 on page A-286).

- Vessel Limit (Production Level Limits: Vessel or Permit Limit)

The following are the categories of goals and objectives affected by the decision to have vessel limits (independent of the level of those limits or the size of the vessel limits relative to the control limits) and the section in which each is addressed.

Section	Related Category of Goals and Objectives										
	Conservation	Net Benefits	Disruption	Excessive Shares	Fairness and Equity	Harvester and Processor Sector Health	Labor	Communities	Small Entities and New Entrants	General Public	Program Performance
Social Versus Net Benefit Trade-off		X			X	X	X	X			
Impact on Labor							X				
Impact on Processors						X					
Impact on Harvester						X					
Impact on the Public										X	

♦ *Social Benefits versus Net Economic Benefit Tradeoff*

The vessel limit is designed to ensure that there is at least some minimum number of vessels in the fleet, so that benefits are more likely to be distributed across more individuals and a broader geographic area. Ensuring this distribution may come at the cost of a lost opportunity for greater efficiency (lower net economic benefits). Absent a vessel accumulation limit, the fleet would be expected to shrink in size to a number that would be determined based largely on efficiency. Control limits alone will not maintain fleet size because several QS owners that are at their control limits might work together to take their QS from a single vessel. Maintaining a larger fleet diverts money from profits to payments for the parts, equipment, supplies, labor, and support services needed to maintain and operate the larger fleet. The diverted profits represent lost efficiency and will likely have a downward influence on the QS price. Had the profits not been diverted they would have been spent or invested on goods and services elsewhere in the economy and overall production in the economy would be greater. While net national benefits may be lower as a result of the vessel limit, the higher expenditures needed to maintain the fleet are likely to occur in the coastal communities, potentially increasing local benefits.

The actual effects of the accumulation limits will depend on whether the fleet would have consolidated to numbers lower than that allowed by the vessel limits. For example, in an analysis based primarily on maximization of efficiency, it was estimated that the nonwhiting fleet would decline to between 40 and 50 vessels. The aggregate nonwhiting vessel limit was set at 3.2 percent, implying that at maximum consolidation if the full trawl allocation was harvested, the fleet might decline to as few as 32 vessels (100 percent/3.2 percent). Thus, in the case of the aggregate limit, the floor on the minimum number of vessels would not directly constrain the maximum efficiency result.[123] While the aggregate limit may not constrain achieving the most efficient fleet size, it may be that vessel limits for individual species could constrain efficiency in particular targeting strategies. For example, the vessel limit for Petrale

[123] The decline could be greater if not all of the allocation can be taken due to limits (such as overfished species constraints). However, it would also be difficult to have 32 vessels that were able to harvest the exact mix of species that would allow each of them to achieve the 3.2 percent accumulation limit and fully exhaust the trawl allocation. For these reasons, a 3.2 percent vessel limit would likely imply a minimum number of vessels at least somewhat greater than 32. The other issue is whether the trawl allocation would end up being taken by full-time trawl vessels or vessels that participated in multiple fisheries. The latter case would also lead to an expectation of more than 32 trawl vessels.

sole is set at 4.5 percent, but it may be that all Petrale sole could be harvested most efficiently with a fleet of fewer than 23 vessels (100 percent / 4.5 percent).

♦ *Impact on Labor*

If vessel limits result in more vessels than would be the case without such a limit, this could result in more job positions, but might not result in an increase in the payments to vessel labor. With more vessels, the annual pay per job position on a vessel might be lower than if there were not a vessel accumulation limit. Under similar circumstances in other systems, individual crewmembers and vessel operators have sometimes rotated between vessels so that crewmembers earn a greater annual income, and the harvesting companies gain the benefit of a more experienced crew.

♦ *Impact on Processors*

For processors that do not own vessels, the vessel limit might help ensure that they have more potential suppliers than if there were not such a limit. In the absence of a vessel limit, as many QS owners as is economically efficient might work together to harvest their QS off a single vessel. Individual QS owners operating off the same vessel might negotiate with processors independently of one another or collectively. Their use of a single vessel would reduce their flexibility for independent negotiations.

For processors that do own vessels, the effect of the vessel limit will depend on where it is set relative to the control limit and whether or not there is a grandfather clause. If there is a grandfather clause for the control limits, or if there is no grandfather clause but the control limit is greater than the vessel limit, the vessel limit will force the processor to operate more vessels to take its QS (or to pay other vessels to harvest its QS). If the control limit is lower than the vessel limit and there is no grandfather clause (the preferred alternative), the vessel limit will not have a direct effect on processors owning vessels.

	Grandfather Clause	**No Grandfather Clause**
Control Limit Greater than Vessel Limit	Processors with more QS than allowed under the vessel limit or grandfathered vessel level forced to operate more vessels to take their QS.	Processors with more QS than allowed under the vessel limit forced to operate more vessels to take their QS.
Control Limit Less than or Equal to the Vessel Limit	Processors grandfathered in at a QS levels higher than the vessel limits may be forced to operate more vessels to take their QS.	Vessel limit will have no effect on the number of vessels the processor operates using its own QS (the processor will be able to take all of its QS on one vessel).

♦ *Impact on Harvesters*

As discussed in the section on net benefits, the vessel QP limit could effectively require that a greater number of vessels operate in the fishery, increasing the costs to harvesters and reducing their benefits. The existence of a vessel limit reduces the opportunity for multiple QS owners to gain efficiency by taking their QP from the same vessel. As with processors that own vessels, the effect of the vessel limits on the number of vessels operated by a particular harvesting company will depend on where the vessel limit is set with respect to the control limit and whether or not there is a grandfather clause (see the matrix in the section on processors). Under the preferred alternative, the vessel limit is higher than the control limit, so it would not require that a harvesting company operate more than one vessel to take its allocation of QS and could provide independent harvesters some opportunity to cooperate by fishing their QP from the same vessel.

♦ *Impact on the Public*

Vessel limits could negatively affect the general public through both lower overall net benefits than might be achieved without a vessel accumulation limit and increased program administrative costs. The effect on net benefits was discussed above. With a vessel accumulation limit, program administration, tracking, monitoring, and enforcement costs may be higher than they would be with a greater degree of fleet reduction. The fleet can be charged fees of up to 3 percent of ex-vessel value. Additional cost recovery may occur through the collection of royalties through means such as auctions, though no such mechanisms are included in the Council's PPA. Some costs may be paid directly by the fleet, such as the cost of carrying an observer. Any program-related expenses that are not covered through the fee, royalty collection, or direct payment by industry would be covered by taxpayers.

● Vessel Unused QP Limit

The following are the categories of goals and objectives affected by the decision to have vessel unused QP limits for overfished species and Pacific halibut and the section in which each are addressed.

	Related Category of Goals and Objectives										
Section	**Conservation**	**Net Benefits**	**Disruption**	**Excessive Shares**	**Fairness and Equity**	**Harvester and Processor Sector Health**	**Labor**	**Communities**	**Small Entities and New Entrants**	**General Public**	**Program Performance**
Impact Mechanism and Conservation	X										
Net Benefits		X								X	
Other Impacts			X	X	X	X	X	X			

♦ *Impact Mechanism and Conservation*

The unused QP limit has its impact through the flexibility it allows for the Council to set lower vessel limits for overfished species and halibut without directly limiting a vessel's ability to achieve the harvests of target species allowed under the vessel limits. Absent this approach, the Council may have had a more difficult time in determining the appropriate balance between setting overfished species and halibut vessel limits that are high enough to accommodate the ranges of bycatch rates that a vessel might reasonably be expect to encounter and low enough so that QP is not sequestered on vessels, possibly making it less available on markets.

The unused limit approach could generate a conservation concern in that, absent an annual cap on total QP an individual vessel could use, there might be greater potential for the fleet to exceed its limits for these species. However, the trawl rationalization program does not end the governmental responsibility to ensure that the fleet stay within its limits. Full observer coverage (100 percent) combined with rapid catch reporting should allow NMFS to impose additional fishery restrictions as necessary to ensure that individual vessel overages do not result in a fleet overage. Additionally, the Council has backed up the unused QP limit with a vessel QP limit to ensure that fishermen who regularly encounter overfished

species and halibut at high rates and who have the money to acquire the needed QP do not cause the fleet to prematurely consume its annual allotment of QP for overfished species and halibut.

♦ *Net Benefits*

As described above, and in the rationale for this provision, it is hoped that low unused QP limits will increase the availability of QP on the market during the year and improve market function, contributing to higher net benefits from the program. Whether this happens depends the degree to whicH QP transfer commitments are made before actual transfers occur. Harvesters will be able to control their own QS for all species, but not up to the maximum of the vessel limits. Therefore, for vessels that want to harvest amounts of QP in excess of what the harvester can hold under the QS control limits, some transfers will be required. For nonoverfished species, these transfers can happen at the start of the year. However, for overfished species or halibut, if the vessel is already at the unused QP limit, the transfers must wait until some of the overfished species or halibut QP are used. Given harvester concern about having adequate amounts of overfished species and halibut QP, it seems likely that they will try to lock up as much as they can early in the year. This could be done through side agreements under which the QP transfers are not registered with NMFS until there is room on the vessel account. If it is not possible to limit such side agreements, and if they are used extensively, the unused QP approach could have limited effect. Another circumvention tactic could be the use of surplus trawl permits. As the fleet shrinks under trawl rationalization, it is expected that there will be numerous surplus permits of limited value. A vessel owner might acquire one of these permits, place it on some other vessel, and then transfer overfished species and halibut QP to that vessel until they are needed by the trawl vessel.

There was some concern that the unused QP limit itself could encourage vessels to fish early so they could recharge their accounts before QP prices increased. This could cause a race for fish and higher bycatch rates. Analysis provided to the Council indicated that seasonality in the prices might self-correct so that there would not be large fluctuations during the year; however, the result is not certain. Because of concern over how the overfished species and halibut vessel limits will perform, the Council will review these limits during the first management cycle after the program is implemented

♦ *Other Impacts*

Sector health, labor, and communities will benefit if the unused QP approach is successful in increasing the availability of QP on the market. However, there was a concern about not having any annual limit on the total amount of QP a vessel could take. This concern went to questions of fairness and equity, as well as the effective function of the program with respect to encouraging bycatch avoidance. In particular, without an annual limit, a vessel that regularly experienced higher than normal bycatch rates and had sufficient wealth to remain in the fishery (perhaps as a lifestyle choice) could adversely affect function of the trawl rationalization system through individual accountability mechanisms. By combining the unused QP approach with a straight vessel limit on overfished species, the ability of such vessels to impact the remainder of the fleet and those dependent on it adversely is limited.

● Control Limit

The following are the categories of goals and objectives affected by the decision to have control limits. The level at which such limits are set, whether there is a grandfather clause, etc., are discussed in other sections.

Section	Related Category of Goals and Objectives										
	Conservation	Net Benefits	Disruption	Excessive Shares	Fairness and Equity	Harvester and Processor Sector Health	Labor	Communities	Small Entities and New Entrants	General Public	Program Performance
Market Power and Efficiency		X				X					
Geographic Dispersion								X			
Fairness and Equity					X						

♦ *Market Power and Efficiency*

Market power is the ability to influence prices away from the competitive equilibrium to the favor of the entity(ies) exerting that power. Exerting such power redistributes wealth and, in some cases, may result in market distortions that reduce overall efficiency of the economy. This issue is discussed in detail in Appendix E.

With respect to relative market power advantage between harvesters and processors, the initial allocation will set the starting point. The initial allocation is (1) an allocation of wealth and (2) an allocation of advantage to certain firms, if there is a grandfather clause. The grandfather clause would allow firms to retain QS they receive as part of the initial allocation that exceeds accumulation limits. However, over time, the accumulation limits will have more of an effect than the grandfather clause or the initial allocation. If the accumulation limits are set sufficiently low, they will limit the opportunity for individual firms to use QS to exert market power. If set too low, they will constrain efficiency to the degree that firms can be develop more efficient operations based on the certainty provided through ownership of QS (i.e., not having to rely on buying QP each year).

When the Council decided not to apply control limits to QP, there was a dramatic change in the implications of the control limits for the size of the harvesting operation and processors' ability to vertically integrate. When control limits applied to QP, harvesting companies could not take more fish than the control limits, and processing companies could not have more vertical integration than allowed under the control limits. By not applying control limits to QP, harvesting companies are free to harvest as much fish as they can so long as none of their individual vessels exceeds the vessel limits. Harvesting companies are only restricted in the amount of QS they can control, not the amount of QP that they can acquire and place on vessels they own during the year. Similarly, with this change processing are able to operate as many vessels as they desire and can support through the acquisition of QP from QS holders, after the QP for each year is issued. Options for the level at which accumulation limits would be set are discussed in the section on Percentages for Limits.

♦ *Geographic Distribution*

With respect to geographic distribution, the control limit does not directly result in greater geographic distribution of the harvest. While requiring that QS be distributed among more entities does not guarantee that those entities will be geographically dispersed, allowing QS to be concentrated into the

hands of only a few would make geographic concentration of harvest, landings, and benefits more likely.

♦ *Fairness and Equity*

Some view the accumulation of large amounts of wealth as unfair. Others view it as fair as long as everyone is under the same rules. The accumulation limits would constrain an entity's ability to accumulate wealth through use of QS, but all would be playing by the same rules (have the same limit), depending on the Council decision with respect to the grandfather clause.

● The Control Rule and Included Scope of Control Relationships

A narrower control rule allows for circumvention of the limits through means outside of the scope of the rule, frustrating achievement of the objectives related to the accumulation limit provision (objectives identified in previous sections). A broader control rule may inhibit relationships that are useful and beneficial for the efficient organization of the seafood industry (e.g., the formation of co-ops to manage overfished species QP or exclusive marketing agreements to encourage entry by a new processor). The analysis of impacts is organized into the following sections:

- Market Power
- Efficiency
- Alternative Organization of Production
- Administrative and Enforcement Costs
- Fairness and Equity

A bullet summary is provided at the end of this section.

♦ *Market Power*

The control rule is specified to take into account the exertion of control beyond the boundaries of ownership. This is required to effectively prevent the exertion of market power and the adverse effects that the exertion of such power would have on the economy and socio-economic conditions. Without a broadly specified control rule and the associated percentage limits, anti-trust law would provide the next level of protection against the adverse effects of excessive control. Anti-trust laws are more difficult and costly to enforce than a control rule with a specified threshold (the accumulation limit percentage).

Effectiveness of the control rule in evaluating the amount of QS under an entity's control may be limited by not taking into account QS that owners of an entity hold separately (not accounting for upstream ownership). See the rationale for this provision for further explanation of "upstream" (page A-292). Not including upstream ownership as part of the calculation of ownership control does not prevent that ownership from being taken into account in the application of the more generalized restrictions that entail "other means of control."

♦ *Efficiency*

The extension of the control rule to means of control beyond ownership could inhibit the formation of relationships that are useful to maintaining an efficient industry. One example is the potential inhibition of the formation of risk control co-ops. This is discussed further in a following section. Another example might be exclusive marketing agreements. On one hand, exclusive marketing agreements can

be a means of exerting control. On the other hand, such agreements may also be used to limit risk and encourage new investment, including the development of new markets. For example, if vessels in a particular port wanted to encourage entry by a new processor, they might reduce that processor's risk by offering an exclusive marketing agreement for a period. If the number of competing buyers in the local area is limited, ability to encourage new entrants via marketing agreement may lead to more competitive pricing in the raw fish markets and a more efficient distribution of resources.

Counting QP against the control limit could have had an adverse impact on processors' ability to vertically integrate. All catch must be covered by QP placed in a processor's vessel accounts. That QP would have counted against the processor's control limits, even if the processor did not own or otherwise control the associated QS. In its final preferred alternative, the Council adjusted this provision so that QP in a vessel account does not automatically count toward the vessel owner's control limit. This adjustment allows processors to use their own vessels to catch a volume of fish that exceeds QS control limits.

♦ *Alternative Organization of Production*

The control rule may affect the ability to effectively form other types of organizations that would benefit the fishery, such as harvester co-ops or regional fisheries associations.

One of the difficulties that harvesters will face under the IFQ program is covering their catch witH QP when they encounter an unexpected high bycatch of an overfished species ("lightning strike" or "disaster tow") for which the amount of QP available is very limited. There has been talk that industry members might form risk pools or risk management co-ops. Such types of arrangements may be established as contractual agreements that place obligations on and provide benefits to the parties to the agreement; or it may be established as an entity unto itself (for example, a co-op established as a corporation). Under a contractual agreement, members might simply agree that, whichever of them encounters a "disaster tow," all parties of the agreement will transfer to that member a proportion of their holdings of the species sufficient to cover the tow. Or, a risk management co-op might be established to which the members transfer certain species and a co-op manager monitors members and transfers QP to the member accounts in accordance with the co-op rules. Under the rules of the IFQ program, in order for such a co-op actually to hold QS or QP, it would have to be incorporated or otherwise take on a legal identity that makes it eligible to own a U.S. documented fishing vessel (the requirement for QS/QP ownership). In the case of an entity eligible to own a vessel, there is clearly an entity to which the control rule would apply. In the case of a contractual agreement, the question may become one of whether or not the contract effectively establishes control of one entity over another.

If consideration is given to exempting risk management pools from the accumulation limits, the types of pools for which such exemptions are provided, and the consequences that would be incurred if attempts were made to use such a pool to circumvent accumulation limits, should be taken into account. Under a contract-based risk management pool for vessel overages, the consequences to the vessel for exceeding the limits would limit the ability of anyone routinely to use the contract to circumvent the control rule. Even if parties entered into a risk management contract, no one party to the contract could start with more QS than allowed. If a vessel experienced an overage, the needed QP would be transferred to that vessel. If the amount needed by the vessel exceeded the QS accumulation limit, the vessel would not be prevented from receiving the QP needed to cover its overage. However, the vessel would have to stop fishing until the end of the year. The requirement that the vessel acquire the needed QP and then stop fishing for the remainder of the year would apply regardless of whether the QP were transferred from the risk management pool or through transactions on the open market. Thus, there would be some limit on the opportunity to abuse an interpretation of the control rule that allows QS control limits to be exceeded by a risk management pool contract entered into for the purpose of covering a vessel overage. On the other hand, it might be easier to abuse a control rule that is interpreted, as an example, to allow

processors to establish contingency contracts to mitigate the risk that they will not be able to keep a plant in operation year-round. Such a contingency contract might specify that if a processor runs short of product, QP would be transferred to vessels that are not under its control, but are under contract to deliver to that processor. So long as the vessels are not at their individual accumulation limits, there would be no disincentive for the exercise of such a contract. The processor would be able to continue processing even if the risk management contract resulted in the transfer of amounts of QP to vessels delivering to that processor that exceeded the accumulation limits. In contrast, for the example of a vessel risk management pool for an overfished species overage, the vessel would be forced to stop fishing if the exercise of the contract gave it more QP than allowed under the accumulation limit. Thus, a determination as to whether contracts that support risk management pools are within or outside the scope of the control rule should consider not only the nature of the control entailed in that contract, but also the consequences that might flow from the abuse of the interpretation.

The control rule may also present challenges in the development of RFAs or CFAs. Specifically, unless an exemption is provided that allows RFAs or CFAs to exceed the general limits, RFAs/CFAs that involve amounts of QS in excess of the accumulation limits will have to be structured such that they cannot be construed as an entity "controlling" the QS/QP of its members. To be eligible to participate in an IFQ program, an RFA must meet criteria developed by the Council (MSA, 303A(c)(4)(A)). At this time, there are no provisions in the IFQ alternative that would establish the criteria needed for creation of RFAs.[124] The Council has indicated its intent to consider special accumulation limit rules for CFAs as part of a trailing action.

As with other types of entities, the problem with providing exemptions or higher limits for co-ops and RFAs is the potential for such entities to be formed as a front for private interests whose main goal is to control QS in excess of the accumulation limits. In response to uncertainty about the application of control rules, the Council provided the following policy statement:

> It is the Council intent that control limits should not constrain the formation of risk pools to help the fishermen deal with overfished species constraints, so long as the pools do not undermine the effectiveness of the accumulation limits. A risk pool is one in which two or more people enter into an agreement whereby if one person does not have the QP it needs, the others would agree to provide the QP, if they have them. Whether these kinds of agreements are informal or formal, as other considerations and conditions are added to the agreements, they may begin to constitute control. It is the Council's intent to allow for these pooling agreements, so long as they do not become control.

[124] When rules are established for RFAs, to minimize the chance that RFAs are established to circumvent the accumulation limit rules, the Council might impose certain restrictions and requirements. The following is an example of the type of language that might be considered as part of the criteria for an RFA:

An RFA plan shall:

(a) not be approved if the Council or NMFS determines that
  (1) the primary purpose or effect is to allow an entity to control quota shares in excess of the accumulation limits which apply to entities that are not part of RFAs or co-ops;
  (2) it will in any way allow the RFA or its members to exert market power with respect to ex-vessel price negotiations between processors and harvesters.

(b) be revocable at any time based on a Council or NMFS determination that the RFA is not meeting the terms and conditions on which the agreement was approved or that the RFA is otherwise being used to circumvent the intent of the trawl rationalization program.

♦ *Administrative and Enforcement Costs*

The control accumulation limit restricts the acquisition of excessive shares, including acquisition by means other than through purchase of QS. "Ownership" and potential violation of such limits would be tracked on an ongoing basis in a NMFS database. The need to track indirect ownership will add to the amount of information NMFS collects about the entities that nominally own QS (as compared, for example, to the information collected on ownership of a trawl LEP). NMFS might also require that additional information be submitted to assist in assessing levels of control not reflected in ownership records. Investigation and prosecution of potential violations of control limits would likely require information beyond that contained in the regular submissions to NMFS. Such investigations would likely be instigated based on substantiated citizen complaints or other sources of information. Adequate enforcement resources would be needed to follow up on substantiated allegations.

♦ *Fairness and Equity*

Full application of the control rule will require case-by-case investigations and evaluation of the situations. If those who are adversely harmed by entities that are alleged to exert excessive control do not believe those violations are being adequately investigated, they may believe that the program is not fair and equitable, or that someone is getting away with violating the program. For this reason, it will be important to ensure that there are resources available to follow up adequately on allegations of violations for which there is some supporting evidence. On the other hand, those who are the subject of such allegations will likely think that the program is not fair and equitable if control is not being evaluated consistently against all participants. In particular, the consistent application of the language "shares that the person controls through other means" will be important. Further, the vagueness of the language may leave some uncertainty about what is and is not allowed. Ultimately, the standard of evaluation might be "Is or isn't control being established that adversely impacts program objectives?"

♦ *Summary*

- A control rule that extends beyond ownership control is necessary to effectively limit control and achieve related program objectives.
- Depending on its interpretation, the control rule may hamper the ability of harvesters to form risk management co-ops or other types of beneficial business arrangements.
- The control rule will hamper the ability of processors to vertically integrate.
- The operation of RFAs/CFAs could be hampered by control rules (the current alternative does not include criteria for formation of RFAs, and the Council will address special limits for CFAs in a trailing amendment).
- Direct and indirect ownership will be monitored on an ongoing basis. Monitoring indirect ownership will add to program costs.
- Control that is not based on ownership will be enforced on a case-by-case basis and will require additional enforcement resources for investigation.
- Perceptions of fairness and equity may be affected by whether it is perceived that nonownership control is being adequately investigated and applied consistently across all QS/QP holders.

● Grandfather Clause, Divestiture, and Cutoff Date

The following are the categories of goals and objectives affected by the decision on the grandfather clause and implications of the control date and the section in which each are addressed:

Section	Related Category of Goals and Objectives										
	Conservation	**Net Benefits**	**Disruption**	**Excessive Shares**	**Fairness and Equity**	**Harvester and Pro-cessor Sector Health**	**Labor**	**Communities**	**Small Entities and New Entrants**	**General Public**	**Program Performance**
Grandfather Clause, Divestiture, and Disruption			X			X					
Grandfather Clause and Fairness and Equity				X	X						
Permit Acquisition Cutoff Date and Disruption, Fairness and Equity			X		X						
Program Performance	X	X									X
Net Economic Benefits		x				X					

The analysis of impacts is organized into the following sections:

- Grandfather Clause, Divestiture, and Disruption
- Grandfather Clause and Fairness and Equity
- Permit Acquisition Cutoff Date, and Disruption, Fairness, and Equity
- Program Performance
- Net Economic Benefits

♦ *Grandfather Clause, Divestiture, and Disruption*

Disruption is often associated with change, and greater disruption is likely to adversely affect sector health over the short term. The grandfather clause and divestiture provisions affect the speed and mechanisms through which the change to an IFQ trawl rationalization system occurs, but have a lesser effect on the total amount of change. In particular, these provisions affect the path by which the QS distributions are brought into line with the long-term rules on accumulation limits, specifically, QS control limits.

With no grandfather clause and no divestiture provision, the initial distribution of QS will comply with the QS control limits, the reallocation of amounts of QS that would have otherwise been issued to entities in excess of the limits will occur administratively (distributed to those below the limits in accordance with the allocation formula), and the initial distribution of the wealth represented by the QS that would have otherwise been issued in excess of the limits will go to those who are under those limits. The amount of the redistribution would depend on the level at which the limits are set. The

number of entities over control limits, and the amount by which they are over, is provided in a following section as part of the analysis of the options for setting percentages for the control limits. With no grandfather clause, there may be some disruption to the degree that those who had made investments in permits that entitled them to QS in excess of limits would not receive QS for those permits. After the initial allocation, the value of those permits would decline, but they would receive no QS in compensation for the reduction. The possibility that they might sell those permits in advance of the initial allocation is discussed below. In addition to the potential disruption from the loss of value of the permits, to the degree that their investment in permits was accompanied by capital investments in harvesting they will experience a sudden change in their annual operating costs, represented by their need to purchase additional QP each year.

With no grandfather clause and a divestiture provision (the PPA), the initial distribution will not be compliant with the QS control limits, but will be brought into compliance over a relatively short time (four years). The reallocation will occur through market transactions instead of administratively (as would occur without a divestiture provision). Those selling the QS will have an opportunity to direct their QS sales to entities with which they may have an ongoing long-term relationship (e.g., a harvester might sell to someone with whom they might enter into an overfished species risk sharing pool, a processor might sell to a vessel from which it expected to receive deliveries, or either of these entities might choose to sell in a manner that maintains the QS in their local community). The opportunity to maintain QS for a few years will provide the divesting entities more opportunity to adjust their cost structures and finances in anticipation of the need to purchase QP annually to replace those from the QS that they divest (if such purchases are necessary to maintain their operations, as would be the case for harvesters but not processors). The revenues from sale of the QS should provide them with sufficient funds to make annual QP purchases for a number of years.

If there were no grandfather clause and no divestiture opportunity, those with permits that place them in excess of accumulation limits could also generate revenue through the sale of those permits prior to initial allocation. By doing so, they could direct the distribution of their harvest privileges and buffer the disruption caused by the move to the IFQ program in a fashion somewhat similar to what they could achieve through divestiture after initial allocation. However, prior to initial allocation there may be uncertainty about whether and when the program will be implemented, its final form, the actual amount of history and QS that will be assigned to a particular permit, the trading value of the QS, and whether the program will be successful and survive over the long term. These uncertainties are likely to result in a lower price for the permit prior to QS allocation than for the permit and QS after initial allocation and initial experience with the program. Additionally, prior to initial allocation, a permit with its entire suite of QS must be traded as a lump to someone who may be more interested in some of the associated species than other species. After the initial allocation, the QS can be divided and sold separately to those who place the highest value on each particular species.

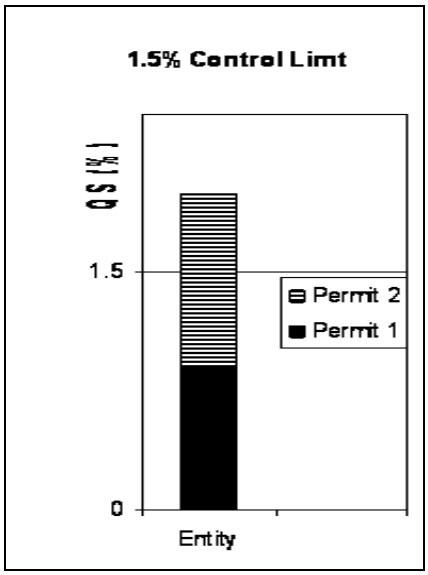


Figure A-114. An entity with two permits selling one permit to get under the control limit may end up being far below the control limit.

If there is no divestiture provision, the opportunity to sell permits provides substantially less flexibility for a permit holder to get under the control limits than with divestiture after initial QS allocation. For example, if two permits put an entity over the limit, selling one permit might put them well under the limits, as illustrated in Figure A-136.

With a grandfather clause, the result is similar to the result without a grandfather clause and with divestiture except that the redistribution is spread out over a substantially longer period. Rather than being forced to come into compliance with the accumulation limits over a relatively short time, those with QS in excess of limits would be able to maintain that QS until they retire from QS ownership. Their retirement from QS ownership might occur substantially later than their retirement from active participation in harvesting or processing activities. On one hand, the ability of some entities to own QS in excess of the QS control limits may have provided those entities a long-term competitive advantage over those whose initial allocation was less than the control limits. In addition to having lower long term operating costs, these entities would have had greater bargaining strength relative to those with lesser amounts of QS. On the other hand, the fact that they qualified for QS in excess of limits indicates the possibility that their operations were larger-scale and that being forced to QS ownership levels within limits would have been disruptive. The exception would be for those that are over limits only because they speculated in permits based on their expectation of receiving QS and not because of their need for that QS to support their harvesting operations.

The impacts of the decision on whether to have a grandfather clause was changed substantially as a result of the Council's decision that control limits would not apply to QP. Application of the control limit to QS and QP would have created a situation in which harvester production was constrained by the control limit but not by processor production. Under such circumstances, the absence of a grandfather clause might have disrupted some harvesters, but would have had less effect on processors (except those owning vessels). The level of production by harvesting companies would have been restricted by QP limits, but not the level of production by processors. However, since QP placed on vessels would have counted against their total quota holdings (regardless of the source of those QP), processors owning vessels might have found themselves needing to reduce their level of vertical integration (ownership of vessels) in order to come into compliance with the control limits.

♦ *Grandfather Clause and Fairness and Equity*

Another major objective affected by the grandfather clause issue is the perception of fairness and equity. If there is no grandfather clause and no opportunity for divestiture, those who do not receive an amount of QS that they would have otherwise received may believe they been treated unfairly (that, unlike those under the limits, they would not have been entitled to receive QS in proportion to their investment in the fishery). With the opportunity to divest after QS issuance, they would be able to receive a capital return through the sale of their QS. The degree of difference in impact between having and not having the opportunity to divest is reduced by the opportunity permit holders have to benefit from the selling before the initial allocation those permits representing an excess. As discussed above, they would have

less flexibility in making those sales and would likely receive lower returns compared to being able to receive the initial allocation and then divest themselves of it. If there is a grandfather clause, those who are unable to accumulate as much QS as those who were grandfathered in above the limit may feel unfairly disadvantaged by the protected competitive position provided to those who are grandfathered in at levels in excess of the accumulation limits. Those below the limits would have no opportunity to buy themselves up to the same level of QS as those who received the initial allocation in excess of accumulation limits.

♦ *Permit Acquisition Cutoff Date, and Disruption, Fairness, and Equity*

Not providing a grandfather clause, but providing an opportunity to divest raises fairness and equity questions. As indicated in the previous section, there are two sides to this issue, one being the fairness of providing rewards to those who have been accumulating permits in anticipation of the issuance of QS (through a grandfather clause or divestiture provision) and the other being the fairness of reducing the opportunity to reap those rewards (through the absence of a grandfather clause).

Related to the balance of perceived fairness is the advance notice provided regarding policy development and its implication for investment while policy was being developed. In regard to a cutoff on permit acquisition and issues of disruption and fairness and equity, the issues to be addressed here are the importance of effective control dates in reducing disruption, whether the November 6, 2003, control date applied to permit acquisition, and the degree to which permits were, in fact, accumulated during Council deliberations on this program.

The Council's final recommendation includes a divestiture opportunity for those with permits, qualifying them for more QS than the QS control limit, but it also provides a cutoff date such that prevents the divestiture opportunity from being applied to permits acquired after that date. In this section, we will address the importance of the control date in setting the cutoff date, providing a sense of fairness and equity, and minimizing disruption; arguments pertaining to whether the control date announced by the Council can be construed as applying to the acquisition of additional permits; and the number of entities affected and the degree of effect of the Council's recommended cutoff date for new permit acquisition.

Provision of advance notice of policy changes has a major impact on the perception of fairness and equity. If there is not a grandfather clause, then it is likely a program will be perceived as more fair and equitable if those making investments during policy deliberations were on advance notice that they might not receive benefits from those investments. On the other hand, if advance notice has been provided, and there is a grandfather clause or an opportunity to divest, then the program may be perceived as less fair and equitable if those who made investments despite the notice are rewarded for those investments. Additionally, when policy makers disregard the advance notice they have provided (e.g., allocations are provided based on activities occurring after announced control dates), the probability increases that future announcements will be less effective in minimizing disruption.

While control dates can contribute to a sense of fairness, a major purpose is to reduce disruption. This reduction occurs through two mechanisms. First, it discourages speculative activities that may have adverse effects on the fishery during deliberations on rationalization programs (discourages "fishing for quota"). Second, if those speculative activities have been minimized by the control date, there is less disruption during implementation (assuming that the policy adheres to the control date). To maintain the ability to announce control dates that are effective in their intent, the resulting policy must generally adhere to the control date. Failure to do so will result in disregard for future control dates. Maintaining the ability to credibly announce control dates is important for controlling the speculation that can have

disruptive effects, both during policy deliberations and when the management system changes as a result of those deliberations.

On November 6, 2003, the Council took action to adopt a control date for the trawl rationalization program. The November 6, 2003, control date was published in the *Federal Register* on January 9, 2004, and the public was put on notice that a trawl rationalization system that could alter their future opportunities in the fishery was under development. One point of discussion around the issue of a cutoff date for the acquisition of additional permits and need for a grandfather clause on accumulation limits is whether the November 6, 2003, control date covers activities such as the acquisition of additional permits. The control date notice stated that "The control date for the trawl IQ program is intended to discourage increased fishing effort in the LE trawl fishery based on economic speculation while the Pacific Council develops and considers a trawl IQ program." There are many ways an individual can increase fishing effort, including more intense use of existing permits and vessels, or aggregation and use of additional permits and vessels. The notice further states that "The control date announces to the public that the Pacific Council may decide not to count activities occurring after the control date toward determining a person's qualification for an initial allocation or determining the amount of initial allocation of QSs." Use of the general term "activities" indicates that the scope of the notice goes beyond fishing activities such that it discourages any activity that might potentially entitle an individual to a greater allocation. Therefore, strictly interpreted, the control date could be applied the acquisition of additional permits. However, in terms of the interpretation applied by the general public, the Council found there was substantial room for alternative views. Therefore, the Council chose to use as a cutoff date a point at which there was little doubt that a grandfather clause would not be provided for QS control limits (the date on which it adopted its final recommendations in this regard).

There has been change in ownership of permits since the November 6, 2003, control date was set. The main data set used in this analysis is based on records held by NMFS on permit ownership as it stood in the fall of 2006 and an examination of state data on the identity of buyers associated with fish ticket records. To evaluate how ownership of permits has changed since the control date, we examined NMFS data on LEP ownership changes, comparing permit ownership information from the start of 2004 with the fall of 2006, the start of 2008, the Council's cutoff date for permit acquisition (November 30, 2008, for registration of the transfer with NMFS), and the most recent date available for this analysis (June 22, 2009). Our assessment of ownership and ownership changes is based on an examination of name and address changes on permit records in consultation with agency personnel and members of industry. We lack information on control other than ownership or on changes in ownership that may not be reflected in the NMFS data set. We were unable to evaluate changes in ownership of processors over that period. From the start of 2004 through the November 30 2006, there were 26 entities that acquired permits, and 45 entities that divested themselves of permits (Table A-90). Most of the divestitures and acquisitions occurred between the start of 2004 and the fall of 2006. After the November 30, 2008, date and through June 22, 2009, three entities divested themselves of permits, and these permits were acquired by two entities. In neither case did the additional permit acquisitions put the entity over the aggregate nonwhiting control limit of 3.2 percent. After the fall of 2006, only one entity acquired additional permits that put it further over the aggregated nonwhiting accumulation limit. However, these conclusions are limited by the limited ownership data available for the analysis. More complete ownership and control information would be collected during program implementation and the Council could review ownership relationships and impacts that we were not able to detect.

Table A-92. Shoreside aggregate nonwhiting QS allocations to business entities acquiring or divesting permits between January 1, 2004, and June 22, 2009 (QS allocations based on a 90 percent allocation to permits, combined shoreside sector, equal sharing of buyback portion).

	Permit Ownership Dates					Change in Permit Ownership							
						2004 to 2006		2006 to 1/1/2008		1/1/2008 to 11/30/2008		11/30/2008 to 6/22/2009	
BUSID	Jan 1, 2004	Fall 2006	Jan 1, 2008	Nov 30, 2008	June 22, 2009	Gain	Loss	Gain	Loss	Gain	Loss	Gain	Loss
B0150	1.32%	4.94%	4.94%	4.94%	4.94%	Y							
B0019	0.66%	0.90%	0.90%	0.90%	0.90%	Y							
B0094	0.65%	1.23%	0.65%	0.65%	0.65%	Y			Y				
B0061	0.50%	0.54%	0.54%	0.54%	0.54%	Y							
B0048	0.47%	0.87%	0.87%	0.87%	0.87%	Y							
B0040	0.44%	0.68%	0.68%	0.68%	0.68%	Y							
B0002	-	3.53%	4.03%	6.95%	6.95%	Y		Y		Y			
B0050	-	1.30%	1.54%	1.54%	1.54%	Y		Y					
B0013	-	1.03%	1.03%	1.03%	1.66%	Y						Y	
B0095	-	0.90%	0.90%	0.90%	0.90%	Y							
B0111	-	0.80%	0.80%	0.80%	0.80%	Y							
B0025	-	0.79%	0.79%	0.79%	0.79%	Y							
B0071	-	0.77%	0.77%	0.77%	0.77%	Y							
B0072	-	0.65%	0.65%	0.65%	0.65%	Y							
B0047	-	0.57%	0.57%	0.57%	0.57%	Y							
B0069	-	0.40%	0.40%	0.40%	0.40%	Y							
B0124	-	0.28%	0.28%	0.28%	0.28%	Y							
B0112	-	0.28%	0.28%	0.28%	0.28%	Y							
B0070	-	0.24%	0.24%	0.24%	0.24%	Y							
B0270	-	0.24%	0.24%	0.24%	0.24%	Y							
B0125	-	0.23%	-	-	-	Y			Y				
B0526	-	-	1.26%	1.26%	1.26%			Y					
B0531	-	-	0.58%	0.58%	0.58%			Y					
B0541	-	-	-	0.67%	0.67%					Y			
B0542	-	-	-	0.38%	0.38%					Y			
B0540	-	-	-	0.25%	0.25%					Y			
B0180	0.61%	0.61%	0.61%	-	0.50%						Y	Y	
B0011	1.26%	1.26%	-	-	-				Y				
B0032	0.50%	0.50%	-	-	-				Y				
B0077	1.15%	1.15%	1.15%	-	-						Y		
B0098	0.83%	0.83%	0.83%	-	-						Y		
B0107	0.67%	0.67%	0.67%	-	-						Y		
B0116	0.38%	0.38%	0.38%	-	-						Y		
B0130	0.33%	0.33%	0.33%	-	-						Y		
B0041	0.25%	0.25%	0.25%	-	-						Y		
B0085	0.63%	0.63%	0.63%	0.63%	-								Y
B0087	0.25%	0.25%	0.25%	0.25%	-								Y
B0065	0.25%	0.25%	0.25%	0.25%	-								Y
QS for 36 entities departing after Jan 1, 2004 (not listed above)	17.12%	-	-	-	-	-	-	-	-	-	-	-	-
QS changing hands compared to previous period		17.12%	2.58%	4.22%	1.13%								
Number of entities acquiring permits	-	21	4	4	2								
Number of entities divesting permits	-	36	4	7	3								

♦ *Program Performance*

Much of the overall performance of the program relies on the transfer of QS from less efficient to more efficient producers and from those with higher bycatch rates to those with lower bycatch rates. If there is a grandfather clause, firms that are grandfathered in at higher accumulation limits will be less likely to sell their QS than others because they will not be able to buy back any QS they sell, as long as they are above the limit. Further, these firms are less likely to change ownership because the grandfather clause will expire with change in ownership, and advantages of the grandfathered levels of QS will be lost. Therefore, it would be difficult to find buyers willing to purchase the firm for an amount that fully compensates the grandfathered owners for what they can earn if they maintain ownership of the firms. The absence of a grandfather clause would eliminate these impediments to the transfers needed for a rationalization program to succeed, with respect to both its efficiency effects and reduction of bycatch rates for overfished species. The divestiture provision may forestall some transfers for a few years (no transfers would be allowed in years one and two, and all divestitures would have to be completed by the end of year four).

♦ *Net Economic Benefits*

In the PPA, control limits applied to both QS and QP such that the control limit grandfather provision had the potential to affect the size of harvesting operations and, therefore, efficiency. In the Council final preferred alternative, the control limit applies only to QS. Therefore, the question of whether there should be a grandfather provision does not affect the size of the harvest operation (size of harvest operation is affected by the vessel limits, and the vessel limits were set to accommodate recent harvest levels). The absence of a grandfather clause will encourage the transfer of QS to the most efficient producer. The delay in those transfers that results from the divestiture provision might delay some of the expected efficiency benefits; however, the delay would be short relative to the duration of the program.

● Percentages for Limits

♦ *Vessel Percentage Limits*

The following are the categories of goals and objectives affected by the decision on the level at which vessel accumulation limits are set and the section in which each are addressed.

Section	Related Category of Goals and Objectives										
	Conservation	Net Benefits	Disruption	Excessive Shares	Fairness and Equity	Harvester and Processor Sector Health	Labor	Communities	Small Entities and New Entrants	General Public	Program Performance
Initial Endowments (Allocations Compared to Vessel Limits)			X	X	X	X					
Structure of the Fleet (Vessel limit effect on historic fleet structure)		X	X			X					
Efficiency		X				X					

The vessel percentage limits will determine the minimum size to which the fleet may shrink while still taking all of the groundfish and will cap the degree to which vessel efficiency may increase (assuming efficiency consistently increases with the amount a vessel can harvest). Because the regulatory focus of concern here is the vessel, this section concentrates on the permits and vessels rather than the firms owning them or the processors. Effects of the allocation on firms, including processors, are addressed in the following section on control limits. The rationale for using vessel limits is discussed above in the section on vessel limits. Here the focus is on the actual percentages chosen for those limits.

INITIAL ENDOWMENTS (ALLOCATIONS COMPARED TO VESSEL LIMITS)

Vessel limits will not constrain initial QS allocations or constrain the acquisition of QS. QS holdings are constrained by the QS control limits. However, there is some relationship between the per permit initial allocations of QS and the historic production levels of vessels operating under the permit, particularly for those permits with greater production history. Therefore, a comparison of the initial QS allocations per permit to the vessel limits provides a sense of the degree to which the vessel limits might constrain a permits historic share of harvest. If QS allocations exceed the vessel limits, the impact of the vessel limits would depend on whether there is a grandfather clause for QS control limits and vessel limits. Such a clause would allow permit owners receiving QS in excess of those limits to use their QS on a single vessel. If there were a grandfather clause, the main issue would be whether there is a perception of inequity because some permits/vessels are able to operate at higher levels of production and efficiency than others. If there were no grandfather clause, the issues would be whether there are inequity, disruption, and reduced efficiency because of the reduced opportunity for permits/vessels that have a history of making greater amounts of deliveries.

In its final preferred alternative, the Council did not provide a grandfather clause for either the vessel QP limits or QS control limits. However, vessel limits were set higher than control limits and higher than the unconstrained initial allocations (allocations without QS control limits applied). Table A-91 shows that, under the FPA, there would be a potential initial allocation that is greater than the vessel limit for only one non-overfished species (starry flounder). With respect to overfished species, there would be an initial allocation of cowcod in excess of the vessel limit; however, the allocation would be only slightly over the limit and only because the vessel limits would be rounded to the nearest tenth of a percent. There were some combinations of QS allocation and vessel limit options considered during the

process for which there could have been more initial QS allocations in excess of the vessel limits. For example, with permit holders allocated 100 percent of the QS using an allocation formula based entirely on landings history (with no equal allocation component) and using the most constraining vessel limits (Option 1), for 18 of 37 potential IFQ management units, some permits would have been eligible for more QS than the most restrictive accumulation limits (Option 1 in Table A-92). In many of these cases, however, the QS allocations in excess of vessel limits would be for management units that the Council exempted from the scope of IFQ program as part of its final preferred alternative, or for overfished species, for which a different allocation formula was used in the final preferred alternative. Under the 100 percent to permit owner option and Option 1 vessel limits, initial allocations would have exceeded vessel limits for only six IFQ management units that are within the scope of the program and are not overfished.

Table A-93. Combined (whiting and nonwhiting) QS allocations to permits based on Council's final preferred alternative (FPA* June 2009).

	# Permits Receiving QS***	MAX QS Alloc.	Vessel Limit	Number of Entities Over the Limit	Total QS Over the Limit	Limit - Max QS Allocation
Nonwhiting Groundfish Species	169	1.55%	3.2%	-	-	1.65%
Lingcod - coast wide	169	2.08%	3.2%	-	-	1.12%
Pacific Cod	169	9.02%	20.0%	-	-	10.98%
Pacific whiting (shoreside)	169	3.73%	15.0%	-	-	11.27%
Pacific whiting (mothership)	30	9.89%	0.3	-	-	20.11%
Sablefish	169	2.23%	-	-	-	-
N. of 36° (Monterey north)	169	1.24%	4.5%	-	-	3.26%
S. of 36° (Conception area)	169	13.50%	15.0%	-	-	1.50%
PACIFIC OCEAN PERCH	169	2.80%	6.0%	-	-	3.20%
WIDOW ROCKFISH **	169	1.86%	8.5%	-	-	6.64%
CANARY ROCKFISH	169	1.91%	10.0%	-	-	8.09%
Chilipepper Rockfish	169	8.60%	15.0%	-	-	6.40%
BOCACCIO	73	13.22%	15.4%	-	-	2.18%
Splitnose Rockfish	169	8.26%	15.0%	-	-	6.74%
Yellowtail Rockfish	169	3.07%	7.5%	-	-	4.43%
Shortspine Thornyhead	169	1.63%	-	-	-	-
N. of 34°27'	169	1.68%	9.0%	-	-	7.32%
S. of 34°27'	169	2.99%	9.0%	-	-	6.01%
Longspine Thornyhead	169	1.13%	-	-	-	-
N. of 34°27'	169	1.13%	9.0%	-	-	7.87%
COWCOD	73	17.71%	17.7%	1	0.01%	-
DARKBLOTCHED	169	1.71%	6.8%	-	-	5.09%
YELLOWEYE	162	4.67%	11.4%	-	-	6.73%
Minor Rockfish North	-	-	-	-	-	-
Shelf Species	169	2.29%	7.5%	-	-	5.21%
Slope Species	169	2.13%	7.5%	-	-	5.37%
Minor Rockfish South	-	-	-	-	-	-
Shelf Species	169	6.72%	13.5%	-	-	6.78%
Slope Species	169	5.80%	9.0%	-	-	3.20%
Dover sole	169	1.14%	3.9%	-	-	2.76%
English Sole	169	3.13%	7.5%	-	-	4.37%
Petrale Sole	169	1.55%	4.5%	-	-	2.95%
Arrowtooth Flounder	169	5.61%	20.0%	-	-	14.39%
Starry Flounder	169	27.44%	20.0%	1	7.44%	-
Other Flatfish	169	8.26%	15.0%	-	-	6.74%
Other Fish	169	3.39%	7.5%	-	-	4.11%
Pacific Halibut	169	5.44%	0.144	-	-	8.96%

* Under the FPA, 90 percent of the QS goes to permits.
**If widow rockfish is rebuilt before initial allocation of QS, the vessel limit will be set at limit will be 1.5 times the control limit.
***At the time the data set for the analysis was developed, there were 169 permits (fall of 2006). By 2009, the number of trawl permits declined to 167.

Table A-94. Number of permits and amounts of QS allocated to permits in excess of vessel limits (100 percent allocation to permits, no equal sharing, with grandfather clause).

	# Permits Receiving QS	MAX QS Alloc.	---------Vessel Limit Option 1----------			---------- Vessel Limit Option 2----------		
			Limit	Number of Permits Over the Limit	Total QS Allocated to Permits Over the Limit	Limit	Number of Permits Over the Limit	Total QS Allocated to Permits Over the Limit
Aggregate Nonwhiting Groundfish (Nonwhiting Grndfsh)	163	2.5%	3.0%	0	0.0%	4.4%	0	0.0%
Lingcod Coast wide	155	3.5%	10.0%	0	0.0%	15.0%	0	0.0%
Pacific Cod	109	20.4%	10.0%	2	31.4%	15.0%	1	20.4%
Pwhiting (bycatch)	73	14.7%	7.5%	3	32.2%	11.3%	1	14.7%
Sablefish Coast								
Sablefish North	152	2.1%	6.2%	0	0.0%	9.3%	0	0.0%
Sablefish South	31	23.4%	6.2%	6	78.6%	9.3%	4	63.6%
Pac Ocean Perch	126	5.0%	6.2%	0	0.0%	9.3%	0	0.0%
Shortbelly	120	35.5%	6.2%	2	43.3%	9.3%	1	35.5%
Widow	157	8.1%	6.8%	1	8.1%	10.2%	0	0.0%
Canary	156	4.7%	10.0%	0	0.0%	15.0%	0	0.0%
Chilipepper	87	11.8%	10.0%	2	22.2%	15.0%	0	0.0%
Bocaccio	73	15.1%	10.0%	1	15.1%	15.0%	1	15.1%
Splitnose	77	12.0%	10.0%	1	12.0%	15.0%	0	0.0%
Yellowtail	130	6.2%	10.0%	0	0.0%	15.0%	0	0.0%
Shortspine Coast	149							
Shortspine No.	127	3.2%	9.6%	0	0.0%	14.4%	0	0.0%
Shortspine So.	101	4.7%	9.4%	0	0.0%	14.1%	0	0.0%
Longspine Coast	148							
Longspine No.	148	1.8%	4.0%	0	0.0%	6.0%	0	0.0%
Longspine So.	1	100.0%	10.0%	1	100.0%	15.0%	1	100.0%
Cowcod	1	100.0%	10.0%	1	100.0%	15.0%	1	100.0%
Darkblotched	153	7.9%	10.0%	0	0.0%	15.0%	0	0.0%
Yelloweye	145	8.9%	10.0%	0	0.0%	15.0%	0	0.0%
Black RF Coast	80							
Black RF WA	19	40.3%	10.0%	2	78.0%	15.0%	2	78.0%
Black RF OR-CA	71	16.7%	10.0%	1	16.7%	15.0%	1	16.7%
Minor RckFsh No.	153							
Nearshore	50	30.8%	10.0%	1	30.8%	15.0%	1	30.8%
Shelf	153	4.4%	8.0%	0	0.0%	12.0%	0	0.0%
Slope	128	3.8%	10.0%	0	0.0%	15.0%	0	0.0%
Minor RckFsh So.	111							
Nearshore	52	15.0%	10.0%	4	47.5%	15.0%	1	15.0%
Shelf	104	9.8%	10.0%	0	0.0%	15.0%	0	0.0%
Slope	104	9.4%	10.0%	0	0.0%	15.0%	0	0.0%
CA Scorpionfsh	2	67.3%	10.0%	2	100.0%	15.0%	2	100.0%
Cabezon CA	2	62.0%	10.0%	2	100.0%	15.0%	2	100.0%
Dover Sole	155	1.8%	3.6%	0	0.0%	5.4%	0	0.0%
English Sole	154	5.4%	20.0%	0	0.0%	30.0%	0	0.0%
Petrale	156	2.8%	5.8%	0	0.0%	8.7%	0	0.0%
Arrowtooth	129	13.0%	10.0%	2	24.0%	15.0%	0	0.0%
Starry Flounder	72	34.6%	10.0%	1	34.6%	15.0%	1	34.6%
Other Flatfish	156	13.5%	20.0%	0	0.0%	30.0%	0	0.0%
Other Grndfsh	136	6.2%	10.0%	0	0.0%	15.0%	0	0.0%

* Gray rows indicate management units not included in the scope of the final preferred alternative.
Rows with a single gray cell indicate an overfished species. In this table, a history-based approach was used for calculating the allocation of overfished species. In the Council's final preferred alternative, an approach was used that applied bycatch rates and logbook information to initial allocations of target species.

STRUCTURE OF THE FLEET (VESSEL LIMIT EFFECT ON HISTORIC FLEET STRUCTURE)

This section addresses how the vessel limits will affect the structure of the harvesting and processing sectors. Specific questions include the following:

- What levels of concentration of harvest on vessels have we experienced recently and in the past?
- What size of fleet has been active in the fishery?
- How do the vessel accumulation limits compare to those levels of concentration and will they allow consolidation or constrain the fleet as compared to the past?

There are a number of ways to look at recent past and historic data. One way is to look at permit/vessel recent and historic shares of annual harvest to determine whether a particular vessel limit option will allow lesser, similar, or greater levels of concentration as compared to that of the past. Comparison to permit shares is most relevant to the proportional sharing of harvest within the fleet, distribution, and equity issues.

Per-vessel recent and historic shares are evaluated in two ways. One approach is that taken by the GAP, in which each permit's catch was compared to its share of the fleet allocation (Table A-84 and right-hand column of Table A-93). If, under an IFQ program, the fleet is able to more fully harvest its allocation (or individual vessels are able to take the entire amount of QP allowed under the vessel limit), then comparison of the vessel limits to recent and historic maximum individual vessel shares of the trawl allocation in recent years may best reflect the impact of the vessel limits. Under such circumstances, the vessel limits would be less than the maximum share of the trawl allocation take by a vessel from 2004 to 2006 (evaluated annually) only for sablefish south, minor slope rockfish south, Dover sole, and Petrale sole (comparing the last column of Table A-93 to the final preferred alternative vessel limits). Thus for most species, the vessel limits would not constrain vessel operations, again assuming overfished species can be avoided as markets develop.

An alternative look compares the permit shares to actual landings for two periods: 1994 to 2003 and 2004 to 2006 (Table A-93). While this approach may not reflect the actual opportunities that may be present under the trawl rationalization program, it allows us to evaluate the vessel limits against the shares of harvest that vessels were taking during the allocation period 1994 to 2003 (for which it is difficult to determine what the trawl allocations might have been). Additionally, to the degree that the vessel limits are not constraining in comparison to vessel share of landings, they would be even less constraining when considered in comparison to vessel share of the trawl allocation, since a vessel's share of fleet landings will be greater than the share of the trawl allocation if the allocation is not fully harvested. Therefore, the share of landings comparison provides an upper bound for the degree of constraint that vessel limits might impose, in comparison to vessel harvest shares for recent and historic periods. In Table A-93, values are provided for the maximum share of landings achieved by any single vessel in a year during the period and for the 90th percentile vessel (i.e., values exceeded by only 10 percent of the fleet). An accumulation limit set at the 90th percentile would accommodate past landing shares of 90 percent of the fleet but not the top 10 percent. The maximum share of nonwhiting species landings taken by any one vessel in any single year from 1994 to 2003 or 2004 to 2006 was 4.9 percent. The aggregate nonwhiting vessel accumulation limits under Options 1, 2, and the final preferred alternative are 3 percent, 4.4 percent, and 3.2 percent, respectively. There was a third accumulation limit (not shown in this table) for which the vessel limit would have been 6 percent (Table A-83). Thus, only under Option 3, would vessels be able to achieve that maximum share of landings reflected in this table. On the other hand, 90 percent of the vessels did not take more than 1.5 percent of the total landings, and such levels of performance would be more than accommodated by Option 1 and the Council final preferred alternative. Additionally, the maximum vessel landings as a

share of the allocation was only 1.8 percent, a value more than accommodated by the most restrictive vessel limit (Option 1). Looking at the results for single species, and taking northern sablefish as an example, the proposed vessel accumulation limits are 4 percent, 6 percent, and 4.5 percent. The maximum share achieved by any vessel from 1994 to 2003 was 2.4 percent, and the maximum for 2004 to 2006 was 5.7 percent. Thus, if Option 2 were selected, with respect to sablefish, the fleet could rationalize to the point where every vessel had slightly more than the maximum share achieved by any one vessel from 1994 to 2003. The Council's final preferred alternative is for a 4.5 percent limit. While less than the 2004 to 2006 5.7 percent maximum, it is well above the 1.5 percent that would accommodate 90 percent of the fleet and also above the 2004 to 2006 maximum share (4.3 percent) as evaluated against the trawl allocations.

For both these approaches (the comparison to trawl allocation and comparison to landings), vessel landings are evaluated rather than vessel catch. Information is not available on individual vessel catch. To the degree that vessel catches exceed reported landings, the share of the trawl allocation required to support historic landings will be greater than indicated in these tables.

Another way to evaluate the accumulation limits would be to determine whether they would allow lesser, similar, or greater poundage of harvest as compared to the past (Table A-94). Where the previous comparisons are relevant to distribution and equity issues, this comparison may be more relevant to the efficiency that individual harvest operations will be able to attain under the trawl rationalization program as compared to the past. For the individual harvesters, the pounds of fish they can catch relate more to their costs and earnings than their share of harvest. This becomes rapidly apparent if we consider, for example, northern slope rockfish. The same maximum share of landings from the mid-1990s applied to northern slope rockfish OY for 2010 would yield one third less harvest. For most of the important target species that are not under rebuilding plans, the vessel limits of the Council's final preferred alternative would allow vessels to catch volumes of fish equal to or exceeding the amounts taken by the single largest annual production by any vessel in any year from 1994 to 2003. For those non-overfished species for which the historic maximum cannot be reached (lingcod, whiting, splitnose, northern and southern shelf and slope rockfish) the 90th percentile harvest levels can be reached. These results seem to indicate that the levels of harvest allowed by the Council's final preferred alternative for vessel limits have a reasonable chance of allowing vessels to increase their annual harvest to levels that match or exceed levels taken when the fleet was believed to be in better economic health. The overfished species could constrain this result until they are rebuilt. In terms of current target species, the primary exception with respect to the opportunity to achieve past harvest levels might be for directed vessels whiting. However, for the shoreside vessels, the vessel limit would allow a vessel to come within 1 percent of the maximum annual landings observed for any one vessel from 1994 to 2003. For the mothership fishery (which will be managed under a co-op system), the vessel limit would allow a vessel to come within 5 percent of the maximum observed from for any one vessel 1994 to 2003. Overall, the vessel limits appear to provide good prospects for increased efficiency and economic health of the trawl fishery.

The number of vessels catching each species/species group also suggests a minimum vessel accumulation limit that might be set if one wanted to ensure that the fishery could accommodate as much consolidation as there has been in the past. For example, if the minimum number of vessels participating in a segment of the fishery in the past is 20 (catching a particular species), an accumulation limit of 2 percent would require that 30 more vessels participate than in the past in order to take the entire available catch (a 2 percent limit requires that at least 50 vessels take part if the entire trawl allocation is to be harvested). Table A-95 provides the accumulation limit options, the minimum limit required to accommodate the minimum number of vessels catching each species in 2004 to 2006, the minimum fleets implied by the vessel accumulation limit options, and the minimum annual number of vessels taking each species for two past periods (1994 to 2003 and 2004 to 2006). There is only one

species for which the vessel limits may force more vessels into the fishery than have participated in recent years, if the full allocation is to be taken (sablefish south). There are a number of species that appear to be taken broadly in the fishery, but for which the vessel limits could allow substantial consolidations (e.g., Pacific cod, northern slope rockfish, and English sole).

Summary

For most species, the Council's final preferred alternative vessel limits would accommodate recent permit/vessel shares of landings and shares of the trawl allocation.

For most species, the maximum poundage landed by a permit in a single year from 1994 to 2003 could be achieved under 2010 OYs and the Council's final preferred alternative for vessel limits. The most important exceptions would be overfished species and target species for which harvest has been dramatically reduced to protect overfished species, including shelf and slope rockfish.

For some species that are broadly taken by many vessels, it appears that the vessel limits would allow levels of consolidation that would leave less than 20 percent of the vessels as compared to recent periods.

In general, it appears that the final preferred alternative vessel limits would provide substantial opportunity for vessels to improve their efficiency and economic performance as compared to levels from the 1990s, if they can develop markets and avoid overfished species.

- The vessel limit for sablefish south is such that the fleet could have to expand to fully take the allocation.

Table A-95. Comparison of vessel limits to vessel share of actual history (maximums and 90th percentile history for the indicated periods [values in gray cells are greater than the Council's final preferred alternative]).

Stock	Vessel Limits (%)			Annual Percent of Total Landings				Max Annual Share of Trawl Fleet Allocation '04-'06
				1994-2003		2004-2006		
	Option 1	Option 2	FPA	90th Percent	Max	90th Percent	Max	
All nonwhiting groundfish (in aggregate)	3	4.4	3.2	1	4.1	1.5	4.9	1.8
Lingcod - coast wide c/	10	15	3.2	1.8	9	2.2	3.7	1.1
Pacific Cod	10	15	20	6.4	22.7	6	21.1	7.2
Pacific Whiting								
Shoreside Sector	15	22.5	15	8.1	9.1	6.2	7.3	6.9
Mothership Sector	25	37.5	30	11.3	18.5	16.4	28.9	
Catcher Processors	65	70		37.3	49.5	31.1	49.4	
All Whiting Sectors Combined	25	37.5						
Sablefish (Coast wide)								
N. of 36° N (Monterey north)	4	6	4.5	1	2.4	1.5	5.7	4.3
S. of 36° N (Conception area)	10	15	15	24	38.4	43.5	60.3	22
PACIFIC OCEAN PERCH	10	15	6	2.7	7.3	3.7	10.1	3.1
WIDOW ROCKFISH	6.8	10.2	8.5	4.5	28.7	6	31.9	6.7
CANARY ROCKFISH	10	15	10	3.5	12.6	3.8	45.7	0
Chilipepper Rockfish	10	15	15	6.2	46.8	14.9	26.5	0.5
BOCACCIO	10	15	15.4	60	78.9	36.8	53.4	0
Splitnose Rockfish	10	15	15	5.7	19.9	12.1	26.9	8.5
Yellowtail Rockfish	10	15	7.5	2.8	9.9	5.2	11.5	0.7
Shortspine Thornyhead - coast wide								
Shortspine Thornyhead - N. of 34°27' N	9.6	14.4	9	1.3	5	2.2	8.7	4
Shortspine Thornyhead - S. of 34°27' N	9.4	14.1	9	4.2	7	8.8	16	0
Longspine Thornyhead - coast wide								
Longspine Thornyhead - N. of 34°27' N	4	6	9	1.4	2	2.2	8.7	2
COWCOD - Conception and Monterey	10	15	17.7	100	100	0	0	0
DARKBLOTCHED	10	15	6.8	2	15.8	3.1	5.6	3.7
YELLOWEYE g/	10	15	11.4	9.4	35.8	13.7	35.5	0
Minor Rockfish North								
Shelf Species	8	12	7.5	2.9	30.6	2.2	49.1	3.1
Slope Species	10	15	7.5	2	11.9	3	15.7	3.5
Minor Rockfish South								
Shelf Species	10	15	13.5	6.1	46.6	13.1	30.9	1.7
Slope Species	10	15	9	5.8	24.8	12.2	21.7	12.1
Dover Sole	3.6	5.4	3.9	1.1	2	1.6	5.6	*5.7
English Sole	20	30	7.5	1.5	13.9	2.6	7.7	2.3
Petrale Sole (coast wide) c/	5.8	8.7	4.5	1.4	6.2	2.3	8	5.9
Arrowtooth Flounder	10	15	20	1.9	25.5	3.2	19.1	8.3
Starry Flounder	10	15	20	13.2	65.7	5.5	54.5	8.3
Other Flatfish	20	30	15	1.3	16.4	2	8.1	1.6
Pacific Halibut (IBQ)			14.4	N/A	N/A	N/A	N/A	1.5

* Greater than maximum share of 2004-2006 landings because the trawl allocation of Dover was exceeded in one year.
N/A = not applicable (all Pacific halibut are discarded)

Table A-96. 90th percentile and maximum pounds per vessel landed in historic period (1994 to 2003) compared with vessel limit options, and translated into shares of average fleet harvest for the more recent period 2004 to 2006.

	Vessel Limits (lbs)		Annual Pounds and Percent of Total Landings			
			1994-2003 (lbs)		1994-2003 Pounds as a % of 2004-2006 Fleet Landings	
Stock	FPA (%)	FPA (lbs based on 2010)	90th Percentile	Max	90th Percentile	Max
All nonwhiting groundfish (in aggregate)	3.2	4,449,253	1,045,368	2,500,536	2.5	5.9
Lingcod - coast wide c/	3.2	144,063	31,057	203,593	15.5	101.6
Pacific Cod	20.0	480,285	115,342	287,803	7.2	18
Pacific Whiting						
Shoreside Sector	15.0	13,909,940	12,145,550	14,042,043	5.7	6.6
Mothership Sector	30.0	15,897,074	8,197,176	16,683,203	8.7	17.7
Catcher Processors			40,313,940	62,729,980	23.8	37
All Whiting Sectors Combined						
Sablefish (Coast wide)						
N. of 36° N (Monterey north)	4.5	300,124	74,566	180,128	1.4	3.3
S. of 36° N (Conception area)	15.0	174,211	49,226	63,959	45.2	58.7
PACIFIC OCEAN PERCH	6.0	23,951	35,725	117,139	19	62.3
WIDOW ROCKFISH	8.5	78,664	247,904	473,554	188.6	360.3
CANARY ROCKFISH	10.0	5,093	29,969	130,574	149.7	652
Chilipepper Rockfish	15.0	602,787	120,083	595,649	174.9	867.4
BOCACCIO	15.4	4,176	40,252	224,802	517	>1,000
Splitnose Rockfish	15.0	144,513	135,035	287,617	51.7	110.1
Yellowtail Rockfish	7.5	563,730	154,382	498,907	34.6	111.9
Shortspine Thornyhead - coast wide						
Shortspine Thornyhead - N. of 34°27' N	9.0	294,441	65,613	245,689	7.2	26.9
Shortspine Thornyhead - S. of 34°27' N	9.0	9,921	58,929	97,906	16.3	27.1
Longspine Thornyhead - coast wide						
Longspine Thornyhead - N. of 34°27' N	9.0	404,504	65,613	245,689	7.2	26.9
COWCOD - Conception and Monterey	17.7	507	19	19		
DARKBLOTCHED	6.8	39,931	26,849	250,799	10.1	94.2
YELLOWEYE g/	11.4	151	4,914	28,578	588.5	>1,000
Minor Rockfish North						
Shelf Species	7.5	110,948	38,680	178,331	55.1	254.1
Slope Species	7.5	150,297	33,529	261,950	11.4	89
Minor Rockfish South						
Shelf Species	13.5	28,813	20,815	83,556	226.7	909.9
Slope Species	9.0	78,251	49,159	285,834	15	87
Dover Sole	3.9	1,312,085	226,860	439,098	1.5	3
English Sole	7.5	1,486,052	36,117	339,187	1.9	17.4
Petrale Sole (coast wide) c/	4.5	215,484	57,251	195,683	1.1	3.7
Arrowtooth Flounder	20.0	4,157,781	181,499	1,432,863	3.9	30.8
Starry Flounder	20.0	233,447	11,631	58,510	8	40.2
Other Flatfish	15.0	1,415,159	69,572	548,878	2.7	21.5

Table A-97. The minimum number of vessels required to take the full allocation as determined by the vessel accumulation limits and the minimum number of vessels that have landed in any one year in the past (by species).

Stock	Vessel Limits (%)			Minimum Number of Vessels Under Vessel Limits			Minimum Annual Number of Vessels	
	Option 1	Option 2	FPA	Option 1	Option 2	FPA	'94-'03	'04-'06
All nonwhiting groundfish (in aggregate)	3	4.4	3.2	33	23	31	206	131
Lingcod - coast wide c/	10	15	3.2	10	7	31	142	105
Pacific Cod	10	15	20	10	7	5	71	57
Pacific Whiting			0					
Shoreside Sector	15	22.5	15	7	4	7	42	30
Mothership Sector	25	37.5	30	4	3	3	11	10
Catcher Processors	65	70	0	2	1		5	6
All Whiting Sectors Combined	25	37.5	0	4	3			
Sablefish (Coast wide)								
N. of 36° N (Monterey north)	4	6	4.5	25	17	22	191	121
S. of 36° N (Conception area)	10	15	15	10	7	7	12	6
PACIFIC OCEAN PERCH	10	15	6	10	7	17	129	83
WIDOW ROCKFISH	6.8	10.2	8.5	15	10	12	61	59
CANARY ROCKFISH	10	15	10	10	7	10	87	67
Chilipepper Rockfish	10	15	15	10	7	7	29	23
BOCACCIO	10	15	15.4	10	7	6	4	9
Splitnose Rockfish	10	15	15	10	7	7	50	23
Yellowtail Rockfish	10	15	7.5	10	7	13	94	72
Shortspine Thornyhead - coast wide								
Shortspine Thornyhead - N. of 34°27' N	9.6	14.4	9	10	7	11	141	90
Shortspine Thornyhead - S. of 34°27' N	9.4	14.1	9	11	7	11	50	27
Longspine Thornyhead - coast wide								
Longspine Thornyhead - N. of 34°27' N	4	6	9	25	17	11	167	100
COWCOD - Conception and Monterey	10	15	17.7	10	7	6	0	0
DARKBLOTCHED	10	15	6.8	10	7	15	171	104
YELLOWEYE g/	10	15	11.4	10	7	9	25	15
Minor Rockfish North								
Shelf Species	8	12	7.5	13	8	13	121	91
Slope Species	10	15	7.5	10	7	13	141	94
Minor Rockfish South								
Shelf Species	10	15	13.5	10	7	7	38	19
Slope Species	10	15	9	10	7	11	54	28
Dover Sole	3.6	5.4	3.9	28	19	26	190	123
English Sole	20	30	7.5	5	3	13	167	110
Petrale Sole (coast wide) c/	5.8	8.7	4.5	17	11	22	186	115
Arrowtooth Flounder	10	15	20	10	7	5	134	99
Starry Flounder	10	15	20	10	7	5	20	40
Other Flatfish	20	30	15	5	3	7	196	125

EFFICIENCY

This section addresses how the vessel accumulation limits will affect efficiency. For most of the objectives, we do not have the quantitative information needed to make exact predictions about how the objectives will be affected by the level at which accumulation limits are set, therefore, we rely on comparisons to historic experiences. However, we do have some general quantitative results indicating the effect of the accumulation limits on overall fleet efficiency. These will be discussed below.

A quantitative analysis by Lian et al. (2008) indicates an expectation that optimal size of the nonwhiting fleet under rationalization might be between 40 and 50 full-time vessels of approximately 60 to 70 feet in length. While it may be that the unconstrained fleet size will be larger if vessels choose to maintain multifishery strategies, aggregate accumulation limits in the range of 2.0 to 2.5 percent would be sufficient to allow a fleet of this size. Lian et al. also indicated that an aggregate accumulation limit of 1 percent would increase the minimum fleet size to 100 vessels, reduce benefits by about $3.8 million, and substantially increase the number of 50-foot vessels. Based on this model, it does not appear that the aggregate limits under consideration by the Council, even under Option 1, would necessarily constrain an efficient outcome.

♦ *Control Percentage Limits*

The following are the categories of goals and objectives affected by the decision on the level at which to set QS control limits and the section in which each is addressed.

Section	Related Category of Goals and Objectives										
	Conservation	Net Benefits	Disruption	Excessive Shares	Fairness and Equity	Harvester and Processor Sector Health	Labor	Communities	Small Entities and New Entrants	General Public	Program Performance
Initial Endowments (Allocations to Firms Compared to Control Accumulation Limits)			X	X	X						
Structure of the Harvesting Sector (QS Control Limit Relative to Past Harvest Levels)		X	X			X					

The control limits will determine the minimum number of firms that may control all the QS and cap the profit levels firms may achieve through QS ownership. Efficiency of firm level fishing operations may also be constrained to the degree that ownership of the QS provides efficiency advantages (see Appendix E for a discussion of possible efficiency benefits from vertical integration through QS ownership[125]).

[125] Summary of information on vertical integration from Appendix E: Under the IFQ program, in addition to other inputs, a harvester must also acquire QP each year to cover its catch. The QP becomes a new required input or "factor of production." QP is issued each year to QS holders. The harvester might be considered vertically integrated with respect to the QP if it owns the QS needed to meet its annual needs for QP. The

We evaluate control limit percentages from the perspective of how they affect the distribution of the initial endowments and the magnitude and degree of concentration as compared to our historical experience.

INITIAL ENDOWMENTS (ALLOCATIONS TO FIRMS COMPARED TO CONTROL ACCUMULATION LIMITS)

This section addresses how the control limits compare to the QS allocations to fishing businesses. It evaluates the specific levels at which the control limits will be set. As discussed in the general sections on QS control limits and cutoff dates (see pages A-340 and A-346), QS that would be issued to entities over the QS control limits would be treated as follows:

- Redistributed to those under the limits (if there is not a grandfather clause)
- Allocated to entities in excess of the limits; those entities will then be required to sell them within four years (if there is not a grandfather clause, but there is a divestiture provision).
- Allocated to entities in excess of the limits; those entities will then be entitled to retain them until they retire from QS ownership (if there is a grandfather clause)

Table A-96 shows the number of entities over the QS accumulation limits and the amounts of their overages under Option 1, Option 2, and the Council's final preferred alternative. In general, under the final preferred alternative, not more than three entities are over the limit for any one species or species group. For about two-thirds of the species, at least one entity is over the limit. Then number of entities directly affected by the control limits may be greater than three if different entities are affected by different individual species limits. The amount potentially available for reallocation, retention and sale, or retention until retirement is greater than 10 percent for many species groups with a southern distribution (sablefish south, bocaccio, shortspine south, cowcod, minor slope rockfish south). The only other species for which the total amount allocated in excess of limits could be more than 10 percent is starry flounder. The greatest amounts potentially available to be redistributed, retained and sold, or kept until retirement are sablefish south, bocaccio, and cowcod (more than 25 percent for each). For bocaccio and cowcod, the entire amount in excess of the control limits may go to a single entity. If these amounts are considered excessive, the control limits will reduce the initial allocation below excessive levels, either immediately or over time. To the degree that businesses have corresponding physical capital invested in harvesting at levels reflected by those initial allocation, the absence of a grandfather clause or requirement to divest may be somewhat disruptive. However, since the control limits do not apply to QP, those entities unable to retain the QS they would otherwise receive under the initial allocation will not be prevented from continuing to operate at their existing production levels by acquiring QP each year from the market.

On one hand, for large initial allocation in excess of limits, the program could be viewed as unfair if there is no grandfather clause to allow those who have acquired assets entitling them to the allocation to also acquire and hold or acquire and sell the initial allocation. On the other hand, others may view the program as unfair if entities are allowed to keep the QS in excess of the limits (if there is a grandfather clause). Table A-97 shows how the amount going to a single entity has varied since discussions of the trawl rationalization program began. For January 1, 2004 (two months after announcement of the November 6, 2003, control date), there was not more than one entity that held permits for any species or species group that would entitle it to QS in excess of the limits. Moreover, the amount by which any

harvester might also vertically integrate by acquiring a processing operation. Similarly, a processor might vertically integrate by acquiring QS or a harvesting operation. Vertical integration through ownership provides certainty about the price that will be paid for each year's QP, reducing the QS holder's price risk and increasing its ability to plan and maximize efficiency.

entity's initial allocations would exceed the limits was less than 1 percent, with the exceptions of sablefish south and starry flounder.

For whiting, the Council selected the lowest control limit it had under consideration (10 percent). In contrast to nonwhiting species the amount of QS going to any single entity, for shoreside whiting is not in excess of the whiting QS control limit and has not changed during the time the Council has been deliberating on the initial allocation (Table A-98).

The amounts by which individual allocations are over the limits would vary by the initial allocation formula. Table A-99 shows amounts of aggregate nonwhiting QS in excess of the initial allocation, as that amount varies depending on whether there is an equal allocation and on the amount of the initial allocation going to processors.

All data provided in this section are based on ownership information as best as it can be determined based on name and address records from the LEP Office. During program implementation, additional ownership information will be collected and may result in determination that existing levels of concentration are higher or lower than indicated here.

Table A-98. Combined (whiting and nonwhiting) shoreside entity-level QS and halibut IBQ allocations compared with the Council Final Preferred Control Limit Alternative and Control Limit Options 1 and 2 from the October 2008 EIS (based on November 30, 2008, permit ownership).

Species category	Number of Entities Receiving QS	Max QS (%)	FPA Control Limit Option (%)	Number of Entities Over the Limit	QS over the Limit (%)	Control Limit Option 1 (%)	Number of Entities Over the Limit	QS over the Limit (%)	Control Limit Option 2 (%)	Number of Entities Over the Limit	QS over the Limit (%)
All nonwhiting groundfish (in aggregate)	116	7.02%	2.70%	2	6.52%	1.50%	9	11.33%	2.20%	2	7.52%
Lingcod - coastwide	116	4.49%	2.50%	3	3.72%	5.00%	-	-	7.50%	-	-
Pacific Cod	116	10.23%	12.00%	-	-	5.00%	3	9.49%	7.50%	2	4.25%
Pacific Whiting (shoreside)	124	8.59%	10.00%	-	-	10.00%	-	-	15.00%	-	-
Pacific Whiting (mothership))	25	10.20%	20.00%	-	-	10.00%	1	0.20%	15.00%	-	-
Sablefish (Coastwide)											
N. of 36° N (Monterey north)	116	4.95%	3.00%	2	3.16%	2.00%	4	6.41%	3.00%	2	3.16%
S. of 36° N (Conception area)	116	34.70%	10.00%	2	32.81%	5.00%	2	42.81%	7.50%	2	37.81%
PACIFIC OCEAN PERCH	116	4.03%	4.00%	1	0.03%	5.00%	-	-	7.50%	-	-
WIDOW ROCKFISH	116	5.06%	5.10%	-	-	3.40%	1	1.66%	5.10%	-	-
CANARY ROCKFISH	116	3.83%	4.40%	-	-	5.00%	-	-	7.50%	-	-
Chilipepper Rockfish	116	11.08%	10.00%	1	1.08%	5.00%	6	17.91%	7.50%	4	6.01%
BOCACCIO	49	37.92%	13.20%	1	24.72%	5.00%	3	36.01%	7.50%	1	30.42%
Splitnose Rockfish	116	10.47%	10.00%	1	0.47%	5.00%	5	18.15%	7.50%	4	6.78%
Yellowtail Rockfish	116	5.76%	5.00%	1	0.76%	5.00%	1	0.76%	7.50%	-	-
Shortspine Thornyhead - coastwide											
Shortspine Thornyhead - N. of 34°27' N	116	7.69%	6.00%	1	1.69%	4.80%	1	2.89%	7.20%	1	0.49%
Shortspine Thornyhead - S. of 34°27' N	116	35.57%	6.00%	2	40.78%	4.70%	2	43.38%	7.10%	2	38.58%
Longspine Thornyhead - coastwide											
Longspine Thornyhead - N. of 34°27' N	116	6.55%	6.00%	1	0.55%	2.00%	5	8.88%	3.00%	4	4.81%
COWCOD - Conception and Monterey	49	43.69%	17.70%	1	25.99%	5.00%	5	45.65%	7.50%	2	36.26%
DARKBLOTCHED	116	4.48%	4.50%	-	-	5.00%	-	-	7.50%	-	-
YELLOWEYE	114	5.95%	5.70%	1	0.25%	5.00%	2	1.62%	7.50%	-	-
Minor Rockfish North											
Shelf Species	116	4.18%	5.00%	-	-	4.00%	1	0.18%	6.00%	-	-
Slope Species	116	3.65%	5.00%	-	-	5.00%	-	-	7.50%	-	-
Minor Rockfish South											
Shelf Species	116	11.25%	9.00%	1	2.25%	5.00%	4	11.60%	7.50%	1	3.75%
Slope Species	116	15.56%	6.00%	3	10.65%	5.00%	3	13.65%	7.50%	1	8.06%
Dover Sole	116	7.42%	2.60%	3	6.63%	1.80%	4	9.71%	2.70%	3	6.33%
English Sole	116	7.11%	5.00%	2	3.89%	10.00%	-	-	15.00%	-	-
Petrale Sole	116	5.87%	3.00%	3	4.71%	2.90%	3	5.01%	4.40%	2	1.51%
Arrowtooth Flounder	116	5.61%	10.00%	-	-	5.00%	2	0.73%	7.50%	-	-
Starry Flounder	116	27.44%	10.00%	1	17.44%	5.00%	4	26.89%	7.50%	1	19.94%
Other Flatfish	116	16.28%	10.00%	1	6.28%	10.00%	1	6.28%	15.00%	1	1.28%
Pacific halibut IBQ	116	5.44%	5.40%	1	0.04%	5.40%	1	0.04%	5.40%	1	0.04%

Initial allocations notes:
Non-whiting spp in non-whiting fishery (90% allocation to permits):
Non-OF spp: 1994-2003, relative lbs, drop 3 years, equal allocation of buyback permits' catch history.
OF spp: Alloc. based on finer area bycatch rates and 2003-2006 logbook target spp history (Average distribution was used in cases where logbook unavailable).
(Canary allocations include equal sharing component)
Whiting in shoreside fishery (80% allocation to permits, 20% to processors):
Permits: 1994-2003, relative lbs, drop 2 years, equal allocation of buyback permits' catch history.
Processors: 1998-2004 (at least 1 mt in any two years 1998-2004), relative lbs, drop 2 years.
Non-whiting in shoreside whiting fishery: allocated to permits in proportion to whiting QS, 90% allocation to permits.

Table A-99. Combined (whiting and nonwhiting) shoreside entity-level QS and halibut IBQ allocations under different permit ownership date scenarios based on Council Final Preferred Alternative (June 2009).

		January 1, 2004				"Fall 2006"				January 1, 2008				November 30, 2008				June 22, 2009			
Species category	FPA Control Limit	# Entities reveiving QS	Max QS	# Entities Over the Limit	QS over the Limit	# Entities reveiving QS	Max QS	# Entities Over the Limit	QS over the Limit	# Entities reveiving QS	Max QS	# Entities Over the Limit	QS over the Limit	# Entities reveiving QS	Max QS	# Entities Over the Limit	QS over the Limit	# Entities reveiving QS	Max QS	# Entities Over the Limit	QS over the Limit
All nonwhiting groundfish (in aggregate)	**2.70%**	142	2.16%	-	-	121	4.89%	2	3.11%	120	4.89%	2	3.61%	116	7.02%	2	6.52%	114	7.02%	2	6.52%
Lingcod - coastwide	**2.50%**	142	2.64%	1	0.14%	121	4.49%	2	2.13%	120	4.49%	2	2.13%	116	4.49%	3	3.72%	114	4.49%	3	3.72%
Pacific Cod	**12.00%**	142	9.02%	-	-	121	10.23%	-	-	120	10.23%	-	-	116	10.23%	-	-	114	10.23%	-	-
Pacific Whiting (shoreside)	**10.00%**	150	8.59%	-	-	129	8.59%	-	-	128	8.59%	-	-	124	8.59%	-	-	122	8.59%	-	-
Pacific Whiting (mothership))	**20.00%**	27	10.20%	-	-	26	10.20%	-	-	25	10.20%	-	-	25	10.20%	-	-	25	10.20%	-	-
Sablefish (Coastwide)																					
N. of 36° N (Monterey north)	**3.00%**	142	2.65%	-	-	121	4.22%	1	1.22%	120	4.22%	1	1.22%	116	4.95%	2	3.16%	114	4.95%	2	3.16%
S. of 36° N (Conception area)	**10.00%**	142	18.11%	2	9.59%	121	28.87%	2	26.98%	120	33.39%	2	31.50%	116	34.70%	2	32.81%	114	34.70%	2	32.81%
PACIFIC OCEAN PERCH	***4.00%***	142	3.59%	-	-	121	4.03%	1	0.03%	120	4.03%	1	0.03%	116	4.03%	1	0.03%	114	4.03%	1	0.03%
WIDOW ROCKFISH	***5.10%***	142	5.06%	-	-	121	5.06%	-	-	120	5.06%	-	-	116	5.06%	-	-	114	5.06%	-	-
CANARY ROCKFISH	***4.40%***	142	3.71%	-	-	121	3.83%	-	-	120	3.83%	-	-	116	3.83%	-	-	114	3.83%	-	-
Chilipepper Rockfish	**10.00%**	142	8.75%	-	-	121	8.75%	-	-	120	8.75%	-	-	116	11.08%	1	1.08%	114	11.08%	1	1.08%
BOCACCIO	***13.20%***	61	13.22%	1	0.02%	54	13.22%	1	0.02%	53	13.22%	1	0.02%	49	37.92%	1	24.72%	48	37.92%	1	24.72%
Splitnose Rockfish	**10.00%**	142	9.39%	-	-	121	9.39%	-	-	120	9.39%	-	-	116	10.47%	1	0.47%	114	10.47%	1	0.47%
Yellowtail Rockfish	**5.00%**	142	3.21%	-	-	121	5.76%	1	0.76%	120	5.76%	1	0.76%	116	5.76%	1	0.76%	114	5.76%	1	0.76%
Shortspine Thornyhead - coastwide																					
Shortspine Thornyhead - N. of 34°27' N	***6.00%***	142	2.74%	-	-	121	4.99%	-	-	120	5.86%	-	-	116	7.69%	1	1.69%	114	7.69%	1	1.69%
Shortspine Thornyhead - S. of 34°27' N	***6.00%***	142	32.69%	2	37.89%	121	33.89%	2	39.09%	120	34.13%	2	39.34%	116	35.57%	2	40.78%	114	35.57%	2	40.78%
Longspine Thornyhead - coastwide																					
Longspine Thornyhead - N. of 34°27' N	***6.00%***	142	3.12%	-	-	121	4.18%	-	-	120	4.83%	-	-	116	6.55%	1	0.55%	114	6.55%	1	0.55%
COWCOD - Conception and Monterey	***17.70%***	61	17.71%	1	0.01%	54	17.71%	1	0.01%	53	17.71%	1	0.01%	49	43.69%	1	25.99%	48	43.69%	1	25.99%
DARKBLOTCHED	***4.50%***	142	4.48%	-	-	121	4.48%	-	-	120	4.48%	-	-	116	4.48%	-	-	114	4.48%	-	-
YELLOWEYE	***5.70%***	137	4.67%	-	-	118	5.67%	-	-	118	5.67%	-	-	114	5.95%	1	0.25%	112	5.95%	1	0.25%
Minor Rockfish North																					
Shelf Species	**5.00%**	142	3.93%	-	-	121	4.18%	-	-	120	4.18%	-	-	116	4.18%	-	-	114	4.18%	-	-
Slope Species	**5.00%**	142	3.65%	-	-	121	3.65%	-	-	120	3.65%	-	-	116	3.65%	-	-	114	3.65%	-	-
Minor Rockfish South																					
Shelf Species	**9.00%**	142	7.08%	-	-	121	7.48%	-	-	120	7.93%	-	-	116	11.25%	1	2.25%	114	11.25%	1	2.25%
Slope Species	**6.00%**	142	7.00%	1	1.00%	121	11.97%	3	7.06%	120	13.01%	3	8.09%	116	15.56%	3	10.65%	114	15.56%	3	10.82%
Dover Sole	**2.60%**	142	2.72%	1	0.12%	121	4.46%	3	3.67%	120	5.32%	3	4.53%	116	7.42%	3	6.63%	114	7.42%	3	6.63%
English Sole	**5.00%**	142	3.13%	-	-	121	6.78%	1	1.78%	120	6.78%	1	1.78%	116	7.11%	2	3.89%	114	7.11%	2	3.89%
Petrale Sole	**3.00%**	142	3.40%	1	0.40%	121	4.44%	3	1.91%	120	4.44%	3	2.20%	116	5.87%	3	4.71%	114	5.87%	3	4.71%
Arrowtooth Flounder	**10.00%**	142	5.61%	-	-	121	5.61%	-	-	120	5.61%	-	-	116	5.61%	-	-	114	5.61%	-	-
Starry Flounder	**10.00%**	142	27.44%	1	17.44%	121	27.44%	1	17.44%	120	27.44%	1	17.44%	116	27.44%	1	17.44%	114	27.44%	1	17.44%
Other Flatfish	**10.00%**	142	8.26%	-	-	121	8.26%	-	-	120	8.26%	-	-	116	16.28%	1	6.28%	114	16.28%	1	6.28%
Pacific halibut IBQ	**5.40%**	142	5.44%	1	0.04%	121	5.44%	1	0.04%	120	5.44%	1	0.04%	116	5.44%	1	0.04%	114	5.44%	1	0.04%

Initial allocations notes:

Non-whiting spp in non-whiting fishery (90% allocation to permits):

Non-OF spp: 1994-2003, relative lbs, drop 3 years, equal allocation of buyback permits' catch history.

OF spp: Alloc. based on finer area bycatch rates and 2003-2006 logbook target spp history (Average distribution was used in cases where logbook unavailable).
(Canary allocations include equal sharing component)

Whiting in shoreside fishery (80% allocation to permits, 20% to processors):

Permits: 1994-2003, relative lbs, drop 2 years, equal allocation of buyback permits' catch history.

Processors: 199**8**-2004 (at least 1 mt in any two years 1998-200**4**), relative lbs, drop 2 years.

Non-whiting in shoreside whiting fishery: allocated to permits in proportion to whiting QS, 90% allocation to permits.

Table A-100. Maximum Pacific whiting allocations to entities under different permit ownership control dates (QS allocation formula uses: 80/20 permit-processor split, equal sharing, and shoreside processor recent participation requirement).

FPA Control Limit = 10%		Maximum Allocation	Enitities Over the Limit	QS Over the Limit
Permit ownership Control Date	**Entities with Allocation**			
January 1, 2004				
Total whiting QS	150	8.59%	-	-
Harvester portion	142	8.59%	-	-
Buyer portion	11	7.20%	-	-
Fall 2006				
Total whiting QS	129	8.59%	-	-
Harvester portion	121	8.59%	-	-
Buyer portion	11	7.20%	-	-
January 1, 2008				
Total whiting QS	128	8.59%	-	-
Harvester portion	120	8.59%	-	-
Buyer portion	11	7.20%	-	-
November 30, 2008				
Total whiting QS	124	8.59%	-	-
Harvester portion	116	8.59%	-	-
Buyer portion	11	7.20%	-	-
June 22, 2009				
Total whiting QS	122	8.59%	-	-
Harvester portion	113	8.59%	-	-
Buyer portion	11	7.20%	-	-

Table A-101. Number of entities receiving allocations of total nonwhiting groundfish above the Option 3 aggregate control limit and the amounts of QS over the limit, categorized by type of entity (Option 3 QS limit = 3%).

	QS Allocations to Harvesters / Buyers	Number of Entities Over the Limit	Total QS Allocated to Entities Over the Limit (%)
1	**All eligible harvesting entities and buying entities**		
	Equal sharing of buyback		
	100% to Harvesters	2	9
	87.5% / 12.5%	2	13
	75% / 25%	2	17
	50% / 50%	3	33
	No equal sharing of buyback		
	100% to Harvesters	4	16
	87.5% / 12.5%	3	16
	75% / 25%	3	20
	50% / 50%	4	37
2	**Only entities that are buyers (includes allocation to buyers that own permits)**		
	Equal sharing of buyback		
	100% to Harvesters	1	5
	87.5% / 12.5%	1	9
	75% / 25%	2	17
	50% / 50%	3	33
	No equal sharing of buyback		
	100% to Harvesters	1	5
	87.5% / 12.5%	1	10
	75% / 25%	3	20
	50% / 50%	4	37
3	**Only entities that are not buyers**		
	Equal sharing of buyback		
	100% to Harvesters	1	4
	87.5% / 12.5%	1	3
	75% / 25%	0	0
	50% / 50%	0	0
	No equal sharing of buyback		
	100% to Harvesters	3	11
	87.5% / 12.5%	2	6
	75% / 25%	0	0
	50% / 50%	0	0

Note: Data in this table are based on ownership information available in the fall of 2006.

STRUCTURE OF THE HARVESTING SECTOR (QS CONTROL LIMIT RELATIVE TO PAST HARVEST LEVELS)

As mentioned in the introduction to this section on QS control limits, these limits may constrain efficiency gains by restricting the degree to which a vessel can support its operation with QS under its personal ownership. In this section, the control limits are compared to past vessel performance levels to evaluate the degree to which a vessel owner might support operations with QS owned (the degree to which the owner can vertically integrate through QS ownership relative to his or her total production level). The section on vessel limits compared those limits to past operations of individual vessels to determine the degree to which vessel limits might directly constrain vessel operations. Here QS control

limits are compared to the same vessel level data to determine the degree to which an owner's ability to control the QS available to support production might be constrained. In general, because QS control limits are about two thirds of the vessel limits (vessel limits are generally 1.5 times greater than control limits) the QS control limits interfere with the amount of QS a vessel might like to have to support operations to a greater extent than the vessel limits interfere with past vessel operation. As an example, Table A-100 shows that for 10 nonwhiting species, the control limits are below the 90th percentile level for vessel landings as a share of 2004 to 2006 fleet landings. This compares to only four nonwhiting species in this category when comparing past performance to the vessel limits Table A-93. This evaluation covers the single vessel case. Harvesters owning multiple vessels could be more constrained in their ability to support those vessels with QS than is indicated in this table.

Table A-102. Comparison of control limits to vessel (permit) share of annual landings (1994 to 2003 and 2004 to 2006. Values in gray cells are greater than the Council's final preferred alternative).

	Control Limits (%)			Annual Percent of Total Catch				Max Annual Share of Trawl Fleet Allocation "04-'06
				1994-2003		2004-2006		
Stock	Option 1	Option 2	FPA	90th Percent	Max	90th Percent	Max	
All nonwhiting groundfish (in aggregate)	1.5	2.2	2.7	1	4.1	1.5	4.9	1.8
Lingcod - coast wide c/	5	7.5	2.5	1.8	9	2.2	3.7	1.1
Pacific Cod	5	7.5	12	6.4	22.7	6	21.1	7.2
Pacific Whiting	10	15						
Shoreside Sector	10	15	10	8.1	9.1	6.2	7.3	6.9
Mothership Sector	10	15	20	11.3	18.5	16.4	28.9	
Catcher Processors	50	55		37.3	49.5	31.1	49.4	
All Whiting Sectors Combined	15	22.5						
Sablefish (Coast wide)								
N. of 36° N (Monterey north)	2	3	3	1	2.4	1.5	5.7	4.3
S. of 36° N (Conception area)	5	7.5	10	24	38.4	43.5	60.3	22
PACIFIC OCEAN PERCH	5	7.5	4	2.7	7.3	3.7	10.1	3.1
WIDOW ROCKFISH	3.4	5.1	5.1	4.5	28.7	6	31.9	6.7
CANARY ROCKFISH	5	7.5	4.4	3.5	12.6	3.8	45.7	0
Chilipepper Rockfish	5	7.5	10	6.2	46.8	14.9	26.5	0.5
BOCACCIO	5	7.5	13.2	60	78.9	36.8	53.4	0
Splitnose Rockfish	5	7.5	10	5.7	19.9	12.1	26.9	8.5
Yellowtail Rockfish	5	7.5	5	2.8	9.9	5.2	11.5	0.7
Shortspine Thornyhead - coast wide								
Shortspine Thornyhead - N. of 34°27' N	4.8	7.2	6	1.3	5	2.2	8.7	4
Shortspine Thornyhead - S. of 34°27' N	4.7	7.1	6	4.2	7	8.8	16	0
Longspine Thornyhead - coast wide								
Longspine Thornyhead - N. of 34°27' N	2	3	6	1.4	2	2.2	8.7	2
COWCOD - Conception and Monterey	5	7.5	17.7	-	100	0	0	0
DARKBLOTCHED	5	7.5	4.5	2	15.8	3.1	5.6	3.7
YELLOWEYE g/	5	7.5	5.7	9.4	35.8	13.7	35.5	0
Minor Rockfish North								
Shelf Species	4	6	5	2.9	30.6	2.2	49.1	3.1
Slope Species	5	7.5	5	2	11.9	3	15.7	3.5
Minor Rockfish South								
Shelf Species	5	7.5	9	6.1	46.6	13.1	30.9	1.7
Slope Species	5	7.5	6	5.8	24.8	12.2	21.7	12.1
Dover Sole	1.8	2.7	2.6	1.1	2	1.6	5.6	5.7
English Sole	10	15	5	1.5	13.9	2.6	7.7	2.3
Petrale Sole (coast wide)	2.9	4.4	3	1.4	6.2	2.3	8	5.9
Arrowtooth Flounder	5	7.5	10	1.9	25.5	3.2	19.1	8.3
Starry Flounder	5	7.5	10	13.2	65.7	5.5	54.5	8.3
Other Flatfish	10	15	10	1.3	16.4	2	8.1	1.6

- Calculation of the Aggregate

The Council decided to establish a fixed formula for calculating an entity's aggregate nonwhiting QS. This formula weights QS based on the 2010 trawl allocation for each IFQ species. As the trawl allocations change over time, there may be more need to adjust the calculation of the aggregate to bring the calculation into line with the intent for the level at which the control limit is set. Because the approach remains fixed until explicitly changed, when such a change appears needed, the amount of adjustment required could be substantial compared to what would have occurred if incremental adjustments were made every two years. However, the approach adopted by the Council will provide more stability for planning and a simpler program for administration.

A-2.3 Program Administration

A-2.3.1 Tracking, Monitoring, and Enforcement

A-2.3.1.a Discarding

❖ *Provisions and Options*

It is the Council's intent to provide NMFS flexibility sufficient to design and implement a tracking and monitoring (T and M) program that will achieve the goals and objectives of the trawl rationalization program.

►T and M Program Alt 1: Nonwhiting – Discarding of IFQ species allowed, discarding of IBQ species required, discarding of non groundfish species allowed.

T and M Program Alt 2: Nonwhiting – Discarding of IFQ species prohibited, discarding of non IFQ commercial species prohibited, discarding of IBQ species required, discarding of non groundfish species allowed except retention of non IBQ prohibited species would be required.

►T and M Program Alt 1 and 2:

Shoreside whiting
Maximized retention vessels: Discarding of fish covered by IFQ or IBQ, and non groundfish species prohibited.
Vessels sorting at sea: Discarding of IFQ allowed, discarding of IBQ required, discarding of non groundfish species allowed.

At-sea whiting
Discarding of IFQ allowed by processors, discarding of IBQ required by processors, discarding of non groundfish species allowed by processors, mothership catcher vessels prohibited from discarding catch.

❖ *Rationale and Policy Issues*

Alternatives 1 and 2 are identical for the shoreside whiting and nonwhiting fisheries. Options are provided for vessels that supply nonwhiting groundfish to shoreside processors.[126] It is expected that the tracking and monitoring program will be able to provide accurate estimates of each vessel's discards of IFQ and IBQ species. Non-marketable species can also be discarded. As a disincentive to IBQ catch, the current policy of mandatory discard of halibut would continue. [127] Allowing discards of IFQ species gives vessels the flexibility to determine what species are retained for landing or discarded. In determining what to discard, vessel captains would review a variety of factors including ex-vessel prices, marketable sizes of fish, and vessel storage space. Allowing discard provides flexibility to the vessels. Discarding will also require changes in vessel operations and the purchase of new equipment to have onboard and at sea. In addition to observers, vessels would need to have scales on board to allow for accurate weighing of fish. To use observer time efficiently, vessel crew will have to aid the observer in the sorting of fish and with other functions associated with sorting, weighing, and identifying discarded fish species.

[126] The shoreside whiting and at-sea mothership and catcher-processors sectors do not bottom trawl; they mid-water trawl for whiting.
[127] Halibut is currently the only IBQ species.

❖ *Interlinked Elements*

IFQ discards have to be accounted for witH QPs. The accuracy and timeliness of IFQ discard estimates will affect all those elements associated with comparing QPs with catch and QS.

❖ *Analysis*

Allowing discards would change the nature of the tracking and monitoring system. Observers will have to focus their efforts on estimating discarded catch and not on estimating retained catch. However, implementation of a full retention program where there is zero discarding of IFQ species would be difficult. Full retention might require keeping everything from tires and derelict fishing gear to bottom items like mud, clams, and sea anemones. For example, the shoreside whiting fishery has evolved from the concept of "full retention" to a "maximized retention" fishery to account for operational discards and safety issues. Maximized retention would apply to the relevant species of the fishery and would not prevent the discard of rocks, seaweed, and plastics, for example.

A-2.3.1.b Monitoring

❖ *Provisions and Options*

At Sea Catch Monitoring

T and M Program Alt 1: Nonwhiting – The sorting, weighing and discarding of any IFQ or IBQ species must be monitored by an observer with supplemental video monitoring.

►T and M Program Alt 2: Nonwhiting – The sorting of catch, the weighing and discarding of any IBQ and IFQ species, and the retention of IFQ species must be monitored by the observer. *(The preferred alternative matches this with T and M Program Alt 1, discarding allowed. Therefore, discards would also have to be monitored.)*

►T and M Program Alt 1 and 2:

Shoreside whiting - *For maximized retention vessels*: video monitoring as proposed under Amendment 10.

►Suboption: Observers would be required in addition to or as a replacement for video monitoring.

For vessels that sort at sea: The sorting, weighing, and discarding of any IFQ or IBQ species must be monitored by an observer with supplemental video monitoring.

At-sea whiting: *Catcher vessels.* Observers would be required in addition to or as a replacement for video monitoring. *Motherships and catcher/processors*: The sorting, weighing and discarding of any IFQ or IBQ species must be monitored by an observer.

►**Shoreside Landings Monitoring** (T and M Program Alt 1 and 2)
Nonwhiting and whiting - The sorting, weighing, and reporting of any IFQ must be monitored by a catch monitor (IBQ will have been discarded at sea).

❖ *Rationale and Policy Issues*

More accurate estimates of total mortality through better catch accounting would help achieve stock conservation goals.

Shoreside whiting and nonwhiting: A monitoring and tracking program is necessary to ensure that all catch (including discards) is documented and matched against QP. For shoreside nonwhiting trips, there is a proposed requirement for 100 percent observer coverage on vessels and for shoreside whiting trips, observers in addition, to or as a replacement for, video monitoring. Note that the Council's preferred alternative is for the shoreside whiting and nonwhiting fisheries to be managed under an IFQ system and as a single combined sector. In its PPA the Council specified that if Congress provided the needed legislation, the shoreside whiting fishery might be managed as a co-op with processor linkages rather than with IFQs. In addition to 100 percent observer coverage, 100 percent shoreside monitoring is also being proposed because the sorting, weighing, and reporting of any IFQ or IBQ species must be monitored by a catch monitor.

At-Sea Sector: Under status quo, mothership processing vessels and catcher-processors currently carry two observers. This monitoring requirement would remain for these vessels. However, a new requirement would be the placement of observers, possibly supplemented by cameras, on catcher-vessels that deliver to motherships. [Note that for the 2009/2010 groundfish harvest specifications and management measures, the Council is proposing video monitoring for these vessels.] See Appendix B, Section 1.4 on at-sea observers and monitoring for information regarding this sector.

❖ *Interlinked Elements*

Overall Program Execution: Implementation of the trawl rationalization program hinges on individual and co-op catch accountability, which in turn hinges on complete observer coverage. Should 100 percent observer coverage not be retained as part of the trawl rationalization preferred alternative, the entire proposed program would have to be rethought.

General Management and Trawl Sectors (A-1.3): The decision whether to manage the shoreside whiting fishery as a co-op or an IFQ fishery will affect the determination whether observers are more appropriate than cameras for the shoreside whiting fishery. As mentioned above, shoreside co-ops with processor linkages will require congressional approval.

❖ *Analysis*

Cameras are currently employed as an electronic monitoring system (EMS) in the shoreside whiting fishery, and EMS is used as a monitoring tool. The EMS system employed under the EFP for Pacific whiting permits shoreside vessels to dump unsorted catch directly below deck and allows this unsorted catch to be landed, if an EMS is used on all fishing trips to verify retention of catch at sea. The EMS is an effective tool for accurately monitoring catch retention and identifying the time and location of discard events. However, current video technology is not good enough to use cameras in trawl fisheries to measure the amount of fish discarded or to determine the species of fish discarded. Therefore, observers are deemed a superior monitoring tool for the nonwhiting trawl fishery given the number of species and need to have accurate estimates of IFQ discards. If the shoreside whiting fishery is managed as an IFQ fishery, observers rather than the current cameras will also be needed for the same reason. The option of requiring cameras in addition to observers (should human observers be deemed necessary to ensure compliance) is a potential cost-cutting measure compared to requiring a second human observer. The purpose of having catch monitoring in the shoreside nonwhiting fishery is to ensure that all IFQ and IBQ species are accurately weighed, sorted, and reported. Catch monitors are already employed in the shoreside whiting fishery. See also the discussion under program costs, below.

A-2.3.1.c Catch Tracking Mechanisms

❖ *Provisions and Options*

►Catch Tracking Mechanisms (T and M Program Alt 1 and 2)

Electronic vessel logbook report
Nonwhiting, shoreside whiting and at-sea whiting: VMS-based electronic logbook required to be transmitted from vessel. At-sea entry by vessel personnel required including catch weight by species and if retained or discarded.

Vessel landing declaration report
Nonwhiting and shoreside whiting: Mandatory declaration reports.

Electronic IFQ landing report
Nonwhiting and shoreside whiting: Mandatory reports completed by processors and similar to electronic fish ticket report.

Processor production report
Nonwhiting, shoreside whiting and at-sea whiting: Mandatory reports (possible inclusion of proprietary data included to be recommended as option is fleshed out).

❖ *Rationale and Policy Issues*

Other than the declaration reports and the processor production reports, these catch tracking mechanisms are largely the conversion of existing state paper-based systems. Converting to electronic reporting is seen as an aid for improved accuracy of reported data and better quota monitoring at the individual vessel, co-op, and sector level. Declaration reports and processor production reports are seen as tools that improve the ability to enforce regulations. One of the issues facing the implementation of these reporting systems is how best to adapt the existing state paper-based systems to the needs of the trawl rationalization program.

❖ *Interlinked Elements*

All of these reports address directly or indirectly address the needs for total catch accounting, biological and management data, socioeconomic data, economic data (including data for anti-trust), excessive share assessments, cost recovery, and program performance measures.

❖ *Analysis*

All trawl sectors (shorebased nonwhiting, shorebased whiting, mothership catcher vessels and processors, and catcher-processors) will require VMS-based electronic logbooks. Nonwhiting and whiting vessels that deliver shoreside will also have to submit declaration reports. Shorebased processors will have to submit the electronic IFQ landing reports in the form of the electronic "fishtickets," and processors will also have to supply mandatory production reports.

Compared to the status quo, the only new reports are the vessel declaration reports and the processor production reports. As cited above, there are many conservation and management reasons for these reports. In addition, electronic reporting will aid vessels, processors, and all QS and QP holders in making real-time decisions. Currently the Pacific States Marine Fisheries Commission (PSMFC) is working with the states on converting their paper-based fish ticket and trawl logbook systems into electronic systems. Electronic fishtickets are now being experimented with in the shoreside whiting

fishery. The actual design of these reports are under development and most likely will be more fully analyzed for public comment under the rulemaking process that converts the Council's preferred alternative into regulation. This process includes addressing reporting issues under the Paperwork Reduction Act process and under the Regulatory Flexibility Act (regulatory reporting burden on small businesses). One of the issues in the design of these systems and the integration with observer, catch monitor, and QP/QS tracking systems concerns lining up the coding systems so that all IFQ species are reported consistently on a species and species group basis. Another issue is understanding when changes are needed. As the Council and Federal management tracking and monitoring needs change, states will have to convert their systems to meet these needs.

A-2.3.1.d Cost Control Mechanisms

❖ *Provisions and Options*

Shoreside landing hour restrictions
T and M Program Alt 1, Nonwhiting and shoreside whiting: Landing hours not restricted.
T and M Program Alt 2, Nonwhiting and shoreside whiting: Landing hours restricted.
►T and M Program Alt 3, Nonwhiting and shoreside whiting: Landing hours may be restricted.

Shoreside site Licenses
►T and M Program Alt 1 and 2, Nonwhiting and shoreside whiting: Mandatory license for shoreside deliveries. License can be issued to any site that meets the monitoring requirements.

Vessel Certification
►T and M Program Alt 1 and 2, All Trawl Sectors: Mandatory certification. Certificate can be issued to any vessel that meets the monitoring requirements.

❖ *Rationale and Policy Issues*

The certification of vessels, licensing of shoreside processing plants, and restricted shoreside landing hours support management and enforcement objectives and potentially reduce costs by restricting the number of shoreside processing plants and the hours under which plant monitors have to be present in the plant.

❖ *Interlinked Elements*

Among other requirements to receive certification or licensing will be the need for accurate scales to be used, thus aiding many of the catch tracking mechanisms discussed above. Tracking and monitoring costs will be affected by the certification requirements and by decisions to limit shoreside landing hours.

❖ *Analysis*

All trawl sectors (shoreside nonwhiting, shoreside whiting, mothership catcher vessels and processors, and catcher-processors) would require certification or licenses that show they meet the monitoring requirements. To reduce costs, landing hours could be restricted. In addition to the options to restrict or no restrict landing hours, a third option was added and selected as the final preferred alternative, which states that landing hours *may* be restricted. This option provides for greater flexibility to provide solutions as issues arise, rather than preemptively limiting landing hours.

Many of the other requirements will be similar to those currently specified as part of the 2008 Pacific Whiting Shoreside Fishery Maximized Retention and Monitoring Exemption Program (see http://www.pcouncil.org/bb/2008/0308/F1a_SUP_ATT2.pdf). This program outlines the reporting

requirements, equipment needs, and vessel and plant responsibilities including relationships with plant monitors, notification and declaration procedures, and the requirement of a NMFS monitoring plan. For IFQ and co-op fisheries, these elements would have to be expanded to include existing observer requirements, together with safety requirements, as well as the responsibilities of the crew to assist the observer in the weighing and sorting of catch and responsibilities of the captain to ensure that vessel operations do not hinder observer efforts. For IFQ vessels, there is likely to be a need to purchase appropriate scales to meet these requirements. The actual design of these reports is under development and would be more fully analyzed for public comment under the rulemaking process that converts the Council's preferred alternative into regulations. This process includes addressing reporting issues under the Paperwork Reduction Act process and under the Regulatory Flexibility Act (regulatory reporting burden on small businesses).

A-2.3.1.e Program Performance Measures

❖ *Provisions and Options*

►**T and M Program Alt 1 and 2,** All Trawl Sectors: integrate into the tracking and monitoring program the collection of data on cost, earnings and profitability; Economic efficiency and stability; capacity measures; net benefits to society; distribution of net benefits; product quality; functioning of quota market; incentives to reduce bycatch; market power; spillover effects into other fisheries; contribution to regional economies (income and employment); distributional effects/community Impacts; employment in seafood catching and processing; safety; bycatch and discards; administrative, enforcement, and management costs. [See A-2.3.2., Socioeconomic Data Collection.]

A-2.3.2 Socioeconomic Data Collection

❖ Provisions and Options

The data collection program will be expanded and submission of economic data by harvesters and processors will be mandatory. Random and targeted audits may be used to validate mandatory data submissions. See footnote for a full description. Information on QS transaction prices will be included in a central QS ownership registry. *NOTE: Data collection started before the first year of implementation would be beneficial, in order to have a baseline for comparison.*

Footnote from IFQ Program provisions:

- Mandatory submission of economic data for LE trawl industry (harvesters and processors)
- Voluntary submission of economic data for other sectors of the fishing industry
- Include transaction value information in a centralized registry of ownership
- Formal monitoring of government costs

Mandatory Provisions: The Council and NMFS shall have the authority to implement a data collection program for cost, revenue, ownership, and employment data, compliance with which will be mandatory for members of the West Coast groundfish industry harvesting or processing fish under the Council's authority. Data collected under this authority will be treated as confidential in accordance with Section 402 of the MSA.

A mandatory data collection program shall be developed and implemented as part of the groundfish trawl rationalization program and continued through the life of the program. Cost, revenue, ownership, employment, and other information will be collected on a periodic basis (based on scientific requirements) to provide the information necessary to study the impacts of the program, including achievement of goals and objectives associated with the rationalization program. These data may also be used to analyze the economic and social impacts of future FMP amendments on industry, regions, and localities. The program will include targeted and random audits as necessary to verify and validate data submissions. Additional funding (as compared to status quo) will be needed to support the collection of these data. The data collected would include data needed to meet MSA requirements (including antirust).
The development of the program shall include the following: A comprehensive discussion of the enforcement of such a program, including discussion of the type of enforcement actions that will be taken if inaccuracies are found in mandatory data submissions. The intent of this action will be to ensure that accurate data are collected without being overly burdensome on industry in the event of unintended errors.

Voluntary Provisions: A voluntary data collection program will be used to collect information needed to assess spillover impacts on nontrawl fisheries.

Central Registry: Information on transaction prices will be included in a central registry of QS owners. Such information will also be included for LE permit owners/lessees.

Government Costs: Data will be collected and maintained on the monitoring, administration, and enforcement costs related to governance of the rationalization program.

❖ Rationale and Policy Issues

The goal of the Council's rationalization alternatives involves several economic components. The stated goal of the program is presented below:

> *Create and implement a capacity rationalization plan that increases net economic benefits, creates individual economic stability, provides for full utilization of the trawl sector allocation, considers environmental impacts, and achieves individual accountability of catch and bycatch.*

The Act also contains a monitoring requirement to determine whether a LAPP is meeting its goals. Sec. 303A (c)(1)(G) states that any LAPP shall do the following:

> *include provisions for the regular monitoring and review by the Council and the Secretary of the operations of the program, including determining progress in meeting the goals of the program and this Act, and any necessary modification of the program to meet those goals, with a formal review 5 years after the implementation of the program and thereafter to coincide with scheduled Council review of the relevant FMP (but no less frequent than once every 7 years).*

The MSA (as amended through January 2007) also places importance on social and economic outcomes resulting with a rationalization programs. Sec. 303A(c)(1)(C) states that any LAPP to harvest fish submitted by a Council or approved by the Secretary under this section shall promote social and economic benefits. The Council has also enumerated several objectives and constraints for the program that involve economic components and monitoring of the program (see Chapter 1).

In order to meet the monitoring requirements for the economic goals, improved and expanded economic data would be needed for the trawl IFQ fishery. The Council's PPA provides for a mandatory economic data collection provision. Regardless of whether the economic data collection is mandatory or voluntary, the types of data necessary to monitor the effects of the program are the same. However, the choice of mandatory or voluntary data collection will likely have a large effect on the Council's and the NMFS' ability to consistently and systematically collect the necessary data.

Despite the NWFSC's recent progress in voluntary economic data collection, economic analysis of the LE trawl fishery historically has been severely constrained by a lack of economic data. Incomplete cost-earnings data on vessels and processors have been a particular problem. While PacFIN provides data on most, but not all, earnings sources for LE trawlers, little data on the cost of operating harvesting vessels have been available. Data on the costs and earnings of processing plants have not been available to NMFS or Council economists. This lack of economic data has hampered attempts to measure economic performance, build regional economic input-output models, assess overcapacity, and build models that predict economic behavior.

The first of recent attempts to collect economic data from LE trawl vessel owners occurred in 1999 and 2000. This mail survey used a lengthy questionnaire asking for considerable fishery-specific information, but obtained a response rate well below 20 percent. Because of the low response rate and nonrespondent bias, data collected through this survey were of limited value. A processor survey conducted at about the same time obtained an even lower response rate.

A second voluntary economic survey of LE vessel owners was conducted from 2005 to 2007. In order to obtain higher response rates, this second survey used a much shorter questionnaire and collected data

through in-person interviews. This survey obtained a fairly high response rate of more than 70 percent, but at the cost of considerably less data collected from each respondent due to the shorter questionnaire. While this second survey provides much data of value for assessing industry economic performance and regional economic impacts, our ability to evaluate the contribution of individual fisheries (such as groundfish) to vessel economic performance is limited by the reduced questionnaire length. Collecting data through in-person interviews helped to substantially increase the response rate, but at considerably increased survey cost.

Mandatory economic data collection offers the advantages of reduced nonresponse bias, the ability to collect more detailed fishery-specific data, and reduced survey fielding costs. These advantages would apply to data collection from both the harvesting sector and the processing sector.

❖ *Interlinked Elements*

The program inherently relies on data collection. These provisions include requirements for data needed to adequately monitor program performance (see Section A-2.3.4).

❖ *Analysis*

The collection of such data are related to several aspects of MSA and groundfish FMP guidance on rationalization that will be discussed in the analysis. These include the categories of net benefits, fairness and equity, and harvester and processor sector health. To a large degree, these broad categories are addressed by data collection because such data collection allows for the measurement of these categories. The measurement of these categories may help inform future decisions on the part of the Council.

Element of Cooperative Alternative	Conservation	Net Benefits	Disruption	Excessive Shares	Fairness and Equity	Harvester and Processor Sector Health	Labor	Communities	Small Entities and New Entrants	General Public
Data Collection		X			X	X				

An economic data collection program will increase the ability to monitor and measure the economic performance of the industry, as described in the rationale above. It will also increase the burden on agencies involved in the data collection and analysis and the burden on industry members in the form of time spent reporting data.

The NWFSC has gone through two voluntary survey efforts. The first effort resulted in a relatively low response rate, which minimized the ability to use the survey. The second effort used face-to-face interviews and resulted in a response rate of more than 70 percent. This relatively high response rate has resulted in several pieces of analysis utilized in the rationalization process and may prove useful for other means as well. While this survey has largely been considered successful, the face-to-face

interview technique is estimated to have cost somewhere approximately $700 to $800 per interview. This cost does not include the time and cost of developing the survey and analyzing the data. Given that the trawl fishery is over 100 vessels, the field cost of conducting a voluntary survey using a face-to-face technique could be approximately $100,000 to the agency each year it is conducted.

On the other hand, a mandatory survey may obviate the need for face-to-face interviews. Face-to-face interviews were used in the voluntary survey for several reasons including obtaining a favorable response rate. If a survey is mandatory, a face-to-face technique may not be necessary. However, differences may exist between a mandatory and a voluntary survey, which can make the burden on the industry greater for a mandatory survey than a voluntary survey.

Factors affecting the response rate of a voluntary survey include the length of the survey and the difficulty of the questions. If a survey is viewed as overly lengthy and/or requests information that is not readily available and that may take time to uncover, the response rate is likely to suffer. The response rate from a mandatory survey may not suffer in the same fashion. Therefore, it is reasonable to expect that a voluntary survey may (at least at times) be simpler and shorter than a mandatory survey simply to get a favorable response rate. If this is the case, a mandatory survey may impose a larger burden on industry than a voluntary survey. In the worst-case scenario (one where the survey is highly burdensome), industry members may at times respond with a "protest response" or information that is of poor quality. Such protest response might be an indication of issues related to the program's costs, fairness, and equity. This can affect the ability to use the survey responses even if the response rate is high.

The collection of economic data relates to several aspects of policy guidance from the MSA, the Groundfish FMP, and Amendment 20 goals and objectives. If better data collection leads to more informed decisions relating to net benefits and efficiency, then data collection is related to MSA National Standard 5, MSA – 303A(c)(1)(B), Amendment 20 objectives 2 and 6, and potentially others. In particular, Amendment 20 objective 6 (promote measurable economic benefits) is related to data collection, because data collection allows economic benefits to be measured. Many benefits may not be measurable without the acquisition of additional economic data. If additional data collection helps in the development of sound policies that benefit the industry, then such data collection may also relate to policy guidance on sector health including Amendment 20 objectives 2 and 6, groundfish FMP goal 2, and groundfish FMP objective 7 and 15. Finally, data collection is directly related to several aspects of policy guidance on program performance monitoring and modification. MSA – 303A(c)(1)(G) calls for a regular review and monitoring of the program for progress in meeting goals.

A-2.3.3 Program Costs

A-2.3.3.a and b, Cost Recovery and Fee Structure

❖ Provisions and Options

Cost Recovery
►Option 1: Fees up to 3 percent of exvessel value, consistent with 303A(e) of the MSA may be assessed. Cost recovery shall be for costs of management, data collection, analysis, and enforcement activities.

Option 2: There will be full cost recovery. Cost recovery will be achieved through landing fees plus privatization of elements of the management system. In particular, privatization for monitoring of IFQ catch (e.g., industry pays for their own compliance monitors). Stock assessments will not be privatized and the electronic fish ticket system will not be privatized.

Fee Structure
To be determined. TIQC recommends a fee structure that reflects usage. A fee structure that allows for equitable sharing of observer costs for smaller vessels may be developed.

❖ Rationale and Policy Issues

Fees would be used to recover costs associated with management, data collection and analysis, and enforcement of the IFQ program. The limit on fees will be 3 percent of ex-vessel value, as specified in the MSA, shown below.

The MSA states in Sections 303A (e):

> (e) COST RECOVERY.—In establishing a LAPP, a Council shall—
>
> > (1) develop a methodology and the means to identify and assess the management, data collection and analysis, and enforcement programs that are directly related to and in support of the program; and
> >
> > (2) provide, under section 304(d)(2), for a program of fees paid by LAP holders that will cover the costs of management, data collection and analysis, and enforcement activities.

In Section 304(d)(2)(A) of the MSA:

> (2)(A) Notwithstanding paragraph (1), the Secretary is authorized and shall collect a fee to recover the actual costs directly related to the management, data collection, and enforcement of any—
> (i) LAPP; and
> (ii) community development quota program that allocates a percentage of the total
> allowable catch of a fishery to such program.
>
> (B) Such fee shall not exceed 3 percent of the ex-vessel value of fish harvested under any such program, and shall be collected at either the time of the landing, filing of a landing report, or sale of such fish during a fishing season or in the last quarter of the calendar year in which the fish is harvested.

The policy issues associated with cost recovery include aligning the Council's preferred alternative to be consistent with MSA by including enforcement costs as required by the MSA and adjusting the provisions of tracking and monitoring program so that the three percent fee covers the costs of management, data collection and analysis, and enforcement activities.

Preliminary cost projections are higher than the maximum fee of 3 percent of ex-vessel value of fish harvested that is allowed for direct cost recovery. Some costs, such as payment for observers, will be paid directly by industry to the observer companies. These costs would not come under the 3 percent limit. However, cost projections are preliminary and will be refined during the regulatory process that converts the Council's preferred alternative into regulation. During this period, it is also expected that there may be several public meetings. These meetings would include the affected industry to determine how costs can be reduced. These discussions would also cover the Council's recommended use of limited landings hours for shoreside processors to limit program costs. NMFS will also be meeting with the states to discuss state needs and integration of the tracking and monitoring elements of this program with existing state programs. In this depressed economy, there are state budget concerns about maintaining existing programs, let alone expending programs. State resources may need augmentation to complete status quo projects (electronic fish ticket system) and address budget needs associated with the trawl rationalization program (e.g., personnel to carry out the program implementation).

Fees collection based on "usage" and any special provisions such as "equitable sharing of observer costs for small vessels" is pending further development of tracking and monitoring cost estimates and Council discussion of these issues.

❖ *Interlinked Elements*

The interlinked elements are all the tracking and monitoring elements discussed above, as well as all elements that affect the costs of management, enforcement, or are associated with data collection and analysis. Almost all elements affect costs. These elements include permits, endorsements, IFQ and co-op allocation and transfer rules, adaptive management rules, excessive share monitoring, gear switching regulations, and regional and area management and allocation rules.

❖ *Analysis*

NMFS presented the preliminary estimates below at the November 2009 Council Meeting. (See November 2009 Briefing Book: Agenda Items G.8.B Supplemental NMFS Presentations, Lockhart and Freese.) NMFS has updated these estimates based on April 2010 Council actions. These estimates can be found in Appendix H. These estimates will be updated again during the regulatory processes that convert the Council's preferred alternative into regulation. Through these and Council processes, we expect to address public comment on how costs can be lowered. NMFS is also proposing to partially fund the costs of observers and compliance monitors for the first three years of this program. It should also be noted that there are state budget concerns regarding upholding existing programs, let alone expanding these programs, given the current state of the economy. State resources may have to be increased to establish the electronic fish ticket and logbook programs or to hire personnel for port sampling, enforcement, and other purposes.

Below are tables that show the existing tracking and monitoring system, current tracking and monitoring costs by sector, and what the costs of additional observers, and plant monitors. In addition to these costs, other state, federal, and Council costs are also listed. Total cost projections are then compared with alternative revenue estimates.

Status Quo Tracking and Monitoring Systems (see Table A-103): VMS are used by all vessels except motherships. Paper logbooks are used by all harvest sectors. Logbooks are mandatory for shoreside vessels but voluntary for the at-sea motherships and catcher-processors. PSMFC combines the state fish tickets and logbooks into a single database. This database is funded federally; states contribute personnel and other resources. Shoreside whiting trawlers are monitored with cameras. The industry pays for the cameras, and NMFS pays for review and analysis of the resulting video. Observer coverage in the nonwhiting fishery is approximately 25 percent, which is funded by NMFS, while the at-sea motherships and catcher-processors use hired observers from a private company. Shoreside whiting plants also pay a private company for compliance monitors. The equipment, training, data collection, and analysis associated with these observers and monitors are paid for by NMFS. Electronic fish tickets are now used in the shoreside whiting fishery.

Table A-103. Status quo observer coverage and monitoring for all sectors.

Status Quo	Shorebased Nonwhiting Trawl	Shorebased Whiting Trawl	At-Sea Mothership Trawl	At-Sea Mothership processor	At-Sea Catcher-Processor
VMX	X	X	X		X
Logbooks	X	X	X	X	X
Cameras		X			
Observers	25% WCOP		0	2	2
Compliance Monitors		100%			
Fish Tickets	X	X			
Electronic Fish Tickets		X			

The Council's preferred alternative would result in the following:

- Increase the observer coverage to 100 percent in the shore based nonwhiting trawl fleet.
- Replace the cameras used in shore based whiting trawl sector with 100 percent observer coverage.
- Expand the whiting compliance monitor program to 100 percent coverage of the shore based nonwhiting trawl program.
- Institute 100 percent coverage to the at-sea mothership trawl fleet.

In comparison to status quo management, rationalization will require increases in NOAA Fisheries' Northwest Region, NOAA General Counsel, Northwest Fisheries Science Center, and the Northwest/Southwest Offices of Law Enforcement staff. State fisheries management and enforcement staff will also have to be increased. Additional equipment, training, and information technology resources (hardware and software) will also needed by both state and federal agencies. The Council will also incur additional costs in the early years of the program.

Listed below are examples of anticipated additions to state and federal staff levels due to rationalization:

- Staff for cost recovery, permitting and, quota tracking and appeals processes
- Staff and contracting for performance monitoring including mandatory economic data collection
- Observers, debriefers, and, port samplers
- Law enforcement officers, technicians, equipment, and training
- Lawyers, policy analysts, and regulation writers to adopt federal and state regulations in support of the program and address enforcement issues
- IT resources (FTEs, hardware, and software) to support electronic reporting (logbooks, fish tickets, observers, compliance monitoring, etc.)
- State and Federal outreach

Based on the preferred alternative, NMFS has developed the following preliminary estimates of potential costs.

Implementation Costs (One-time costs to develop the tracking and monitoring programs.)

State management and enforcement $300,000 to $500,000 per state
NMFS management and enforcement $2.1 million
NMFS (NWFSC) Observer Program and
Economics Data Collection Programs $3.150 million

Total: Approximately $6.5 million

Annual Costs (State, Council, and federal costs associated with running the Program when fully implemented.)

State management and enforcement$750,000 to $1.5 million per state
NMFS management and enforcement $1.7 million
NMFS (NWFSC) Observer Program and
Economics Data Collection Programs$3.15 million

Total: Approximately $8 million

Direct Observer and Monitoring Costs (Daily costs associated with hiring observers and plant monitors.)

Shoreside nonhake trawl fishery$3.5 million
Mothership Processors$243,000
Mothership Catcher Vessels$253,000 to $362,000
Catcher-Processor$415,000
Shoreplant Compliance Monitors non hake$950,000
Shoreplant Compliance Monitors hake$300,000

Total: Approximately $5.7 million

Total Annual Costs and Direct Observer and Monitoring $14 million

These costs are preliminary, and the direct observer and monitoring costs depend heavily on operational decisions by industry (both fishing vessels and processors) to reduce costs. In addition, it is impossible to predict how much consolidation will occur, especially in the initial years of program implementation. For these reasons, this analysis makes broad assumptions about industry behavior to frame the range of costs. At one extreme, annual observer costs could rise to $18 million if a 100-vessel fleet needed observers 365 days a year at a cost of $500 per day. The industry could reduce costs by imposing voluntary limits on the number of vessels that can be at sea at any one time or agreeing to share observer coverage between multiple vessels. These and other costs could decline as the number of participating vessels decline, when the fleet consolidates because of the program. A quantitative analysis (Lian *et al*., 2008) indicates an expectation that there will be a fleet of 50 to 60 vessels of a size of 60 to 70 feet after rationalization. If this were to happen, one would expect the costs to be significantly lower and approximately half of the estimated costs for the current fleet.

Table A-104 below shows harvest, revenue, and price dimensions of the fishery. The 2007 fishery earned $57 million in ex-vessel revenues with the nonwhiting groundfish components earning $27 million while the whiting components earned $30 million. Between 2004 and 2007, there were

rising whiting and fuel prices. In 2008, these fisheries earned approximately $90 million in ex-vessel revenues mainly based on the size of the whiting quota and continued high prices for whiting. The total estimated annual cost of the Trawl Rationalization Program, including the direct observer and monitoring costs, is estimated to be $14 million. These costs can be addressed by a combination of industry fees, congressional appropriations, or state/federal reprogramming of existing resources. Additionally, as has been stated, these cost estimates can be reduced via industry adoption of operational changes to lower cost tracking and monitoring alternatives.

Table A-104. Economic comparison of 2004 and 2007 revenues.

Economic Comparison		2004	2007
Harvests Metric Tons			
Total Non-Tribal Whiting		191,793	180,056
Total Nonwhiting Groundfish		17,238	22,253
Total Groundfish including Whiting Tons		209,031	202,309
Ex-vessel Revenues Million $			
Total Non-Tribal Whiting		$26.1	$29.7
Total Nonwhiting Groundfish		$16.2	$27.2
Total Groundfish including Whiting Tons		$42.3	$56.9
Ex-Vessel Prices			
Ex-Vessel Price Whiting		0.046	0.075
Ex-Vessel Price All flatfish	$/lb	0.425	0.43
Ex-Vessel Price Thornyhead Compl.	$/lb	0.609	0.627
H&G Whiting Export Price	$/lb	0.55	0.75
Marine Diesel Fuel Costs Newport, Oregon, June	$/gal	1.65	2.5

Regardless of how these costs are addressed, it is likely that the industry will be paying the maximum recovery fee of 3 percent. (NMFS will discuss fee collection processes with the Council and industry when it undertakes cost-recovery rule-making.) All industry borne compliance costs would be expected to reduce the value of QS prices by corresponding amounts. For those having to buy into the fishery, higher compliance costs would be expected to reduce what they have to pay for QS.

However, for perspective, according to the Council's SSC review of the Lian Analysis (this analysis included an estimate of $350 per day observer costs.) (See: http://www.pcouncil.org/bb/2008/0608/F6d_SUP_SSC_0608.pdf), the following is noted:

The TIQAT (Trawl Individual Quota Analytical Team) used a fleet consolidation model to estimate the size and profitability of the groundfish trawl fleet that may result from the TIQ program....

A standard econometric methodology was used to estimate the economic efficiency of individual trawl vessels based on vessel cost and earnings data collected for 2003 and 2004 by the Northwest Fisheries Science Center (NWFSC). Results from the analysis, based on 2004 costs and harvests, indicated considerable consolidation, with the fleet being reduced to 40 to 60 vessels and with cost savings in the range of $18 to 22 million. The cost savings would arise from a shift in fleet composition to vessels with lower costs, which were estimated to fall in the 50- to 60-foot size range, and a reduction in fixed costs due to the operation of a smaller fleet.

Nonwhiting Trawl (Table A-105***):*** According to the Lian-Weninger analysis (Lian, *et al.* 2008), there were 117 vessels operating in the nonwhiting trawl fishery, taking 2,699 trips in 2004. Based on average of three days per trip, these vessels operated just over 8,000 days. Based on observer cost estimates used in NMFS's Alaska Region and Northwest Region analyses of $350 per day, 100 percent

observer coverage would require the industry to pay approximately $2.8 million in observer costs. If, in addition to observers, cameras were also required, industry costs would be about $700,000 based on the industry estimate of $6,000 per camera per vessel. It is not known how many vessels already have the proper scales that may cost in the neighborhood of $5,000 to $10,000 each. Processors would have to pay plant monitors to monitor the landings from the 2,699 trips. Assuming that each trip requires one day of plant monitoring, the costs to the processors will be approximately $945,000 for 100 percent monitoring. Currently, vessels and processors do not have observer and monitoring coverage, so the status quo estimate is zero. The costs of observers and plant monitors are estimated to be approximately $3.8 million. Note that there will be operational costs to both the plants and vessels as they adjust their operations to account for the observers and monitors. There are no available estimates of these adjustment costs. If, in addition to observers, vessels also are required to carry cameras, this option raises the estimated cost of monitoring to approximately $4.5 million.

Table A-105. Nonwhiting trawl sector observation and monitoring costs at sea and shoreside.

Nonwhiting Trawl				
Catcher Vessels	**Current**			
Number	117			
Trips	2,699			
Days per trip	3			
Observer days	8,097			
Observer variable cost per day	$350			
Observer cost		$2,833,950		
Camera unit cost	$6,000			
Camera cost	$702,000	$702,000		
Additional equipment costs	Discard option may require vessels to have motion-compensating scales			
Processors				
Number	29			
Trips	2,699			
Number of trips per day	1			
Operating days	2,699			
Number of monitors	1			
Monitor variable cost	$350			
Total monitor variable cost		$944,650		
Status Quo			**0**	
T&M Alternative 1 Observers and Monitors			**$3,778,600**	
T&M Alternative 2 Observers, Monitors, and Cameras			**$4,480,600**	

Shoreside Whiting (Table A-106***):*** Based on recent participation rates, a whiting fishery prosecuted by 30 vessels with a season length of 60 days leads to 1,800 observer days at an industry cost of $630,000. The current camera costs are $180,000, and the current processor monitoring costs are about $294,000 for a combined status quo cost of $474,000. If cameras are replaced with observers, the costs rise to $924,000; if cameras are used to supplement observers, the costs rise to $1.1 million. These cost estimates will be updated based on information on the 2008 fishery, the first year in which plant monitors were employed in this fishery. It is unknown if these vessels will have to purchase scales, and the operational adjustment costs of these vessels to the use of observers are also unknown.

Table A-106. Shoreside whiting trawl sector observation and monitoring costs at sea and shoreside.

Shorebased Whiting				
Catcher Vessels	**Current**			
Number	30			
Season length	60			
Observer days	1,800			
Observer variable cost per day	$350			
Observer cost		$630,000		
Camera unit cost	$6,000			
Camera cost	$180,000	$180,000		
Additional equipment costs	???			
Processors				
Number	14			
Season length	60			
Operating days	840			
Monitoring cost per day	$350			
Total monitor variable cost		$294,000		
Status Quo			**$474,000**	
T&M Alternative 1 Observers and Monitors			**$924,000**	
T&M Alternative 2 Observers, Monitors, and Cameras			**$1,104,000**	

Mothership Whiting (Table A-107***)***: This analysis follows a similar approach to the shoreside whiting analysis above. Under status quo, mothership processors are required to carry two observers, and the catcher vessels have no direct monitoring; therefore, the costs are about $250,000. Adding observers to the catcher vessels increases the costs to $672,000, and adding observers and cameras further increase costs to $828,000.

Table A-107. Mothership sector observation and monitoring costs.

Mothership Whiting				
Catcher Vessels	**Current**			
Number	20			
Season length	60			
Observer days	1,200			
Observer variable cost per day	$350			
Observer cost		$420,000		
Camera unit cost	$6,000			
Camera cost		$120,000		
Processors				
Number	6			
Season length	60			
Operating days	360			
Number observers	2			
Observer cost per day (1)	$350			
Total Monitor variable cost		$252,000		
Camera unit cost	$6,000			
Camera cost		$36,000		
Status Quo			**$252,000**	
T&M Alternative 1 Observers Catcher Vessels and Processors			**$672,000**	
T&M Alternative 2 Observers, Monitors, and Cameras			**$828,000**	

Catcher-processor Whiting (Table A-108***):*** Unless cameras are required, there would be no change to industry costs of tracking and monitoring because catcher-processors already carry two observers. If cameras are also required, industry costs would rise from $378,000 to $432,000.

Table A-108. Catcher-vessel sector observation and monitoring costs.

Catcher-Processor Whiting				
Processors				
Number	9			
Season length	60			
Operating days	540			
Number observers	2			
Observer cost per day (1)	$350			
Total Monitor variable cost		$378,000		
Camera unit cost	$6,000			
Camera cost		$54,000		
Status Quo			**$378,000**	
T&M Alternative 1 Observers			**$378,000**	
T&M Alternative 2 Observers and Cameras			**$432,000**	

State and Federal agency costs for program enforcement, data collection and analysis, and administration are outlined in the following paragraph and in Chapter 4. The costs in Table A-109 on the following page are 'incremental' costs of the IFQ program compared to the status quo. The shift from dockside enforcement to enforcement through auditing-reported data as a result of IFQ was discussed by the Enforcement Committee. With the presence of 100 percent observation and monitoring on vessels, the need for dockside enforcement is greatly reduced, and restricted landing hours may not be crucial for cost reduction purposes. Consequently, state/Federal enforcement estimates ranged from no additional costs above the status quo to $500,000. Camera program costs are based on scaling up the costs NMFS is currently incurring for the whiting EMS camera program and scaling up to the entire trawl sector. Estimates of the At-Sea Observer Program are based on scaling up the estimated current costs of managing the trawl portion of the West Coast Observer Program to 100 percent of the fleet. The $3 million estimate for scaling up the observer program includes the costs of administration, observer training, and program infrastructure. It does not include the observer services. Data quality assurance would result from the periodic substitution of industry-paid-for observers with those paid by NMFS. The catch monitoring program cost estimate is based on the scaling up of the current costs of catch monitoring in the current shoreside whiting fishery. [These estimates will be updated based on analysis of the 2008 season, the first year catch monitors were employed in the whiting fishery.]

The IFQ/Co-op Permits, Quota Program estimate is based on doubling the current size of the NMFS NWR Permit Staff (supervisor, computer specialist, permits specialist, and permits assistant) plus one staff person devoted to the cost-recovery process. The appeals costs were based on requiring the services of a lawyer and a paralegal. It is expected that the PSMFC will continue working with the states, NMFS, and industry in developing electronic fish ticket and logbook reporting. There will be costs in the collection of data to monitor the performance of the fishery and developing various reports. In sum, these estimated costs total $5.2 million.

Table A-109. Program enforcement, data collection and analysis, and administration estimated costs.

	Total Costs	
State/Fed Enforcement	$500,000	Incremental cost – 4 staff support, 1 uniform officer **could be $0
Camera Program	$500,000	Tape review and analysis
At-Sea Observer Program	$3,000,000	Scale up current observer programs to 100% and data quality assurance
Catch Monitor Program	$300,000	Monitor, computer specialist, training and equipment, logistical
ITQ/Coop Permits and Quota Program	$500,000	Permits staff plus cost-recovery specialist
Appeals/GCF/GCF	$200,000	Lawyers and para-legal
E-Reporting Support	$100,000	Working with industry/states
Performance monitoring data collection and reporting	$100,000	Collect data and draft reports
TOTAL	**$5,200,000**	

To provide an economic comparison, Table A-110 below shows current harvest, revenue, and price dimensions of the fishery. It shows the recent variation in landings, revenues, ex-vessel prices, fuel prices, and wholesale whiting prices. The 2007 fishery generated $57 million, approximately $27 million of which was associated with nonwhiting groundfish, and $30 million of which was generated by the whiting fishery. Over the 2004 to 2007 period, the whiting fishery experienced a significant increase in prices, while all sectors experienced rising fuel costs.

To provide a summary of the comparison of costs to revenues,

Table A-110 below compares the status quo to costs of a trawl rationalization program that requires 100 percent observer coverage for all trawl sectors and 100 percent monitoring coverage in shoreside plants (T and M Alternative 1), as well as costs if cameras are also used to supplement observers (T and M Alternative 2). Again, the costs of observers are divided between government and industry, with government requiring about $3 million for administration, observer training, and program infrastructure and industry paying for observer services. The largest increase in industry costs occurs in the nonwhiting fishery with change in costs of $3.8 million over the status quo. This change is due to the fact that the industry currently neither pays for the 25 percent observer coverage, nor is it required to have plant monitors. Program management costs under T and M Alternative 1 are about $4.7 million. The total costs of T and M Alternative 1 are about $10.5 million. However, funds currently received by NWFSC for observing the trawl sector would continue to be used, thus reducing the total new costs related to the program to $8.2 million. If ex-vessel revenues in the fishery were $57 million, then the total costs of management would be about 14 percent. The industry would pay $10.5 million directly to contractors to obtain the services of observers and plant monitors required by the program. This would leave 4 percent needed to cover Federal government management costs, which is higher than the maximum fee level of 3 percent. Therefore, in developing this program, such aspects as limited landing hours have to be explored to see if program costs can be reduced enough to match up with the 3 percent maximum cost recovery level.

However, as the fishery adjusts to the IFQ and co-op programs, it is expected that costs will be reduced, because consolidation will create fewer, more-productive vessels earning greater revenue by catching more target species. If industry costs are reduced 25 percent, and revenues are increased by $20 million, then the resulting program costs fall to 3 percent. If program costs also fall, then possibly the cost recovery fee will fall below 3 percent.

The revenue estimate includes estimates of ex-vessel revenues associated with the whiting fishery. In 2007, the catcher-processor sector accounted for about 40 percent of the fish landed or about $12 million. If the catcher-process cooperative is not a LAPP then the cost recovery fee would not apply. The 2007 industry revenue estimate would have to be adjusted to $45 million. The program cost ($2.4 million after the offset) to industry revenues ($45 million) percentage is about 5 percent. After the projected industry adjustment to IFQs, the program costs would be 3.5 percent of industry revenues ($68 million).

Fees collected from industry to cover program costs will reduce the value of the QS initially allocated and the price at which QS and QP is traded by an amount that reflects the additional costs of participation in the program.

Table A-110. Summary comparison of tracking and monitoring costs.*

Summary Totals (Millions $)	Status Quo	T&M Alt 1	T&M Alt 2	Change from Status Quo T&M Alt 1 - Status Quo
Non-Whiting Trawl	-	3.8	4.5	3.8
Shoreside Whiting	0.5	0.9	1.1	0.4
Mothership Whiting	0.3	0.7	0.8	0.4
Catcher Processor	0.4	0.4	0.4	-
Program(s) Management	2.3	4.7	5.2	2.4
Grand Total	3.5	10.5	12.0	
NWFSC Observer Program Offset	2.3	2.3	2.3	
Net Grand Total	1.2	8.2	9.7	7.0
Ex-vessel Revenue Millions $	57	57	57	
% Net Grand Total		14%	17%	
% Direct Payments by Industry		10%	12%	
% Program Management		4%	5%	
Assume: IFQs reduce costs by 25% because it leads to few more productive vessels				
Assume: IFQs lead to $20 million in nonwhiting revenues as educed bycatch allows greater target catch				
Adjusted Costs		6.15	7.28	
Adjusted Revenues		77	77	
% Net Grand Total		8%	9%	
% Direct		6%	7%	
% Program Management		3%	4%	

* These values are provided for the purpose of providing an initial estimate of the magnitude of the impacts for the environmental impact assessment. The RIR/IRFA produced in conjunction with publication of the propose rule provides more refined estimates and an assessment of impacts on the fishing industry.

A-2.3.4 Program Duration and Modification

❖ Provisions and Options

Preliminary Preferred Language: Four-year review process to start four years after implementation. Community advisory committee to review IFQ program performance.

► **Final Preferred Language:** The Council shall begin a review of the IFQ program no later than five years after implementation of the program. The review will evaluate the progress the IFQ program has made in achieving the goal and objectives of Amendment 20. The result of this evaluation could include dissolution of the program, revocation of all or part of QSs, or other fundamental changes to the program. Holders of QSs should remain cognizant of this fact when making decisions regarding their QSs, including buying selling, and leasing of these shares.

The Council shall consider the use of an auction or other nonhistory based methods when distributing QS that may become available after initial allocation. This may include quota created when a stock transitions from overfished to nonoverfished status, quota not used by the AMP, quota forfeited to "use it or lose it" provisions, and any quota that becomes available as a result of the initial or subsequent reviews of the program.

The specific form of the auction or other method of distribution shall be designed to achieve the goals of Amendment 20, specifically including minimizing the adverse effects from an IFQ program on fishing communities to the extent practical.

After the initial review, there will be a review process every four years. A community advisory committee will take part in the review of IFQ program performance.

❖ Rationale and Policy Issues

Within five years of implementation, a quadrennial review cycle would begin. The four-year review is more frequent than that required by Section 303A(c)(1)(g) of the act. The act only requires that the review occur within five years of implementation and thereafter in conjunction with the Council's scheduled review of the groundfish FMP, but not less frequently than once every seven years. The Council wanted to ensure regular review but, for workload management purposes, to time the review around its biennial management cycles.

A community advisory committee would review IFQ program performance. At its November 2005 meeting, this provision was added when the Council considered provisions to ensure full consideration of community concerns.

Options were considered to provide a sunset provision for the program as a whole. Early on, the Council rejected the automatic program sunset provision because of the uncertainty it would introduce into the program and the mandated need it would create to reenter an extensive and controversial process when there might not be a need to do so. The program performance review process is expected to ensure adequate consideration regarding whether the program is meeting its objectives and the appropriateness of its continuation.

A closely related issue is whether the terms of the QS should be limited. The MSA mandates such a provision with a term of no more than 10 years, but specifies it in such a way that the term is effectively limited only for those who violate the program. The Council has not identified any specific acts in this program that would be the cause for QS revocation (Section 303A (f)) and has not specifically identified

a limit on the term of the QS. The MSA type of fixed term for QS is discussed in this section in the context of a discussion of provisions for program modification and the limited nature of the QS privileges issued. In Section A-6, the Council considers an approach for fixed term QS under which QS owners might lose some of their QS even if they have not violated the program. This provision is considered in combination with an auction. The provisions, analysis and the rationale for the Council's decision not to include the option are provided in Section A-6.

❖ Interlinked Elements

This provision could be modified by the fixed term option included in Section A-6 and analyzed in Appendix F. However, the Council chose not to recommend the fixed term and auction option analyzed in Section A-6. The Council did include consideration of a sunset and auctions as part of the quadrennial program review.

❖ Analysis

The following are the categories of goals and objectives affected by the decisions on program duration and modification.

Section	Related Category of Goals and Objectives										
	Conservation	Net Benefits	Disruption	Excessive Shares	Fairness and Equity	Harvester and Processor Sector Health	Labor	Communities	Small Entities and New Entrants	General Public	Program Performance
Schedule for Program Review											X
Program Modification		X	X			X					
Auction										X	

Schedule for Program Review

The Council's current schedule requires more frequent review than that required by the MSA. It entails higher administrative costs than one that is less frequent. By timing the review process to occur every four years, the Council can set the review up to coincide with either the on-year or the off-year for the biennial groundfish specifications process. Depending on the degree of work entailed and modifications to be considered, reviewing the program at the same time the biennial specifications are developed could be more efficient or could create untenable workloads. The specification of a flexible review period could provide the Council with an opportunity to better prioritize and manage its workload.

Program Modification

The IFQ program may be modified at any time through Council action. QS do not constitute a property right. An IFQ program does not change the resources public ownership status. It is a public resource managed by the government as a public trust. Under the current management system, the government

manages the resource to the public benefit by controlling catch (directly or indirectly) and allowing catch taken under the management rules to be converted to private property sometime between when it is caught and when it is sold to a fish buyer. IFQs are an alternative way for the government to control and organize harvest activity. IFQs do so by creating a catch privilege. A catch privilege is different from ownership of the resource. The following MSA language pertains to the limits on this catch privilege:

> Sec. 303A(b) NO CREATION OF RIGHT, TITLE OR INTEREST.—LAP, QS, or other limited access system authorization established, implemented or managed under this Act—
>
> (1) shall be considered a permit for the purposes of sections 307, 308, and 309;
>
> (2) may be revoked, limited or modified at any time in accordance with this Act, including revocation if the system is found to have jeopardized the sustainability of the stock or the safety of fishermen;
>
> (3) shall not confer any right of compensation to the holder of such LAP, QS, or other such limited access system authorization if its revoked, limited or modified;
>
> (4) shall not create, or be construed to create, any right, title, or interest in or to any fish before the fish is harvested by the holder; and
>
> (5) shall be considered a grant of permission to the holder of the LAP or QS to engage in activities permitted by such LAP or QS.

> Sec. 303(d)(3) "An individual fishing quota...
>
> (B) May be revoked or limited at any time in accordance with the MSA.
>
> (C) Shall not infer any right of compensation to the holder of such individual fishing quota, if it is revoked or limited.

The MSA requires that QS be set with specific fixed terms. However, the MSA specifies that QS must be automatically renewed at the end of those terms, unless an individual has violated the program or the program has been modified. This effectively makes the MSA mandated fixed term more like an unlimited or indefinite term with the possibility of modification or termination, but not on any particular schedule.

The explicit statement that the program may be modified has an indirect effect on all objectives as it makes clear that the privileges conferred by the IFQ program are not open-ended. If it becomes apparent that conditions in the fishery could be improved by the modification or termination of this program, there would no doubt be objections by some based on capital expenditures in expectation that the program was expected to continue unchanged, the disruptive effects of those changes, and related fairness and equity arguments. While this provision will not end or eliminate these arguments, the explicit advance notice should reduce the amount of disruption that occurs if a change is made (to the extent that people take the possibility of change into account when making investments) and reduce the weight of such arguments against changes.

While the specification of IFQ as harvest privileges that may be changed to the point of revocation introduces some uncertainty into the system, private markets are generally able operate effectively under such circumstances. Industries often rely on key inputs for which they do not secure long-term rights of access. For example, airlines rely on fuel as a key input, but most do not try to secure their access to fuel through ownership of oil companies. If they believe it necessary, there are other ways they can mitigate risk due to changing fuel costs (e.g., futures trading). In fisheries, changing resource conditions always create uncertainty about future harvest opportunity. While industry members cannot necessarily plan on continuation of their QS privileges, it is highly likely that some form of access to the fishery will be provided, to the degree that conservation objectives allow. Thus, it is unlikely that, even with

termination of the IFQ program, a firm necessarily would totally lose access to the resource. A firm's ability to secure tenure over a key input is a form of vertical integration. Such vertical integration can contribute to a firm's profitability, increase efficiency, and improve net benefits (see discussion of vertical integration in Appendix E). Whether the IFQ program might generate more net benefits if the QS were issued with no statement about their limited tenure depends on the extent to which people take the possibility of change into account and modify their investments. If a greater possibility of change is taken into account, there may be some reduction in private efficiency gains. The effect on net benefits also depends on whether losses occur as a result of not clearly preserving the opportunity to make changes to the program, i.e. a loss could occur if failure to explicitly identify the limits on QS tenure creates opposition to change that cannot be overcome despite identification of some socially and/or economically desirable improvements that might result from the change.

In summary, explicitly maintaining limited tenure (as mandated by Congress) creates some uncertainty that may have some negative effect on industry efficiency, but makes it more likely and less costly to implement program changes that may increase net social and economic benefits. No limit on tenure might create more efficiency but there would be less opportunity for program change, and change would be more costly. Finally, limited tenure over some key input is something that almost every sector of most industries deals with to some degree. At issue here is the government specification of limited tenure as a quality of the asset that is to be created.

While this section addresses in general the possibility that the IFQ program may be modified and, thus, the terms of the QS issued may be limited, Section A-6 and Appendix F present and analyze an option that would explicitly limit the duration of the terms of the IFQ program and provide for an auction of shares returned to the government. The effect of a fixed term of this type, accompanied by certain revocation and an auction, would be different than the type of fixed term mandated by the MSA (described above).

- Auction Provisions

This provision gives notice of the Council's intent to consider implementing an auction if QS become available that have to be redistributed. The public, industry, and in particular those who acquire QS should be aware that the program could be changed at any time and an auction implemented, after going through the appropriate process for amending the FMP. If the Council considers such an auction, a full regulatory amendment and rule making process would accompany that decision. That process would include a complete analysis of the specific proposal and an opportunity for public comment. Auctions are a way to secure for the public royalties representing a portion of the resource rents that would otherwise be received by the sellers of QS.[128] Other impacts would depend on the source of the QS for the auction and other specifics of the proposal. An analysis of one auction proposal is provided in Appendix F to this document.

[128] QS owners who purchase QS may or may not gain rents when they sell the QS but rather, under stable price and resource conditions, may recover their original investment plus some normal level of return. If resource abundance levels or prices change, they may lose or gain relative to their original investment when selling the QS, depending on the effect of those changes on profitability in the industry.

A-2.4Additional Measures for Processors (All Options – Not Adopted)

❖ Provisions and Options

No options from this section were included as part of the preferred alternative.

Option 1: Any QS received for processing history as part of the initial allocation will expire after a certain period of time (to be determined prior to final Council action). At that time all remaining QS will be adjusted proportionally so that the total is 100 percent.
Option 2: The accumulation limit grandfather clause of Section A-2.2.3.e will not apply for processing history. Regardless of the percent of the total QS designated for processors, processing history will not entitle a person to receive QS in excess of the accumulation limits.
Option 3: The Adaptive Management allocation and process (Section A-3) will be used to compensate processors for demonstrated harm by providing QP to be directed in a fashion that increases benefits for affected processors.

❖ Rationale and Options Considered but not Analyzed Further

Note: In this section and for these options the impacts of the not having a grandfather clause provision assume that there is not an opportunity for divestiture. Under divestiture entities that according to the allocation formulas would receive QS in excess of accumulation limits are allowed to receive and sell such QS within a specified time. Without a divestiture provision QS not allocated because of accumulation limits would be redistributed among other the QS recipients in proportion to the QS they received.

These options were considered as possible ways to address processor concerns short of a full allocation of QS to processors. In Section A-2.1.1.c, we focused on reasons for allocating or not allocating to all groups. The focus of this section is on measures that might be adopted in addition to, or in lieu of, an allocation to processors. In the spring of 2007, we compiled and received public comment on a list of the reasons provided for allocating and not allocating to processors. A summary of that compilation is provided here.

Reasons to Allocate to Processors	Reasons Given for Not Allocating to Processors
Compensate for stranded capital.	Stranded capital will not occur for processors. Long-term compensation should not be given for a short-term problem.
Processors are fishery participants that are invested and dependent on the fishery (303A) and have contributed to the development of the fishery.	National Standard 4 says allocations, when necessary, should be to "fishermen." No precedence for allocating IFQ to processors.
Keep balance of market power and flow of product to existing plants.	Will create a market power imbalance.
Facilitate communication and coordination of fishing activity between plants and vessels, including management of total harvest, bycatch, and participation among co-ops.	Such communication and coordination occurs under status quo and processors do not need an initial allocation to continue. If processors do not receive an initial allocation they can still participate in co-ops by acquiring QS in the market place.
There is a conservation benefit whether you give QS to permit holders or processors.	Degrades conservation benefit.
Maintain diversity and competition in the processing sector.	The processing sector will be consolidated and new entry will become more difficult.
Processor buy-in is needed to move the program forward.	Consolidation among permit holders not associated with processors will increase.
	An allocation to processors does not take into account the permit owner's obligation to repay loans from the buyback program. Those loans bought up permits representing nearly 50 percent of the fleet's landing history.

The following option was considered but rejected from the list of possibly additional measures related to processors:

> As needed, a fee will be established to provide financial compensation to processors for demonstrated harm. A process will be established for the demonstration of harm.

Establishing the fee and using it to provide direct financial compensation would require congressional action.

The Council adopted none of the options provided in this section. Rationale for its action on each of these options is provided below. Rationale for the Council's decision on the amount of QS it would allocate to processors is provided in Sections 2.8.7 and A-2.1.1.a.

Limited Duration QS. Option 1 would provide processors with QS for a limited period. Under the Amendment 6 program, limited duration permits ("B" permits) were issued to provide an adjustment period for those to whom "A" permits were not granted. One reason that limited duration QS might be considered would be if the primary rationale for granting QS to processors were the concern that QS holders may capture a portion of processor profits. This may be a possibility if processors are overcapitalized, the processing side of the market is structured competitively, and QS holders are able to exert market power. The period might be set such that it is believed excess processing capital will have left the fishery when the QS expire or that any processors who had taken out loans to finance their investment would be able to pay that investment back. Holding QS for that period would provide leverage in the market place while the QS is active.

As explained in Section 2.8.7, the strongest argument that IFQs would create excess processing capital applied to the shoreside whiting sector. For the nonwhiting sector, no QS was provided; therefore, this provision could not be applied. For the whiting sector, harvesters and processors reached a compromise agreement in which processors would receive 20 percent of the whiting QS and no QS for bycatch species. Given the compromise reached by the parties, the Council did not consider limitations on the duration of the QS issued.

No Grandfather Clause. Option 2 would place caps on the amount of QS a processor receives at the time of initial allocation. It is relevant only if the Council adopts a grandfather clause as part of the accumulation limit option. This option might be adopted to pursue at least two different ends:

(1) To provide another balance the Council could strike in trying to establish the appropriate distribution of QS between processors and harvesters
(2) To alter the balance of program impacts between small and large processors (independent of issues related to the harvester/buyer split of the initial allocation)

If a grandfather clause had been included in the program, this option would provide more QS to smaller processors and less to larger processors and would not affect the split between harvesters and processors (assuming that the intent of the option is to preserve the split of QS between harvesters and processors established in section A.2.1.1.a, e.g., a 75/25 split). [129] Part of the rationale for a grandfather clause for harvesters is that they must have QP to operate, and a grandfather clause allows them to achieve certain historic scales of operation. Processors do not need the grandfather clause to preserve their historic scale of operation because they do not have to hold QP to buy groundfish. The grandfather clause might

[129] An alternative interpretation of this option could be that any QS that is not issued to a processor because it exceeds the accumulation limit would be distributed as part of the initial allocation to QS holders.

be needed to provide for historic scale of operations with respect to processor owned permits; however, this option is phrased such that QS allocations issued for processor owned permits would still be grandfathered in.

This provision was rejected when the decision was made that no grandfather provision would be provided for any QS recipient.

Adaptive Management. Option 3, like Option 1, is focused primarily on the issue of compensation for harm to processors. Option 3 would establish that it is the Council's specific intent to use the AMP to compensate processors for harm. Under this option, no special action would be taken to benefit processors until after such harm has been identified. At that time, the Council would have to decide if the holdback program would be used to benefit all processors, a certain class of processors, or just those specific entities that demonstrate they have been harmed by the program.

The Council's final action on the adaptive management essentially includes this option as a possible purpose for using the QP provided for adaptive management (Section A-3). The specific related objective included in the program is "Processor Stability." While processor stability does not necessarily imply some form of direct compensation for loss, to the degree that it is necessary to use adaptive management QP for this purpose, there may be some benefit to processors that have experienced harm.

❖ *Interlinked Elements*

Depending on the rationale for considering these options, each of these may be linked with the decision on the amount of QS allocation to give buyers (processors) as part of the initial allocation (Section A-2.1.1.c).

Options 1 and 2 are interlinked with the accumulation limit decision on whether to include a grandfather clause. Option 2 only makes sense if such a clause is provided in Section A-2.2.3.e. Option 1, in particular, would require some additional considerations with respect to specification of the grandfather clause. Specifically, when the QS issued to processors expires, and the result is that all other QS increase proportionally, are those who control QS allowed to keep the additional QS they receive that is in excess of the accumulation limits? If there is a vessel grandfather clause, will the grandfathered levels for vessels be increased?

Under a previous version of the AMP (Section A-3), Option 3 of this section would have applied to relatively few processors if it was adopted in conjunction with Option 5 of Section A-2.1.1.a (Option 5 allocated to processors and specifies a set-aside for the AMP). The previous version of the AMP specified that, if the Council were to allocate QS to processors (adopt Option 5 in Section A-2.1.1.a), those processors who receive an initial allocation would not be eligible to receive QP issued through the AMP. Option 3 of this section allocates only to those processors able to demonstrate harm. Presumably, in order to demonstrate harm from an IFQ Program, the processor would have to exist at time of program implementation. Since if there were an allocation to processors most processors would receive an initial allocation, the only processors eligible for QS under Option 3 would be those that had entered the program relatively recently (i.e., after 2003) or are preexisting, but did not meet the recent participation criteria of Section A-2.1.2.

❖ *Analysis*

These options impact goals and objectives related to net benefits and efficiency, disruption, excessive shares, fairness and equity, and sector health. The impacts will be reviewed here in the context of the effect of the options on processors and harvesters. There may be some indirect impacts to communities

and labor related to the amount and duration of the QS issued to processors or the distribution of QP under adaptive management. These impacts are discussed in Section A.2.1.1.a and A-3. Whether communities benefit more by a provision that benefits harvesters or one that provides more benefits to processors depends in part on the degree to which each of these entities tends to be tied to communities.

Limited Duration QS (Option 1)

Impacts on Processors

One of the rationales for allocation to processors is that during the post-implementation transition period, those who hold QS will be able to capture profits from the harvesters or processors that would otherwise go to a return on investment and possibly repayment of debt. In Section A-2.1.1-a, we identified that the opportunity for QS holders to capture such profits would be limited to the time and the sectors for which overcapitalization exists. If, prior to implementation of the IFQ program, processors competed for vessel deliveries primarily on the basis of the prices offered, then under IFQs, processor profits should not vary substantially from what is observed under status quo. If, under status quo, processors competed for deliveries at least partially based on their ability to handle product volume during an Olympic fishery, then profits that might otherwise go to return on investment might be captured by QS holders under an IFQ program. That ability to capture such profits should be limited to the period during which overcapitalization remains in the sector. Thus, whether this measure would address the concern about capture of processor profits by QS holders would depend on when QS issued to processors are set to expire, the time over which the processors capture adequate return on capital, and the time required to repay debt on the capital investment.

With respect to the difference between capturing adequate return and paying off debt, adequate return is that return needed to compensate the owners of capital for their investment, and it should be comparable to the return for investments of similar levels of risk in other sectors of the economy. When such compensation is not available, it discourages future investments in the sector. Adequate return should be taken into account, whether the capital investment is financed through the firm's own assets (e.g., cash on hand) or through a bank loan. The period required to cover debt is an important consideration with respect to the effect of the IFQ program on financial stress and potential bankruptcies. Banks generally require that most fishery-specific equipment investments be paid off within 5 to 10 years.

Another reason for providing QS to processors is to affect the balance of market power in the fishery. Those initially receiving QS will receive resource rents and be in a better position to thwart an attempt by those on the opposite side of the market to exert market power. If processors are given QS over concern about harvesters' ability to exert market power, limiting the duration of the QS will cut short the achievement of this objective. It would provide processors with a grace period during which they might move to a better position to maintain their profits (assuming that harvesters would otherwise exert market power) and that period could provide an opportunity for them to acquire QS from harvesters (QS that will not expire). Under this option, at the start of the program, the QS available from harvesters may be somewhat less expensive relative to their value after expiration of the QS issued to processors. At the same time, those holding the QS may be more reluctant to part with them because they know their value will increase substantially as the time at which the QS issued to processors approaches. Additionally, an initial moratorium on the transfer of QS (an option in Section A-2.2.3.c) would also make it more difficult to accumulate QS.

An initial allocation of QS will provide an infusion of wealth to the initial recipients, which may give them a leg up in the growth and expansion of their operations, including the accumulation of additional QS (see Section A-2.1.1.a). If the intent of an initial allocation to processors is also to provide them with this advantage, or an advantage more on a par with harvesters, that advantage will be substantially decreased if the QS are set to expire after a certain period.

The initial allocation will also create a competitive advantage for existing businesses compared to new entrants (a barrier to new entry, see Section A-2.1.1.a). Over the long run, sectors are able to exert market power only to the degree that a barrier to entry prevents new competitors attracted by higher profits. Limiting the duration of the initial allocation will reduce this affect.

Impacts on Harvesters

If processor QS is to expire after a time, and all QS that were originally issued to harvesters expanded, the expiration will cause QS prices to increase as the expiration approaches, and there will be a second transition period. The effect of the expiration on price and QS availability on the market is described above in the section on processors. After QS are issued, it is expected that the individual quota will migrate into the hands of the most efficient producers (whether as QS they own or as QP they acquire from other QS holders). It is, however, likely that the initial distribution will affect the vessels to which the QS/QP migrates. The QS issued to permit owners will likely migrate through the market to the most efficient vessels, some of which may be owned by harvesters and others owned by entities that also process.[130] Processors may be more likely to use QS on their own vessels (taking advantage of vertical integration opportunities) and accumulate additional QS to make those vessels more efficient;[131] or they may decide it is more efficient not to operate vessels, but rather to use the QS they own to influence deliveries of independently operated vessels. Depending on this choice and the decision to allocate to processors, the rationalization process may leave a different set of active vessels. Either way, however, if a substantial degree of rationalization is achieved within the "lifespan" of the limited duration QS, once those limited duration QS expire, some vessels may find themselves with more QS than they need and others with less than they need (those who depended on QS issued to processors). Vessels owners may use a variety of contracting mechanisms to arrange in advance to minimize the disruptive effects of the second transition period. However, this will require additional transaction costs.

Impacts on Net Economic Benefits

The need to track QS originally issued to processors separately from other QS will add some cost to the QS tracking program. The second adjustment period occurring when limited duration endorsements expire will also have an effect on net benefits by increasing transaction costs as QS owners prepare for the repositioning required by the expiration.

No Grandfather Clause (Option 2) *(and no opportunity for divestiture)*

Impacts on Processors

The absence of a grandfather clause for processors (in the presence of a grandfather clause for permits) would not affect any QS issued to a processor based on the history of a LEPs owned by that processor. However, a processor that would receive for its LEPs an amount of QS in excess of the accumulation limits would not be eligible to receive QS for its processing history (assuming no divestiture is allowed). QS it would have otherwise received will be redistributed to the remaining processors in accordance with the allocation formula. Thus, if there were a grandfather clause, excluding processors from the grandfather clause provision may have evened the distribution of QS among processors. However, it is likely that those processors with permits that would put them over accumulation limits would sell those permits to gain some financial benefit related to the QS they represent. To the degree that excess permits would be transferred away, the absence of a grandfather clause would cause less redistribution

[130] In some cases, it will be the QP that migrates, while others retain ownership of QS.
[131] Up to accumulation limits.

among processors than would otherwise be the case. This effect has been discussed in Section A-2.1.1.a.

To the degree that there is an allocation to processors and no grandfather clause or opportunity for divestiture, some of the smaller processors could be made relatively better off by this provision in that they would have more QS and thus potentially more bargaining power in their interaction with harvesters. Relative to larger processors, they are likely to have greater strength, as compared to what they would have had if there had been a grandfather clause.

Impacts on Harvesters

As compared to a processor allocation in which a grandfather clause is applied to processors, harvesters are more likely to face a buying sector that has a greater number of buyers and smaller buyers with relatively more bargaining power.

Impacts on Net Economic Benefits

The impact of Option 2 on net benefits, relative to a processor allocation without a cap on the accumulation limit, is uncertain and likely depends on whether there would be any greater or lesser reason to expect that market function would be hampered (i.e., that one side or the other could be effective in exerting market power). As compared to Options 1 and 3, the transition/implementing costs of Option 2 are lower.

Adaptive Management (Option 3)

Impacts on Processors

Under Option 3, QP issued through the AMP would be used to compensate processors for demonstrated harm. If adopted, the exact impacts of this provision would depend on the process by which the provision is activated and how the QP issued for this purpose are distributed.

With respect to activation of the provision, the first step is demonstration of harm. If, prior to implementation of the IFQ program, there were no further development of this option, there would be several implicit lags in its activation. First, the harm would have to be identified, and someone, the industry or government, would have to collect the information and provide it in a Council forum. The Council would then develop criteria for evaluating the information and harm, conduct the evaluation, identify a remedy, and complete the Council decision process, at which time NMFS would evaluate the Council recommendation and take appropriate action. Alternatively, the matter of developing criteria, evaluating the harm, and determining a remedy could be delegated to NMFS discretion. In either case, the action would require a public process. The first QP would likely be issued in the year following completion of that process.

On one hand, leaving the program completely open with respect to criteria and response provides the maximum flexibility for appropriate adaptive management in response to harm to processors. On the other hand, that flexibility results in a time lag for taking action. Depending on the length of that lag and the degree of harm, processing companies could go out of business prior to remedial action. Alternatively, some criteria and remedial actions might be developed in advance, so they are ready to support a rapid initial response using the AMP QPs. The Council's consideration of this possibility and final recommendations are described in Section A-3.

Option 3 of this section and Option 5 of A-2.1.1.a (Option 5 allocates QS to processors and provides for an AMP) could both be adopted; in that case, however, the only processors able to benefit from Option 3 of this section would be those entering the fishery after 2003 or those disqualified by recent participation criteria (Section A-2.1.2). This is because the AMP (A-3) prohibits allocation of QP to processors that received an initial allocation.

Impacts on Harvesters

As with the processors, the impact on harvesters will depend on how the program is implemented. If adaptive management QP are issued to processors, depending on the criteria for usage, it may be more likely that a processor will use the QP on its own vessel rather than an independent harvester. This would cause a direct disruption in the flow of QP among vessels; by definition, however, the AMP will likely alter either product flow or the prices at which raw fish are sold. While issuing QP to processors for use in balancing bargaining power might alter product flow among harvesters, issuing QP to harvesters as a reward for delivering to the same processors that they had in the previous year would stabilize product flow. Issuing the QP to harvesters in this fashion would also stabilize the rationalization process. Alternatively, if the fleet rationalizes, adjusting operation sizes to QS holdings, and QP is diverted for use to compensate for processor harm and not available to the same harvesters (e.g., processors that receive the QP want to use it on their own vessels), then harvesters would go through another adjustment.

Impacts on Net Economic Benefits

There will be some management costs associated with the AMP, and, depending on how the program is implemented, there may be some additional transaction costs if the QP available to particular harvesters are reduced and they have to adjust their QS holdings in order to re-optimize. For example, in the first year of the IFQ Program, all AMP pounds will be passed through to harvesters. If harvesters adjust to those initial levels of QP, and then QP is diverted to other harvesters through AMP mechanisms, some may have to readjust.

In general, imposing a restriction on a properly functioning market system results in some inefficiency. However, if market power is being exerted, and adaptive management is used to counter that effect, the effect on efficiency may be minimal. It might be possible to distribute the QP in such a way as to change the balance of market power, essentially redistributing the profits without changing who harvests and processes the fish. If this end were achieved, the effect on efficiency would be lower than if the program resulted in an actual redistribution of the product flow. In order for the distribution to redistribute profits without redistributing the flow, it would be the threat of the potential redistribution that would cause a different outcome in the bargaining process, rather than an actual shift.

A-3 ADAPTIVE MANAGEMENT (OPTION)

❖ *Provisions and Options*

Preliminary Preferred Language. During the biennial specifications process, up to 10 percent each year's QP available for the trawl IFQ program will be set aside for use in an AMP that could create incentives for developing gear efficiencies, or community development or to compensate for unforeseen outcomes from implementing the IFQ program. Examples of unforeseen outcomes include, but are not limited to, unexpected geographic shifts in the distribution of catch or landings, unexpected effects on certain segments of the industry (e.g., processors), or an unexpected barrier to new entry into the fishery. Should the Council adopt initial allocation of **fishing QS** to processors, those processors receiving an initial allocation would not be eligible to hold QP issued through an AMP. This provision will apply to the overall trawl sector (whiting and nonwhiting) but the QP set-aside from each trawl sector would be specific to that sector.

►**Final Preferred Language.** Ten percent of the nonwhiting QS will be reserved to facilitate adaptive management in the shoreside nonwhiting sector. Therefore, each year 10 percent of the shoreside trawl sector nonwhiting QPs will be available for use in adaptive management (adaptive management QP). The set-aside will be used to address the following objectives.

- Community stability
- Processor stability
- Conservation
- Unintended/Unforeseen consequences of IFQ management.
- Facilitating new entrants.

Years 1 and 2. During the first 2 years in which the IFQ program is in place,

- The method to be used in distributing QP in years 3 through 5 is to be determined, including.
    - The decision making and organization structure to be used in distributing the QP set-aside135F[132]
    - The formula for determining community and processor eligibility, as well as methods for allocation, consistent with additional goals.
    - The division of QP among the states.
    - Whether to allow the multi-year commitment of QP to a particular project.

Years 3 through 5.
QP will be distributed through the organizational structure, decision process, formulas and criteria developed in years 1 and 2 and implemented through subsequent Council recommendation and NMFS rule making processes. Consideration will be given to the multiyear commitment of QP to particular projects (3 year commitments).

Review and Duration. The set-aside of QP for the identified objectives will be reviewed as part of the year 5 comprehensive review and a range of sunset dates will be considered, including 10, 15, 20 year and no sunset date options.

[132] The following are three options for the sequences of agency involvement in decision making for the distribution of adaptive management QP after year 2:
1. NMFS
2. State → Council →NMFS
3. Council →NMFS

❖ Rationale and Policy Issues

Rationalization of the trawl LE fishery could have unforeseen or unanticipated consequences. The QS set-aside for an AMP provides a tool to adaptively deal with these unforeseen issues. For example, if unforeseen harm to processors or communities occurs, adaptive management QPs could be used for compensation. The Council intends that the adaptive management holdback for each sector would be specifically for use in that sector. The Council's adaptive response would not be limited just to the use of the QS set aside for this purpose. See Section A-10 for additional discussion of adaptive response.

The Council may choose to build flexibility into the management of the rationalization program by providing incentives to harvesters to shape fishing behaviors. Adaptive management could be used to rewarded low bycatch rates/amounts, low prohibited species catch rates/amounts, or to encourage conversion to fixed gear.

The Council intends that the adaptive management QP be fished. Any QP not allocated through the adaptive management provision would be redistributed to all the QS holders in proportion to the amount of QS they hold. In this manner, no QP in the AMP would remain unallocated. It is not the intention of the Council to remove 10 percent of each sector's allocation from use.

Vessels receiving adaptive management QP in addition to QP already held in a vessel account could cause the vessel to exceed a vessel accumulation limit. The Council would have to address this issue of excessive shares/pounds caused by allocation of adaptive management QP. If adaptive management QP count towards the accumulation limit, then for those vessels that are at the maximum, there is no way to provide them with the incentives. If AMP QP are not counted towards the vessel's accumulation limit, that would add a small amount of complexity to the tracking and monitoring of accumulation limits. The Council could consider this issue as part of the trawl rationalization program, or leave it as a modification to be made upon implementation.

If the Council were to allocate QS to processors (adopt Option 5 in Section A-2.1.1.a), those processors who receive an initial allocation would not be eligible to "hold" QP issued through the AMP, according to the way the adaptive management provision is written. It may be difficult to track indefinitely which processors were initially allocated QS, and whether they are processors that CAN or CANNOT hold adaptive management QP. The Council may wish to address this issue by changing the term "hold" to "cannot initially receive." In other words, processors would not be able to initially be awarded adaptive management QP, but could later in the year buy them, hold them, and fish them. This alternation to the provision would substantially reduce the amount and cost of tracking adaptive management QP beyond the initial receiver. Another possible approach might be to put a sunset date on processors that are ineligible to hold adaptive management QP.

Depending on the final purpose and structure of the Adaptive Management provision, the goals and objectives addressed include the following: promote fishery conservation and assist in rebuilding of overfished species (MSA 303A(c)(1)(A) and (C)); address concerns over excessive geographic or other consolidation in the harvesting or processing sectors (MSA 303A(c)(5)(B)(ii)); avoid unnecessary adverse impacts on small entities (Groundfish FMP Objective 15); and assist fishing communities, entry-level and small vessel owner-operators, captains, and crew through set-asides or assistance in the purchase of quota (MSA 303A(c)(5)(C)).

Conservation	Net Benefits	Disruption	Excessive Shares	Fairness and Equity	Sector Health	Labor	Communities	Small Entities and New Entrants	General Public	Program Performance
X			X			X	X	X		

❖ *Interlinked Elements*

Quota shares allocated to processors – Adaptive management QP would not be allocated to processors that received an initial allocation of QS.

Tracking and Monitoring – Adaptive management QP may have to be tracked separately from other QP, if they cannot be transferred to processors that receive an initial allocation.

Accumulation limits – Adaptive management QP may or may not count against an individual's, an entity's, or a vessel's accumulation limit.

Transferability – Adaptive management QP may or may not be transferable, depending on the purpose of the awarded QP.

Program costs – Adaptive management would add some complexity and increase the cost of execution of the rationalization program.

Additional measures for processors – A particular use of the adaptive management QP is specified in Section A-2.4, Option 3.

❖ *Analysis*

A Council staff paper was presented at the April 2009 Council meeting (Agenda Item F.5.a, Attachment 1, April 2009) to assist decision-making. The paper outlined the following general principles:

- The decision-making process will be governed by one or more goals identified by the Council, providing boundaries on what activities or entities will be eligible to receive AMP quota.[133]
- The decision-making process will most likely involve the Council, but states may play an independent role in decision-making (for example, by pre-screening proposals).
- NMFS will be involved in the decision-making process, at a minimum reviewing Council/state decisions.
- For legal reasons it is likely that NMFS will retain control of AMP QS while distributing the associated QP to program participants.[134]

[133] It is expected that the program goal or goals could be modified from time to time to address changing socioeconomic or environmental conditions.

[134] Note that this is somewhat at odds with the language in the Council's motion.

- The AMP could be "proposal-driven" or "formulaic." In a proposal-driven process, the use of AMP quota will be identified by individuals or entities that apply to receive quota. A decision-making process then evaluates proposals to determine which "applicants" should receive quota, and how much quota each applicant should receive. In a formulaic process, very specific criteria or performance standards determine who receives AMP quota and the allocation is based on a formula rather than case-by-case decisions.
- The Council and NMFS will not be directly involved in structuring local entities that may receive AMP quota, such as regional fishery associations, community stability plans, or other entities that might receive quota, although evaluation criteria could favor certain types of entities or limit eligibility to certain types.

Up to 10 percent of each trawl sector's allocation would be distributed to those harvesters that meet the criteria established for the AMP. The Council may choose to utilize the AMP QP trawl fishery (including processors) so that trawl rationalization is consistent with the goals, objectives, and guiding principles laid out by the Council (see Chapter 1 in the FEIS); Groundfish FMP goals and objectives; National Standards listed in §301 of the MSA; and requirements of limited access programs listed in §303A(c) of the Act. A truly adaptive program would respond to unforeseen and adverse effects from trawl rationalization stemming from implementation.

Establishing program goals is an important part of program design. Goals could be kept broad, essentially relying on the language from the MSA, FMP, and EIS cited above. This would give the Council the greatest flexibility to consider particular activities or proposals for the use of AMP quota on a case-by-case basis. As an alternative or in addition, specific program goals could be enumerated, focusing on particular issues that are anticipated to arise. In that case, the specific goals would be translated into (ideally measurable) standards and evaluation criteria used to decide what specific activities, projects, and entities should receive AMP quota. If more specific goals are identified, the overall AMP framework could incorporate enough flexibility to allow the Council to change the goals from time to time.

The following examples program goals were presented in the staff white paper:

Vulnerable communities: *Protect vulnerable communities from the adverse effects of trawl rationalization*. A program with this goal would distribute AMP quota to harvesters or others (e.g., government or nongovernment organizations) to ensure landings in specified vulnerable communities or communities that can demonstrate harm resulting from trawl rationalization. Objectives could include preventing the loss of fishing-dependent businesses and related employment and tax revenues supporting port infrastructure. This would approximate the competitive grant program of the Groundfish Development Authority (GDA) in British Columbia, Canada. In that program, 10 percent of the quota is available to harvesters if they have an agreement with a processor for delivery. The criteria for this program favor Canadian processors and favor more established or stable processors. The Canadian program is not intended to help new entrants into the fishery, but rather is intended to act as a stabilizing factor for processors. The GDA was set up as the alternative to allocating processor QSs.

Stabilizing harvester-processor relationships: *Support existing business relationships between harvesters and processors*. A program with this goal would distribute AMP quota to processors and/or harvesters that commit to continue an existing business relationship. Objectives could include preventing the closure of a processing plant or providing an incentive for processors to develop new product forms or markets. As noted in Section A-2.4 on processor measures, QP issued through the AMP also could be used to compensate processors for demonstrated harm, which would have to be evaluated in any decision-making process.

Encouraging conservation benefits: *Favor harvesting techniques and technologies that reduce environmental impacts*. A program with this goal would distribute AMP quota to harvesters that use gear and methods producing conservation benefits. Activities could include testing new gear and methods to determine the conservation benefits or supporting the switch to gear and methods that have proven conservation benefits. Objectives could include reducing incidental catch of depleted species or reducing habitat impacts.

Another goal not discussed in the staff white paper is to facilitate entrants into the fishery. To address this goal, the AMP QP could be distributed to applicants based on certain criteria that must be met. These criteria might include a certain amount of time as crew on a U.S. commercial fishing vessel or on a west coast groundfish trawl vessel. For example, the halibut/sablefish fishery in Alaska has a 150-crew-days-in-any-U.S.-commercial-fishery requirement for new entrants to become quota shareholders.

AMP QP would not be retired or held back from use in the fishery. All AMP QP would end up with vessels; however, the distribution would not necessarily be equal among all vessels. Depending on how the adaptive management provision is structured, all vessels may have an equal shot at competing to receive adaptive management QPs (e.g., a QP bump would be given to vessels delivering to same processors as the previous year, or vessels that achieve a certain reduction in bycatch over the previous year). The adaptive management provision could be structured in a way that would benefit certain vulnerable communities; therefore, some vessels would be positioned to access adaptive management QPs, while other vessels would not be positioned well to compete. Note also that control of AMP QP could be given to communities or regional fishing associations.

In designing the decision-making process, the central question is the role that the states, the Council, and NMFS will play in deciding the distribution of AMP quota. The staff white paper identified four possible decision-making structures:

1. **States → Council → NMFS (Proposal Evaluation Process)**: Under this structure, first a state would prescreen proposals from applicants within their state or work with applicants in developing proposals. Proposals accepted by the state would then be forwarded to the Council. The Council would review all proposals submitted and make a recommendation to NMFS on the allocation of AMP quota among the proposals.

2. **States → NMFS (Proposal Evaluation Process)**: This structure is similar to the first except that there would be no direct Council role. States would submit proposals directly to NMFS with the Council having a broad oversight role. For example, the Council's role would be confined to specifying program goals, periodically evaluating program performance, and modifying the program as necessary.

3. **NMFS (Proposal Evaluation Process)**: Under this structure, individual applicants would submit proposal directly to NMFS. The Council would have the type of broad-scale involvement described above (e.g., setting program goals).

4. **NMFS (Allocation by Formula)**: This structure would substantially reduce or eliminate regular decision-making. At its simplest, there would be no proposal process as suggested in the first two structures. Any entity that meets specific criteria, which could be defined as a performance standard, would automatically receive AMP quota, divided up among recipients according to a pre-set formula. For example, anyone who delivers to a specified port or processor would receive quota. Alternatively, as in the previous two decision structures, applicants could be selected but the allocation of AMP quota would then be made formulaically.

The overall decision-making structure could still accommodate varying degrees of state involvement. For example, the framework could be open enough so that each state could decide what role they want to play in selecting recipients. This approach is similar to how the Council currently reviews groundfish exempted fishing permit (EFP) applications, found in Council Operating Procedure 19. In some cases, a state will work with applicants to bring forward proposals, while in other cases applicants bring proposals they have developed independently to the Council without state agency involvement.

Any decision-making process involving the Council would require at least a two-Council-meeting process with full public participation. Production of a regulatory package, including an environmental assessment, might be needed in some circumstances. From a process perspective, environmental review requirements could possibly be folded into the groundfish biennial specifications process, although this is already a complex decision-making process, and adding new elements could increase the difficulty in implementing regulations in a timely manner.

There are two basic ways to view AMP quota that influence how AMP quota use would be monitored. One perspective is to see AMP quota as a reward for past behavior or as an incentive for committing to a particular course of action in the future (i.e., the coming year). For example, any harvester who delivers to specified ports would receive a portion of AMP quota in the following year; alternatively, if he commits to those deliveries in the current year, he could receive the AMP quota at the beginning of the year.[135] In an incentive-oriented program, there is little need to monitor how AMP quota is used; if recipients wish to sell the AMP quota, that should not be a problem, as long as they engage in the behavior that AMP was designed to encourage. Another perspective is to direct AMP quota to specified uses. For example, a harvester requests AMP quota to experiment with a new fishing method that has a high risk-reward ratio. In this case, the AMP distributes quota for specified activities that will occur in the future, and there is, thus, a greater need to monitor its use because the receiver of AMP quota should not do anything with it other than use it for a stated purpose. However, since QP will be fungible (one unit of quota is indistinguishable from all other units of the same type), it will be difficult to determine whether the AMP quota (separate from any other QP in a vessel account) was used for the stated purpose, was sold, or remained unused.

Another consideration is whether AMP quota receivers would be exempted from accumulation limits up to the amount of AMP quota received. This is especially an issue with vessel limits. If vessels at their limits cannot exceed them with AMP quota, it will be difficult to use AMP quota to influence the largest harvesters' actions.

How frequently AMP quota will be allocated has to be considered. Ultimately, AMP quota will be used in the form of QP in vessel accounts, and QP will be of one-year duration. However, allocation decisions do not have to occur that often. For example, allocation could be made to an activity or project that has a multiyear time span. This could provide recipients more certainty about their future operations, which some entities may find beneficial, but may reduce the flexibility to make adaptations to the program (although periodic review could be built in). A proposal-driven program structure would have to specify how frequently proposals would be accepted and AMP quota allocated.

If AMP QP can be held elsewhere than in vessel accounts, the Council may wish to establish eligibility criteria for AMP quota receipt different from the general IFQ eligibility requirements.

[135] In either case there would need to be a mechanism to check whether the behavior actually occurred.

The Adaptive Management provision could be used in many different ways. If the QP is used to protect vulnerable communities by ensuring that landings are delivered to those locations, the following will occur:

An AMP program will likely require several different monitoring and evaluation elements:

- If proposal-driven, a framework for evaluating proposals and deciding which ones to "fund"
- If AMP quota is allocated for a specified activity, a monitoring element to ensure that AMP quota is actually used in that way; if the AMP quota is provided as a reward or an incentive for a particular action, a monitoring or auditing element may be needed to verify that the action was taken (e.g., use of a particular gear)
- Periodic review of the overall AMP to decide if goals are being met and whether those goals have to be changed

In a proposal-driven process, if the amount of AMP quota available is lower than the amount requested, evaluation criteria could be a way to better match the total amount of AMP quota requested with the amount available. Criteria would likely be matched with program goals (for example, making only vulnerable communities, processors, or harvesters eligible). Measurable, minimally subjective criteria would be preferable to make it clear what a proposal has to focus on to successfully receive AMP quota. In these situations, the Council could decide in advance on a maximum number of recipients based on the amount of available quota. Alternatively, if proposals specify the amount of AMP quota needed, the Council would use that information when screening proposals so that the total amount did not exceed the total amount of AMP quota available.

If the program is set up so that AMP quota use must be monitored, as discussed above, there are two monitoring issues: checking whether the AMP quota was transferred (sold) to someone else outside the terms of the proposal and whether it is fully utilized, at least in preference to any other quota the recipient may possess. Figuring out whether this happens does not necessarily require AMP quota to be tracked separately from other quota but would rely on a year-end accounting of the use of quota. However, the need to account for AMP quota in this way could be difficult and could reduce the overall efficiency of IFQs. If the terms of the AMP proposal have been violated, then sanctions could be applied, such as loss of the future eligibility or reduction in the amount of AMP quota received in subsequent periods to make up for unused quota.

The Council's motion states that "up to 10 percent of the non-whiting QS will be reserved for" the AMP. The "up to" language reflects the Council's intent that any unused AMP quota will be redistributed back to QS holders based on the percentage value of their QS holdings. [Figure A-137 illustrates the general process for the allocation of AMP QP based on this model.]

The decision on the amount of AMP quota to be reserved would have to be synchronized with the harvest specifications process and the resulting distribution of QP into vessel accounts. First, the Council could decide in advance the amount of quota to set aside, once OYs and sector allocations have been set. Then the AMP quota could be allocated under whatever mechanism is established. Finally, if there is any unused AMP quota after the allocation process it could be returned to all QS holders. The allocation of AMP quota and any subsequent redistribution of unused AMP quota to QS holders does not necessarily have to occur before the beginning of the fishing year as long as deposits to vessel accounts is timely enough to allow its use at some point during the year and/or for the specified purpose.

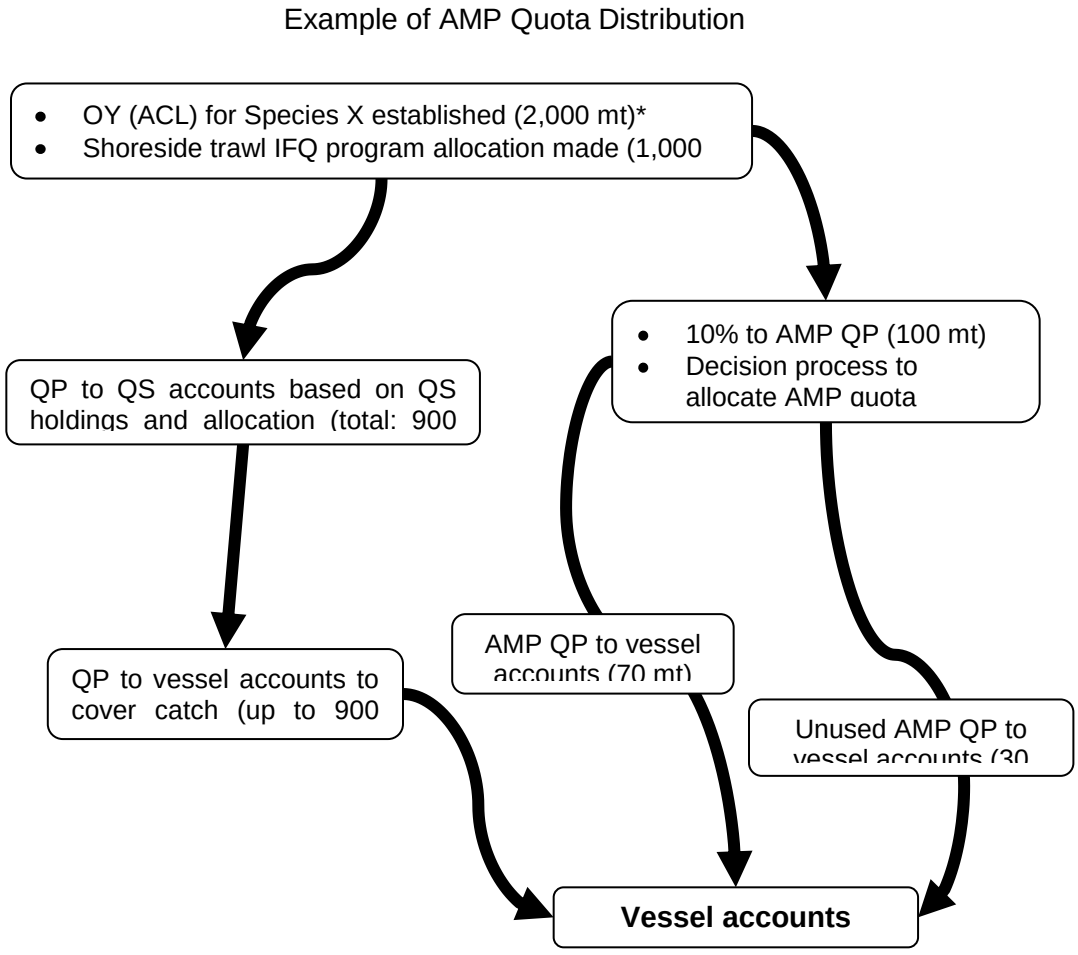


Figure A-115. Schematic of likely process for distribution of AMP quota.

The Council chose to wait to implement the adaptive management provision until year three of the trawl rationalization program, both to reduce the complexity of initial program implementation and to allow more time to develop the AMP. In the first two years the AMP, QP would be distributed pro rata to QS holders ("pass through"). This delay in implementation could cause some disruption and uncertainly for harvesters because the specifics of a future program have not been worked out. Although uncertainty may have a marginal effect on QS prices, the stated intention to implement the program in year three gives notice to QS holders that an adaptive management holdback will occur at a future date. Although the intent in delaying the AMP was to make implementation of both the overall trawl rationalization program and the AMP easier, it may also allow more effectively addressing unforeseen issues in the new management program. By definition, these cannot be determined a priori, but are likely to become apparent in the first two years. On the other hand, delay in implementing the AMP will mean that disruptions in the short term due to transition to the new management program cannot be addressed through the AMP.

A-4 PACIFIC HALIBUT INDIVIDUAL BYCATCH QUOTA (IBQ) – NONRETENTION

❖ *Provisions and Options*

Preliminary Preferred Alternative Language. IBQ for Pacific halibut bycatch in the trawl fishery will be established. Such IBQ will be issued on the basis of a bycatch rate applied to the target species QS an entity receives in a manner similar to that described in Section A-2.1.3.a, Overfished Species Option 2. Area specific bycatch rates may be used for allocation but halibut IBQ will not be geographically subdivided.

►**Final Preferred Alternative Language:** IBQ for Pacific halibut bycatch in the trawl fishery will be established. IBQ limit will be required to cover legal and sublegal sized Pacific halibut bycatch mortality in the area north of 40°10 N latitude. It is the intent of the Council that halibut IBQ mortality be estimated on an individual vessel basis. Such IBQ will be issued on the basis of a bycatch rate applied to the target species QS an entity receives in a manner similar to that described in Section A-2.1.3.a, for overfished species caught incidentally. Area-specific bycatch rates may be used for allocation but halibut IBQ will not be geographically subdivided.

❖ *Rationale and Policy Issues*

Under the status quo trawl fishery, the trawl sector bycatch of halibut constrains directed halibut fisheries. As in all IPHC management areas, Area 2A (off Oregon and Washington) has a total constant exploitation yield[136] (TCEY). Trawl caught halibut bycatch is estimated each year by the WCGOP and is taken off the top of the Area 2A TCEY. The trawl caught halibut subtracted from the TCEY is expressed in pounds of legal-sized halibut mortality. Currently the trawl fleet has no cap on the amount of halibut caught, discarded, or killed. Under the trawl rationalization program, actual bycatch of all sizes of halibut would be capped. Under Amendment 21, it is proposed that the trawl caused halibut mortality be reduced, increasing the amount of halibut that would be available for directed halibut fisheries. This reduction would be achieved through the individual vessel accountability provided by the IBQ program.

Pacific halibut IBQ would function in a manner similar to IFQ for other species, except that retention and landing of halibut would be prohibited, and only pounds of dead halibut would be counted against the IBQ. Discard at sea of Pacific halibut would be required; before discard occurred, observers would estimate the halibut bycatch mortality on that vessel (average mortality rates would be applied based on the condition of the halibut in a particular tow) to provide greater individual accountability and incentives for harvesters to control halibut mortality. Minimization techniques by the individual harvester might include taking short test tows to explore what fish are present in the area (and avoiding areas with high halibut rates), taking shorter tows or smaller amounts of groundfish so that halibut bycatch is less likely to be crushed in the cod end, and helping the observer to the extent possible in order to minimize halibut time on deck ,thereby improving the fish's condition at the time of discard. If a vessel were held accountable for catch instead of mortality, a fleetwide discard mortality rate would be applied, and there would be little incentive for the individual harvester to change his/her fishing behavior to reduce mortality rates. Therefore, the Council specified that under the trawl rationalization program discard mortality should be estimated on a vessel-by-vessel basis to encourage conservation-oriented behaviors in harvesters.

[136] TCEY is expressed in terms of legal-sized halibut, since the primary commercial target halibut fishery (using gear other than trawl) can only retain and land legal-sized halibut.

Consideration was given to requiring IBQ only for legal sized halibut. However, this option would not encourage harvesters to avoid sub-legal sized halibut and would not do as good a job of achieving the objective of reducing bycatch and bycatch mortality.

In order to allocate IBQ, the LE trawl sector cap must be specified; this has not been done in the past. Defining the sector total allocation would allow that amount to be divided up into individual QSs. There are various ways to define the trawl sector allocation, and those methods are described as options in the ISA EIS (Amendment 21). In its final action under Amendment 21, the Council decided to "allocate" 15 percent of the Area 2A (i.e., all waters off Washington, Oregon, and California) TCEY of Pacific halibut to the LE trawl sector, not to exceed 130,000 for the first four years and not to exceed 100,000 pounds for years five and beyond of the trawl rationalization program.

Halibut IBQ would be required only in the area north of 40° 10' north latitude line. At the start of program development, IBQ would have been required for the entire west coast (i.e., anywhere in Area 2A); however, as the trawl rationalization program evolved towards the final preferred alternative, the Council recognized that halibut bycatch in the at-sea sectors and south of 40° 10' north latitude line were negligible and could be managed with set-asides rather than IBQ. Tracking IBQ by sub-area would add an additional tracking and monitoring feature to the rationalization program. Therefore, the Council decided instead to use set-asides for at-sea and the southern management area. This approach requires monitoring of bycatch but does not manage the fishery with IBQ. The 10-mt set-aside for these two fisheries comes off the trawl allocation described in the previous paragraph.

The method for the initial allocation of halibut is described in Appendix C and is similar to that used for overfished species. The Council decided to base initial allocation of IBQ on the different rates of bycatch in different areas or in association with various target species (e.g., arrow tooth flounder and Petrale sole). Halibut cannot be allocated based on individual vessel records because halibut mortality is estimated based on fleet averages; there is no data set of per vessel halibut catch. For a similar reason, there is no history for buyback permits; thus, equal allocation of a portion of the QS related to the buyback fleet is not possible.

❖ *Interlinked Elements*

IFQ Management Units – The management unit options would not apply to IBQ, unless specified by the Council.

Initial Allocation – Initial allocation of IBQ would be similar to the allocation of overfished species IFQ in the nonwhiting fishery (Option 2). That method includes determining a fleet average halibut bycatch rate and then tying that to the target species QS allocations. Initial allocation of IBQ could not be based on landings of halibut, because Pacific halibut is a prohibited species and is not landed in the trawl fishery.

Annual Quota Pound Issuance – Surplus or deficit IBQ would not likely be carried over

Tracking, Monitoring and Enforcement – IBQ discard would be required in all options

Adaptive Management – Adaptive management would not likely be applied to IBQ

In general, most of the IFQ program provisions for groundfish would also apply to halibut bycatch. Notable exceptions include the following:

- Tracking, Monitoring and Enforcement – IBQ discard would be required in all options.
- Adaptive Management – Adaptive management has not been applied to IBQ.

❖ *Analysis*

The IBQ provision addresses the following goals and objectives: reduce nongroundfish mortality (FMP Objective 4); reduce bycatch (Amendment 20, Objective 3); and account for total mortality (Amendment 20, Constraint 4).

	Conservation	Net Benefits	Disruption	Excessive Shares	Fairness and Equity	Sector Health	Labor	Communities	Small Entities and New Entrants	General Public	Program Performance
Conservation	X									X	
Initial Allocation and Accumulation Limits		X		X	X						
Net Benefits, Sector Health and Communities		X				X		X			

Conservation

The International Pacific Halibut Commission (IPHC) manages the conservation and sustainability of the Pacific halibut resource by conducting an annual coast-wide stock assessment and developing and setting directed fishery catch limits. IPHC accounts for bycatch mortality in an area prior to setting the catch limits for the directed halibut fisheries program. The estimate of discard mortality of trawl caught halibut potentially would be based on observed condition upon release, if observer coverage were at 100 percent, as proposed under rationalization. For Area 2A, the fleetwide discard mortality rate (DMR) had previously been estimated at 50 percent of total catch. IPHC studies have found that discard mortality in trawl fisheries is depends on the size of the fish, the target fishery, and the duration and size of the trawl haul. Under the status quo fishery, the percentage of observer coverage was not extensive enough to estimate a DMR based on condition/release data collected by observers prior to 2007. After 2007, observer viability data were used to estimate the halibut mortality rate, which turned out to be higher (56 percent) than the 50 percent fixed mortality rate. In British Columbia, where the trawl fleet has near 100 percent observer coverage, the DMR is based on observed condition, and, in some instances, is lower than 50 percent. A similar circumstance has the potential to occur in the U.S. groundfish trawl fishery, if individuals have the incentive to behave in a more conservation-oriented way, such as helping the observer to minimize halibut time out of water.

The IFQ program requirement for 100 percent monitoring will increase assurance that total halibut mortality is being properly estimated. Halibut individual bycatch quota (IBQ) would provide incentives to reduce halibut bycatch in the trawl fishery. Bycatch reduction is an objective of the trawl rationalization. The broader experiences of our Canadian counterparts are relevant to this trawl rationalization analysis. Up until 1995, before Canadian groundfish trawl rationalization, the B.C. trawler fishery was estimated to have taken 1.5 to 1.7 million pounds of halibut bycatch mortality annually (all sizes). At the onset of the Canadian IVQ program in British Columbia, a cap of 1 million

pounds was set by Canada's Department of Oceans and Fisheries for the B.C. trawl sector. In 1996, after implementation of the trawl IVQ management program and an IBQ program for managing the halibut bycatch, bycatch was just less than 300,000 pounds. Reasons for this large reduction include the concurrent decline of the cod fishery, avoidance behavior by harvesters, and more deliberate conduct of fishing operations. In addition, 100 percent observer coverage allowed quick and accurate feedback to the skipper of pounds of halibut caught and discarded each trip.

Observed Catch of Pacific Halibut in the Trawl Fishery

The bycatch rate estimates are generated by NMFS Northwest Region using West Coast Groundfish Observer Program (WCGOP) halibut bycatch information, stratified by season, depth, latitude, and amount of arrowtooth flounder and multiplied by effort in each stratum using Oregon and Washington logbook information. Halibut bycatch rates may be different in different areas; however, according to the IPHC, there is no biological reason to divide Area 2A into finer scales of management.

Observations of Pacific halibut bycatch in the west coast LE trawl fishery show some distinct patterns. In particular, Pacific halibut bycatch tends to be closely associated with the catch of arrowtooth flounder, Petrale sole, lingcod, and skates. The association with arrowtooth, Petrale, and skates is not unexpected as these species exhibit similar habitat preferences and have similar life-history characteristics as with Pacific halibut. However, the association with lingcod is somewhat surprising and unexpected. Other patterns clearly exist, including associations with depth and with latitude. Pacific halibut tend to be encountered more frequently by vessels fishing off the northern Washington coast (north of 47.5° N. lat), and differences exist on a depth basis. The majority of Pacific halibut observed in the trawl fishery was caught at depths less than 115 fathoms, though a large percentage was caught at deeper depths as well. This information is illustrated in the following table.

Table A-111. Amounts of species catch (retained + discard weight) and bycatch ratios between Pacific halibut and two flatfish species on observed limited entry bottom trawl hauls during 2003 to 2006.

	Depth Stratification		
	< 115 fm	**> 115 fm**	**All depths**
Area North of 47.5₀ N. lat Number of observed hauls	1,487	724	2,211
Observed catch of species (lbs) Petrale sole	314,471	450,562	765,033
Arrowtooth flounder	1,648,667	753,976	2,402,643
Petrale + Arrowtooth	1,963,138	1,204,538	3,167,676
Pacific halibut	230,090	73,092	303,182
Ratio of halibut lbs to arrowtooth lbs	**0.140**	**0.097**	**0.126**
Ratio of halibut lbs to combined Petrale + arrowtooth lbs	**0.117**	**0.061**	**0.096**
Area between 40₀10' and 47.5₀ N. lat Number of observed hauls	4,646	4,395	9,041
Observed catch of species (lbs) Petrale sole	1,353,420	1,457,496	2,810,916
Arrowtooth flounder	958,221	1,361,180	2,319,402
Petrale + Arrowtooth	2,311,642	2,818,676	5,130,318
Pacific halibut	161,217	85,553	246,769
Ratio of halibut lbs to arrowtooth lbs	**0.168**	**0.063**	**0.106**
Ratio of halibut lbs to combined Petrale + arrowtooth lbs	**0.070**	**0.030**	**0.048**
Total Area North of 40₀10' Number of observed hauls	6,133	5,119	11,252
Observed catch of species (lbs) Petrale sole	1,667,891	1,908,058	3,575,949
Arrowtooth flounder	2,606,889	2,115,156	4,722,045
Petrale + Arrowtooth	4,274,780	4,023,214	8,297,993
Pacific halibut	391,307	158,645	549,952
Ratio of halibut lbs to arrowtooth lbs	**0.150**	**0.075**	**0.116**
Ratio of halibut lbs to combined Petrale + arrowtooth lbs	**0.092**	**0.039**	**0.066**

Observer information also indicates that Pacific halibut bycatch occurs south of the 40° 10' north latitude line. The tool for allocating Pacific halibut bycatch (described in Appendix C) does not provide a mechanism for allocating Pacific halibut to vessels in this southern area, due in part to the lack of observations for informing a bycatch rate calculation. However, in the final preferred alternative, a set-aside of Pacific halibut was made for the fleet in this southern area and the at-sea sector.

Initial Allocation and Accumulation Limits

Like overfished species, halibut will be allocated using a formula intended to provide QS to those who most need it to cover their bycatch while pursuing target species. Providing an initial allocation to these entities is expected to reduce disruption and related costs, thereby increasing overall benefits. To achieve this end, halibut IBQ will be allocated proportionally to arrowtooth flounder and Petrale. Information on the initial allocation and accumulation limits for halibut is provided starting on page A-330. The control and vessel limits for Pacific halibut are covered in Section A-2.2.3.e.

Net Benefits, Sector Health and Communities

It is anticipated that the bycatch of Pacific halibut will decrease under trawl rationalization due to the incentive for individual vessels to avoid bycatch and based on observations of the B.C. fishery. Reduction of trawl bycatch of Pacific halibut would provide more yield for directed Area 2A halibut fisheries. This would increase net benefits, positively impacting net national benefits and the fishing and processing sectors, as well as the communities that depend on them. The overall effect on net benefits, sector health, and communities will depend on whether enough halibut is provided for trawlers to access all of the available and marketable target species. If the amount of halibut is not sufficient for this purpose, net benefits may still be higher under the IBQ system if the value of the additional halibut directed fishing opportunities is greater than the value of the target groundfish harvest forgone because of IBQ constraints.

A-5 ALTERNATIVE SCOPE FOR IFQ MANAGEMENT (OPTION)

❖ *Provisions and Options*

Option: IFQ will be required to cover all groundfish catch except for bycatch species taken on whiting sector trips.

If this option is selected sections above would be modified as follows.

Section A-1. Replace "QP will be required to cover catch of all groundfish (including all discards" with "for nonwhiting trips, QP will be required to cover catch of all groundfish (including all discards), for whiting trips, QP will be required to cover catch of all whiting (including all whiting discards but not incidental catch of nonwhiting groundfish species)." If the three sector option is selected in Section A-1.3, then in the previous sentence replace "nonwhiting trips" with "shoreside trips" and replace "whiting trips" with "trips delivered at sea."

Section A-1.3 Under the three sector option (shoreside, mothership, and catcher-processors) this alternative scope does not apply to the shoreside sector. For all catch destined for shoreside delivery QP would be required, including catch on trips targeted on whiting. For catch destined for at-sea delivery, QP would be required for whiting but not bycatch species. Under the four sector option, shoreside whiting trips would be included among those for whicH QP is required to cover whiting and not required for bycatch species.

Section A-1.5. Whiting trip bycatch species will not be managed with IFQ but will be pooled and managed with bycatch caps. Select one of the following options for incorporation in Section A-1.5:

Bycatch Management Option 1: A single bycatch caps covering all whiting sectors. All sectors and co-ops will close as soon as the whiting fishery bycatch cap is reached for one species; a controlled pace may be established if the sectors choose to work together cooperatively, potentially forming an intersector/interco-op cooperative.

Bycatch Management Option 2: A single bycatch caps covering all whiting sectors and seasonal releases. Same as Option 1, including the potential for forming co-ops, except there will be seasonal releases of bycatch allocation.[137]

[137] At the outset, it is envisioned that the seasonal approach will be used to manage widow rockfish bycatch; for canary rockfish and darkblotched rockfish, status quo management will be maintained (i.e., no sector allocation and no seasonal apportionment). A seasonal release bycatch management program will be implemented through regulation. For reference, a similar program is used to manage halibut bycatch in NPFMC-managed flatfish and Pacific cod fisheries, see 50CFR679.21(d). In practice, seasonal releases protect the next sector entering the fishery. For example, a May 15 to June 15 release will be used by the catcher-processors and motherships, but it protects the shoreside fishery; the June15 to September release will be used by shoreside and whichever catcher-processors and motherships are still fishing whiting and to protect a fall at-sea season after September 15; the final release in September will again be shared by the catcher-processors and motherships, assuming shoreside is done.

For example:

1. No sector bycatch allocations.
2. Status quo for canary and darkblotched rockfish; i.e., no seasonal or sector allocation.
3. May 15 to June 15; 40 percent of widow hard cap released.
4. June 15 to August 31; an additional 45 percent of widow hard cap released.
5. Sept. 1 to December 31; final 15 percent of widow hard cap released.
6. Once a seasonal release of widow rockfish is reached, the whiting fishery is closed to all three sectors for that period. The fishery reopens to all three sectors upon release of the next seasonal release of widow rockfish.
7. Unused amounts from one seasonal release rollover into subsequent release periods.

(Note: percentages are for illustration purposes only, actual release percentages will be developed through the PFMC process).

Bycatch Management Option 3: A separate bycatch caps for each sector. Each sector closes when its bycatch cap is reached.

Bycatch Management Option 4: A separate bycatch cap for each sector and a roll-over. Each sector closes when its bycatch cap is reached. Unused bycatch may be rolled over from one sector to another if the sector with unused bycatch has used its full allocation of whiting or participants in the sector do not intend to harvest the remaining sector allocation.

❖ *Rationale and Analysis*

The rationale and analysis covering this topic are included in Section A-1 and within Appendix B. Therefore, the reader is referred to these analyses when considering the effect of this alternative scope.

❖ *Interlinked Elements*

Interlinked elements are identified in the text of the option.

A-6 DURATION: FIXED TERM (AND AUCTION) (OPTION – NOT PREFERRED)

❖ *Provisions and Options*

Fixed Term Option: The term of all QS issued will be limited to 15 years (except that the Term-1 QS may last 15 or 16 years, depending on when the biennial specification period ends). Starting with Term-2 of the program, **Reallocation Option 1:** QS will be reallocated to holders at the end of the term, unless the program is otherwise modified. **Reallocation Option 2:** Starting with Term-2 of the program, every two years up to 20 percent of all QS will be returned to NMFS for reissuance via an auction, unless the program is otherwise modified.

If the fixed term option is selected, sections above would be modified as follows.

Section A-2.3.4. Add the following. The initial allocation of QS will be valid for a period of 15 or 16 years (ending at the end of the second year of the biennial specification period). Thereafter, in the absence of actions to end or amend the program, QS will be issued for 15 year terms (i.e., all QS will expire every 15 years) on the following basis.

Section A-2.1.6. Add the following.

Reallocation Option 1: After initial issuance, for the start of each subsequent term of the program, QS will be reallocated to current QS holders (those holding the QS on the day the term expires), in proportion to the amounts they held on the day of expiration, unless the program is otherwise modified,

Reallocation Option 2: After initial issuance, for the start of each subsequent term of the program, up to 20 percent of the QS will be reallocated in an auction with the remainder going to the current QS holders (those holding the QS on the day the term expires), in proportion to the amounts they held on the day of expiration, unless the program is otherwise modified. Additionally, every two years during the term up to 20 percent of each holder's QS will return to NMFS for redistribution via an auction. All auctions for the QS to be redistributed will be held at least one year in advance of the actual redistribution. When the redistribution occurs, the QS will come from those holding it at the time of the redistribution and go to the winners of the auction.

The specific form of the auction will be decided by the Council in the period between trawl rationalization implementation and the first auction. It will be designed to achieve the goals of the trawl rationalization program, including reducing bycatch, increasing operation flexibility, measurable economic and employment benefits through the seafood catching, processing, distribution elements, and support sectors of the industry.

❖ *Rationale and Policy Issues*

An initial auction is not proposed because of the need for a transition during a period of economic stress. It is unlikely that many of the participants in the current fishery have structured their operations financially in a manner that would allow them to effectively compete in an auction. After 15 years, the fishery should be in much better shape, and 15 years would provide fishermen a long time to get used to the IFQ program without having to pay for the QS. It would also provide a substantial amount of advance notice to allow existing firms an opportunity to position themselves financially to effectively compete in an auction. The general reason for 15 years is to provide a substantial amount of stability for industry to make fishing decisions. The term of 15 years was also chosen because of the rebuilding periods for overfished species. Within 15 years, Boccaccio, canary, POP and widow would all be rebuilt. With the exception of darkblotched, the other species are not projected to rebuild for a

substantially longer period. An auction should not be included in the period during which the Council is exploring how it will handle allocation when species are rebuilt.

Holding an auction every year would result in too much annual change and increased administrative costs; therefore, it was proposed that the auction occur every two years in conjunction with the biennial specifications. There should be a transition at the end of the 15 years; therefore, an auction of 20 percent of the QS every two years was specified. The Council could choose to auction less than 20 percent, and that decision could come out of the analysis conducted when the auction is designed. The auction could be designed to provide for new entrants and protect communities by setting aside specific amounts to go to small fishermen, communities, etc.

The 15-year limit and auction were also intended to add to the assurance that IFQ would not be viewed as property rights. The largest investors in the fishery are the citizens of the U.S., and that had to be more strongly recognized, at least as an option for analysis. There are various other public natural resources for which use rights are auctioned.

Funds collected in the auction would go into the new fund specified in the MSA, which, subject to appropriations, could come back to the fishery.

The rationale for the Council's final action on the auction option is provided in Appendix F.

❖ *Interlinked Elements*

The option is a variation on Section A-2.3.4Program Duration and Modification.

❖ *Analysis*

Analysis is provided in Appendix F.

A-7 GEAR CONVERSION (OPTION – NOT PREFERRED)

❖ Provisions and Options

The scope of the IFQ program allows trawl vessels to use other types of gear to harvest groundfisH QPs. At its June 2008 meeting, the Council added the following option for consideration. ***This option is not necessarily a preferred option.***

Gear Conversion Option: allow a permit holder to use an alternative legal gear for a two-year period after which the permit holder decides whether to continue to use the alternative gear or trawl gear.

❖ Rationale and Policy Issues

When trawl vessels use a nontrawl gear in the current groundfish fishery, their groundfish catch is attributed to the trawl sector allocation. Section A-1.1 specifies the scope of the trawl rationalization program, which implicitly allows vessels to switch back and forth between trawl and other gears. The purpose of a gear conversion provision would be to make a permanent reduction in the amount of groundfish catch taken with trawl gear, change the fishing footprint on bottom habitat, and provide an additional option to harvesters on gear usage. Gear conversion would be voluntary. Permanent gear conversion would not change the scope of the IFQ program but, depending on how it is implemented, gear conversion would not allow vessels to convert back to trawl gear. In other words, some of the trawl permits, vessels, and/or QS/QP would be prohibited from use with trawl gear.

Gear switching and gear conversion would both allow harvesters to have greater flexibility, though to differing degrees. To achieve gear conversion, incentives would likely be required to encourage trawlers to permanently convert gear types. Adaptive management QP in the shoreside nonwhiting trawl sector could be used to reward or encourage bottom trawlers to convert to fixed gears.

The Council decided against this option based on its preliminary specifications. Additional guidance would have been needed to fully specify this gear conversion provision. Specifically there was a question as to what would be constrained or converted to "fixed-gear only" after the two-year period. Choices appeared to include the following:

- The permit
- The vessel
- All QS/QP used with the vessel (including QS/QP taken with trawl gear)
- Only certain QS/QP used with the vessel (partial conversion)

With respect to the question of "what would be constrained," constraint of the permit would be unlikely to achieve the purpose of the provision until enough permits had been converted to constrain the fleet's ability to use trawl gear to take the full amount of the available harvest. Until such time, QS could be moved from the converted trawl permits (trawl IFQ sector permits) to regular trawl permits, such that no permanent conversion to nontrawl gear is achieved. Constraint of the vessel would be even less likely to achieve the desired end because there are even more substitute vessels available than there are trawl permits. Requiring the conversion of all QS/QP used with the vessel would provide a substantial disincentive for a vessel to opt for conversion unless it was the vessel's intent to use only nontrawl gear. In addition to the constraint on the vessel's activities with full conversion of all a vessel's QS, the loss of flexibility to use those QS with trawl gear would reduce the market value of those QS. Partial conversion, requiring the conversion of only those QS representing the QP used with the converted gear, would substantially reduce the disincentive for participating in conversion at the end of the second year.

The vessel choice between conversion and returning to the use of a trawl gear would likely depend on the benefits the vessel experienced by using the nontrawl gear compared to the amount of time it would be required to forgo use of that gear before it would be once again allowed to engage in gear switching.

Both the complete and partial QS conversion approaches could present tracking problems with determining what QS would be converted. First, the QP used on a vessel may not be from QS owned by the harvesting company. Second, the QS from which a vessel receives its QP may be different from one year to the next. One possible approach would be to require that QS to be converted be assigned to the vessel, along with the QP, and left there for two years in order to trigger the conversion provision. For this approach to work, there would have to be an incentive for harvesters to want to permanently convert their QS to nontrawl gear, otherwise most harvesters would probably prefer to take advantage of the gear switching opportunities without committing to permanent conversion. There may be some possibility that at-sea monitoring with cameras instead of observers is more feasible with nontrawl gear than with trawl gear. If this were the case, providing an opportunity to fish their QS without having to pay observer costs (an opportunity that using converted QS might allow) would provide an incentive for some harvesters to commit to the conversions. Another incentive might be to use some of the adaptive management QP to bump up the QP allocated to QS that have been converted. Another approach for addressing the tracking problem would be not to require the identification of the QS to be converted, until the end of the two-year period. At that time, if the harvester wanted to continue to use nontrawl gear, it would be required to submit QS to NMFS for conversion.

Because the gear conversion option needs further development, two analytical options are provided. These options focus on the conversion of QS rather than the vessel or permit. Under these options, vessels would either be provided a positive incentive to permanently switch QS from trawl to nontrawl gears (Option 1), or a disincentive for not switching after using a nontrawl gear for two years (Option 2). Under the second gear conversion option, the disincentive would be a restriction on a vessel's ability to switch gear types for a period. The design of these options takes into account that, under the program as it is currently designed, only QP is associated with a vessel (QS is held in separate accounts that may be held by processors, crewmembers, and communities, as well as individuals that happen to be vessel owners).

Analytical Option 1: Incentive for Permanent Gear Conversion, No Constraint on Gear Switching

Adaptive management QPs could be utilized as an incentive to convert permanently to fixed gear. Gear conversion is a long-term prospect. To provide sufficient incentive, either the amount of the adaptive management QP provided as incentive would have to be high enough to compensate for the longer-term commitment, or there would have to be a longer-term commitment of the adaptive management QP. If the 10 percent set-aside of adaptive management QP is to be fished only by vessels that have permanently converted to fixed gear, this would require an extra element of tracking of adaptive management QP to make sure it was caught with fixed gear.

Analytical Option 1a: QS Acquired In Advance and Designated for Conversion

At the start of a two-year period, a harvester interested in permanent conversion would assign to a vessel the QS it intends to convert to another gear. At the end of the two-year period, the harvester would be required to choose between permanently converting those QS to an alternate gear or not receiving the incentives in the following period. Incentives would be provided for permanent conversion of all QS the vessel designated for conversion. Examples of possible incentives include additional quota for the following two-year period and/or ability to use some lower cost at-sea monitoring technologies (e.g., electronic monitoring) if deemed to meet the program's monitoring standards. Vessels that gear

switch but do not assign QS to the vessel for purpose of conversion would not have to make a gear conversion choice after two years, but would receive no incentives for switching.

All other provisions of the IFQ program would continue to apply, including the requirement that a trawl permit must be held in order to fish in the rationalization program. Harvesters who assign QS for conversion but opt out within two years must wait two years before having an opportunity to again take advantage of the conversion incentives.

Analytical Option 1b: QS Acquired At End of Two-year Period

Option 1b is the same as Option 1a except that instead of acquiring the QS in advance to receive the incentives, a vessel would acquire the QS at the end of the two-year period and submit the request to NMFS for permanent conversion of that QS. The amount of QS a vessel would be required to acquire and designate for permanent conversion would be the amount that is equivalent to the average amount of QP it used with nontrawl gear during the previous two-year period.

Analytical Option 2: Disincentive for Not Switching After Two Years

Option 2 is the same as Option 1b except that there would be no incentives and a vessel that used nontrawl gear and, at the end of that period, did not permanently convert the required amount of QS would be prohibited from using the nontrawl gear again for two years.

❖ *Interlinked Elements*

Tracking and Monitoring (A-2.3) - At the permit level, NMFS may have to track which permits/QS/QP had permanently converted to fixed-gear usage. Tracking of the specific gear type used to catcH QPs would not necessarily occur. Observer coverage and compliance monitoring coverage are necessary elements for the trawl rationalization program.

Adaptive Management (A-3) - Adaptive management QSs could be utilized to develop gear efficiencies, which might include incentives for permanent gear conversion in the shoreside nonwhiting fishery.

Regional Landing Zones (A-8) – The need to track additional types of QS is multiplicative. If regional landing zones are adopted, the 30 different IFQ management units would be subdivided, possibly resulting in well over 100 different categories to track. If some QS and QP were designated as "converted," that number would double.

❖ *Analysis*

The goals and objectives addressed by the gear conversion provision include the following: reduce bycatch and minimize adverse impacts on EFH; contribute to reducing capacity; maximize the value of the groundfish resource by providing further flexibility to harvesters; and minimize negative impacts resulting from localized concentrations of fishing effort if fixed gear users access different locations than trawl gear users.

Conservation	Net Benefits	Disruption	Excessive Shares	Fairness and Equity	Sector Health	Labor	Communities	Small Entities and New Entrants	General Public	Program Performance
X	X				X		X			

The conservation consequences of gear conversion include a potential reduction in bottom trawl contact in areas where trawl gear is allowed to fish; a potential increase in fixed-gear bottom contact, both in areas where trawlers can fish and in areas where only fixed-gear types are allowed to fish; and a change in the volume and species mix of fish taken by the LE trawl fishery. Fixed gear is better able to avoid certain bycatch species, but fixed gear can also access and impact more sensitive (rocky relief) habitat, upon which trawl gear cannot fish. Should 10 percent of trawl gear be converted to fixed gear, there would likely be a decrease in bottom disturbance from trawl gear and a corresponding (but not equivalent) increase in bottom disturbance by fixed gear.[138] Fixed-gear impacts benthic habitat differently than trawl gear.

As noted in the "gear switching" analysis in Section 4.7.2.1, some trawlers in southern-central California coast have expressed an interest in using fixed gear due to public demand for fixed-gear-caught product. Fishing effort could increase south of Eureka, an area where there currently is little trawling, if fixed gear is utilized to a greater extent because fixed gear is more workable in that area of the west coast. That analysis also suggests that harvesters in areas that encounter constraining bycatch species at a higher rate than other areas of the west coast may be more likely to utilize gear switching (and perhaps, by extension, gear conversion) to avoid those stocks. Those areas of higher constraining species bycatch rates are northern Washington and southern Oregon.

The Chapter 4 gear-switching analysis states that market prices of certain species – like fixed-gear-caught sablefish – may incentivize the switch to fixed gear. Gear switching would also provide flexibility to the harvester to catch all of the QP in a vessel account in a given year (modifying the mix of gear used based on conditions and the mix in the trawl harvest in a particular year). However, these advantages for gear switching would not be incentives to commit to permanent gear conversion.

The permanence of gear conversion may deter some trawlers who want to use fixed gear but do not want to fully convert with no provision to convert back. A Natural Resources Defense Council funded study (Jenkins 2008) of west coast trawlers regarding gear conversion, noted that "because of the long-term commitment, some trawlers, especially those with the highest volume, are not likely to convert to an alternative gear." Absent adequate incentives, the likelihood of trawlers permanently converting to fixed gear may be low because nonpermanent gear switching would already be allowed (see Section A-1). Without an incentive or prohibition otherwise, trawlers could use fixed gear for two years, come to the point of making a decision whether to convert to fixed gear, choose not to, and still use whatever gear type they choose. If a requirement were specified that after two years of using an alternative gear a

[138] The 10 percent switching number is mentioned because the Council requested an analysis based on the assumption that there would be a 10 percent switch from trawl to other gears. Unfortunately, we are not able to provide quantification of the impacts from this switch.

trawler chose not to permanently convert, then the vessel would have to fish only with trawl gear, trawlers would be forced to use trawl gear when they might have preferred to continue to use nontrawl gear. This could reduce the amount of gear switching and the associated benefits.

While permanent conversion to fixed gear would provide less flexibility than gear switching, it may provide other advantages. For example, camera monitoring could be more feasible with fixed gear than with trawl gear. Incentives could also be provided by charging different annual renewal fees or transaction fees for QS that has been converted or by providing a supplemental amount of QP from the AMP. These differences and incentives could contribute to differences in the overall cost and revenue of fishing with the alternative gear, encouraging use of that gear.

Gear conversion may create imbalances in the multispecies mix necessary for prosecution of the trawl fishery. Species targeted by trawlers include flatfish and the Dover sole-Thornyhead-Sablefish (DTS) complex. Flatfish cannot be effectively harvested by fixed gear, and that market would be sacrificed by trawlers that convert to fixed gear. Sablefish caught by fixed gear could yield a higher price than sablefish caught by trawl gear. For example, in response to multiyear-duration, cyclical swings in price, relative availability, and/or species mixes, conditions may favor the conversion of some of the trawl sablefish QS to nontrawl gear, reducing its availability for use in the DTS fishery. If conditions then reversed, favoring targeting of the sablefish harvest with trawl gear, the switch back would not be possible without a regulatory change. This could reduce the net economic value derived from the fishery. While permit holders or vessel owners may consider that conditions in the fishery vary over time, the effect of those conditions on their decisions will depend on their planning horizon. The planning horizon needed to appropriately organize production in the fishery may be longer than that of the individual fishermen, (i.e., decisions based on short-term conditions may be suboptimal as fishery conditions change).

A-8 REGIONAL LANDING ZONE (OPTION – NOT PREFERRED)

❖ *Provisions and Options*

Under the preferred alternative, the Council will choose between creating a split in the management units at 40°10' N latitude and the regional landing zones option (see Section A-1.2). The following describes the regional landing zone option as presented in the WDFW proposal:[139]

Regional Landing Zone Option:

1. Two basic types of QS would be issued for target species:
   (a) zone-specific QS and
   (b) zone-free QS.
   Zone specific QS would not be required for incidentally caught overfished bycatch species.
2. The Council would decide the overall split between zone-specific and zone-free QS (e.g., 80 percent zone-specific, 20 percent zone-free). Each permit owner or processor would be allocated the same split of zone-specific and zone-free QS.
3. Zones would be limited in number (i.e., two to six per state with a coast wide maximum of ten), designed and nominated by the states, and approved by the Council. The states could design individual zones to encompass a single port or group of ports.
4. QP from zone-specific QS could only be landed in the zone for which the QS is issued. However, the zone designation would not restrict the catch area. Zone-specific QS would be transferable to holders outside the zone, but the QP associated with that QS would have to be landed within the specified zone.
5. QS would be issued to permit owners and processors based on the allocation formulas specified in Section A-2.1. These formulas use a 1994-2003 allocation period. The QS issued to each recipient would be designated for a particular zone based on the recipient's landings history over a time period chosen to reflect recent conditions (e.g., 2005-2007). For each target species, zone-specific QS would be issued to a recipient based on the proportion of landings history in each zone during the recent period.
6. The Council could adaptively manage the system by varying the split of zone specific to zone free QS, redistributing QS among zones, permitting limited transfers between zones, adding or subtracting zones, etc.

❖ *Rationale and Policy Issues*

Rationale for the Option

The Council added the regional landing zone option for consideration alongside the June 2009 PPA out of concern over the negative impact that consolidation in the nonwhiting fleet could have on fishing communities. The option was proposed as a means of directing landings towards communities that have traditionally participated in the nonwhiting trawl fishery.

The option was proposed with both short- and long-term social objectives in mind. The short-term objective would be to provide stability to communities by preventing quota recipients from completely transferring their QS/QP out a region. Quota holders could transfer their QS/QP, yet any zone designated QS/QP-transferred would remain subject to the landings restriction. Over the long term, the zone landings requirement could be used as a tool to prevent excessive geographic consolidation of quota, to promote sustained participation from fishing communities, and to ensure that the economic benefits of the program were dispersed coast wide.

[139] PFMC, June 2008 Briefing Book: Agenda Item F.6.f, WDFW Supplemental WDFW Attachment 1.

The Council did not include the regional landing zones option in the November 2008 preferred alternative. Many Council members expressed their concern about fleet consolidation and the impact to communities. However, the Council's discussion and motion in November 2008 focused on the AMP as the tool for addressing those concerns.

Policy Guidance and Previous Consideration of Area Landings Requirements

Section 303A(c)(5) of the MSA requires the Council to do the following:

> (B) consider the basic cultural and social framework of the fishery, especially through—
>
> > (i) the development of policies to promote the sustained participation of small owner-operated fishing vessels and fishing communities that depend on the fisheries, *including regional or port-specific landing or delivery requirements*; and
> >
> > (ii) procedures to address concerns over excessive geographic or other consolidation in the harvesting or processing sectors of the fishery (emphasis added).

The Council's consideration of regional area management and landing requirements began even before Congress added Section 303A to the MSA. Indeed, the need for such policies was a major topic of discussion during the NEPA scoping process:

> The question has been raised as to whether or not an IFQ program might increase the need for regional area management to address biological or socioeconomic concerns. Without area management, it has been suggested that under an IFQ program there may be a greater potential for effort to be concentrated within some areas than there would be under other types of catch control tools. . . . Assigning area-specific OYs may prevent regional depletion of stocks, which is an issue of biological concern to the extent that mixing or migration of stocks between areas is not occurring. Maintenance of fishing opportunities and protection of local community interests and processing infrastructure could be potential socioeconomic reasons for dividing OYs by area.[140]

The scoping process identified three key objectives for of regional area management:

- Preventing regional depletion and set catch levels for areas based on stock assessments
- Distributing economic benefits of catch along the coast
- Ensuring that certain communities receive economic benefits

The scoping process also drew a distinction between biological and social objectives and the appropriate methods for achieving the two:

> Catch area restrictions on IFQs would more precisely address biological concerns and would likely keep landings more geographically dispersed than might be the case without such restrictions. Landing area restrictions on IFQs would more precisely address socioeconomic

[140] PFMC. 2005. NEPA Scoping Results Document: Individual Fishing Quotas (A Kind of Dedicated Access Privilege) and Other Catch Control Tools for the Pacific Coast Limited Entry Trawl Groundfish Fishery.

All quotations and references made to the scoping document in this section can be found in Appendix A, Section A.1.0.

> concerns and would likely keep catch more geographically dispersed than might be the case without such restrictions.

At the end of scoping, the TIQC rejected any type of landings area endorsement and concluded that area management measures "should be based solely on the need to address stock conservation concerns." The TIQC's recommendation was based on concerns about possible constraints on the fleet's operational flexibility:

> Minimizing restrictions, such as catch area restrictions, will increase operational flexibility and increase the value of the IFQ. Given flexibility, vessels will go to areas where they can fish the cleanest.
>
> Landing area endorsements should be rejected. With respect to protection for ports, the TIQC felt that there are not enough groundfish to support processing facilities in every port that has historically had such fisheries. The economics of the trawl fishery do not allow vessels to travel far from the fishing grounds to deliver their catch. Where fish should be landed cannot be accurately forecasted and is worked out through negotiations between vessels and processors. The potential for geographic redistribution is a reality for market driven systems. Nothing in the current system prevents vessels from migrating between ports.

In October 2008, the GAC considered the regional landings zone option but did not recommended that it go forward as part of the Council's preferred alternative.[141] The GAC had concerns about the task of tracking the additional types of quota that would be created by the option. Members of the GAC and its advisors raised questions about the landings requirement's potential effectiveness given that fish can just be landed in a port and trucked elsewhere. Some members of the GAC stated their belief that adaptive management would do a better job of providing community stability. The GAP discussed the regional landings zone option in November 2008 and was not in favor of its inclusion in the trawl rationalization program.[142]

❖ *Interlinked Elements*

The regional landings zone option shares overlapping objectives with the proposed AMP. However, the structure and approach of the two are substantially different and, therefore, potentially compatible. The proposed latitudinal area management option described in Section A-1.2, in contrast, would potentially be redundant to this option. An area management program that combined the biological objectives of the latitudinal area management option with the socioeconomic objectives of the regional landings zone option would have to be carefully designed.

[141] PFMC, November 2008 Briefing Book, Agenda Item F.3.e, GAC Report.
[142] PFMC, November 2008 Briefing Book, Agenda Item F.3.f, Supplemental GAP Report.

❖ Analysis

This analysis examines how a regional landing zone option would modify and integrate into the IFQ system. There are several design elements, which we identify and discus in this section. There are many possible configurations of these design elements, making it difficult to analyze anything but broad dynamics.

Design elements of the regional landings zone option that would have to be considered by the Council:

- Number and location of the regional landing zones
- Method for assigning zone restricted QS/QP to the zones and for tracking and enforcement of the landings obligation
- The overall ratio between zone free and zone restricted QS/QP
- Identifying the IFQ management units to be covered by the landings restriction
- Adaptive features

Assigning and Tracking QS/QP under a Regional Landings Zone Program

Assigning Zone Restricted QS/QP

This regional landings zone option would divide QS issued for a set of IFQ management units in the shoreside nonwhiting trawl fishery into two categories: zone-restricted QS and zone-free QS. Zone-free QS would be identical to the IFQ management units described in Alternative A.1-2. QS would have a restriction on the zone where the associated QP can be taken, but it would not otherwise alter the IFQ Management Units.[143]

Zone-restricted QS would be marked with a zone designation at initial allocation and would "run with" the QS through transfers. This means that zone-restricted QS/QP would be transferable subject to the IFQ Transfer Rules chosen in Alternative A-2.2.3, yet transferees would still be bound by the landings requirement. The zone designations would remain in effect until extinguished through regulation.

Table A-110 illustrates the basic process of how the zone assignment would occur at initial allocation. In the first step, the QS for each IFQ management unit covered by the option would be designated either as zone-free or zone-restricted based on the percentage of QS the Council desired split. The example in Table A-110 uses a 40/60 split so that 40 percent of all QS is zone-free, and 60 percent is zone-restricted. Each QS recipient would receive the same overall amount of QS they would obtain under the Initial Allocation and Direct Reallocation rules chosen under Alternative A-2.1. In Table A-110, the hypothetical Company X stands to receive 0.02 of the *Sablefish N. of 36* QS. Using the 40/60 split, 0.008 of Company X's QS would be zone-free, and 0.012 would be designated as zone-restricted.

In the second step, each permit's zone-restricted QS would be assigned specific zone designations based on the permit's landings history. The assignment would be based on a window or "zone assignment"

[143] The IFQ management units are based on stocks and catch areas and ensure that acceptable levels of fishing morality are not exceeded. The landing area restrictions placed on the QS will not alter the amount of QP issued or directly change the areas where the harvest is taken. However, harvest areas could be indirectly influenced by the zone restrictions because trawl vessels tend to operate close to where fish are landed.

period chosen by the Council. In the Table A-110 example, the zone assignment period is 2006 to 2009; in those years, Company X made 6 percent of its *Sablefish N. of 36* landings in Zone 1, 83 percent in Zone 2, and 11 percent in Zone 3. Applying the percentages to Company X's overall zone-restricted QS (0.012) would then yield Company X's QS for each zone.[144]

Table A-112. Illustration of the process for assigning a quota recipient's ("Company X") zone-restricted QS/QP. The example is based on a 40/60 split between zone-free/restricted QS. Initial QS, landings history, and "Trawl OY" data are hypothetical.

Company X -- "Sablefish N. of 36" IFQ

[Step 1] QS Split

Initial QS
0.0200

Zone Free QS
40% *x 0.0200*
= 0.008

Zone-restricted QS
60% *x 0.020*
= 0.012

[Step 2] Zone Assignment
(based on window period 2006-2009)

		Zone 1	Zone 2	Zone 3
Total Landings			*150 mt*	
Landings by Zone		*Zone 1* 8.4 mt	*Zone 2* 125.1 mt	*Zone 3* 16.5 mt
			÷ 150 mt	
% of Total Landings		*= 6%*	*= 83%*	*= 11%*
	⟶		*x 0.012*	
Zone Restricted QS		***= 0.00067***	***= 0.01001***	***= 0.00132***

[Step 3] QS/QP Portfolio in Year

	Zone Free	Zone 1	Zone 2	Zone 3
QS	***0.00800***	***0.00067***	***0.01001***	***0.00132***
Trawl OY in Year	7,000 mt			
QP for Year	123,458 lbs	10,370 lbs	154,445 lbs	20,371 lbs

Additional zone assignment rules may be necessary to address the issuance of *de minimis* amounts of zone restricted QS to quota recipients. The amount of zone-restricted QS resulting from this minor amount of landings could be so small that the quota holder would not bother to land within the zone and may even have difficulty trading it on the market. A minimum threshold percentage (e.g., 5 percent) would be one method of addressing the issue. Landings not meeting this percentage threshold could be assigned to an adjacent zone or designated as zone-free QS.

[144] The zone assignment could be based on species-by-species basis, as shown in Table A-110, or based on all groundfish landings in aggregate during the window period.

After initial allocation of QS, the next step would involve translating the zone-restricted QS into an annual landing requirement. In this step, the zone-restricted QS would either (1) be converted into QP using the same IFQ Annual Issuance process chosen under Alternative A-2.2.2 used for all IFQ management units, or (2) converted into zone assignment QS ratios depending on how the zone landings requirement was tracked (discussed below). Neither method would involve an annual sub-allocation of the trawl sector OY to the regional zones. Unless altered through the Council process, the QP received by each zone would be based solely on QS assigned to the zone at initial allocation.

Tracking Zone Restricted QS/QP

There are two potential methods for tracking zone restricted QP. The first would track zone-restricted QP in the same manner contemplated for tracking QP without the zone landings option in place. Doing so would require zone-restricted QP to maintain its species-zone identity throughout the year as a special type of QP. For example, a vessel account could contain multiple types of Dover sole QP: zone-free Dover sole QP, Zone A Dover sole QP, Zone B Dover sole, and so on. The Permit/IFQ Holding Requirements described in Alternative A-2.2.1 would apply to eacH QP type. If a vessel landed a particular species in a particular zone, QP for that species-zone combination would be required. Zone-free QP could be used as well. If the vessel account had both types, the owner could designate which type and the amount to deduct from the vessel account.

The second approach—which would have to be worked out in more detail—would fashion the option as an annual requirement. QS account owners would be given zone assignment QS ratios at the start of the fishing year. At the close of the fishing season, account owners would have to show documentation that proved their annual landings achieved or bettered the zone assignment ratios (e.g., Company X show that 1.32 percent of its *Sablefish N. of 36* landings were made into Zone 3.

The potential downside to the first method is that there would be significantly more types of QP categories to track than there would be in the absence of the zone landings requirement. The potential number of QS/QP combinations is explored below. Under the second method, data collection would be the same as it would be absent the regional landings requirement. Quota holders would only have to know the amount and location of each landing to track their cumulative landings in each zone. However, the review of landings documentation at the end of the year would create another administrative task for NMFS.

Design Elements and Other Considerations

IFQ Management Units Covered by the Regional Landings Zone Requirement

As described in the WDFW proposal, the regional landings zone requirement would apply to all nonwhiting groundfish IFQ stock management units except the overfished stocks. The potential universe of stocks is identified in Table 2-5. Table A-111 provides a list of those species that tend to be trawl targeted and were included within the scope of the Council's PPA.[145]

[145] See section A.1-2 for details on the IFQ management units. The Council's preliminary preferred alternative would not have required QS/QP for longspine thornyhead south of 34°27' N latitude, minor nearshore rockfish north, minor nearshore rockfish south, black rockfish (WA), black rockfish (OR-CA), California scorpionfish, cabezon, kelp greenling, shortbelly rockfish, other rockfish, and spiny dogfish. In June 2009, the Council recommended adding the Other Fish category to the list.

Table A-113. The shoreside nonwhiting IFQ stock managed units that would potentially be subject to the regional zone landings restriction under the Council's PPA.

1	Lingcod N of 42º	12	Dover Sole
2	Lingcod S of 42º	13	English Sole
3	Pacific Cod	14	Petrale Sole
4	Sablefish N of 36º	15	Arrowtooth Flounder
5	Sablefish S of 36º	16	Starry Flounder
6	Chilipepper Rockfish	17	Other Flatfish
7	Splitnose Rockfish	18	Other Fish
8	Yellowtail Rockfish	19	Longnose Skate
9	Shortspine Thornyhead - N of 34º27'	20	Minor Rockfish North
10	Shortspine Thornyhead - S of 34º27'	21	Minor Rockfish South
11	Longspine Thornyhead - N of 34º27'		

The total number of QS units in the zone landings option would depend on the configuration and number of zones and actual landings into those zones during the zone assignment window period. The number of QS units would be something less than the following:

> [(*the # of IFQ management units subject to the zone restriction*) * (*the # number of zones* + 1)] + [the # of *overfished stocks management units* / *other stocks not subject to the restriction*].[146]

It would be "something less than" the number produced by this equation because not all IFQ management units would have coast wide landings history. Very few stocks (e.g., Dover sole, Petrale sole) would have landings history for every zone. Several stocks are already subject to some geographical subdivision. In addition, other stocks like arrowtooth flounder and Pacific cod are not geographically subdivided as management units yet would only have landings history within a limited number of zones because of the natural geographic distribution.

Even so, the regional zone landings option would likely add a considerable number of stock-zone QS units. If the Council designated eight zones, all 21 stock units in Table A-111 were subject to the zone restriction, and (on average) those stock units had landings history in four different zones, then the zone landings option would create 105 QS units for a total of 112 management units (including 7 QS/QP units for the overfished stock).[147] If the average number of zones were five instead of four, then the number of QS units created by the option would increase to 126 for a total of 133 management units. For comparison, the latitudinal area management option in Alternative A-1.2 would increase the number of management units from about 35 to 58. This number is comparable to the B.C. IVQ program, which involves eight groundfish management areas and 27 stocks that are managed for a total of 55 species area quota units.[148]

Another factor to consider in subdividing QS into regional units would be the potential risk posed by the pools of quota becoming too small. In other words, for species with a relatively small trawl sector

[146] The "plus 1" accounts for the zone free QS.

[147] 105 = 21 * 5 = (# of stock management units) * (average # of zones + 1 zone free).

[148] The B.C. trawl IVQ species area units can be viewed in Appendix 8 of the 2008/2009 Groundfish Trawl Commercial Harvest Plan: Fisheries and Oceans Canada, Pacific Region Amended Integrated Fisheries Management Plan: Groundfish, March 8, 2008 to February 20, 2009. (http://www-ops2.pac.dfo-mpo.gc.ca/xnet/content/mplans/mplans.htm#Groundfish).

allocation to begin with, the subdivision of pools of zone-restricted quota might create thin market conditions and potentially erode some of the efficiency gains expected under an IFQ program (see discussion of thin markets in Section 4.7.2.3).

To reduce the number of stock-zone QS combinations, the Council could choose to designate only a subset of stocks with the zone restriction. Given that a relatively few target species drive the nonwhiting groundfish trawl fishery, the outcome of the regional landings zone option could be more or less the same if only those key target species were covered. Still, even a limited number of target stocks would still have the potential to create a considerable number of new species area management units. Covering the top five target stocks would be similar to the area management by geographical subdivision option in terms of the total number of additional QS/QP units. For example, assuming 8 zones and an average of 6 zones per stock (target stocks tend to be more widely distributed), the total number of management units would be 58.

Table A-112 identifies the most economically significant stocks based on approximate average annual ex-vessel value from 2004 to 2006.[149]

Another potential way of reducing the number of QS units in the program would be to endorse certain zone-restricted QS units with multiple zone designations (e.g., Dover sole QS eligible for landing Zone 1, 2, or 3).

Table A-114. Top 12 nonwhiting, groundfish species in terms of average ex-vessel value, 2004 to 2006 (PacFIN).

	Species	Approx. value (thousands $)
1	Sablefish	~$6,200
2	Dover sole	~$5,200
3	Petrale sole	~$5,200
4	Shortspine thornyhead	~$1,000
5	Pacific cod	~$900
6	Longspine thornyhead	~$700
7	English sole	~$700
8	Arrowtooth Flounder	~$500
9	Rex Sole	~$500
10	Lingcod	~$450
11	Pacific sanddab	~$300
12	Unspecified. Skate	~$300

Designating the Regional Landings Zones

The configuration of the regional landings zones—their number and location—is perhaps the key design element of the option. The zones would redefine the geographic scope of the quota market. In addition, the ultimate configuration of the zones would be the primary factor determining the option's impact on

[149] There may be other significant target species that have been targeted in the past, and may again be targeted under the IFQ system, that do not have recent landings history because of overfished species constraints (e.g., chilipepper rockfish, yellowtail rockfish).

harvesting efficiency and operational flexibility. Some configurations might be highly constraining to some areas of the coast, whereas other configurations might have negligible impact on overall efficiency and flexibility.

As described in the WDFW alternative, the regional landings zones would be designed and nominated by the states and approved by the Council. The proposal suggests that there should be no more than 10 zones. The borders of each zone would be delineated by a north and south latitude line. Zone borders could either coincide with state borders or cross them. In addition, a regional landing zone could conceivably be designed to cover a single port to provide strong protection to that community. Alternatively, zones could be designed to encompass multiple ports to increase competition and operational flexibility. Overlapping zones would also be possible. Overlapping zones could make a single port or port group eligible to receive multiple sets of zone restricted QS/QP.

Multiple sections in this document could be used to guide the design of the zones. The regional comparative advantage analysis in Section 4.7.2.1 and Appendix C discuss some of the initial conditions (e.g., distribution of QS/QP at initial allocation) that are expected to influence geographic shifts in fishing effort and landings under an IFQ program. The regional geography of processing infrastructure is examined in Section 4.10.2.2. Possible impacts to fishing communities from the proposed action fleet are detailed in Section 4.15.2. Section 3.7 discusses the current status and vulnerability of individual fishing communities based on their dependence on and engagement in the groundfish fishery and other fishing activities.

Designating the Zone-Free/Restricted QS Split

As highlighted in the Table A-110 example, the Council would determine the overall split or ratio between zone-free and zone-restricted QS. The WDFW proposal suggested that the percentage split would be uniform across the program; however, it would also be possible to vary the split between IFQ stock management units (e.g., 40/60 for Dover sole, 25/75 for Petrale sole).

While the configuration of the zones defines the geography of the quota markets, the zone-free/zone-restricted QS split essentially determines the degree of independence between those markets. Competition between zones would be limited to the zone-free QS/QP, so the degree of independence would be proportional to the percentage of zone-restricted QS/QP designated by the Council: the higher the percentage, the lower the QS/QP competition between zones. At the same time, the independence of zone QS/QP markets would remain limited as long as overfished stocks were tradable coast wide.

Again, the objective of the option is to provide community stability by preventing quota from shifting geographically. Buyers and processors within regional landings zones could leverage the zone-restricted QS/QP to attract zone-free QS/QP. To remain "whole" in the IFQ program, each zone would have to leverage its zone-restricted QS/QP up to the amount of the zone-free QS ratio. The chances of this happening would presumably increase with higher percentages of zone-restricted QS. At the same time, restricting QS to a zone would not necessarily mean that all the associated QP would be landed every year. As is the case with the status quo, harvesters may not be able to access the full trawl sector OY because of overfished species constraints or they might not have a market for the fish.

Designating the Zone Assignment Window Period

As also discussed and illustrated in Table A-110, the Council would need to identify a zone assignment window period for assigning each quota recipient's zone-restricted QS to specific zones.

To achieve the goal of providing community stability during the IFQ program, this window period should be chosen to reflect recent landings patterns. A window period that went too far back might increase restrictions on operational flexibility because it would increase the chances that permit holders receiving the initial allocation of QS may have purchased the permit, or changed the location of their operations, outside or at the tail end of the window period.

Given that the zone assignment window would not influence the overall amount of QS issued to quota recipients, and that the objective of the option is to mitigate against substantial disruption to the fishery, the Council could consider designating a window period that extended to the present and beyond (e.g., 2004 to 2010). Doing so would allow those eligible to receive QS some influence over their potential portfolio of zone-restricted QS.

Further examination of potential window periods or alternative zone assignment rules would likely reveal a need for additional procedures for assigning the initial allocation of QS to zones. For example, if a recent window period is chosen, there may be permits receiving an initial allocation of QS/QP that have no landings history. There are known latent LEPs that will receive little QS/QP other than what may be distributed from the buyback history.

Adaptive Features of the Regional Landing Zones Option

The WDFW proposal suggests that the regional landings zone program could be managed adaptively by altering the design elements of the program. As seen above, there is considerable flexibility in the design elements of the program. For example, IFQ management units could be added to or subtracted from the zone requirement; the zone-free/zone-restricted QS percentage split could be decreased or increased; the boundaries of zones could be redesignated to add or subtract ports, etc. The Council would presumably make such changes in response to new information about the performance of the fishery.

Changing the design elements would involve varying administrative complexity and costs. The simplest change to the program would involve converting zone-restricted QS to zone-free QS, either wholesale or for a certain percentage (e.g., converting 25 percent of zone-restricted Dover sole QS to zone-free).[150] This conversion to zone-free could be made on a permanent basis or temporarily in response to inseason conditions. Increasing the number of zones in which a QS unit could be landed (e.g., permitting Zone 1 QS to be landed in Zone 2 as well) would also be relatively simple in terms of administrative complexity. In contrast, redesignating zone boundaries or increasing the amount of zone-restricted QS from the pool of zone-free QS would be more administratively complex and would require use of a zone assignment window period or other formula.

Biological effects of the Regional Landings Zones Option

Although the objectives of the regional landings zones option are exclusively socioeconomic in nature, any shift in fishing activity induced by the landings restrictions could have biological implications as well. Many of these implications are discussed in the analysis of the latitudinal area management provision in A-1.2. The biological effect of the regional landing zones option would be similar to that of the area management provision—i.e., precautionary and expected to decrease the likelihood of localized stock depletion—to the extent that the regional landing zone provisions were successful at preventing geographic consolidation of fishing activity. If, however, the design of the zones somehow increased concentration of fishing effort in certain regions, then the risk of localized depletion in those

[150] If the regional landings boundaries coincided with the 40° 10’ N latitude line (e.g.. if Zones 1-4 were north of 40, and Zones 5-8 south), then it would also be relatively simple to convert to the area management option.

regions would be higher. A major difference between area designations and the landing zone provisions is that the landing zone designations do not necessarily force vessels into particular catch areas if the fish are not there. The vessels can fish anywhere along the coast as long as they meet the landing area requirements for zone designated QP.

Influence of the Regional Landings Zone on the IFQ system

The regional landings zones option would not amount to a fundamental alteration of the IFQ mechanism. Therefore the tradability of QS/QP and individual accountability for total catch and discards would still be expected to change the behavior and composition of the fleet. The regional zones would, however, be expected to alter the scale at which these dynamics operate, and in turn, to impact the geographic redistribution of landings under the program. Again, markets for zone-restricted QS/QP would maintain some degree of independence from one another, yet would remain connected through trade for zone-free QS/QP. Competition for overfished species QS/QP in particular would be expected to remain high.

Potential Benefits to Fishing Communities

By creating landings restrictions based on recent conditions in the fishery, the regional zone provision would preclude wide-scale redistribution of QS/QP under the IFQ program. Over the long run, the regional zones would be expected to prevent excessive geographic consolidation of landings and promote broader distribution of benefits from the IFQ program. However, the degree to which individual ports and communities would benefit from these protections would depend largely on the configuration of the zones. The option could also provide communities disadvantaged under the IFQ system some protection by reducing coast-wide competition for QS/QP and by dampening down the influence of initial conditions (e.g., port infrastructure) on the redistribution of QS/QP. The converse of this, of course, is that communities that stood to gain the most from increased coast-wide competition would lose some of their advantages under the zone requirement.

Ports and communities within zones would still face competition from one another; thus, fishing activities and zone-restricted QS/QP could still shift within zones. If a port were placed into the same zone as a major competitor, then the zone provision might not provide much protection to that community. From the point of view of individual buyers and processers, nothing in the regional landings zone option would prevent new entrants from competing for landings. As happens under status quo, competitors could enter a zone with little or no capital investment in the community by sending mobile buyers into a zone to purchase fish and transport them to another area for processing.

The regional landings zones option would also present some risk of undermining overall economic efficiency and long-term benefits to the fishery. In 2004, the GAO evaluated landings restrictions as part of a report evaluating various community protection measures for IFQ programs and reached the following conclusion:

> *Requirements to bring catch into ports in a particular geographic area . . . may not be healthy for a community's economy in the long term. For example, such a requirement may subsidize inefficient local fish processors that cannot compete on the open market. With reduced competition, these processors may offer less money for the catch, thus reducing the fishermen's income and ultimately harming the community. According to Shetland Islands fishery managers we spoke with, had fishermen been required to land their catch in the Shetland Islands, they would have been forced to sell their catch at a*

> *price far below the market value and the processor would have had no incentive to restructure into the competitive business it is today.(GAO, 2004)*[151]

Although conditions on the west coast are much different than those in an isolated archipelago like the Shetland Islands, the potential for the zone landings provision to reduce competition within zones would still exist. As discussed elsewhere in Appendix A and in Appendix E, there are issues of market power and competitiveness in the processing and harvesting sectors related to the transition to an IFQ system and the initial distribution of QS/QP. These would be important factors for the Council to consider during the design of the regional zones.

Potential Impacts in the Harvesting Sector

The IFQ program would be expected to produce gains in harvesting efficiency over the status quo even with the regional landings zone option in place. Any additional costs associated with the landing restriction would be internalized into the IFQ mechanism, and the price harvesters are willing to pay for QS/QP will remain connected to the potential profits earned through harvesting the fish. As explained in Section 1.3.1, given that the zone-restricted QS/QP would still be divisible and tradable, harvesting efficiency within each zone would improve over time as the quota accrues to those able to harvest and land fish within the zone most profitably.

At the same time, there is some risk that economic improvement in the fishery would be lower than it would be without landings restrictions in place. This risk can be weighed by examining the potential impact of the landings restriction on the two sources of expected economic improvement under the proposed IFQ system: (1) reductions in overall and per-vessel harvesting costs and (2) increased access to target species from improved avoidance of overfished species bycatch. The risks posed by the regional landings zone option to improvements in these two areas are weighed separately.

- Risk to Expected Reductions in Harvesting Costs

Reductions in harvesting cost alone are expected to bring significant economic benefit to the fishery, with fleet consolidation being a major the source of the savings. This consolidation would occur as less efficient vessels transfer quota to vessels that are more efficient and exit the fishery. As more vessels exit, overall harvesting costs in the fishery are reduced as fixed costs and capitalization decrease, and the proportion of efficient vessels in the fleet increases.

Assuming that market conditions for zone-restricted QS/QP remain competitive, and transaction costs not too high, then consolidation and associated cost savings would still be expected within the regional landings zones. The geographic pattern of consolidation would ultimately depend on the configuration of the zones. The degree of consolidation and cost savings could vary between zones and could be higher or lower overall than it would be in the absence of the zone structure, depending on economic conditions within the zones.

Vessel efficiency could also be impacted. Vessel efficiency is a function of the vessel's harvesting capacity and its cost structure. Harvesting capacity would not be expected to differ over the long run under this option, yet a vessel's cost structure might vary because it depends in part on port infrastructure. Zones that contained only high cost ports would thus be expected to hamper cost savings of the vessels within that zone and reduce the overall efficiency gains in the program.

[151] GAO. 2004. Individual Fishing Quotas: Methods for Community Protection and New Entry Require Periodic Evaluation. GAO-04-277.

Bycatch is expected to be a major contributor to harvesting costs in the IFQ program. As described in Appendix C, there are regional differences in the distribution and abundance of overfished species. If a regional zone locked vessels into fishing in one of the known high bycatch areas, the cost of harvesting a given volume of target species would be higher in this zone because of the overfished species QP costs. Yet, this would be true only to the extent that higher bycatch rates could not be avoided within the zone, or if the cost of travel to harvest in lower bycatch rate areas was high. If the zones were large enough to provide multiple fishing and landings locations, high bycatch areas could likely be avoided. Over the long term, we would expect harvesters to try to reduce their bycatch rates by changing fishing locations and strategies. The incentives produced by individual accountability, together with improved at-sea data collection, should push harvesters to identify and avoid bycatch hotspots at a much finer scale than is possible under the status quo management structure. At the same time, if the only available bycatch avoidance strategy available were farther travel to fishing ground, then the increased travel distance would be a forced inefficiency and an undesirable outcome of the program.

- Risk to Potential Increased Access to Target Stocks

Increased access to target stocks is expected to occur under the IFQ program as regulatory discards are eliminated, and individual accountability creates incentives to reduce overall bycatch rates in the fishery. The regional landings zones program could potentially lower target species access compared to having no landings requirements in place if the zones somehow hampered improvement in bycatch rates.

This incentive to avoid bycatch might lead to coast-wide differences in target strategies and, in turn, regional differences in the amount of bycatch needed to access a given volume of target species. If zone restrictions prevented QS/QP from flowing to those areas where target stocks could be accessed for the least amount of bycatcH QP, then bycatch rates would not decrease to what they could have in the absence of the landings restriction. Yet, as mentioned above, this would only be true to the extent that the bycatch avoidance techniques used to achieve the lower bycatch rate would not be effective everywhere. As long as bycatch rates can be lowered through improved fishing techniques, the amount of target stock QP accessible per QP of bycatch would be expected to even out among zones over the long run.

Increased access to target stocks would also depend on demand for the increased volume of raw fish product. Therefore, differential market conditions for raw fish product between zones could also be a factor in how large the increase in landings will be under a zone-restricted IFQ program. For example, assume Zone 1 received zone-restricted QS/QP for a species that had little or no market for the raw fish product within the zone. With no zone restrictions in place, the QS/QP for this locally unmarketable species would flow to regions where demand for the species did exist. With zone restrictions in place, this transfer could only occur with zone-free QS/QP. With no market for the fish, the value of Zone 1 QS/QP would be zero. However, given that the assignment of QS to zones would be based on recent conditions in the zones, such situations should not be common. Significant landings of a species would not have been made in the zone if there were no market for the fish. Moreover, even if such market disconnections did occur, they might only be a problem over the short term. Over the long term, if enough demand existed for the raw fish product, processors or buyers would enter the zone to capture the profits.

Landing Patterns and Implications for Potential Zone-Restricted QS Portfolios

Vessels in the nonwhiting groundfish trawl fleet show a high degree of port fidelity, thus most permit owners receiving a quota allocation based on their trawl permit landings history would likely have their zone-restricted QS/QP assigned to a single zone. Yet, those that visited multiple ports during the zone assignment window period could have their zone-restricted QS assigned to several zones.

We examined permit ownership and landings patterns associated with those permits during 2004 to 2006 to get a sense of how many recipients would have their zone-restricted QS assigned to multiple zones.[152] As shown in Table A-113, 59.5 percent of permit owners hold LEPs with landings history in only one port group, nearly 25.6 percent hold permits with landings history in two or more port groups, and 14.9 percent hold permits with no landings history at all. Considering just the permits with landings during 2004 to 2006, nearly 70 percent hold permits with history in a single port, 12.6 percent in two ports, 10.7 percent in three ports, and 6.8 percent in four or more ports. Given that zones would likely be designed to cover multiple ports, it would be expected that more than 80 percent of quota recipients would receive zone-restricted QS for a single zone.

Quota recipients with history in multiple port groups could have very small portions of their zone-restricted QS assigned to a certain zone. Table A-114 shows that permit owners with landing history in multiple ports tend to make the majority of their landings into a single port group. Those with landings history in three or more port groups made, on average, less than 10 percent of their landings into the third port group. Those with landings history in four or more port groups show even smaller percentages. Some of these small numbers might not reflect regular business practices and could be artifacts of one-time business transactions or the transfer of permits between vessels. If so, then the regional zone landings provision could force additional transactions on quota recipients as they attempt to divest themselves of quota assigned to unwanted zones.

If the processing business received initial allocation of quota based on processing history, they would also potentially receive zone-restricted QS for multiple zones. Almost two-thirds of the QS would go to processors that have processing history in more than one port group. However, processing history is more likely to reflect recent business practices than vessel landings history. In other words, if the zone assignment window period reflects recent conditions in the fishery, then the zone-restricted QS received by processors should tend to match the location of their processing operations. Nonetheless, depending on the zone assignment window period, processors could still receive zone-restricted QS quota for a zone where they no longer, or no longer wish to, do business.

[152] The port groups used in this analysis are based on the PacFIN W-O-C port groupings (e.g., Eureka Area, San Francisco Area, Coos Bay Area; see *www.psmfc.org/pacfin*) except that Washington's north coast (e.g., Neah Bay) and Puget Sound ports were combined into a single port group based on the WDFW proposal's indication that those ports would likely be covered by a single zone.

Table A-115. Profile of limited entry trawl permit owners' nonwhiting groundfish landings history, 2004 to 2006, including count of port groups where landings were made. Ports consisting of less than 1 percent of a permit owner's landings were excluded.

	# of Port Groups with Landings					
	0	***1***	***2***	***3***	***4+***	**Total**
Count of Permit Owners	18	72	13	11	7	121
% of total	14.9%	59.5%	10.7%	9.1%	5.8%	--
		Permits Active during 2004-2006				
		1	***2***	***3***	***4+***	**Total**
Count of Permit Owners		72	13	11	7	103
% of total		69.9%	12.6%	10.7%	6.8%	--
Cumulative %		--	82.5%	93.2%	100.0%	--
Total landings (mt)		13,765	2,466	1,388	1,253	18,871
% of total landings		72.9%	13.1%	7.4%	6.6%	--
Landings per permit owner (avg. mt)		191.2	176.1	242.0	179.0	--

Table A-116. Distribution of groundfish landings history, 2004 to 2006, by permit owner and port group. The percentages in the table signify the average, maximum, and minimum percentages of permit owners' total landings made into their primary port group ("1st port"), secondary port group ("2nd port"), etc. Ports consisting of less than 1 percent of a permit owner's landings were excluded.

Permit owners with landings history in 4 or more port groups	**1st Port**	**2nd Port**	**3rd Port**	**4th Port**	**5th Port +**
Avg.	55.1%	16.1%	9.4%	5.1%	1.3%
Max.	90.3%	37.3%	23.5%	21.7%	1.8%
Min.	30.4%	3.0%	1.4%	1.3%	1.0%
Permit owners with landings history in 3 port groups	1st Port	2nd Port	3rd Port		
Avg.	69.5%	21.4%	8.8%		
Max.	95.9%	36.0%	26.7%		
Min.	44.0%	3.0%	1.2%		
Permit owners with landings history in 2 port groups	1st Port	2nd Port			
Avg.	83.3%	16.7%			
Max.	98.9%	42.6%			
Min.	57.4%	1.1%			

A-9 COMMUNITY FISHING ASSOCIATIONS (OPTION – NOT PREFERRED)

❖ Provisions and Options

The Council did not include in Amendment 20 any special provisions for formal CFAs but did commit to the consideration of such provisions as part of a trailing amendment.

❖ Rationale and Policy Issues

In the summer and fall of 2005, the Council gave extensive consideration to provisions to address the concerns of communities (see also "Consideration of Communities" on page A-38). In response to the trawl rationalization analysis in the preliminary draft EIS, as well as to public comment, the Council recognized a continuing concern regarding community stability and vulnerability associated with the implementation of the trawl individual quota program. In November 2008, the Council selected a final preferred alternative on the essential elements for a trawl rationalization program, but left three issues for trailing actions: establishing accumulation limits, defining eligibility to own, and an AMP. Part of the latter two actions included consideration of special community-based entities. As a starting point, the Council considered utilizing definitions of two types of special geographic entities provided for by the MSA: Fishing Communities and Regional Fishing Associations. The Council looked at both definitions and chose to define another type of entity more suited to the Council and constituencies' needs - CFAs. CFAs may approximate or utilize certain elements from the MSA's Fishing Communities and Regional Fishing Associations, but would not necessarily match either definition precisely. The MSA requires consideration of RFAs, but does not require the councils to adopt RFAs. In March 2009, the Council indicated interested in defining a CFA as an entity that is expressly eligible to own QS and as an entity that may be entitled to special accumulation limits. Council staff were directed to use, as a starting point, the National Oceanic and Atmospheric Administration (NOAA) Memorandum titled Design and Use of LAPPs, and a public comment letter from The Nature Conservancy. CFAs may be defined as a special class of entities eligible to hold IFQ, or could be an association of QS holders. Through the definition process, CFAs could be given special considerations or privileges, such as higher control caps, waivers of other program requirements, or priority consideration for Adaptive Management QPs. In return for such special privileges, the Council might require CFA goals, objectives, and performance measures that further the Groundfish FMP goals and objectives.

In April, the Council made and then withdrew a motion to further define CFAs and goals related to aiding vulnerable communities. There was little consensus on which communities were vulnerable, how to define vulnerability, and what analysis could be completed before the final preferred option would be selected in June 2009. The Council opted to defer the CFA decision-making to a trailing amendment.

A-10 ADAPTIVE RESPONSE AND FOLLOW-ON ACTIONS

Ad Hoc Response

After program implementation, the Council will continue to monitor the trawl rationalization program and make modifications as necessary. There will be a comprehensive program review after five years; however, adjustments may be made prior to that time. In Section A-3 (Adaptive Management) of the program, QS are set aside specifically to be available to support adaptive response. While this set-aside and the objectives and criteria for its use have been labeled the "AMP," the Council's adaptive response to program performance would extend beyond the objectives specifically identified for using the Section A-3 adaptive management set-aside. The Council will monitor the program and adaptively respond as necessary to address MSA requirements, MSA national standards, groundfish FMP goals and objectives, and goals and objectives for trawl rationalization. In particular, the Council has identified that it may modify the following program elements as part of the biennial specifications process:

- The percent used for the carry-over provisions (Section A-2.2.2.b)
- The vessel unused QP limits (Section A-2.2.3.e)

Through the process of developing the biennial management regulations, the Council may also recommend regulatory modifications to specific elements of the trawl rationalization program identified in Appendix D of this document. Modification to these elements would be made as needed to address the requirements, standards, goals, and objectives that apply to the groundfish plan and trawl rationalization. Any regulatory adjustments requiring a change to the related FMP language (Appendix G) would have to comply with the standard processes for amending the FMP.

Modification and termination of the program are options at any time (after required process and opportunity for public comment); under such circumstances, no compensation would be due to QS holders or others making investment decisions based on the trawl rationalization program.

Comprehensive Program Review

Section A-2.3.4 covers the Council comprehensive review process. The first review will occur five years after implementation with subsequent reviews every four years. In addition to evaluating performance of the program, during the first review process consideration will be given to the use of an auction or other non-history-based methods for redistributing QS that may become available after the initial allocation. Need for a use-or-lose provision may also by a significant topic for consideration.

First Biennial Management Cycle Actions

As part of the process of developing the biennial specifications for the first year in which this program is implemented, the Council will have to specify an allocation between the shoreside nonwhiting and whiting fisheries for all species within the scope of the IFQ program for which such allocations were not established as part of Amendment 21 (including and allocation of whiting bycatch in the nonwhiting fishery and whiting taken in the shoreside whiting fishery). Completion of the allocation decision is a onetime action and will not have to be repeated in subsequent management cycles. As part of every biennial cycle, a determination will have to be made on the need for bimonthly cumulative limits or other catch controls for species not covered within the scope of the IFQ program.

Planned Follow-on Amendments and Rulemakings

As identified in Section A-9, it is the Council intent to consider whether or not there should be special provisions for CFAs. Additionally, during the first two years of the program the Council will be working on an approach for using the QS set-aside for adaptive management (as discussed above and in Section A-3).

A-11 PROVISIONS REJECTED FROM FURTHER CONSIDERATION

During the process of developing the IFQ program, a number of provisions were considered but rejected without further development. When such provisions fall within the scope of sections of the program, they are discussed above in the related sections. For example, allocation to crewmembers was rejected early on, but that option and the reason for its rejection are covered in the section on eligible groups (Section A-2.1.1). In this section, we will cover some rejected provisions that do not fall within the scope of sections of the IFQ program. All such provisions are documented in the administrative record of the Council's deliberations. During the end of the Council deliberations, two potential provisions not covered elsewhere in this document were the topic of discussion and comment:

1. Sideboards or other measures to prevent spillover
2. Owner on Board Requirement

Sideboard and Measures to Prevent Spillover

A rationalized trawl fishery may have an effect on other west coast fisheries through the transfer of effort and capital into other fisheries (spillover). Most of the other nongroundfish fisheries are already under LE programs. Shrimp is an exception.[153] There are generally three additional fisheries in which LE trawl vessels participate: the Dungeness crab fishery, the pink shrimp and prawn trawl fisheries, and the sablefish tier fishery. Because the current bimonthly management structure of the groundfish trawl fishery provides ample opportunity for vessels to participate in other west coast fisheries, both the GMT and the TIQC advised the Council that they did not believe that nontrawl participants in these other fisheries will be impacted to any noticeable degree by a move to manage the groundfish trawl fishery with IFQs. The possibility that consolidation in the groundfish trawl fleet could result in surplus vessels and that these vessels might acquire latent permits for these other fisheries was discussed. However, since the LE systems for these other fisheries are state-managed, it was thought best that the latent permit issue be addressed outside the Council process.

Owner-on-Board Requirements

An owner-on-board requirement was discussed at various times during the process of developing the IFQ program. The topic often came up in the context of concern over absentee ownership of QS ("sharecropping") and the potential need for a "use-or-lose" provision to ensure that QS were not acquired by groups that would like to see harvest reduced to levels lower than those determined appropriate through the processes provided by the MSA. Overall, an owner-on-board requirement would be intended to provide control over resource access to those most closely involved with harvesting operations. By doing so, it would be hoped that the links between the fishery and fishing communities would be maintained and that communities would benefit from QS ownership by their citizens. Additionally, it was thought that by maintaining QS in the hands of active fishermen it would be more available for purchase by those wishing to enter the fisheries as harvesters. Without an owner-on-board requirement, the concern is that QS might be acquired by investors, and it could be more expensive for fishers to acquire the shares.

The owner-on-board provision was rejected because of at least three concerns. First is the practicality of such a provision in a multispecies fishery. Because of the variation in the mix of catch that may be taken on any particular trip, it is expected that there will be substantial QP trading during the year in

[153] Participation in the shrimp fishery is cyclic and more dependent on biomass and the strength of the market. As compared to the situation under cumulative landing limits, an IFQ program is not likely to have a substantial effect on participation in the shrimp fishery.

order for vessels to match the mix of species in the catch with the mix of species held in the vessel account. Developing an owner-on-board rule that accommodated the need to transfer quota between vessels was intractable. Second, if such a rule could be developed, it would add substantially to tracking costs. Under the current design, QP would be transferred to a vessel account, and no distinction would be made between the sources of the QP. Provisions were intentionally designed to make it unnecessary to track QP back to the owner of the QS and to make it unnecessary to split a single trip up and count it against various QP accounts. This approach was taken to reduce administrative costs. An owner-on-board program would require tracking QP to QS owners and splitting the catch taken on a single trip among various QP accounts, instead of just the vessel account. The third reason for not adopting an owner-on-board requirement was concern about the nature of vessel operations in the trawl fishery as compared to other fisheries in which owner-on-board provisions have been implemented. Compared to other coastal fisheries, the trawl fishery is believed to involve many more multi-vessel companies with hired operators. Therefore, it was thought that the owner-on-board provision might change the character of the fishery rather than preserve it. At the same time, it was recognized that under an IFQ program it is highly likely that the character of the fishery will change and that provisions such as that considered here will determine the direction of change. After evaluating this issue, on balance, the Council believed that an owner-on-board provision would be excessively cumbersome in a multispecies fishery, relative to the benefits that it might bring. Provisions such as the owner-on-board provision and use-or-lose requirement could potentially be reconsidered during review of the IFQ program performance.

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ANALYSIS OF COMPONENTS, ELEMENTS, AND OPTIONS FOR THE HARVEST COOPERATIVE ALTERNATIVE
COOPERATIVE COMPONENTS ANALYSIS

Appendix B

TO THE
RATIONALIZATION OF THE PACIFIC COAST
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An Introduction to Harvest Cooperatives and the Pacific Whiting Cooperative Alternative

A cooperative is used to describe a collective arrangement among a like-minded group of individuals. Cooperatives are entities that are controlled by the people who use them. They differ from other business entities because they are member-owned and operate for the benefit of members. The general activity of cooperatives being considered under the Council's rationalization program is the harvest of fish, so these types of cooperatives are best described as "harvest cooperatives" and a harvest cooperative can be defined as an entity which acts to coordinate the harvest of its members.

Harvest cooperatives are organizations made up of vessels that work together to harvest a fishery resource. We can categorize this broad definition into two different possible models. One may be made up of vessels that negotiate catch-sharing arrangements among themselves without agency involvement. The Pacific Whiting Conservation Co-op is an example of this type of cooperative—a voluntary association of catcher-processors that have negotiated catch sharing arrangements among themselves without agency and Council involvement. This cooperative depends on an allocation of whiting to the sector and a barrier to entry by other catcher-processors that are not part of the arrangement.

The second model is created by vessels with catch history assignments (a percentage of allowable catch) that each vessel brings to the cooperative organization. The collective catch history then comprises the pool of catch available to that cooperative. This catch history can be leased to another vessel in the same cooperative through a private agreement without needing agency involvement, and the motivations and outcomes from doing so may be similar to those motivations and outcomes that exist when transferring quota pounds in an Individual Fishing Quota (IFQ) program (the reader is referred to Appendices A and E for a further elaboration on such incentives and outcomes). The administration and enforcement of harvest activities among member vessels is primarily done through the cooperative organizations and through private contracts governing the operation of those organizations. The regulatory activities of the agency are generally limited to reviewing and approving or disapproving cooperative contracts, monitoring for sector or co-op catch levels, and closing when a sector or co-op reaches their allocation. The mothership and shorebased cooperative proposals are examples of this type of cooperative. Each catcher vessel permit would have a percentage of the allowable catch based on their catch history and those catcher vessels would form cooperative arrangements with other catcher vessels. The cooperative organization would coordinate harvest activities of its member vessels and these activities would include leasing of shares between member vessels without agency involvement.

The primary difference between the two models is the assignment of catch history. In cooperative programs with a relatively diverse set of harvesters, catch history assignments may be necessary in order to solve allocation disputes that may arise between vessels over catch sharing. In cooperative programs with harvesters that are less diverse, catch history assignments may not be necessary because vessels have similar historic participation in the fishery and similar historic catch levels, and find it relatively easy to reach catch sharing arrangements.

In some cooperative programs, catch history assigned to each vessel is linked to a processing entity. This linkage provision can trace its roots to the American Fisheries Act (AFA) which rationalized the Bering Sea Pollock fishery. The AFA cooperatives were designed to "ensure that both harvesters and processors benefited from rationalization" (Stevens and Gorton 1999 as cited in Matulich 2000), and one outcome was to establish a partial link between catcher vessels and shoreside processors. Catcher vessels (CVs) and mothership (MS) processors are not linked in the Pollock fishery. Binding a vessel to a processor creates a system that takes on many characteristics of a vertically integrated firm. Harvesters cannot operate without a simultaneous action on the part of a processor and vice versa. With a harvester-processor linkage provision, harvesting entities and processing entities must negotiate with one another, and both are in a similarly powerful negotiating position. Neither the processing entity nor the harvesting

entity can operate independent of the other, and therefore the goals and operations of both entities become more aligned, partly out of necessity. This type of mutual dependence places both entities in a relatively strong negotiation stance resulting in the sharing of profits that accrue as a result of harvesting and processing activity. Furthermore, a processor linkage provision takes on some of the characteristics of a limited access privilege because those linkages are somewhat defensible and are somewhat transferable (at least in the model envisioned for Pacific whiting cooperatives). Processors with an established linkage have catch available to them from linked catcher vessels and other processors cannot take that catch in the current year.[1] When combined with processor limited entry and the fact that processors can transfer their permits and/or associated linkages to another processor, this tool tends to decrease the amount of competition that exists among processors for catch, making it possible for the processing sector to rationalize itself to a certain degree. This participation in processing activity leads to the generation of greater profits.

Although harvesters and processors have been linked in other harvest cooperative programs, that linkage can be broken. Two options are analyzed in the existing cooperative alternatives for breaking or switching a linkage. Under one option, harvesters can break the linkage by electing to fish in a noncooperative fishery that is designed as a derby fishery. Harvesters in this noncooperative fishery compete with one another for the catch allotted to the non co-op, and the non co-op is closed when the allowable non co-op catch is attained. The reason for including a noncooperative portion of the fishery is to make the linkages to processors that may exist in cooperative systems voluntary. Harvesters may elect to not participate in a cooperative and deliver to any processor as long as the harvester remains in the non co-op fishery. Structuring the non co-op as an Olympic fishery is intentional. This manner of fishing has proven to be less beneficial to participants in a fishery economically, thereby providing an incentive for harvesters to remain in a cooperative and maintain the existing processor linkage This also increases the chances that processors can benefit from rationalization.

Another option assessed for switching processors is similar to one that occurs in the shoreside Pollock fishery, where vessels in a cooperative can switch processors by delivering the majority of their catch to a different processor the previous year. The method envisioned for doing this would be fishing the unlinked portion of catch history of other vessels in a cooperative through a lease agreement and delivering the majority of one's catch to another processor in that way. If that vessel delivers the majority of its catch to another processor through that mechanism, then a new linkage is formed the following year without ever participating in the noncooperative fishery. If cooperatives must be formed around processors, this would mean that the vessel would need to join a new cooperative when it switches processors. Requiring that a catcher vessel also switch cooperatives may make it somewhat difficult to switch processors by using this tool because it essentially relies on other catcher vessels agreeing to let that catcher vessel (and its associated catch history) leave the co-op. In the existing alternatives for whiting cooperatives, this processor-switching tool may be combined with an option that does not require co-ops to be formed around processors, and if this is the case, the outcome is one where the effect of a processor tie is substantially reduced, if not eliminated. If a single cooperative is formed for a sector, vessels can fish the catch history and associated linkages of other vessels in that cooperative and effectively switch processors simply by leasing another's catch history. Overall, this approach for switching processors would tend to decrease the amount of time harvesters spend in the noncooperative fishery, but could result in a much different relationship between catcher vessels and processors with catcher vessels assuming greater leverage in negotiations over profits and other matters.

The final tool intended to acknowledge the interest of motherships is a "declaration" procedure. This tool

[1] Provisions exist for breaking the linkage in subsequent years. The decision to break the linkage ultimately rests with the catcher vessel, meaning the processor cannot defend the linked catch history from other processors over the longer term. This condition violates one of the principal definitions of a property right and is one principal reason why the processor linkage is not a resource access privilege.

was ultimately adopted as the Council's FPA and is intended to provide for some certainty to the mothership on a short-term basis without raising some of the legal complexities that were raised by National Oceanic and Atmospheric Administration (NOAA) General Counsel (GC) over the linkage provision. The declaration process is described as a process requiring that, if a catcher vessel elects to participate in a cooperative, it must declare a mothership to which it will deliver in the coming season. The catcher vessel is then obligated to deliver to that mothership for that coming season, but can freely declare a different mothership in the subsequent season. This procedure avoids some of the penalty mechanisms that exist in a linkage provision if a catcher vessel switches motherships, but provides for some relative short-term certainty to assist the mothership with developing business plans for that coming year.

One tool proposed in the Pacific whiting cooperative alternatives that does not exist in the Bering Sea Pollock fishery is the "mutual agreement exception." In cases where a processor elects to not participate in the fishery, this tool allows processors and catcher vessels the ability to enter into a mutual agreement that allows a catcher vessel to deliver to another processor without permanently breaking the existing processor linkage. Upon the original processor's return to the fishery, the original linkage is reestablished. If such a mutual agreement exception did not exist and a processor did not participate in a fishery in a given year, it is possible that processor would permanently lose its linked catcher vessels. In the case of a declaration procedure, the mutual agreement exception also allows the catcher vessel and mothership to enter into an agreement that would allow the catcher vessel to deliver to a different mothership in that current year.

This mutual agreement exception mostly applies to a cooperative structure with a processor linkage (which is not part of the Council's FPA). This provision allows the processing sector the ability to increase or decrease the number of active processors in the fishery so that the amount of processing capital present in any one year is appropriate to the available harvest. If this provision did not exist, it is more likely that the amount of processing capital in the fishery would remain relatively constant even as the allowable catch varies, leading to years where excess processing capital exists in the fishery and cost inefficiencies are present. This would tend to occur because processors would risk losing their linked catcher vessels if they did not participate in the fishery, even if the allowable catch level was relatively low and may not justify the presence and activity of all qualifying processors in that year. This provision does not have quite the same effect in a cooperative system with a declaration procedure. Since a catcher vessel can freely declare different motherships from year to year, the mothership does not have the same risk of permanently losing catcher vessels if it elects not to participate in the fishery in a given year. Under a linkage provision, catcher vessels are penalized for switching motherships, making it difficult for a mothership that has left the fishery to regain deliveries from catcher vessels if it elects to return (unless there is a mutual agreement). Under a declaration process, it is easier for the processor to reacquire catcher vessels since those vessels can easily elect to move back to that original processor. However, a mutual agreement exception still appears to be a valid tool under a declaration procedure. Should a mothership not be able to participate in the fishery after the declaration procedure has taken place, that mothership has some say over which mothership its catcher vessels elect to deliver to, and this may have some advantages.

History on the Development of the Cooperative Alternative

The development of the noncatcher processor cooperative alternatives began with discussions among participants in the mothership fishery. Beginning in 2004, mothership catcher vessel participants, mothership processor participants, and their technical advisers engaged in over 100 hours of discussion and deliberation to develop a rationalization alternative for Council consideration that was palatable to participants in the mothership sector. The objectives of these deliberations were that the alternative:

- Recognize historical participation in the mothership sector,

- Ensure that rationalization benefits those that have participated in the mothership fishery (both harvesters and processors), and
- Strive to treat everyone fairly so that there are "no big winners and no big losers" (Paine 2007 personal communication).

These discussions began with deliberations over the structure of a possible IFQ-based fishery that could accommodate the existing participants in the mothership sector and bring that fishery successfully into a rationalization program. However, the possibility of developing an agreed upon IFQ-based alternative with "no big winners and no big losers" was quickly abandoned due in large part to the friction created over allocation issues and how much IFQ mothership catcher vessels and mothership processors would receive. Participants in the mothership fishery then turned to their experiences in the Bering Sea Pollock fishery and the cooperatives that were enacted in that fishery through the AFA. The cooperatives developed through that legislation were constructed with the goal that "both processors and harvesters benefit from rationalization" (Stevens and Gordon 1999 as cited in Matulich 2000). Participants in the mothership fishery felt that a harvest cooperative model could be successfully applied to the Pacific whiting fishery (with some notable differences) because the whiting fishery is, in many ways, operationally similar to the Bering Sea Pollock fishery, where cooperatives have been used successfully. Participants in the mothership sector also felt that a harvest cooperative model with processor linkage provisions could successfully accommodate existing participants in the fishery and ensure that all sides benefited from rationalization.

The mothership cooperative alternative developed by participants of the mothership fishery was intended to protect the interests of mothership processors and mothership catcher vessels. This was done by granting catcher vessels harvest privileges and linking those privileges to mothership processors. The proposed alternative was intended to be relatively inclusive, by considering the granting of permits to those that had participated in the mothership portion of the fishery after the separation of the two at-sea sectors (which occurred in 1997) and by considering the granting of catch history to catcher vessels with history since the introduction of limited entry (1994). This initial proposal was supported by the membership of United Catcher Boats (a trade association representing, at the time, 15 active catcher vessels in the fishery) and five of the six mothership entities operating in the fishery.

At the September 2006 Council meeting, representatives of the mothership sector presented their proposal for a harvest cooperative alternative in the mothership portion of the whiting fishery. The Council adopted the mothership sector cooperative proposal for analysis, officially moving the concept of a harvest cooperative alternative forward as one means of rationalizing portions of the limited entry trawl fishery.

In November 2006, the Trawl Individual Quota Committee (TIQC) discussed the newly added mothership cooperative alternative and the possibility of expanding the harvest cooperative model to the shoreside portion of the Pacific whiting fishery. The TIQC recommended modifications to the mothership cooperative alternative, including the consideration of additional harvest privilege qualification criteria, and an option to not have a mothership/catcher vessel linkage provision. Several of these suggested additions and modifications took into account the concerns of those mothership sector participants that did not fully support the original mothership sector proposal. The TIQC also recommended that the Council consider a cooperative alternative for the shoreside portion of the whiting fishery, based largely on the mothership cooperative alternative.

Following this meeting, members of the shoreside whiting industry discussed the structure of a shoreside whiting harvest cooperative, with the intention of developing an industry-preferred alternative. The shoreside whiting industry members consulted with the National Marine Fisheries Service (NMFS), members of the mothership whiting industry, and participants in the Bering Sea Pollock fishery.

At the March 2007 Council meeting, representatives of the shoreside whiting harvesting and processing industry presented a proposal for a shoreside whiting cooperative which included many similarities to the mothership sector alternative, but with differences in processor linkages and processor limited entry. These differences were based, in part, on the possibility that a shoreside processor limited entry program with shoreside processor linkages might not be allowable under the Magnuson-Stevens Fishery Conservation and Management Act (MSA). During Council discussion on the alternative, NOAA GC reaffirmed this. The Council voted to move all harvest cooperative alternatives forward for analysis.

At the November 2007 Council meeting, NOAA GC again confirmed that the processor licensing requirements and linkage elements of the shoreside cooperative alternative went beyond the authority of the MSA. Following this guidance, deliberation reverted to an IFQ-based model for rationalization of the shoreside whiting fishery, due in part to the notion that the lack of processor licensing and linkage provisions in a cooperative-based fishery could mean that processors would not benefit from rationalization. At this meeting, the Council also made several refinements to the options that comprised the mothership cooperative alternative. In particular, the option to not have a mothership linkage provision was discussed and the Council decided to drop that option from analysis because it was believed the lack of such a linkage meant processors would not benefit from rationalization.

At the June 2008 Council meeting, the Council adopted their preliminary preferred alternative, which included harvest cooperatives with processor linkages for the mothership sector and a shoreside whiting cooperative program with processor linkages (pending Congressional approval). This motion came about after much public testimony from the harvesting and processing sectors of the fishery on the potential benefit and drawback of rationalizing the fishery. The motion to adopt a cooperative program in the shoreside fishery appears to have been spurred by the idea that a harvest cooperative system with processor linkages may benefit both harvesters and processors while avoiding the friction created by a harvester and processor allocation issue found within an IFQ program. However, the Council also adopted an alternative that would manage the shoreside whiting fishery with IFQs if Congressional approval of a cooperative program with processor linkages does not occur.

Following the June Council meeting and the adoption of the Council's preliminary preferred alternative, additional analysis was done by Council staff, NMFS, and NOAA GC. As part of this effort, NOAA GC indicated that the processor linkage provisions of the mothership cooperative alternative raised "significant and complex legal issues that call into question whether it complies with antitrust laws, and therefore, whether it could be approved by the agency." Leading up to the November Council meeting, several members of the mothership sector met to discuss this issue and some members felt that a mothership "declaration" option may be a viable alternative to a mothership linkage if the linkage provision could not in fact be approved by NOAA. The declaration option would obligate a catcher vessel to a mothership of its choosing for a year. That declaration could be changed without penalty the following year. The purpose of the declaration option was to provide for some degree of certainty over business planning for the motherships engaged in the fishery. At the November Council meeting, several members of the mothership sector testified to the Council that they in fact supported the declaration option if the linkage provision could not be approved by the agency. The Council voted to establish a cooperative system for the mothership sector with a mothership declaration process rather than a mothership linkage.

Also at the November meeting, several members of the public and some Council members expressed their discomfort with pursuing the shoreside cooperative alternative with processor linkages if doing so would rely upon Congressional approval. Rather than potentially having no rationalization program in the event Congress did not approve such a program, many harvesters and processors in the shoreside whiting fishery agreed to support an IFQ program for that fishery. Many of these same industry participants (both harvesters and processors) reached agreement on how to divide an initial allocation of IFQ to harvesters and processors. This agreement established 80 percent of the initial allocation of IFQ to harvesters and 20

percent to processors. These participants, apparently representing the majority of interests in the shoreside whiting sector, jointly testified to the Council where they indicated their support of the 80/20 initial allocation split. The Council voted to establish an IFQ program for the shoreside whiting fishery with 80 percent of the initial allocation going to harvesters and 20 percent to processors.

Description of Approach for Components Analysis

The cooperative alternatives contain multiple elements and sub-options. This appendix is intended to address each of those elements and options that potentially make up the pieces of a cooperative-based fishery by including rationale and analysis of each of the elements of the alternative. The analysis for each option includes a description of related issues and whether those issues are related in such a way that the selection of one element necessitates the selection of another. This appendix also includes a description of rationale and policy issues that are associated with each of the options and elements of the alternatives. Policy issues may include legal or implementation issues that are associated with each of the elements. Rationale includes the reasons, or basis, for considering each of the elements. Finally, an analysis that describes the effect of each of the options and elements is included.

The analysis in this section draws heavily on several different sources. In addition to economic and social theory, these sources include two National Research Council publications (Sharing the Fish and Drama of the Commons), multiple documents published by the North Pacific Fishery Management Council (NPFMC) and the NMFS Alaska Region relevant to cooperative-based management, and proceedings of the Tenth Biennial Conference of the International Institute of Fisheries Economics and Trade.

B-1 Whiting Sector Management under Co-ops

In the cooperative alternatives, all catcher vessels have a choice of whether to participate in a co-op or opt-out (noncooperative) portion of the fishery. For catcher-processors, no formal co-op fishery would be established but rather a closed class would be established. In this case, a vessel could, at its option, decide not to participate in a co-op with other members of that fishery; however, doing so would mean the sector would default to an IFQ-based fishery with each permit in the sector receiving an equal initial allocation of quota shares.

The existing allocation of whiting between the shoreside whiting, mothership, and catcher-processor sectors remains under this alternative (42 percent, 24 percent, and 34 percent, respectively). Within each sector, this allowable catch is assigned each year to co-ops or to the non co-op portion of the fishery. Co-ops will then be responsible for monitoring and enforcing the catch of the organization and of co-op members, and NMFS will monitor the catch of each sector and in the non co-op fishery, as well as the overall catch by all three sectors. NMFS will make the following closures if limits are reached: close a co-op fishery if co-ops have collectively reached their limit, close the non co-op fishery if it reaches its limit, and/or close the combined co-op and non co-op fishery if that whiting sector reaches its limit.

Provisions may also address the catch of bycatch species (overfished species and nontarget species). The Council is considering whether or not to make bycatch limits applicable to the entire whiting fishery, individual whiting sectors, or to individual cooperatives and to which species bycatch limits will be developed. NMFS may close the whiting fishery, whiting sectors, or cooperatives, if a bycatch limit is reached.

B-1.1 Whiting Management

Under the co-op options for the mothership and shoreside sectors, catcher vessel permits will be endorsed for deliveries to these sectors and amounts of "catch history" (a nondivisible share of the allowable catch)

assigned to each catcher vessel permit based on past harvest in the fishery. Catcher-processor permits will be endorsed for participation in the catcher-processor sector.

The whiting catch history calculation for each mothership-endorsed catcher vessel permit [CV(MS)] and shoreside-endorsed catcher vessel permit [CV(SS)] will be assigned to a pool for the co-op in which the permit will participate or a pool for the mothership or shoreside non co-op fishery, respectively. Co-ops are responsible for monitoring and enforcing the catch limits of co-op members.

NMFS will monitor the catch in the non co-op fishery, the co-op fisheries, and the overall catch of all three sectors. NMFS will close the various segments of the at-sea fisheries when their catch limits are projected to be attained and close the overall at-sea fishery when the overall at-sea whiting allocation has actually been attained.

❖ Rationale and Policy Issues

Establishing a system of cooperatives is intended to rationalize the Pacific whiting fishery. Cooperatives create many of the same effects attributed to other types of rationalization programs, including slower paced fishing practices, consolidation of capital, and greater net economic benefits to participants in the fishery. In order for harvest cooperatives to achieve this outcome, several necessary ingredients need to exist, including a barrier to entry, an allocation of fish,[2] and the establishment of a catch sharing arrangement among cooperative members (either through voluntary or regulatory means). Another ingredient some argue is necessary is access to catch data by the members of the cooperative. This is necessary for self-enforcement, monitoring of the catch of each catcher vessel, and making sure that the agreements that the cooperative members have arrived at can be enforced by the cooperative institution.

Endorsements for the catcher-processor, mothership, and shoreside sectors are intended to stabilize participation in these sectors and act as a barrier to entry to these sectors. A barrier to entry is one necessary ingredient for cooperative formation. In the case of the shoreside and mothership sector alternatives, catch histories are established. Catch histories serve as a harvest privilege which grant the holder of that catch history a defensible resource access privilege so long as they become part of a cooperative. This element is included in the mothership and shoreside alternatives because it is widely believed that participants in those two sectors will not be able to arrive at a resource sharing arrangement on their own. Therefore, in order for cooperatives to be able to form, the resource sharing arrangement must be decided for them through a Council action. If a participant in the shoreside or mothership sector elects to participate in the noncooperative portion of the fishery, that catch history is not a defensible harvest privilege because other noncooperative participants may compete for the catch available in that fishery. The presence of a noncooperative fishery is intended to ensure that cooperative membership is voluntary. In a system with processor linkages, the noncooperative portion of the fishery is intended to act as an incentive to maintain those linkages (assuming that breaking or switching a linkage requires participation in the noncooperative fishery). Voluntary membership of cooperatives is necessary to insure that cooperative members are of a like mind and can operate together successfully. Furthermore, structuring the noncooperative fishery as an Olympic fishery is intended to act as a deterrent to catcher vessels that may be contemplating the departure from a cooperative and/or the breaking of a linkage to a processor. This deterrent is intended to stabilize relations between harvesters and processors and also stabilize cooperative membership and help foster longer term relationships among cooperative members. Cooperatives rely heavily on member relations; therefore, longer term relationships tend to help the operation and success of cooperatives.

[2] Options exist for which species sectors would be responsible for covering with catch history or IFQ. This issue is covered under Appendix A.1. The allocation of non-whiting species to various sectors of the trawl fishery will be established through the inter-sector allocation process.

Catch history designations, when combined with a "golden rule" provision, help solve resource sharing arrangements among participants in a cooperative-managed fishery. This combination solves resource sharing for fishery participants ahead of time and helps ensure that cooperative agreements do not suffer due to negotiations and potential disagreements over catch sharing.

Making cooperatives responsible for the monitoring and enforcing of catch limits of co-op members is intended to accomplish several goals. One rationale for requiring cooperatives to self monitor and enforce is that it reduces the administrative workload on management agencies. In addition to this, self-monitoring and self-enforcement allow cooperatives to engage in other types of self-management that may not be possible (or that may take much longer to implement) through a regulatory process. Self-monitoring and self-enforcement are necessary ingredients for cooperatives to implement fishing restrictions such as bycatch performance standards and area closures. Without self-monitoring and self-enforcement (and access to the data necessary to self-monitor and self-enforce), cooperatives would not be able to verify and enforce management goals of the cooperative and, by extension, may not be able to adequately meet the goals specified by the Council.

Having NMFS close appropriate portions of the fishery is intended to ensure that overall management levels are adhered to. This ensures that catch levels do not exceed acceptable biological catches (ABCs) and optimum yields (OYs) and that other fishery sectors are not impacted by higher-than-intended catch levels in sectors managed by cooperatives.

The consideration of factors in this subsection addresses several aspects of MSA and groundfish Fishery Management Plan (FMP) guidance. Specifically, factors discussed here are related to guidance, goals, and objectives related to conservation, net benefits, harvester and sector health, and small entities and new entrants. These factors are outlined more specifically in the next section, which serves as the analysis of this component.

	Related Category of Goals and Objectives									
Element of Cooperative Alternative	**Conservation**	**Net Benefits**	**Disruption**	**Excessive Shares**	**Fairness and Equity**	**Harvester and Processor Sector Health**	**Labor**	**Communities**	**Small Entities and New Entrants**	**General Public**
Divisibility of catch history and harvest cooperative stability	X	X				X			X	
Resource sharing and the golden rule	X	X				X				
Intra and Inter-cooperative management and responsibility	X	X				X				
Noncooperative fishery	X	X				X				

❖ Interlinked Elements

Golden rule provision. This provision assures catcher vessels in a cooperative that they have access to their catch history, but no more (unless a private arrangement is developed for sharing catch differently). This is necessary in order for resource sharing arrangements to be solved. The lack of such a provision may make it difficult for some cooperatives to form.

❖ Analysis

- Divisibility of Catch History and Harvest Cooperative Stability

Cooperative institutions rely on close-knit relationships for success. Divisible catch history assignments make it more likely that new participants will enter and leave the fishery, possibly making cooperative operations more difficult and less successful, or making participation in the noncooperative fishery more common than if relations were more stable. The reader is referred to Chapter 4 for more discussion of cooperative institutions and relationships in those institutions.

Enhanced cooperative stability may help foster fishery management and conservation for a variety of reasons. If a lack of cooperative stability results in more frequent participation in the noncooperative portion of the fishery (which acts similar to an Olympic fishery), fishery participants may behave in a less "rational" way, resulting in higher bycatch or other impacts that are not beneficial to management. Cooperative stability depends on a relatively stable set of participants, for the reasons described above and in Chapter 4. Since cooperative stability is closely tied to having a nondivisible catch history designation, the creation of such nondivisible catch history helps foster conditions that are consistent with MSA – 303A(c)(1)(C)(ii) MSA – 303A(c)(1)(A) and Amendment 20 Objectives 1 and 3.

In addition to conservation guidelines, the granting of nondivisible catch history to fishery participants appears to achieve net benefit and efficiency guidelines as well as guidelines referring to sector health. A fishery with a cooperative fishery structure that is relatively stable can be assumed to have a limited number of participants engaged in the noncooperative portion of the fishery. If participation in the noncooperative portion of the fishery is limited to a substantial degree, the behavior of participants in that portion of the fishery may continue to resemble the behavior of participants in a rationalized fishery. This is because, with a limited number of participants in the noncooperative fishery, they are not likely to feel as threatened, or in as much competition, with one another. Less participation in the noncooperative portion of the fishery equates to more participation in the cooperative portion of the fishery. The result of high degrees of cooperative membership and low participation in the noncooperative fishery are operations that are "rational" and such rational behavior results in fishing operations that are relatively cost efficient, creating a net economic benefit. Such net economic benefits, and the consideration of such benefits, are consistent with the groundfish FMP Objective 6, groundfish FMP Goal 2, and MSA National Standard 5. Such improvement in the cost efficiency of participants is also consistent with Amendment 20 Objective 2 and groundfish FMP Goal 2.

Nondivisible catch history designations may make it more difficult for new entrants to acquire permits. New entrants would be required to purchase the entire catch history associated with a permit which is likely to be relatively costly. If new entrants cannot acquire the capital necessary to purchase a permit with catch history, then they are constrained in their ability to become the owner/operator of a vessel in a cooperative fishery. However, other means of becoming a new entrant may be available. A cooperative system in a high volume, capital-intensive fishery (like Pacific whiting) may be more conducive to the creation of fishing corporations, where multiple individuals have an ownership stake in fishing and processing operations, rather than a smaller volume, less capital-intensive fishery where independent owner operators are more common. Under a corporation-like structure, new entrants may purchase an

ownership stake in a fishing company that is part of a cooperative-based fishery, work their way up the ranks in the business, and in this way become new entrants into the fishery.

- Resource Sharing and the "Golden Rule"

The amount of catch each vessel/permit in a cooperative can access may be the same as the catch history they bring to the cooperative, or it may be different if agreements are made among cooperative members for leasing catch history. In the absence of a leasing arrangement, the "Golden Rule" applies, where a vessel has access to the catch history associated with that permit even though catch history of vessels in a cooperative are pooled. The Golden Rule provision is intended to resolve resource-sharing arrangements if cooperative members cannot agree to sharing arrangements among themselves. If sharing arrangements are not resolved, participants may have trouble forming cooperative agreements, or (if an agreement is reached), a cooperative may destabilize as members continually deliberate over the sharing of catch. Therefore, allowing each vessel access to its own catch history in the absence of some other mutual arrangement helps foster stability among cooperatives and their members. In the absence of a Golden Rule, certain members could hold out against other cooperative members for a larger catch share than they historically harvested (sometimes referred to as the "last man standing" effect). In the worst-case scenario (where a group of individuals that cannot agree to catch-sharing arrangements), cooperative agreements can break down and members may move to the non co-op fishery.

Nondivisible catch history and the Golden Rule both help ensure the stability of cooperative organizations. This affects the economic status of cooperative participants and the successful management of fishery resources. In the most extreme example of a cooperative structure without catch history assignments, participants might not be able to form or maintain cooperative agreements. In this event, fishing behavior would likely become more competitive, with more participants in the non co-op fishery, and with higher rates of bycatch and less economically efficient fishing practices (for reasons explained above). As a result, the application of the Golden Rule to sectors of the fishery where catch history designations are necessary to form cooperative agreements is consistent with MSA – 303A(c)(1)(A), MSA – 303A(c)(1)(C)(ii), Amendment 20 Objective 1 & 3, MSA - 303A(c)(1)(B), groundfish FMP Goal 2, Amendment 20 Objective 2, and groundfish FMP Goal 2. However, it should be noted that catch history assignments and the Golden Rule provision are not always necessary for the successful operation of a harvest cooperative, as evidenced by the existing catcher-processor cooperative.

- Intra and Inter-Cooperative Management and Responsibility

One likely outcome of having NMFS close cooperatives or sectors when catch limits are projected to be reached (and therefore treat participants in those cooperatives or sectors equally) means that cooperatives will manage individual members and develop procedures that shut down members when they have harvested their allowed catch, mostly out of necessity. This reduces the burden on management agencies, but it also influences the agreements and governing contracts developed among cooperative members, simply because the cooperatives must be responsible for managing their members.

Since the cooperative is held responsible for a given amount of catch, more than the expected amount of catch by one member will reduce the catch available to other members. This fosters the development of rules for managing individual catches, and may include enforcement and penalty provisions that discourage behavior that may result in more catch than expected by a single cooperative member. Furthermore, because this arrangement requires cooperatives to self-monitor and self-manage, cooperatives and their members have a strong reason to require quality catch monitoring onboard vessels so that one vessel is not at a relative advantage over others, and so that trust regarding catch levels is maintained. The lack of quality monitoring will erode trust in members' catch levels, adversely impacting the cooperative.

Inter-cooperative agreements can be established for sharing bycatch or whiting harvest opportunities across cooperatives. Inter-cooperative agreements can be constructed to transfer catch history of whiting if one cooperative finds that it will not catch the rest of its available whiting and another cooperative has an interest in doing so. Inter-cooperative transfers of bycatch can also occur if one cooperative finds it needs more bycatch than another. The result of inter-cooperative bycatch agreements may lead to more "risk sharing" of bycatch species across fishery participants and greater utilization of available whiting. Inter-cooperative agreements can also be used by cooperatives to cover catch deficits if one cooperative has harvested more than its available catch history and another cooperative has catch history available. If an inter-cooperative agreement is formed between two cooperatives, NMFS will monitor the two cooperatives as one and close both cooperatives when the collective catch limit has been reached.

- Noncooperative Fishery

The presence of a noncooperative fishery serves several roles. If a cooperative fishery is complimented with a linkage provision, a noncooperative fishery serves as a way for catcher vessels to switch processors, while creating incentives for them to remain linked to their obligated processor. In order to switch processors, it may be necessary for catcher vessels to participate in the noncooperative fishery, which is expected to be less economically beneficial to participants for the reasons described above. Because of this, there is a strong incentive for catcher vessels to remain in the cooperative fishery, which entails retaining the existing processor linkage. This protects the interests of processors because it provides them with some certainty that catcher vessels and their deliveries will remain linked with their processing operations. This allows processors to engage in behavior that resembles a form of processor sector rationalization, leading to more profitability from processing activities.

Requiring that catcher vessels fish in the noncooperative fishery before switching motherships will mean that catcher vessels will participate in a year (or more) of relatively economically inefficient production in order to do so. Harvesters may still generate revenue in the noncooperative fishery, but it is possible that they may not. In any case, the net revenue generated by participants in the noncooperative fishery is expected to be less than the net revenue generated by the cooperative fisheries.

The fact that the noncooperative portion of the fishery is structured as an Olympic fishery means that noncooperative fishery participants are likely to behave less "rationally" than they would in the cooperative fishery. Theory suggests that participants in the noncooperative fishery would engage in a "race" for available catch. As a result, economic performance would deteriorate, bycatch would increase, and management performance of the fishery would suffer. In order to validate or invalidate this theory, it is useful to examine the operation of catcher vessels and processors in the existing fishery, which operates as a sector-wide noncooperative fishery. In the current fishery, motherships are able to influence the behavior of catcher vessels that deliver to that mothership. It is possible that shoreside processors also influence the behavior of catcher vessels delivering to them, but it may be to a lesser degree. It is not unreasonable to expect this influence to temper the behavior of a catcher vessel in a noncooperative mode and result in greater economic and bycatch performance in the noncooperative fishery than may be expected based on theory.

When considering the operations of catcher vessels and processors in a cooperatively-managed fishery with processor ties, the effect of the processor tie will tend to influence the operations of a catcher vessel even if a catcher vessel is in a noncooperative mode. This is because, during this noncooperative mode, catcher vessels and processors attempt to establish new linkages. In order to establish a new linkage, the noncooperative catcher vessel must deliver the majority of its catch to a new processor in the year it participates in the noncooperative mode. To do this, the catcher vessel will need to coordinate with the new processor and be folded into the processor rotation with other catcher vessels delivering to that processor. This tempers the speed and timing at which that catcher vessel harvests fish, translating into a

more modest amount of effort exerted on the part of the catcher vessel and a more rational pace of fishing than might theoretically be expected in a noncooperative mode.

Differences exist between the mothership and shoreside sectors of the whiting fishery. In general, more coordination occurs between motherships and mothership catcher vessels than between shoreside processors and shoreside processing catcher vessels. In the mothership sector, catcher vessels must follow a mothership operation in order to make routine deliveries to that mothership and to coordinate the transfer of codends (codends are often owned by the mothership, while shoreside processors do not provide codends to harvesters). The mothership tries to optimize the economics of harvesting and processing operations, including measures to help ensure that catcher vessels linked to the mothership do not encounter bycatch problems that can prematurely shut down fishing and processing activity (especially if the catcher vessels linked to that mothership operation are in the same cooperative). By default, the noncooperative catcher vessel will take on many of the same behaviors as the cooperative catcher vessels that deliver to that same mothership because it fishes the same general area and delivers in a rotation with those catcher vessels operating in the cooperative mode, and in this way the "race for fish" behavior expected of that noncooperative vessel will be tempered.

The shoreside sector appears to be slightly different in that harvesters operate more independently of shoreside processors, though some coordination still occurs. While this information is largely anecdotal, several factors support this notion, including the fact that catcher vessels in the shoreside sector fish independently of the shoreside processor (provided that they fish within close enough proximity to make deliveries). Industry members have indicated that successful shoreside catcher vessels can leap another shoreside vessel that is in the same rotation. This means that participants in the noncooperative portion of the mothership fishery may have more measured and paced fishing practices than shoreside catcher vessels in a noncooperative mode. However, catcher vessels in both sectors may have their pace of fishing tempered to some degree by coordination with the processor.

Occurrences of catcher vessel participation in the noncooperative fishery are expected to be relatively infrequent in an appropriately designed cooperative fishery. However, information suggests there may be more occurrences of shoreside vessels participating in a noncooperative portion of the fishery than mothership catcher vessels. Supporting information is illustrated in the following tables. These tables show an ad-hoc vessel identifier and the associated processing company where that vessel delivered from 2004 to 2006. It is apparent that catcher vessels in the shoreside sector deliver to more processing entities than catcher vessels in the mothership sector. This may reflect the motivation catcher vessels in each sector have for switching processors and, by extension, participating in the noncooperative fishery. If this shows motivation for switching processors, then there may be more frequent participation of shoreside whiting vessels in the noncooperative fishery compared to catcher vessels in the mothership portion of the whiting fishery. Therefore, the performance of the shoreside sector would be less than that for the mothership sector, if both are managed with harvest cooperatives. This may be especially true when considering the influence processors have over catcher vessel activity in those sectors, and the effect this influence has on fishing behavior.

Table B-1. Mothership catcher vessel activity to mothership processing entities (2004 – 2006).

MS Catcher Vessel	MS Processor	2004	2005	2006
1	Supreme Alaska	X	X	X
2	Premier Pacific		X	X
3	Supreme Alaska		X	X
4	Premier Pacific		X	X
5	American Seafoods			X
6	Premier Pacific		X	X
7	Arctic Storm	X	X	X
8	Arctic Storm		X	
8	Premier Pacific			X
9	Supreme Alaska	X	X	X
10	American Seafoods		X	X
	Arctic Storm	X	X	X
11	Supreme Alaska	X	X	X
12	Arctic Storm	X	X	X
13	Arctic Storm			X
14	Arctic Storm		X	X
15	American Seafoods	X	X	X
16	Arctic Storm			X
	Premier Pacific			X
17	American Seafoods			X
18	Arctic Storm	X	X	X
19	American Seafoods		X	X
20	American Seafoods	X		
21	Arctic Storm	X	X	X

Table B-2. Shoreside catcher vessel activity to shoreside processing entities (2004 – 2006).

SS Catcher Vessel	Shoreside Whiting Processor	2004	2005	2006
A	Ocean Gold Seafoods Inc			X
B	Pacific	X	X	
	Bornstein			X
	Da Yang			X
	Jessies Ilwaco Fish Co Inc			X
C	Ocean Gold Seafoods Inc	X	X	X
D	Pacific		X	
	Ocean Beauty	X	X	X
E	Jessies Ilwaco Fish Co Inc			X
F	Pacific	X	X	
	Bornstein			X
G	Pacific	X	X	X
H	Pacific		X	X
I	Pacific	X	X	X
	Jessies Ilwaco Fish Co Inc			X
J	Pacific			X
K	Pacific	X		
	Ocean Gold Seafoods Inc		X	X
L	Pacific	X		
	Del Mar		X	
	Ocean Gold Seafoods Inc	X	X	X
M	Bornstein			X
	Da Yang			X
N	Trident	X	X	X
O	Pacific	X		X
	Trident	X	X	
P	Pacific	X	X	X
	Shoreline		X	
	Wf Alber	X		X
Q	Trident	X	X	X
R	Pacific	X		
	Trident	X	X	X
S	Jessies Ilwaco Fish Co Inc		X	X
T	Ocean Gold Seafoods Inc	X	X	X
U	Jessies Ilwaco Fish Co Inc	X	X	X
V	Pacific	X	X	X
W	Ocean Gold Seafoods Inc	X	X	X
X	Del Mar			X
	Ocean Gold Seafoods Inc			X
Y	Da Yang			X
	Del Mar			X
	Jessies Ilwaco Fish Co Inc			X
Z	Pacific	X	X	X
	Del Mar		X	
Aa	Pacific	X	X	X
Bb	Pacific	X	X	X
	Jessies Ilwaco Fish Co Inc		X	
	Wf Alber			X
Cc	Ocean Gold Seafoods Inc		X	
Dd	Pacific	X	X	X
Ee	Shoreline		X	
	Trident		X	X
Ff	Pacific	X	X	X
Gg	Pacific	X	X	X
Hh	Ocean Gold Seafoods Inc			X
Ii	Pacific	X	X	X
Jj	Ocean Gold Seafoods Inc	X	X	X
Kk	Hallmark			X
	Oregon Brand			X
Ll	Trident	X	X	X

The presence of a noncooperative portion of the fishery also serves another important purpose. While a sector of the fishery may be managed with a cooperative structure, it is important that the formation of cooperatives (and the membership of those cooperatives) be voluntary. Voluntary cooperative membership helps to ensure that those forming a cooperative are of a like mind and have similar enough objectives that the cooperative will be successful. In the event that a cooperative member develops goals which are not conducive or agreeable to other cooperative members, that individual can leave the cooperative and fish in the noncooperative mode. This helps to protect the stability and make-up of the cooperative over time and helps ensure that the activities of the cooperative do not become disrupted due to disagreements among members.

	Related Category of Goals and Objectives									
Element of Cooperative Alternative	**Conservation**	**Net Benefits**	**Disruption**	**Excessive Shares**	**Fairness and Equity**	**Harvester and Processor Sector Health**	**Labor**	**Communities**	**Small Entities and New Entrants**	**General Public**
Divisibility of catch history and harvest cooperative stability	X	X				X			X	
Resource sharing and the golden rule	X	X				X				
Intra and Inter-cooperative management and responsibility	X	X				X				
Noncooperative fishery	X	X				X				

B-1.2 Annual Whiting Rollovers

Whiting Rollover Option 1 (Preferred Alternative): There will not be a rollover of unused whiting from one whiting sector to another.

Whiting Rollover Option 2: Each year, rollovers to other sectors may occur if sector participants are surveyed by NMFS and no participants intend to harvest remaining sector allocations in that year. Current provisions for NMFS to reallocate unused sector allocations of whiting (from sectors no longer active in the fishery) to other sectors still active in the fishery will be maintained (see 50CFR660.323(c)—Reapportionments).

❖ Interlinked Elements

Bycatch limits. The interaction of bycatch limit management and a rollover provision may prove controversial if a sector is closed because of attainment of bycatch and has not harvested its full whiting allocation. That sector may plan to petition the Council for an increase in the bycatch limit at a later date, and if so, consideration would need to be given regarding the time at which a rollover of that sector's whiting to another should occur.

❖ Rationale and Policy Issues

A rollover mechanism is intended to facilitate the attainment of the Pacific whiting OY if one or more sector(s) does not intend to harvest the full allocation of Pacific whiting. If a rollover mechanism is not established, harvestable amounts of the whiting OY are likely to be foregone, resulting in less revenue than would otherwise be the case.

The consideration of a rollover mechanism is related to MSA and groundfish FMP guidance that are related to net benefits, harvester and processor sector health, and labor. The rationale for considering this provision is largely economic, because rollover allows greater economic activity than would otherwise occur. This ties into harvester and processor sector health, because it stimulates economic activity and may be expected to facilitate a healthier economic status of harvesters and processors. Labor is affected by the same reasons.

	Related Category of Goals and Objectives									
Element of Cooperative Alternative	**Conservation**	**Net Benefits**	**Disruption**	**Excessive Shares**	**Fairness and Equity**	**Harvester and Processor Sector Health**	**Labor**	**Communities**	**Small Entities and New Entrants**	**General Public**
Roll over		X				X	X			

❖ Analysis

A rollover provision provides a mechanism for the Pacific whiting fishery OY to be fully taken if one or more directed whiting sectors does not intend to harvest their full allocation. Rolling over a sector's allocation to another sector grants access to harvestable surplus that otherwise may be foregone. Under status quo conditions, this action occurs if NMFS determines that one sector does not intend to harvest their full allocation. Upon such a determination, NMFS reapportions the unused amount of whiting to a sector that is still active in the fishery. This action has occurred several times in recent years. In a cooperative program, the rollover of one sector's whiting to another will likely require NMFS to calculate the available catch that is to be allocated to each cooperative in the sector that is the recipient of the rollover. Presumably, this will be done on a pro-rata basis. This is an additional administrative step above that which occurs under status quo.

If bycatch is managed at the sector, a sector may close due to bycatch limit attainment but still have whiting available. In this case, a sector may petition the Council for an increase in the bycatch limit in order to reopen the fishery if doing so is an option. Through the rollover provision, that sector's whiting may be rolled over to another sector before that sector can petition the Council for an inseason increase to the bycatch limit. Therefore, if a rollover mechanism is adopted and a sector is closed because of attainment of a bycatch limit, the possibility of an inseason increase to the bycatch limit may need to be considered before rolling the closed sector's whiting to another sector.

Not having a rollover provision from one sector to another is a change from status quo. Not allowing a rollover may mean that the available harvest is not realized in some years, potentially reducing economic activity. However, having a rollover may allow some entities that participate in more than one sector the opportunity of consolidating operations into a single sector, creating the opportunity of working around the sector divisions that are established in regulation. This has been described as a type of "loophole" that is created when the fisheries are rationalized and a rollover occurs. It may be possible for an entity with catch history in one sector to not fish that catch history, declare that they no longer wish to participate in that sector, and have the catch remaining in that sector roll over to another. In the other sector, that entity could then harvest the fish they did not harvest in the first sector, effectively consolidating operations from more than one sector onto the operations occurring in a single sector.

As discussed above, bycatch management is related to a carryover provision. It is not clear how a carryover provision would work if a sector is closed upon attainment of bycatch but wants to increase its bycatch limit at a later date. If bycatch is managed at the sector level, it is possible that a sector may be shut down upon bycatch limit attainment. However, if a sector intends to lobby for an increase in the bycatch limit, it is not clear when NMFS would roll the unharvested whiting over to another sector. If bycatch limits are set at the fishery-wide level, this concern does not exist.

B-1.3 Bycatch Species Management

Final Preferred Alternative

Under the Council's FPA, the at-sea whiting fishery will be managed under bycatch limits (hard caps) for widow, canary, Pacific Ocean perch (POP), and darkblotched rockfish. The Endangered Species Act (ESA)-listed salmon bycatch management measures—that is, the 11,000 Chinook threshold, 0.05 rate threshold, and triggered 100 fathom closure—will also continue to be in place. The goal of bycatch management is to control the rate and amounts of rockfish and salmon bycatch to ensure each sector is provided an opportunity to harvest its whiting allocation.

The anticipated catch of other species which are incidentally caught in at-sea activity, such as Pacific halibut, will be set aside to accommodate incidental catch in the at-sea fishery. No management measures are associated with these set asides. These set asides are established to accommodate incidental catch amounts in the at-sea fishery so that overall management targets are not exceeded.

Set asides are established instead of bycatch caps for some species because incidental catch volumes are small. The benefit to management from establishing bycatch caps on infrequently encountered species would tend to be small in these cases, but the implications to fishery participants could be large, as doing so may constrain fishery activity.

B-1.3.1 Bycatch Allocation Subdivision

Subdivision Option A (No Subdivision): Do not subdivide bycatch species.

Subdivision Option B (Subdivide by Sector): Subdivide bycatch species allocation among each of the whiting sectors (sector allocations will be determined in the intersector allocation process).

Subdivision Option C (Subdivide by Sector and Co-op/Non Co-op Fisheries): Subdivide bycatch species allocation among each of the whiting sectors, and, within the sectors, subdivide between the co-op fishery and non co-op fishery. (Subdivision for the non co-op fishery does not apply to the catcher-processor co-op program.)

Subdivision Option D (Subdivide by Sector, Co-op/Non Co-op Fisheries, and Among Co-ops): Same as C, but also subdivide bycatch among the co-ops.

Subdivision Option E (Preferred Alternative): Same as Option D but also specify that only those species with hard caps will be subdivided for bycatch management and that bycatch will be allocated to each permit and co-op pro rata in proportion to its whiting allocation. The mothership sector's bycatch allocation will be divided between its co-op and non co-op fishery, based on the allocations made to the permits participating in each portion of the fishery.

B-1.3.2 Bycatch Management

Language for Final Preferred Alternative

All sectors and co-ops will close based on projected attainment of the at-sea whiting fishery bycatch cap for any one species. The mothership co-op fishery, non co-op fishery, and catcher-processor fishery will each be closed based on projected attainment of their individual allocation. Additionally, each co-op will cease fishing when its bycatch allocation is reached.

The Council may also use area closures (seasonal or year-round) to manage overfished stocks in the co-op and non co-op fisheries. The area closures may be the same or different for different species. Area closures may be year-round, seasonal, or triggered automatically by the attainment of certain levels of catch.

Unused bycatch may be rolled over from one sector to another if the sector's full allocation of whiting has been harvested or participants in the sector do not intend to harvest the remaining sector allocation.

*The language from the Council's **final preferred alternative** is based on its selection from the options below with the following modifications:*

- *All segments of the at-sea fishery, except the individual co-ops, would close based on projected attainment of their bycatch caps. The individual co-ops would close based on actual attainment of their bycatch caps or the projected attainment of the fishery or sector bycatch caps, whichever comes first.*
- *The references to "seasonal releases" are eliminated.*

Options and Language Considered

All sectors and co-ops will close as soon as the whiting fishery bycatch cap is reached for one species. The Council may use seasonal releases of allocations and area closures (seasonal or year-round) to manage overfished stocks in the co-op and non co-op fisheries. The seasonal releases and area closures may be the same or different for different species. Area closures may be year-round, seasonal, or triggered automatically by the attainment of certain levels of catch.[3]

For Section B-1.3.1, Subdivision Option A (No Bycatch Subdivision): If bycatch species are not allocated among the sectors, then:

Bycatch Management Option 1: Initially, the Council will not use seasonal releases and a controlled pace may be established if the sectors choose to work together cooperatively, potentially forming an inter-sector/inter-co-op cooperative.

[3] The Council asked for analysis of "seasonal releases" and area management at the sector, individual, and co-op levels (if there is an inter-co-op agreement).

Bycatch Management Option 2: There will be seasonal releases of bycatch allocation. At the outset, it is envisioned that the seasonal approach will be used to manage widow rockfish bycatch. For canary rockfish and darkblotched rockfish, status quo management will be maintained (i.e., no sector allocation and no seasonal apportionment).

A seasonal release bycatch management program will be implemented through regulation.[4]

In practice, seasonal releases protect the next sector entering the fishery. For example, a May 15-June 15 release will be used by the catcher-processors and motherships, but it protects the shoreside fishery; the June 15-September release will be used by shoreside and whatever catcher-processors and motherships are still fishing whiting, and to protect a fall at-sea season after September 15; the final release in September will again be shared by the catcher-processors and motherships, assuming shoreside is done fishing.

For example:

1. Status quo for canary and darkblotched rockfish (i.e., no seasonal or sector allocation).
2. May 1-June 15: 40 percent of widow hard cap released.
3. June 15-August 31: An additional 45 percent of widow hard cap released.
4. September 1-December 31: Final 15 percent of widow hard cap released.
5. Once a seasonal release of widow rockfish is reached, the whiting fishery is closed to all three sectors for that period. The fishery reopens to all three sectors upon release of the next seasonal release of widow rockfish.
6. Unused amounts from one seasonal release rollover into subsequent release periods.

(Note: percentages are for illustration purposes only, actual release percentages will be developed through the Council process).

For Section B-1.3.1, Subdivision Options B, C, D, and E (Bycatch Subdivision among Trawl Sectors):

Rollover Option 1: If each sector has its own allocation of bycatch, unused bycatch may be rolled over from one sector to another if the sector's full allocation of whiting has been harvested or participants in the sector do not intend to harvest the remaining sector allocation.

Rollover Option 2: Rollovers are not allowed.

For Section B-1.3.1, Subdivision Options C, D, and E (Bycatch Subdivision among the Co-op and Non co-op Fisheries)[5]: A sector's bycatch allocation will be divided between the co-op and non co-op fishery of the sector, in proportion to the whiting allocated to each fishery. The co-op fishery will close based on attainment of its allocation.

Option 1: For the non co-op fishery, there will be a bycatch buffer. When only the buffer remains, the fishery would close temporarily while a determination is made as to a possible reopening. If the fishery is reopened, it will close based on attainment of its allocation. The buffer amounts considered will be:

Sub-option i: 20 percent
Sub-option ii: 10 percent
Sub-option iii: 5 percent

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[4] For reference, a similar program is used to manage halibut bycatch in NPFMC-managed flatfish and Pacific cod fisheries, see 50CFR679.21(d).

[5] In the Council's final action, the following provision was eliminated from this location and worked into Section B.1.3.1 and the opening paragraph of this section.

For Section B-1.3.1, Subdivision Option D and E (Bycatch Subdivision among Co-ops): Bycatch will be allocated to each co-op pro rata in proportion to its whiting allocation. Each co-op will cease fishing when its bycatch allocation is reached.

Option 2: For the non co-op fishery, there will not be a buffer. The fishery will close based on projected attainment of its allocation.

In the Council's final action, the following provision was eliminated from this location and worked into Section B.1.3.1 and the opening paragraph of this section.

For Section B-1.3.1, Subdivision Option D and E (Bycatch Subdivision among Co-ops):

> *Bycatch will be allocated to each co-op pro rata in proportion to its whiting allocation. Each co-op will cease fishing when its bycatch allocation is reached.*

❖ Interlinked Elements

Rollover. See previous.

❖ Rationale and Policy Issues

Bycatch limits in a cooperative program are put in place as a catch management tool in order to prevent exceedance of ABCs and OYs, and also to prevent harm to other fishery sectors that may be impacted by higher than expected catch amounts of bycatch species. The appropriate level of bycatch management is a trade-off between the appropriate level of individual accountability, and the appropriate level of risk sharing across fishery participants. For stocks with low OYs and highly variable and uncertain catch events, the risk posed to fishery participants and their fellow cooperative members may be quite high if bycatch is managed at the cooperative level and there is a potential for relatively few tows to catch the full bycatch limit of that cooperative. However, the spreading of bycatch management across a relatively wide enough number of participants may mean that those participants cannot agree on bycatch management conditions and successfully manage that bycatch collectively. Therefore, the appropriate balance is a mix of risk spreading and individual accountability.

A seasonal release of bycatch acts similarly to a sector-specific allocation to each of the whiting sectors, but with more flexibility, and with less risk to individual harvesters. If a common bycatch limit is specified and a bycatch limit is reached (and the fishery is closed) all three sectors can again prosecute the fishery after the subsequent release. This seasonal release acts like a sector allocation because each fishery operates at different times of the year. Depending on how bycatch is released, it may play more into the hands of some sectors during specific times of the year and less into the hands of another sector during that same time period.

Area management of bycatch is intended to minimize the encounters of bycatch species through a regulatory mechanism which would close areas where bycatch is relatively high. Closing areas where bycatch is relatively high is intended to reduce the risk of encounters of overfished species.

A bycatch rollover gives other sectors access to bycatch that may not be necessary to the first sector. This provides increased certainty to the sectors receiving the bycatch that they will not be closed due to attainment of a bycatch limit and increases the chance that the whiting OY will be attained.

A noncooperative fishery bycatch buffer is intended to serve as a risk-mitigating factor that protects cooperative fishery participants from the actions of noncooperative fishery participants. It is intended to increase the certainty that the noncooperative portion of the fishery will stay within its assigned catch and not inadvertently impact other cooperatives or other fishery sectors.

Management of bycatch in a cooperative fishery meets conservation goals because it restricts the harvest of a nontarget species and provides some assurance that management targets will not be exceeded. This

helps rebuild overfished species, promotes conservation and management, and reduces bycatch (compared to no bycatch management). As a result, bycatch management in a cooperative program is consistent with MSA-303A(c)(1)(A), MSA-303A(c)(1)(c)(ii), and Amendment 20 Objectives 1 and 3.

The type of bycatch management can have an effect on the operations of a sector, the economic status and operation of that sector, and the net benefits associated with engaging in fishing operations. In particular, if bycatch is managed across the three whiting sectors, it is possible that a race for fish would ensue because of the common bycatch limit (often described as a "race for bycatch"). Such behavior is contrary to goals of capacity reduction and efficiency. However, it is not necessarily the case that a common bycatch limit would lead to such behavior, although it is possible. A common bycatch limit has the effect of spreading the risk of unexpected bycatch events across a wider number of participants, thus relating bycatch management to equity concerns contained in the MSA.

Element of Cooperative Alternative	Conservation	Net Benefits	Disruption	Excessive Shares	Fairness and Equity	Harvester and Processor Sector Health	Labor	Communities	Small Entities and New Entrants	General Public
Bycatch Management	X	X			X	X				X
Bycatch Subdivision	X	X			X	X				X
Seasonal Releases and Area Management	X	X			X	X				X
Bycatch Buffers	X	X			X	X				X

❖ Analysis

- Bycatch Management and Bycatch Subdivision

As shown above, bycatch limits can be imposed in several ways, including a common bycatch limit for the entire directed whiting fishery, a specific limit for each sector. a specific limit for each sector where each sector's limit is divided between the cooperatives and the noncooperative portion of the sector, and a limit applied to each cooperative and to the noncooperative portion of the fishery.

Bycatch limits in the whiting fishery introduce several types of risk. As noted above, bycatch limits (and the successful management thereof) require that harvesters agree to management conditions. As bycatch limits are spread across more participants, the possibility that those participants can agree decreases. In the worst case scenario, harvesters will not be able to agree to bycatch management terms. Because attainment of a bycatch limit means closure of the fishery, sector, or cooperative (depending on the level of management), harvesters may fear preemption of their target opportunities if a bycatch limit is attained. If they cannot successfully agree to bycatch management conditions, they are therefore liable to begin engaging in Olympic-style behavior, potentially eroding the gains typically attributed to rationalization. Such behavior may result in faster-paced harvest activity, more capital used in the fishery, and lower quality products, among others.

Bycatch limit management at a smaller, cooperative scale may mean that harvesters are more likely to agree to bycatch management terms. However, it also increases individual risk and makes it less likely that a large and unexpected catch event can be absorbed by the collective. This may lead to a bycatch-induced closure that would be limited to the cooperative (rather than the entire fishery) but the impact on the individual harvester would be greater than if bycatch management were spread across a wider collective because it would be more likely to eliminate the future harvest opportunities for that individual.

One factor that may mitigate the risk to individual harvesters if bycatch is managed at the cooperative level is the presence of an intercooperative agreement to manage bycatch. An intercooperative agreement can allow individual cooperatives to develop relationships between one another for successfully managing bycatch species and sharing the amount of bycatch between them, thus spreading the risk across a wider array of participants. Since intercooperative agreements rely on each cooperative agreeing to enter into that relationship, the development of such relationships is likely to rely heavily on each individual cooperative having a successful management plan for their own cooperative members. This provides greater certainty to the other cooperative that management is likely to be successful and, therefore, mutually beneficial.

The following table (also found in Chapter 4 of the Environmental Impact Statement [EIS]) illustrates the type and level of risk associated with each level of bycatch management starting with the lowest level (IFQs) and ending at the highest level (fishery wide bycatch limits). This table illustrates two forms of risk faced by harvesters when dealing with bycatch species, particularly for overfished rockfish where relatively large and unexpected tows can occur. It shows that if bycatch is managed at a small level, the implication of an unexpected catch event spilling over and affecting other harvesters is relatively small compared to a case where bycatch is managed at a relatively large level. Inversely, if bycatch is managed at a low level, the burden faced by individuals from an unexpected catch event is large relative to a case where bycatch is managed at a larger level.

Level of Bycatch Management	**Collective Risk** **(risk of a race for bycatch)**	**Individual Risk** **(risk posed to individuals from catch uncertainty and individual accountability)**
IFQ	Low	High
Co-op level	Med-Low	Med-High[6]
Sector Level	Med-High	Med-Low
Fishery Level	High	Low

- Seasonal Releases and Area Management

Seasonal releases of bycatch can have a similar effect on sector-specific allocations of bycatch. The difference, however, is in the amount of risk spread across fishery participants. In a seasonal release strategy, risk is spread across a wider number of participants, while in a sector-specific allocation, risk is spread across fewer participants.

[6] If inter-cooperative agreements are formed for managing bycatch across co-ops, a co-op level allocation of bycatch species may have a low level of risk posed by individual accountability and catch uncertainty, while also having a low level of risk that a race for bycatch could develop. This is because a co-op level allocation of bycatch forces the cooperative to internalize bycatch management and this would be evident in the cooperative agreement signed by harvesters in that cooperative. Such internalization of bycatch management in the co-ops would tend to foster the development of high levels of individual accountability for bycatch by members. Allowing inter-cooperative agreements to form would allow cooperatives to spread the risk of catch uncertainty across cooperatives (thus reducing individual risk) if those cooperatives can agree to terms.

Seasonal releases are one method of protecting one sector from another (since the sectors operate at different times) and minimizing the risk of bycatch in one sector affecting opportunities in another sector. If the amount of bycatch allocated to each season is well structured, such releases may allow successful prosecution of whiting activity while ensuring that the sector that starts later in the year is not pre-empted by the attainment of a bycatch limit from sectors operating earlier in the year. However, a seasonal release tool will almost certainly have an allocative effect. Depending on how the seasonal release is structured, it may benefit some sectors more than others. For example, if a substantial portion of widow rockfish is released in May and then released again in September, the shoreside sector may be at a relative disadvantage. This is because the at-sea sectors could benefit from the first release before the shoreside sector opens, and would then benefit from the September release when the shoreside sector begins losing access to the whiting resource. The following figure illustrates the average catch of widow rockfish by month and sector in 2006 and 2007.

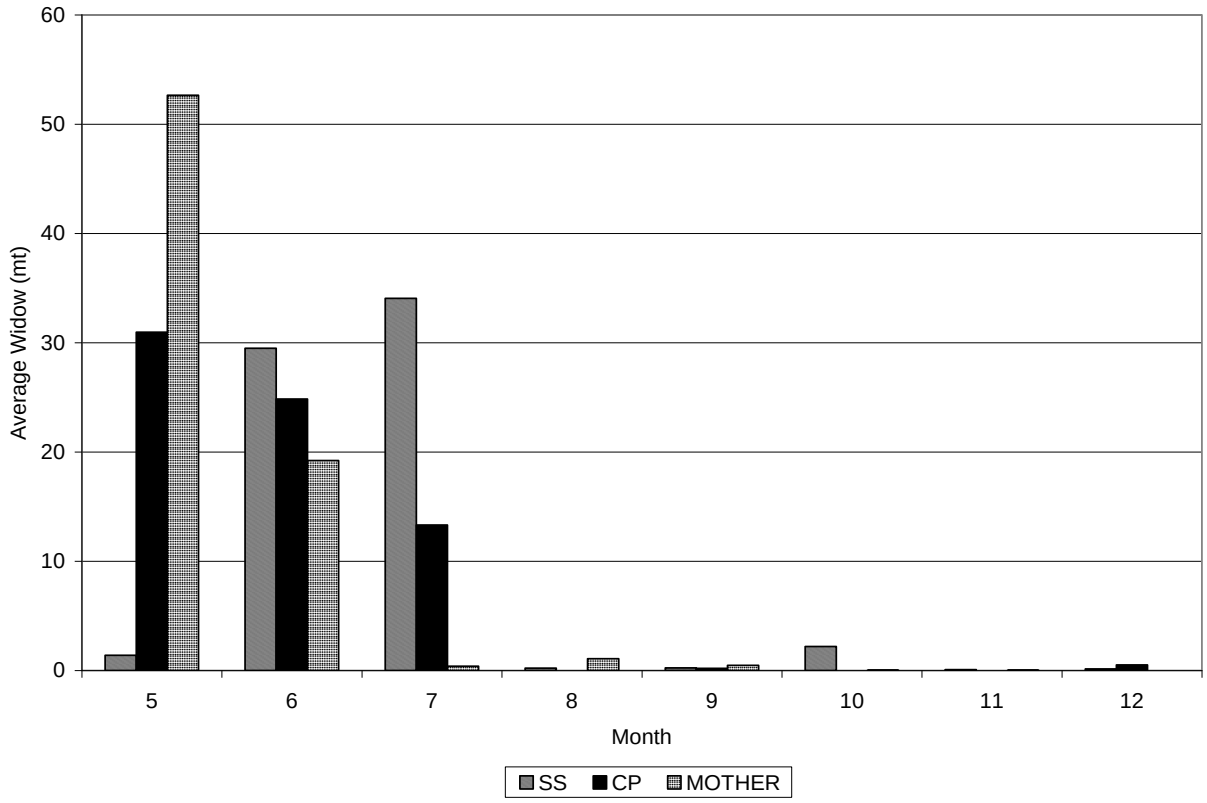


Figure B-1. Average monthly catch of widow rockfish by month and sector (2006 and 2007).

Seasonal releases of bycatch may make it more difficult for harvesters to change the timing of their fishing activity. If, for example, 50 percent of the widow rockfish is allocated between May and June based on past fishing practices, that allocation may preserve fishing opportunity based on past practice. If one sector wants to spend more time fishing in the fall months, however, that widow allocation may make it difficult for harvesters to fish later in the year (because there would presumably be less widow later in the year than would otherwise be the case). In contrast, if each sector or cooperative has its own bycatch limit, harvesters can time their activity for when they find it most appropriate, and use the allocated bycatch during that time. In this case, changing harvest timing may be relatively simple compared to having seasonal releases of bycatch.

One benefit of the seasonal release strategy is that (assuming it is applied to a fishery-wide bycatch limit), the seasonal release strategy will continue to minimize the risks faced by individuals (as would be the

case under a fishery level bycatch allocation) while preserving fishing opportunity throughout various times of the year. For example, if a fishery-wide bycatch limit is used and harvesters cannot agree to a bycatch management plan, then a seasonal release strategy would continue to protect the shoreside whiting sector from the at-sea sectors (which start earlier). In addition, harvesters who encounter large and unexpected catch events would face a relatively low burden for doing so because the covering of that catch event would be spread out across the multiple participants in the fishery instead of being concentrated on that one harvester or that one harvester's cooperative.

Area management is a tool that can be described as one used to reduce the risk of unexpected tows of bycatch species. It may be reasonable to expect that a successful bycatch management plan from a cooperative would include provisions for area management. Therefore, establishing area management through regulation and implementation by the agency would be used to reduce risk if bycatch limits are set at the fishery level, or to mitigate the risk that a harvester in the noncooperative portion of the fishery will unexpectedly encounter a large amount of a bycatch species. Area management may be necessary if bycatch is managed at the fishery level because individual cooperatives would not be internalizing management of their own bycatch and would still be sharing some of the burden with other cooperatives. If cooperatives are internalizing the management of their own bycatch, bycatch management provisions in the cooperative agreements are likely to be relatively more robust. As cooperatives become less responsible for their own bycatch, it is not unreasonable to expect that the cooperative agreements, and the bycatch management plans contained therein, would be less robust, possibly making the implementation of area management restrictions through regulation more necessary.

- Bycatch Buffers

Bycatch buffers can be used to protect co-op fishery participants from unexpectedly large bycatch events in the non co-op fishery. If buffers do not exist and a noncooperative fishery exceeds the amount of bycatch allocated to it, then that overage would need to come from other fishery participants. If bycatch is managed at the co-op and non co-op level with aggregate limits on each sector, then an overage in a non co-op fishery can restrict opportunities for co-ops in that same sector. If the non co-op fishery has a buffer, then that buffer would hedge against the possibility of a bycatch overage restricting the fishing opportunities for co-op fishery participants.

The appropriate buffer size is likely to vary by species. Empirical evidence from the fishery under status quo conditions provides one example of catch uncertainty and the magnitude of buffers that may be necessary for a non co-op fishery. In other words, a non co-op fishery may act similarly to the existing fishery. Based on evidence from past recent years, canary rockfish and darkblotched rockfish appear to be subject to less variability or less potential for "disaster tows." However, in one of the last four years, a large tow of canary rockfish occurred which jeopardized the continued operations of all three whiting sectors. In this event, there is not likely to be a buffer large enough to matter. However, ignoring that particular event, other data suggests that canary rockfish encounters are less variable and therefore less likely to need a large buffer. Darkblotched rockfish appear to exhibit a similar pattern with less variable catch events. Widow rockfish is different from these two species because there is substantial variability in catch events. Some tows encounter relatively little, while others may encounter several dozen metric tons (mt). In the case of widow rockfish, a large buffer on the non co-op fishery may be necessary to minimize the risk to the co-op fisheries posed by the presence of a non co-op fishery. In any event, there does not appear to be a "one size fits all" buffer and, therefore, if buffers are used, a range of available buffer sizes to be used on a case by case basis may be the best approach.

- Species Covered

The set of species for which vessels in the fishery will be accountable for is a subset of all groundfish in the Council's FMP. The rationale for including a subset of species, rather than all species, is that many species are infrequently caught in the whiting fishery and holding vessels accountable for those species may be unnecessarily constraining to harvest activity through a variety of mechanisms. One possibility is that harvesters in the at-sea fishery encounter conditions similar to the thin market conditions described in Chapter 4 of the EIS. Another possibility is simply that the uncertainty of possible catch events of these infrequently encountered species induces fishing behavior that resembles hording to hedge against the risk of that happening. Yet another possibility is that fishing behavior occurs similarly to what happened in the 2007 whiting fishery, where the avoidance of one species resulted in an increase in the catch of another bycatch species. Played enough times, the sector inadvertently reaches the limit of one species and is shut down prior to attaining the whiting allocation. While such stringent management may be appropriate for some species (like overfished stocks and species of which the whiting fishery takes a substantial amount), it is not necessary for all species. The outcome of holding the fishery accountable for species of which it does not catch noteworthy amounts is one where the economic implications to the fishery can be quite large, but the benefit to management or conservation is small to negligible. Therefore, rather than holding vessels accountable for infrequently encountered species, a portion of the allowable harvest is simply set aside to accommodate incidental catch volumes for those infrequently encountered species.

Table B-3 shows the incidental harvest of several species in the at-sea fishery over a handful of years. It is most informative to examine these species relative to the size of the OY or allocation. Species which are not shown in the table are caught in even smaller volumes, so were excluded.

Table B-3. Incidental harvest of selected groundfish species, 2003-07 (mt).

At Sea Sector Catch by Year and Species (mt)						
	Year					
Species	2003	2004	2005	2006	2007	OY/Allocation
Spiny dogfish	269	615	355	61	155	
Widow rockfish	14	21	80	142	146	368
Yellowtail rockfish	36	47	112	110	79	4,548
Slope rockfish (N)		24	51	8	32	1,160
Sablefish	17	29	15	2	3	2,651
Darkblotched rockfish	4	7	11	11	12	330
Shortspine thornyhead	16	5	7	1	3	1,634
Shelf rockfish (N)		5	7	4	2	958
Arrowtooth flounder	4	3	4	3	3	5,800
Pacific ocean perch	6	1	2	3	4	150
Lingcod	1	1	3	3	6	5,558
Canary rockfish	1	5	1	1	2	44
Pacific halibut	3	1	2	1	1	
Other flatfish		2	3	-	-	4,884
Longnose skate		0	1	0	1	

Table B-4 shows another perspective. When the at-sea sector catch is viewed as the average catch of the 2008 OY over the 2004 to 2006 time period, widow rockfish, canary rockfish, darkblotched rockfish, slope rockfish, and POP are the most frequently encountered incidental species. However, there is a substantial overlap in the catch of these last three species. In general, limiting the catch of one of these last three species will tend to indirectly constrain the catch of the other species as they are found in similar areas (the continental slope). Arguably two of the last three species most important for direct coverage are darkblotched and POP, as they are currently undergoing rebuilding. Another worthwhile perspective is to view whether those incidental species are caught in substantial amounts in the nontrawl

sectors. This means that the portion of catch attributed to the at-sea sector may be more important if that species is important to nontrawl sectors.

Table B-4. Average portion of OY caught by at-sea activity.

Species	OY/Allocation	Average Portion of 2008 OY (2004 to 2006)	Substantially Caught in Non-trawl Sectors
Widow rockfish	368	21.89%	No
Canary rockfish	44	4.85%	Yes
Darkblotched rockfish	330	2.77%	No
Slope rockfish (N)	1,160	2.48%	No
Pacific ocean perch	150	2.20%	No
Yellowtail rockfish	4,548	1.69%	No
Sablefish	2,651	0.50%	NA
Shelf rockfish (N)	958	0.47%	Yes
Shortspine thornyhead	1,634	0.38%	No
Arrowtooth flounder	5,800	0.06%	No
Lingcod	5,558	0.05%	Yes
Other flatfish	4,884	0.03%	No
Longnose skate			No
Pacific halibut			Yes
Spiny dogfish			Yes

In summary, several species appear to have a higher degree of priority for direct coverage in the at-sea sectors than the others. This prioritization appears to be (in addition to whiting):

1. Widow rockfish
2. Canary rockfish
3. Darkblotched/Slope rockfish/POP

Selecting one of these last three species may indirectly control the catch of the other two. Covering additional species may lead to adverse economic impacts as discussed above.

B-1.4 At-sea Observers/Monitoring

❖ Provisions and Options

Shoreside Whiting Fishery: Observer coverage for the combined shoreside sector managed with IFQs is described at A-2.3.1.

At-sea Whiting Fishery: 100 percent observer coverage aboard mothership and catcher-processors will continue. Observers would be required in addition to or as a replacement for video monitoring. For some coverage, cameras may be used in place of observers (feasibility to be determined).

Added as part of the Final Preferred Alternative: It is the Council's intent to provide NMFS flexibility sufficient to design and implement a tracking and monitoring program that will achieve the goals and objectives of the trawl rationalization program.

The Council has fleshed out extensive provisions for tracking, monitoring, and enforcement for trawl sector management under the IFQ alternative and this alternative. See Section A-2.3.1 for a description of the provision and options pertaining to discard, at-sea catch monitoring, shoreside landings monitoring, catch tracking mechanisms, cost control mechanisms, program performance measures, and cost recovery. This discussion is also repeated below.

As part of the FPA, the Council indicated its intention to provide NMFS flexibility sufficient to design and implement a tracking and monitoring program that will achieve the goals and objectives of the trawl rationalization program.

❖ Interlinked Elements

Self-monitoring and self-enforcement of cooperative members by the cooperative organization is related to the type of observers/monitoring in place for the fishery and access to information reported by the observation/monitoring system. In addition to having access to catch information from the observation/monitoring system, self-monitoring and self-enforcement relies on relatively robust monitoring systems. The lack of a robust monitoring system may make it problematic to self-enforce if cooperative members can successfully question the accuracy of the data and avoid enforcement penalties that may be brought by the cooperative organization. Furthermore, the lack of robust data may decrease the confidence that individual cooperative members have in the actions of other members, and this can begin to compromise the success of the cooperative agreement. In addition to the need to support self-enforcement, management of the fishery throughout the year (such as cooperative-imposed area restrictions to minimize bycatch) can be compromised if monitoring of the fishery is not relatively robust, largely for the same reasons that enforcement is compromised. A cooperative manager could, for example, suggest area closures be put in place mid-season, but if catch data is questionable, then the ability for that cooperative manager to implement management measures may be compromised.

The interlinked elements are all the tracking and monitoring elements discussed above as well as all elements that affect the costs of management, enforcement, data collection, and analysis. These elements include permits, endorsements, IFQ and co-op allocation and transfer rules, adaptive management rules, excessive share monitoring, gear switching regulations, and regional and area management and allocation rules.

❖ Rationale and Policy Issues

At-sea monitoring is necessary to support a rationalization program that manages total catch (retained catch and discards), because it documents events at sea which may not be documented by fish tickets alone (such as discard events). If at-sea monitoring was not in place in a rationalized fishery that was intended to manage total catch, then individual harvesters would have a large incentive to misreport catches of constraining species. If such misreporting were to occur, the total mortality attributed to fishing activity would not be known, thus compromising the ability to successfully manage fisheries within ABCs and OYs. Furthermore, such misreporting may tend to economically benefit those that misreport (if they are not caught and fined), but if such misreporting is eventually accounted for, it may affect all fishery participants equally.

Element of Cooperative Alternative	Conservation	Net Benefits	Disruption	Excessive Shares	Fairness and Equity	Harvester and Processor Sector Health	Labor	Communities	Small Entities and New Entrants	General Public
At-sea Observers/Monitoring	X	X			X	X				

❖ Analysis

NMFS presented the preliminary estimates below at the November 2009 Council Meeting. (See November 2009 Briefing Book: Agenda Items G.8.B Supplemental NMFS Presentations Lockhart and Freese). NMFS will refine these projections during the regulatory process that converts the Council's preferred alternative into regulation. NMFS will also seek recommendations from the industry on how to lower program costs. NMFS will consult with the states to discuss state needs and how to integrate the elements of this program with existing state programs. Note that there are state budget concerns of upholding existing programs not to mention expanding these programs given the current state of the economy. State resources may need increasing to establish the electronic fish ticket and logbook programs or to hire personnel for port sampling, enforcement, and other purposes.

Below are tables that show the existing tracking and monitoring system, current tracking and monitoring costs by sector, and what the costs of additional observers, and plant monitors. In addition to these costs, also listed are other state, Federal, and Council costs. Total cost projections are then compared with alternative revenue estimates.

Status Quo Tracking and Monitoring Systems (see Table B-5): Vessel monitoring systems (VMS) are employed by all vessels except motherships. Paper logbooks are employed by all harvest sectors. Logbooks are mandatory for shoreside vessels but voluntary for the at-sea motherships and catcher-processors. PSMFC combines the state fish tickets and logbooks into a single database. This database is funded federally; states contribute personnel and other resources. Shoreside whiting trawlers are monitored with cameras. The industry pays for the cameras, while NMFS pays for review and analysis of the resulting video. Observer coverage in the nonwhiting fishery is about 25 percent, which is funded by NMFS while the at-sea motherships and catcher-processors use hired observers from a private company. Shoreside whiting plants also pay a private company for compliance monitors. The equipment, training, and data collection and analysis associated with these observers and monitors are paid for by NMFS. Electronic fish tickets are now used in the shoreside whiting fishery.

Table B-5. Status quo observer coverage and monitoring for all sectors.

Status Quo	Shorebased Nonwhiting Trawl	Shorebased Whiting Trawl	At-Sea Mothership Trawl	At-Sea Mothership Processor	At-Sea Catcher-Processor
VMS	X	X	X		X
Logbooks	X	X	X	X	X
Cameras		X			
Observers	25% WCOP		0	2	2
Compliance Monitors		100%			
Fish Tickets	X	X			
Electronic Fish Tickets		X			

The Council's preferred alternative would:

- Increase the observer coverage to 100 percent in the shorebased nonwhiting trawl fleet.
- Replace the cameras used in shore-based whiting trawl sector with 100 percent observer coverage.
- Expand the whiting compliance monitor program to 100 percent coverage of the shore-based nonwhiting trawl program.
- Institute 100 percent observer coverage to the at-sea mothership trawl fleet.

In comparison to status quo management, rationalization will need increases in NOAA Fisheries' Northwest Region, NOAA GC, Northwest Fisheries Science Center, and the Northwest/Southwest Offices of Law Enforcement staff. State fisheries management and enforcement staff will also need to be increased. Additional equipment, training, and information technology resources (hardware and software) will also be needed by both state and Federal agencies. The Council will also incur additional costs in the early years of the program.

Examples of anticipated additions to state and federal staff levels due to rationalization are listed below.

- Staff for cost recovery, permitting, quota tracking and appeals processes.
- Staff and contracting for performance monitoring including mandatory economic data collection.
- Observers, debriefers, and port samplers.
- Law enforcement officers, technicians, equipment, and training.
- Lawyers, policy analysts, and regulation writers to adopt Federal and state regulations in support of the Program and address enforcement issues.
- IT resources (FTEs, hardware, and software) to support electronic reporting (logbooks, fish tickets, observers, compliance monitoring, etc.).
- State and Federal outreach.

Based on the preferred alternative, NMFS has developed the following preliminary estimates of potential costs.

Implementation Costs (one-time costs to develop the tracking and monitoring programs)

State management and enforcement	$300,000 to $500,000 per state
NMFS management and enforcement	$2.1 million
NMFS (NWFSC) Observer Program and Economics Data Collection Programs	$3.150 million
Total:	**Approximately $6.5 million**

Annual Costs (state, Council, and Federal costs associated with running the Program when fully implemented)

State management and enforcement	$750,000 to $1.5 million per state
NMFS management and enforcement	$1.7 million
NMFS (NWFSC) Observer Program and Economics Data Collection Programs	$3.15 million
Total:	**Approximately $8 million**

Direct Observer and Monitoring Costs (daily costs associated with hiring observers and plant monitors)

Shoreside nonhake trawl fishery	$3.5 million
Mothership Processors	$243,000
Mothership Catcher Vessels	$253,000 to $362,000
Catcher-Processor	$415,000
Shoreplant Compliance Monitors non hake	$950,000
Shoreplant Compliance Monitors hake	$300,000
Total:	**Approximately $5.7 million**

Total Annual Costs and Direct Observer and Monitoring $14 million

These costs are preliminary and it is important to note that the direct observer and monitoring costs are very dependent on operational decisions by industry (both fishing vessels and processors) to reduce costs. In addition, it is impossible to predict how much consolidation will occur, especially in the initial years of program implementation. Because of this, this analysis makes broad assumptions about industry behavior to frame the range of costs. At one extreme, annual observer costs could rise to $18 million if a 100-vessel fleet needed observers 365 days a year, at a cost of $500 per day. The industry could reduce costs by imposing voluntary limits on the number of vessels that can be at-sea at any one time or agreeing to share observer coverage between multiple vessels. These and other costs could decline as the number of participating vessels decline as the fleet consolidates because of the program. A quantitative analysis (Lian et al. 2008) indicates an expectation that after rationalization there will be a fleet of 50-60 vessels of a size of 60-70 feet. If this were to happen, one would expect the costs to be significantly lower and approximately one half of the estimated costs for the current fleet.

Table B-6 below shows harvest, revenue, and price dimensions of the fishery. The 2007 fishery earned $57 million in ex-vessel revenues with the nonwhiting groundfish components earning $28 million and the whiting components earning $30 million. Between 2004 and 2007, there were rising whiting and fuel prices. In 2008, these fisheries earned about $90 million in ex-vessel revenues mainly based on the size of the whiting quota and continued high prices for whiting. The total estimated annual cost of the Trawl Rationalization Program, including the direct observer and monitoring costs, is estimated to be $14 million. These costs can be addressed by a combination of industry fees, congressional appropriations, or state/Federal reprogramming of existing resources. Additionally, as has been stated, these cost estimates can be reduced via industry adoption of operational changes to lower cost tracking and monitoring alternatives.

Table B-6. Economic comparison of 2004 and 2007 revenues.

Economic Comparison		2004	2007
Harvests Metric Tons			
Total Non-Tribal Whiting		191,793	180,056
Total Nonwhiting Groundfish		17,238	22,253
Total Groundfish including Whiting Tons		209,031	202,309
Ex-vessel Revenues Million $			
Total Non-Tribal Whiting		$26.1	$29.7
Total Nonwhiting Groundfish		$16.2	$27.2
Total Groundfish including Whiting Tons		$42.3	$56.9
Ex-Vessel Prices			
Ex-Vessel Price Whiting		0.046	0.075
Ex-Vessel Price All flatfish	$/lb	0.425	0.43
Ex-Vessel Price Thornyhead Compl.	$/lb	0.609	0.627
H&G Whiting Export Price	$/lb	0.55	0.75
Marine Diesel Fuel Costs Newport, Oregon, June	$/gal	1.65	2.5

Regardless of how these costs are addressed, it is likely that the industry will be paying the maximum recovery fee of 3 percent. (NMFS will discuss fee collection processes with the Council and industry when it undertakes cost-recovery rule-making.) All industry borne compliance costs would be expected to reduce the value of QS prices by corresponding amounts. For those having to buy into the fishery, higher compliance costs would be expected to reduce what they have to pay for QS.

However, for perspective, according to the Council's SSC review of the Lian Analysis (see http://www.pcouncil.org/bb/2008/ 0608/F6d_SUP_SSC_0608.pdf). (Note that this analysis included an estimate of $350 per day observer costs.)

> The TIQAT (Trawl Individual Quota Analytical Team) used a fleet consolidation model to estimate the size and profitability of the groundfish trawl fleet that may result from the TIQ program....
>
> A standard econometric methodology was used to estimate the economic efficiency of individual trawl vessels based on vessel cost and earnings data collected for 2003 and 2004 by the Northwest Fisheries Science Center (NWFSC). Results from the analysis, based on 2004 costs and harvests, indicated considerable consolidation, with the fleet being reduced to 40-60 vessels and with cost savings in the range of $18-22 million. The cost savings would arise from a shift in fleet composition to vessels with lower costs, which were estimated to fall in the 50-60 foot size range, and a reduction in fixed costs due to the operation of a smaller fleet.

Catch monitoring is a necessary tool for cooperative function. In order to hold the overall fishery, each sector of the fishery, and each cooperative to a catch limit, catch monitoring must be in place to verify catch relative to that catch limit. Furthermore, catch monitoring must be applied in a manner that is substantially equal to all cooperative participants harvesting fish. Equal application of catch monitoring to all participants in a fishery is arguably necessary because it puts all participants on equal footing, and this equality is necessary for self-management of the fishery by the cooperative members and their governing contracts. If catch monitoring was not applied equally (or not trusted), cooperative members may "second guess" the reported catch of other cooperative members, or feel that other cooperative members are at a relative advantage in some fashion. This second guessing among cooperative participants would tend to result in a destabilization of a cooperative because of an erosion of trust among cooperative members. If substantial second guessing, or questioning, of other participants' catch reporting comes into play, it may break down the strength of the cooperative and the contract.

One necessary component to a catch monitoring program in a cooperative-based fishery is that cooperative members must have access to their own and others' catch data. This is necessary in order for the cooperatives to self manage and enforce the catch quantities of the cooperatives and the cooperative members. It is also necessary so that cooperatives can develop responsive management tools, such as voluntary area management closures, to reduce bycatch. Without access to catch information, it may prove quite difficult for cooperative members to self manage and enforce the actions of cooperative members.

The following paragraphs excerpted from Appendix A, Section 2.3.1 speak to catch monitoring, catch tracking, landings monitoring, and cost control.

Catch Monitoring: Under status quo, mothership processing vessels and catcher-processors currently carry two observers. This monitoring requirement would remain for these vessels under trawl rationalization. However, a new requirement would be the placement of observers, possibly supplemented by cameras, on catcher vessels that deliver to motherships. (Note that for the 2009-10 Groundfish Harvest Specifications and Management Measures, the Council is proposing video monitoring for these vessels.) Cameras are currently employed as an electronic monitoring system (EMS) in the shoreside whiting fishery as a monitoring tool. The EMS employed under the EFP for Pacific whiting allows shoreside vessels to dump unsorted catch directly below deck and would allow unsorted catch to be landed, providing that an EMS is used on all fishing trips to verify retention of catch at sea. The EMS is an effective tool for accurately monitoring catch retention and identifying the time and location of discard events. Catch monitors are already employed in the shorebased whiting fishery. The

addition of observers and EMS monitoring measures for catcher vessels that deliver to motherships is to assure that all fish, including discards, are delivered to the mothership. See also discussion under Program Costs.

Catch Tracking: Other than the declaration reports and the processor production reports, these catch tracking mechanisms are largely the conversion of existing state paper-based systems. Converting to electronic reporting is seen as aid for improved accuracy of reported data and better quota monitoring at the individual vessel, co-op, and sector level. Declaration reports and processor production reports are seen as tools that improve ability to enforce regulations. One of the issues facing the implementation of these reporting systems is how best to adapt the existing state paper-based systems to the needs of the Trawl Rationalization Program.

Landings Monitoring: For shoreside nonwhiting trips, there is a proposed requirement for 100 percent observer coverage on vessels and for shoreside whiting trips, observers in addition to or as a replacement for video monitoring. Note that the Council's preferred alternative is for the Shoreside Whiting and Nonwhiting Fisheries to be managed under an IFQ system and as a single combined sector. However, if Congress provides the needed legislation, the shoreside whiting fishery may be managed as a co-op with processor linkages rather than with IFQs. In addition to 100 percent observer coverage, there is also being proposed a 100 percent shoreside monitoring as the sorting, weighing, and reporting of any ITQ or IBQ species must be monitored by a catch monitor.

Cost Control: All trawl sectors (shorebased nonwhiting, shorebased whiting, mothership catcher vessels and processors, and catcher-processors) would require certification or licenses that show they meet the monitoring requirements. In order to reduce costs, landing hours could be restricted.

Many of the other requirements will be similar to those currently specified as part of the 2008 Pacific Whiting Shoreside Fishery Maximized Retention and Monitoring Exemption Program (see http://www.pcouncil.org/bb/2008/0308/F1a_SUP_ATT2.pdf). This program outlines the reporting requirements, equipment needs, vessel and plant responsibilities including relationships with plant monitors, notification and declaration procedures, and the requirement of a NMFS monitoring plan. For ITQ and co-op fisheries, these elements would have to be expanded to include existing observer requirements, including safety requirements as well as the responsibilities of the crew to assist the observer in the weighing and sorting of catch and responsibilities of the captain to assure that vessel operations do not hinder observer efforts. For ITQ vessels, there is likely to be a need to purchase appropriate scales to meet these requirements. The actual design of these reports are under development and will most likely be more fully analyzed for public comment under the rulemaking process which converts the Council's preferred alternative into regulation. This process includes addressing reporting issues under the Paperwork Reduction Act process and under the Regulatory Flexibility Act (regulatory reporting burden on small businesses).

With respect to a catcher-processor voluntary co-op, it is not clear that the sector as it currently operates is a limited access privilege program (LAPP), as the management alternatives developed by the Council do not include a special permit or endorsement. In the MSA, the term "limited access privilege":

> (A) means a Federal permit, issued as part of a limited access system under Section 303A to harvest a quantity of fish expressed by a unit or units representing a portion of the total allowable catch of the fishery that may be received or held for exclusive use by a person; and
> (B) includes an individual fishing quota; but
> (C) does not include community development quotas as described in Section 305(i).

However, under the tracking and monitoring provisions, vessels are to be certified and, under the catcher-processor provisions, there are fallback ITQ processes in case the voluntary co-op breaks up. It is not clear if these requirements can be deemed a limited access privilege. In addition, NMFS is in the process

of developing formal LAPP guidance which may affect this determination (see http://www.nmfs.noaa.gov/sfa/PartnershipsCommunications/lapp/LAPPguidance.htm).

B-1.5 Mandatory Data Collection (Option)

Mandatory Provisions: The Council and NMFS shall have the authority to implement a data collection program for cost, revenue, ownership, and employment data. Compliance with which will be mandatory for members of the west coast groundfish industry harvesting or processing fish under the Council's authority. Data collected under this authority will be treated as confidential in accordance with Section 402 of the MSA.

A mandatory data collection program shall be developed and implemented as part of the groundfish trawl rationalization program and continued through the life of the program. Cost, revenue, ownership, employment and other information will be collected on a periodic basis (based on scientific requirements) to provide the information necessary to study the impacts of the program, including achievement of goals and objectives associated with the rationalization program. This data may also be used to analyze the economic and social impacts of future FMP amendments on industry, regions, and localities. The program will include targeted and random audits as necessary to verify and validate data submissions. Data collected under this authority will be treated as confidential in accordance with Section 402 of the MSA. Additional funding (as compared to status quo) will be needed to support the collection of these data. The data collected would include data needed to meet MSA requirements (including antirust).

The development of the program shall include: A comprehensive discussion of the enforcement of such a program, including discussion of the type of enforcement actions that will be taken if inaccuracies are found in mandatory data submissions. The intent of this action will be to ensure that accurate data are collected without being overly burdensome on industry in the event of unintended errors.

Voluntary Provisions: A voluntary data collection program will be used to collect information needed to assess spillover impacts on nontrawl fisheries.

Central Registry: Information on transaction prices will be included in a central registry of whiting endorsed permit and processor permit owners. Such information will also be included for sales and lessees.

Government Costs: Data will be collected and maintained on the monitoring, administration, and enforcement costs related to governance of the rationalization program.

❖ Interlinked Elements

There do not appear to be any elements substantially interlinked with data collection.

❖ Rationale and Policy Issues

The goal of the Council's rationalization alternatives involves several economic components. One stated goal of the program is to:

> *Create and implement a capacity rationalization plan that increases net economic benefits, creates individual economic stability, provides for full utilization of the trawl sector allocation, considers environmental impacts, and achieves individual accountability of catch and bycatch.*

The Council has also enumerated several objectives and constraints for the program that involve economic components and monitoring of the program.

The MSA (as amended through January 2007) also places importance on social and economic outcomes resulting with a rationalization program. Section 303A.(c)(1)(C) states that any LAPP to harvest fish submitted by a Council or approved by the Secretary under this section shall promote social and economic benefits.

The MSA also contains a monitoring requirement to determine whether a LAPP is meeting its goals. Sec. 303A.(c)(1)(G) states that any LAPP shall:

> *include provisions for the regular monitoring and review by the Council and the Secretary of the operations of the program, including determining progress in meeting the goals of the program and this Act, and any necessary modification of the program to meet those goals, with a formal review 5 years after the implementation of the program and thereafter to coincide with scheduled Council review of the relevant fishery management plan (but no less frequent than once every 7 years).*

In order to meet the monitoring requirements for the economic goals, improved and expanded economic data would be needed for the trawl IFQ fishery. One of the current trawl rationalization alternatives provides for a mandatory economic data collection provision. Regardless of whether the economic data collection is mandatory or voluntary, the types of data necessary to monitor the effects of the program are the same. However, the choice of mandatory or voluntary data collection will likely have a large effect on the Council's and the NMFS' ability to consistently and systematically collect the necessary data.

Despite the NWFSC's recent progress in voluntary economic data collection, economic analysis of the limited entry trawl fishery has historically been severely constrained by a lack of economic data. Incomplete cost-earnings data on vessels and processors has been a particular problem. While Pacific Fishery Information Network (PacFIN) provides data on most, but not all, earnings sources for limited entry trawlers, little data on the cost of operating harvesting vessels has been available. Data on the costs and earnings of processing plants has not been available to NMFS or Council economists. This lack of economic data has hampered attempts to measure economic performance, build regional economic input-output models, assess overcapacity, and build models which predict economic behavior.

The first attempt to collect economic data from limited entry trawl vessel owners occurred in 1999 and 2000. This mail survey utilized a lengthy questionnaire asking for considerable fishery-specific information, but obtained a response rate well below 20 percent. Because of the low response rate and nonrespondent bias, data collected through this survey was of limited value. A processor survey conducted at about the same time obtained an even lower response rate.

A second voluntary economic survey of limited entry vessel owners was conducted in 2005-2007. In order to obtain higher response rates, this second survey utilized a much shorter questionnaire and collected data through in-person interviews. This survey obtained a fairly high response rate of over 70 percent, but at the cost of considerably less data collection from each respondent due to the shorter questionnaire. While this second survey provides much data of value for assessing industry economic performance and regional economic impacts, the ability to evaluate the contribution of individual fisheries (such as groundfish) to vessel economic performance is limited by the reduced questionnaire length. Collecting data through in-person interviews helped to substantially increase the response rate, but at considerably increased survey cost.

Mandatory economic data collection offers the advantages of reduced nonresponse bias, the ability to collect more detailed fishery-specific data, and reduced survey fielding costs. These advantages would apply to data collection from both the harvesting sector and the processing sector.

The collection of such data is related to several aspects of MSA and groundfish FMP guidance on rationalization. These include the categories of net benefits, fairness and equity, and harvester and processor sector health. To a large degree these broad categories are addressed by data collection because such data collection allows for the measurement of these categories. The measurement of these categories may help inform future decisions on the part of the Council.

Element of Cooperative Alternative	Conservation	Net Benefits	Disruption	Excessive Shares	Fairness and Equity	Harvester and Processor Sector Health	Labor	Communities	Small Entities and New Entrants	General Public
Data Collection		X			X	X				

❖ Analysis

The effect of a data collection program includes the effects of increased ability to monitor and measure the economic performance of the industry, as described in the rationale above. Other effects include the burden on agencies involved in the data collection and analysis, and the burden on industry members in the form of time spent reporting data.

The NWFSC has gone through two voluntary survey efforts. The first effort resulted in a relatively low response rate which minimized the ability to use the survey. The second effort used face to face interviews and resulted in a response rate of over 70 percent. This relatively high response rate has resulted in several pieces of analysis utilized in the rationalization process and may prove useful for other means as well. While this survey has largely been considered to be successful, the face to face interview technique is estimated to have cost somewhere on the order of $700 to $800 per interview. This cost does not include the time and cost of developing the survey and analyzing the data. Given that the trawl fishery is over 100 vessels, the field cost of conducting a voluntary survey using a face to face technique could be on the order of $100,000 to the agency each year it is conducted.

On the other hand, a mandatory survey may be able to avoid the need for face to face interviews. Face to face interviews were used in the voluntary survey for several means including returning a favorable response rate. If a survey is mandatory, a face to face technique may not be necessary. However, differences may exist between a mandatory and a voluntary survey which can make the burden on the industry greater for a mandatory survey than a voluntary survey.

Factors affecting the response rate of a voluntary survey include the length of the survey and the difficulty of the questions. If a survey is viewed as being overly lengthy and/or requests information that is not readily available and that may take time to uncover, the response rate is likely to suffer. The response rate from a mandatory survey may not suffer in the same fashion. Therefore, it is reasonable to expect that a voluntary survey may (at least at times) be simpler and shorter than a mandatory survey simply to

get a favorable response rate. If this is the case, a mandatory survey may impose a larger burden on industry than a voluntary survey. In the worst case scenario (one where the survey is highly burdensome), industry members may at times respond with a "protest response" or information that is of poor quality. This can affect the ability to use the survey responses even if the response rate is high.

The collection of economic data relates to several aspects of policy guidance from the MSA, the Groundfish FMP, and Amendment 20 goals and objectives. If better data collection leads to more informed decisions relating to net benefits and efficiency, then data collection is related to MSA-National Standard 5, MSA – 303A(c)(1)(B), Amendment 20 Objectives 2 and 6, and potentially others. In particular, Amendment 20 Objective 6 (Promote measurable economic benefits) is related to data collection because data collection allows economic benefits to be measured. Many benefits may not be able to be measured without the acquisition of additional economic data. If additional data collection helps in the development of policies, then such data collection may also relate to policy guidance on sector health including Amendment 20 Objectives 2 and 6, Groundfish FMP Goal 2, and Groundfish FMP Objectives 7 and 15. Finally, data collection is directly related to several aspects of policy guidance that relate to program performance monitoring and modification. MSA – 303A(c)(1)(G) calls for a regular review and monitoring of the program for progress in meeting goals.

B-1.6 Adaptive Management (Option)

Option 1 (Preferred Alternative): There will not be a set-aside for adaptive management with respect to the whiting co-op programs.

Option 2: During the biennial specifications process, up to 10 percent of the available aggregate harvest pounds for the co-op program (including harvest potentially available both to co-ops and the non co-op fisheries) will be set aside for use in an adaptive management program that could create incentives for developing gear efficiencies, or community development or to compensate for unforeseen outcomes from implementing the trawl rationalization program. Examples of unforeseen outcomes include, but are not limited to, unexpected geographic shifts in the distribution of catch or landings, unexpected effects on certain segments of the industry (e.g., processors), or an unexpected barrier to new entry into the fishery. This provision will apply to the overall trawl sector (whiting and nonwhiting) but the allocation set aside from each trawl sector would be specific to that sector.

❖ Interlinked Elements

There do not appear to be other cooperative components substantially interlinked with the adaptive management provision. However, if adaptive management is used to facilitate new entry into a cooperatively-managed fishery, it is likely that such new entry will mean greater participation in the noncooperative fishery, as those new entrants may not immediately become cooperative members. This new entry may cause some disruption to the particular sectors in which it occurs.

❖ Rationale and Policy Issues

The adaptive management provision is intended to serve several different goals and objectives. The Council identified the goals and objectives for the adaptive management program as: community stability, processor stability, conservation, unintended/unforeseen consequences of the TIQ program, and to facilitate new entrants (both processors and harvesters). The Council's preferred alternative also specified that the adaptive management program would be used for harvests of shoreside nonwhiting species; therefore, the adaptive management program does not apply to the whiting fishery. However, prior to voting to apply the adaptive management program only to nonwhiting species, the Council considered applying the program to Pacific whiting and to harvest cooperatives. This section addresses the potential

effects of applying the adaptive management program to harvest cooperatives. This analysis assumes that the adaptive management program is mostly based on addressing unforeseen/unintended consequences but also addresses several factors that an adaptive management program could be used to address in a harvest cooperative.

The consideration of an adaptive management provision is related to multiple categories of guidance related to the MSA and the groundfish FMP that are related to rationalization. Ultimately, the degree to which adaptive management is related to these categories of guidance depends on how the program is used. Several potential uses include conservation, assisting new entrants, and assisting disadvantaged communities. These potential uses are arguably related to issues of fairness and equity.

Element of Cooperative Alternative	Conservation	Net Benefits	Disruption	Excessive Shares	Fairness and Equity	Harvester and Processor Sector Health	Labor	Communities	Small Entities and New Entrants	General Public
Adaptive Management	X				X			X	X	

❖ Analysis

As noted above, an adaptive management provision can be used to achieve multiple objectives. The outcome of the provision depends on the objective and manner in which the provision is used to achieve these objective(s). In order to facilitate analysis, we assume that the adaptive management provision is used for several different outcomes in the whiting fishery, including salmon bycatch reduction; overfished species bycatch reduction; community protection; and facilitation of new entry into the fishery, where new entry is defined as the establishment of new vessel owner-operators.

The use of adaptive management to facilitate salmon bycatch reduction may benefit harvesters who have a demonstrated ability to reduce bycatch, or harvesters who plan to experiment with new gear designs to reduce salmon bycatch. If the latter approach is used, the testing of new gears may eventually be followed up by a regulatory amendment requiring whiting harvesters to use a different gear type that has demonstrated success in reducing salmon bycatch. It should be noted that the Council has given no indication that this is the process that would be followed. However, assuming this is the process that would be followed is useful to illustrate the possible effects of this provision.

If the adaptive management provision is used to encourage the development of new gears, it is likely that any benefit to harvesters from experimenting with new gears would be short-term. As the success of experimental gears is determined, the need to direct adaptive management to those harvesters would lessen because the next logical action would either be a regulation designed to implement those gears, or a determination that the gear is not successful. In either case, it may not be necessary to continue directing adaptive management quota toward those harvesters after a particular goal has been achieved, thus freeing up the quota for another use. However, the original recipients of that adaptive management quota would have future opportunities to receive adaptive management quota by attempting to achieve other, future objectives specified by the Council.

If adaptive management quota is used to reward those with a demonstrated ability to reduce salmon bycatch, then the quota may be allocated on a longer-term basis, depending on the long-term success of harvesters in reducing salmon bycatch. If harvesters demonstrate a continued ability to reduce salmon bycatch more than others, then they may continue to receive adaptive management quota. However, this also depends on the way the measures used to achieve the objectives are specified. For example, if the adaptive management quota is distributed to the top five harvesters (in terms of salmon bycatch reduction), then harvesters could receive the quota on a long-term basis. However, if the objectives set a benchmark for reducing salmon bycatch to a specified rate, then more and more harvesters may begin meeting that benchmark, thus reducing the amount of adaptive management quota available to each harvester meeting the benchmark.

Using adaptive management for overfished species bycatch reduction may work in the same way. Again, the specific effects depend on the objectives of the program and the manner in which they are achieved. The effects may be short- or long-term. If the program objectives are to allow harvesters to benefit over the long-term from adaptive management, harvesters who alter fishing practices in order to achieve overfished species bycatch reduction may receive adaptive management quota over the long-term. However, if adaptive management quota is used to encourage the development of new gears, which are then put into regulation if successful, then recipients are likely to receive that quota only for as long as it takes to determine whether a new gear design is successful.

The use of adaptive management quota for community protection will almost certainly have positive effects for recipient communities. However, it may have differing effects for fishery participants, processors, and fishing-dependent businesses. For example, since the at-sea fishery does not make routine deliveries to shoreside processors and does not make routine stops into port, except perhaps cities in the Puget Sound region, it is not clear how the adaptive management provision could be used for community protection for the at-sea fishery. In the shoreside whiting fishery, activity is more closely aligned with a geographic place. Using adaptive management quota in the shoreside whiting fishery could be used to direct landings of whiting to certain ports, thus spurring fishing-related activity in a distinct area. It is unclear how the specific mechanisms would work in order to achieve this outcome, but one method could tie adaptive management to vessels that home-port in specific locations, thus increasing the chances that whiting would be landed in those ports.

The use of adaptive management to facilitate new entry (in the form of new owner-operators) may achieve that very outcome. This could be accomplished by allocating the adaptive management shares to entities that desire to enter the fishery. However, there is some question about how this would work, since catch history assignments made to CV(MS) permits are not divisible and not separable from the permit. Thus, a new entrant to the fishery would still need to acquire a CV(MS) permit with catch history to remain in the fishery. Adaptive management quota may make it easier for a new entrant to acquire the CV(MS) permit since that new entrant would have access to the catch associated with the CV(MS) permit, as well as to the catch attributed to him/her from the adaptive management provision. This would tend to increase revenues (both gross and net) to the new entrant, increasing the ability of that new entrant to purchase the new permit.

Although the adaptive management provision could be constructed in a manner that facilitates new owner-operators, cooperatives rely on close-knit and long-term relationships for success. This means that some barriers to new entry are necessary in order to maintain stable relationships between harvesters in a cooperative. As discussed in Chapter 4, collective institutions (like cooperatives) often develop complex relationships and/or function in complex systems effectively. The ability to work within these complex systems requires that participants be stable and that entry and exit be limited, in order for relationships to develop and for knowledge to be shared across participants. Fostering the entry of new owner-operators into a cooperative system may inject uncertainty and instability into cooperative relationships. This instability, in the worst case scenario, may jeopardize the success of cooperatives. Therefore, while an

adaptive management program could be used to assist new entrants, a relatively large number of new entrants could compromise the operation of harvest cooperatives which rely on relationships among participants who are familiar with one another.

B-1.7 Length Endorsement

Length endorsement restrictions on LE permits endorsed for groundfish gear will be retained; however, the provision that requires that the size endorsements on trawl permits transferred to smaller vessels be reduced to the size of that smaller vessel will be eliminated (i.e., length endorsements will not change when a trawl endorsed permit is transferred to a smaller vessel).

❖ Rationale and Policy Issues

The modification of the vessel length endorsement is intended to serve a couple of different purposes. The rationale for not removing the length endorsement entirely is that many vessel owners have made substantial investments in their vessels, and the vessel size is governed by the length endorsement on the associated permit. Since there is a limited number of permits of any given size category, this means that the fishery must be comprised of a certain number of vessels of lengths specified by the various LE trawl permits. This creates a somewhat artificial value for vessels that may fall under a relatively inefficient size category as the regulations ensure that a certain number of vessels of inefficient size must remain in the fishery. There is some belief that eliminating the length endorsement from the permit would make some vessels that are in a relatively inefficient length category less valuable over time as more efficient vessels are sought, enter the fishery, and replace those relatively inefficient vessels. Retaining the length endorsement puts a cap on the number of efficient vessels that can enter the fishery and makes the less efficient vessels more valuable than they otherwise may be.

One reason for not requiring that the length endorsement be reduced in size, should it be transferred to a vessel of a smaller size, is that the need for capital reduction in the fishery is achieved through a reduction in fleet size rather than a reduction in the length of vessels in the fishery. In other words, the requirement that the permit length endorsement decline if it is transferred to a smaller vessel acts as a capacity reduction measure. That particular capacity reduction measure is no longer necessary in a rationalized fishery because capacity is reduced through fleet consolidation. Therefore, to require that the permit length endorsement decline if the permit is transferred to a smaller vessel is no longer appropriate.

Element of Cooperative Alternative	Conservation	Net Benefits	Disruption	Excessive Shares	Fairness and Equity	Harvester and Processor Sector Health	Labor	Communities	Small Entities and New Entrants	General Public
Length Endorsement		X			X					

❖ Analysis

The retention/modification of the length endorsement provision appears to do very little to the potential efficiency gains of catcher vessels in the fishery or to fleet consolidation. By extension, it appears to do very little in terms of retaining asset values for vessels that may be in a relatively inefficient size category. In the nonwhiting fishery, some degree of fleet consolidation is expected which will lead to a case where enough permits in the "efficient" size category will remain to accommodate many, if not all, of the remaining vessels in the fishery. While these same estimates do not exist for the whiting portion of the fishery, some fleet consolidation is to be expected in that fishery. Since the efficient size category for whiting vessels is not known, it is difficult to predict whether enough permits of the efficient size will be available in the whiting fisheries to accommodate the entire fleet after it is consolidated. However, the fact that excess permits will be in the fishery – combined with the fact that catch history or IFQ will be instated – means that permits will likely have very little value. If insufficient numbers of permits exist which are in the efficient size category for the whiting fisheries, several permits could be combined at relatively little cost to create a larger permit which may be in a more efficient category for the whiting fishery.

The following figure illustrates the existing count of limited entry trawl permits by size category. From this figure it is apparent that nearly 80 permits exist which fall under the efficient size category for the nonwhiting fishery as identified by Lian, Weninger, and Singh (2009). When compared to the expected amount of fleet consolidation, it appears that there will be sufficient permits in the efficient category to handle the number of boats in the nonwhiting fishery. This means that, contrary to some arguments made for retaining the endorsement, retaining the length endorsement is likely to do very little in terms of retaining the asset value of permits or associated vessels. However, as the number of permits in the efficient category is still somewhat limited, there may still be some small effect of retaining that endorsement. Furthermore, if the efficient vessel size changes over time through technological change, retaining the length endorsement would limit the ability for the fleet to adapt to that new, more efficient size, but only if the more efficient size is larger. This is because the modification of the length endorsement provision (which does not make the length endorsement decline if it is placed on a smaller vessel) means that the length endorsement is effectively changed to mean that vessels can be equal to or less than the length specified by the permit.

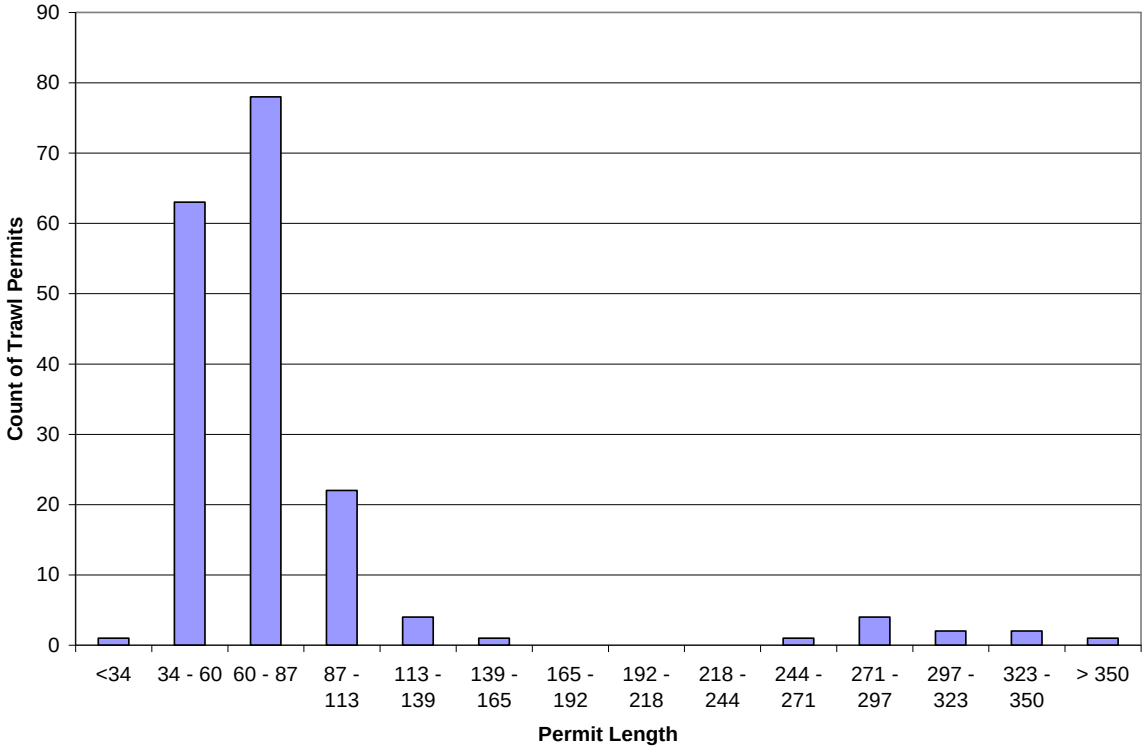


Figure B-2. Count of limited entry trawl permits by size category.

B-2 Whiting Mothership Sector Co-Op Program

Overview. Qualified permits will be endorsed for mothership co-op participation. Each year the holders of those permits will choose whether their vessels will fish in the co-op fishery, in which individual co-ops will direct harvest, or fish in a non co-op fishery that will be managed by NMFS as an Olympic-style fishery.

Certain elements of the whiting cooperative program have the effect of obligating catcher vessel deliveries to a specific mothership. The Council's Final Preferred Alternative specifies a "declaration" process for catcher vessels wherein those catcher vessels desiring to participate in a cooperative would declare a mothership to which they will deliver to in the coming year. LE permits will be issued for motherships and required for a mothership to receive whiting from catcher vessels.

The preferred alternative for the mothership sector cooperative program can be described as a LAPP that allocates portions of the mothership sector allowable catch level to catcher vessel permits licensed to participation in the mothership sector. Participants in the mothership sector only have defensible access to their assigned catch if they join a cooperative. If a permit fails to join a cooperative, the share of catch attributed to that permit is placed in the noncooperative fishery (a common quota fishery where participants are likely to fish competitively). Permits that join a cooperative have access to their own catch history through the "golden rule" provision, but can share catch with other vessels in that cooperative voluntarily. Furthermore, cooperatives in the mothership sector may form inter-cooperative agreements and voluntarily share allowable catch across cooperatives. The catch history associated with each permit cannot be separated from the trawl permit, nor can the catch history be made divisible. This lack of divisibility in catch history is intended to stabilize membership in the fishery, thereby stabilizing relationships within the cooperative institutions that are formed.

Under the preferred alternative, motherships in the sector will receive limited entry permits designed to restrict the number of participating motherships. Catcher vessel permit holders in a cooperative must enter into a declaration procedure, where they declare that their catch will be delivered to a particular mothership in the upcoming year. The purpose of the declaration procedure is to help provide some business planning certainty to the mothership within the current year. If a catcher vessel desires to deliver to a different mothership in a subsequent year, the catcher vessel can simply declare that intention without penalty. This declaration can be broken within the year through "mutual agreement" on the part of both the mothership permit holder and catcher vessel permit holder.

The qualifying criteria for motherships and mothership catcher vessels differ. In the case of motherships, the qualifying criteria are based on participation in the fishery from 1997 through 2003. This is a time period that reflects the separation of the two at-sea sectors (1997) and the control date for the rationalization program (2003). The qualifying criteria for catcher vessels encompass 1994 through 2003, a time period reflecting limited entry for catcher vessels and the control date.

Catcher vessel permit ownership is allowed to grow under the preferred alternative. The ownership limit for catch history is specified at 20 percent, which is higher than the largest amount estimated to be initially allocated to catcher vessel entities. Consolidation among catcher vessels is also provided in this alternative through the usage limit, set at 30 percent of the mothership sector allocation. This provides opportunities for cost efficiencies to be realized through fleet consolidation while assuring at least four (4) catcher vessels in the fishery, though the number is likely to be higher.

The size of the catcher vessel accumulation limits simultaneously takes into account the mothership accumulation limits. Since motherships and catcher vessels are both dependent on the fishery, accumulation limits for both catcher vessels and motherships were set while taking into account the balance of power between catcher vessels and motherships and the relationships that may be established and changed through fleet consolidation. In taking these factors into account, the mothership limit was set at 45 percent, assuring at least three (3) motherships in the fishery.

B-2.1 Participation in the Mothership Sector

a. Catcher Vessels

Vessels with CV(MS)-endorsed permits may participate in either the co-op or non co-op portion of the mothership fishery. They will choose annually which fishery they will participate in for the coming year. Additionally, any groundfish LE trawl permitted vessels may participate in the co-op portion of the fishery if they join a co-op (as described in Section B-2.3.3).[7] No other catcher vessels may participate in the mothership fishery.

Option: A vessel may not engage in the processing of whiting during any year in which a CV(MS)-endorsed permit is registered for use with the vessel.

b. Processors

Only motherships with a mothership LE permit may receive deliveries from catcher vessels participating in the co-op or non co-op portions of the mothership sector whiting fishery. (Note: motherships may acquire such permits by transfer; see Section B-2.2.2.)

[7] When such permits participate in a co-op, the co-op will not be allocated any additional fish based on participation by such a vessel.

c. Vessels Excluded[8]

Motherships also operating as a catcher-processor may not operate as a mothership:

Option 1 (Preferred Alternative): During a year in which it also participates as a catcher-processor.
Option 2: During a month in which it also participates as a catcher-processor.
Option 3: At the same time it is participating as a catcher-processor.

❖ Interlinked Elements

CV catch history. Catcher vessel license limitation and catch history designations are both necessary for rationalizing the harvesting side of the mothership fishery. Without these provisions, other catcher vessels could enter the fishery and compete with existing catcher vessels. Such competition runs counter to the ingredients necessary for rationalization. The issuance of catch history to catcher vessels must be implemented alongside a license limitation program in order for the amount of catch available to each cooperative to be calculated and to ensure that members of that cooperative do not compete with other vessels for that catch.

Processor linkage. Processor license limitation and processor linkages work in concert to help ensure that processors will achieve some benefit from rationalization. Processor license limitations and linkages restrict other processors from entering the fishery and reduce competition between existing processors for deliveries from catcher vessels.

Processor declaration. Processor license limitation and processor declarations help provide some stability to processors from rationalization. A declaration process helps a processor develop business plans to accommodate expected catch volume in the coming year.

❖ Rationale and Policy Issues

- Mothership Sector Licensing

    - ♦ *Catcher Vessels*

Limiting participation of catcher vessels in the mothership sector is one component necessary for the rationalization of a fishery managed with harvest cooperatives. Limitation means that only those participants with appropriate licensing may harvest fish in the sector, creating a barrier to entry which is necessary for rationalization – and associated effects – to occur. If other vessels were able to harvest fish in the sector, this would introduce competition that would tend to eliminate the rational type of behavior expected from setting up a cooperative-based fishery. Furthermore, allowing other vessels to harvest fish in the sector would lead to more fishing capital than necessary, eroding the potential economic gains induced through fleet consolidation and associated cost savings. However, if other licensed trawl vessels are allowed to join cooperatives, and therefore be subject to legally-binding agreements which would manage the participation of those vessels, this would give participants in the mothership sector additional tools for harvesting the catch available to them while also managing the participation of those non-CV(MS) endorsed vessels through the cooperative contract.

Restricting a vessel from engaging in mothership opportunities if it has been registered to a CV(MS) permit during the year is intended to maintain the distinctions between motherships and catcher vessels

[8] A vessel that has been under foreign registry after the date of the AFA and that has participated in fisheries in the territorial waters or exclusive economic zones of other countries will not be eligible to participate as a mothership in the mothership sector of the Pacific whiting fishery, as per Section 12102(c)(6) of the AFA.

and also prevent opportunities for participants in the mothership sector from engaging in catcher-processor activity.

♦ *Motherships*

The rationale for the two possibilities for licensing motherships (one would license motherships and one would not) is described in this section. The rationale against establishing a mothership limited entry program is that under status quo, vessels are not required to have a permit to operate as a mothership and there is no limit on the number of vessels that can participate as a mothership. Under these unrestricted conditions, the entire mothership sector allocation is often not harvested completely, so limiting the number of motherships would limit the ability to realize the full economic potential of the mothership sector harvest. Furthermore, establishing a mothership limited entry provision would limit the number of motherships that catcher vessels can deliver to.

A mothership limited entry program is intended to stabilize participation of motherships in the mothership sector. This is an important component of a fishery managed with cooperatives, especially if the fishery includes processor linkages. Linkages require relationships between catcher vessels and motherships and will affect the behavior of catcher vessels and the operation of the cooperatives. Allowing unfettered participation in the mothership sector would cause instability in mothership participation, affecting the entire fishery. Furthermore, it would negatively affect existing motherships. Because of the competition that could occur between motherships if a limited entry mothership program were not implemented, existing mothership processors might not benefit from rationalization.

Restricting catcher-processors from also engaging in mothership activity is intended to protect existing mothership processors in the sector and help ensure that they benefit from rationalization in addition to catcher vessels. Catcher-processor vessels may have the ability to attract catcher vessels from other motherships due to their relatively greater efficiency and the ability to pay higher prices for raw fish deliveries as a result.

License limitation for mothership catcher vessels and mothership processors arguably is intended to help achieve net benefits and efficiency guidance contained in the MSA and Groundfish FMP and to foster a healthy catcher vessel and mothership sector. Furthermore, license limitation of catcher vessels is a necessary ingredient for rationalization through a harvest cooperative structure. The result of such successful rationalization tends to achieve such things as bycatch reduction, thereby relating to conservation goals found within the MSA and Groundfish FMP. Considering the allowance of catcher-processors to also operate as a mothership addresses several aspects of policy guidance on rationalization from the MSA, the Groundfish FMP, and Amendment 20 goals and objectives. In particular, allowing catcher-processors to operate as motherships would arguably increase the efficiency of the program and would contribute toward achieving the greatest benefit to the nation, thus meeting MSA Standard 5, Groundfish FMP Objective 6, and Groundfish FMP Objective 2. However, allowing catcher-processors to operate as motherships may cause disruption in mothership sector participation, which is contrary to Groundfish FMP Objective 14. Allowing catcher-processors to operate as motherships is also related to policy guidance referring to sector health - Groundfish FMP Goal 2 in particular.

Element of Cooperative Alternative	Conservation	Net Benefits	Disruption	Excessive Shares	Fairness and Equity	Harvester and Processor Sector Health	Labor	Communities	Small Entities and New Entrants	General Public
Catcher vessel license limitation	X	X				X				
Mothership license limitation		X				X				
Catcher-processors operating as a mothership		X	X			X				

❖ Analysis

- Catcher Vessel Participation in the Mothership Sector

Catcher vessels participating in the mothership sector must be a limited entry trawl vessel. Only those vessels that have a CV(MS) endorsement are able to fish in either the co-op or in the non co-op portion of the fishery. Vessels with a limited entry groundfish trawl permit may participate in a co-op and harvest the catch available to that co-op, but those vessels that do not have a CV(MS) endorsement cannot participate in the non co-op fishery. These participation requirements effectively limit participation in the sector, but mechanisms exist that allow capital in the fishery to change and adapt to varying conditions by allowing non-CV(MS) vessels into a cooperative Allowing any limited entry trawl vessel to participate in a co-op allows the cooperatives the flexibility to determine the amount and type of capital appropriate for harvesting the fish available to the cooperative. This also provides a greater certainty that the harvest available to the cooperative will be realized. If a situation occurs where CV(MS)-endorsed vessels in a cooperative all travel to the Bering Sea to participate in the Pollock fishery and cannot leave the Bering Sea without foregoing Pollock catch, that mothership whiting cooperative can use other licensed trawl vessels on the west coast that are members of that cooperative to harvest their allowable catch, thus providing a mechanism to cooperative members for harvesting the cooperative catch while not foregoing other harvest opportunities. For those motherships that may be relying on harvest from mothership whiting cooperatives, allowing licensed trawl vessels without a CV(MS) permit to harvest cooperative fish provides a greater certainty that the catch in that cooperative will be realized and the motherships will be able to expect delivery activity from the catch attributed to those cooperatives.

- Mothership Processor Limited Entry

Establishing a mothership limited entry program stabilizes participation of motherships in the mothership sector. In addition to stabilizing the capital involved in the processing of whiting, a mothership limited entry program will tend to stabilize the relations between motherships and catcher vessels. This is because it restricts the ability for different mothership participants to enter into the fishery. As described previously, and in Chapter 4, cooperatives rely heavily on close knit relationships between participants. While mothership entities are not members of a cooperative, the relationships established between motherships and catcher vessels will almost certainly have an effect on the prosecution of the fishery and influence cooperatives, especially in a fishery where processor/catcher vessel linkages are established. By extension, the relationships between motherships and catcher vessels will tend to influence the relationships present in a cooperative. It may be reasonable to expect that more stable relations between

individual catcher vessels and individual motherships will affect the stability of relationships that exist among catcher vessels in a cooperative.

The stability in mothership participation created through a mothership limited entry program may lead to longer term and more stable relationships between catcher vessels and motherships compared to a case where there is no limited entry for motherships. If mothership participation is not limited, new motherships may enter into the fishery. If catcher vessels are allowed to freely deliver to any mothership, this would lead to increased competition between motherships for catch from catcher vessels. This is likely to play into the catcher vessels favor because it is likely that catcher vessels would receive higher prices as a result of bidding among motherships for catcher vessels. However, if switching motherships requires that a catcher vessel fish in the noncooperative fishery, having new motherships enter into the fishery may make it more likely that catcher vessels will move into the noncooperative portion of the fishery in greater numbers, or on a more frequent basis. Increased participation in the noncooperative portion of the fishery may decrease the management performance of the fishery because of increased probability of bycatch events or other matters. This may occur because this noncooperative portion of the fishery is a competitive, derby fishery and behavior in that type of a fishery may be less rational.

If new motherships were allowed to enter into the fishery, the effect on existing motherships would tend to be adverse. New motherships would likely reduce the number of catcher vessels (and therefore catch) delivering to the average mothership, which would lead to reduced revenue being generated by each mothership operation. Limiting the number of motherships would work in the opposite direction with more catcher vessels delivering to the average mothership. When combined with processor linkages, processor limited entry may also allow processors to rationalize, similar to what may occur among the catcher vessel portion of the fishery.

● Catcher-processors Operating as a Mothership

Allowing catcher-processors to operate as a mothership effectively means that rationalization will allow consolidation to occur across the catcher-processor and mothership sectors rather than remaining within each of two sectors. Over time, theory would suggest that (if catcher-processors are allowed to operate as a mothership) the differentiation of catcher-processors and motherships would no longer exist. Instead, the fishery may be made up of several vessels which do a combination of catcher-processor and mothership activity in order to reach a more efficient point of production.

Several factors indicate that some entities will be in a relatively better position than others to capitalize upon this breakdown in sector divisions that occurs by allowing catcher-processors to operate as a mothership. These include institutional factors affecting the make-up of operations in each sector, institutional factors influencing participation in both activities, and the marginal amount of revenue generated by catcher-processor activity and mothership activity. These are outlined briefly below with additional explanation following.

<u>Institutional factors</u>

- Through the catcher-processor cooperative governing contract, catcher-processors have a defensible harvest privilege that may allow them to be flexible and accommodating to mothership catcher vessels without giving up access to fish in the catcher-processor sector. Catcher-processors that operate in Bering Sea Aleutian Islands (BSAI) Pollock also have a defensible harvest privilege that allows them to be flexible because they do not risk losing BSAI Pollock opportunities based on their activities in the whiting fishery.
- Mothership vessels may not be able to be as flexible and accommodating to catcher vessels because they do not have a defensible access to catcher vessel catch (especially if a long-term linkage does not exist). Furthermore, motherships in the BSAI Pollock fishery do not have

linkages to catcher vessels, meaning motherships compete to a certain extent with other mothership vessels for deliveries. This may at times mean a mothership can lose potential Pollock deliveries if they accommodate a whiting catcher vessel rather than a Pollock catcher vessel.[9]

- Mothership vessels could participate in catcher-processor activity (if they acquire the necessary license), but flagging requirements make several mothership vessels unable to participate in the harvesting of fish. This means that only three existing motherships would be able to engage in catcher-processor activities, but all catcher-processors would be able to engage in mothership activities (subject to appropriate licensing).

Cumulative and marginal revenue

- A vessel that engages in both catcher-processor and mothership activity may be able to take a smaller profit margin in the mothership sector than a vessel that operates exclusively as a mothership vessel and still generate cumulatively more revenue. This means that a catcher-processor could pay catcher vessels higher prices (and attract catcher vessels from other motherships) and still be more profitable than a mothership which processes the same volume through mothership activity exclusively.

♦ *Catcher-processors Operating as a Mothership, the Potential Attainment of Cost Minimization, and the Effect on Efficiency*

Allowing catcher-processors to operate as a mothership is a change from status quo, and breaks down some of the barriers created through the division of the mothership and catcher-processor sectors (created in 1997). This allows both motherships and catcher-processors to access greater volumes of whiting, but only if consolidation occurs and some motherships and/or catcher-processors leave the fishery. Assuming both motherships and catcher-processors have a limited entry program restricting access, then theory would suggest that some catcher-processors are likely to acquire mothership permits and some motherships acquire catcher-processor permits, resulting in consolidation in both sectors.

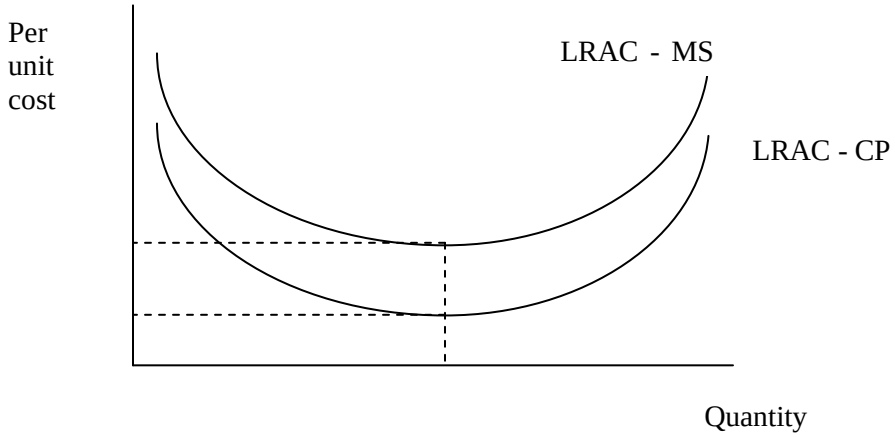
Assuming motherships can engage in catcher-processor activity and vice versa, then the least efficient motherships will theoretically drop out of the fishery as catcher-processors move into the mothership sector, and the least efficient catcher-processors will theoretically drop out of the fishery as motherships move into the catcher-processor sector. Vessels that remain would participate in both sectors of the fishery simultaneously (if allowed), and the outcome would be an improvement in the economic efficiency of the fishery. However, because of flagging requirements restricting the ability of some motherships to harvest fish, just three existing motherships would be able to operate as catcher-processors, meaning that several others would be restricted from operating as catcher-processors even if they were the more efficient vessels. Catcher-processors would not be restricted from operating as motherships (so long as they hold a mothership permit). This means that several existing motherships would not be able to capitalize on this breakdown in sector divisions, and would be more likely to be consolidated out of the fishery even if they are more efficient.

♦ *Catcher-Processor and Mothership Cost Structure Comparison*

The cost structure associated with catcher-processing activity is generally acknowledged to be different than that cost structure associated with mothership activity. While a catcher-processor and a mothership platform may be made up of entirely the same capital, a mothership operation must pay for fish deliveries

[9] Anecdotal information indicates that a substantial amount of vertical integration exists in the mothership portion of the Pollock fishery. Therefore, competition for catcher vessels among motherships in that fishery may not be widespread.

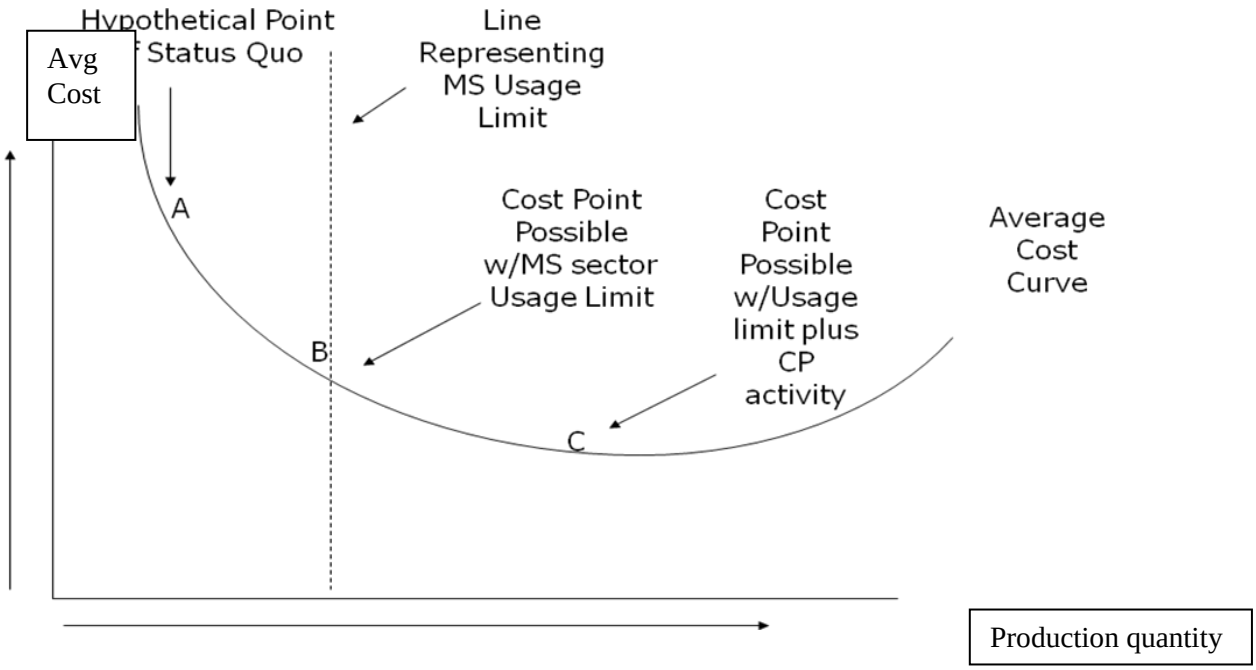
from catcher vessels, while a catcher-processor operation does not. A mothership operation uses more capital than a catcher-processor operation because of the involvement of catcher vessels. This additional capital arguably makes mothership operations more costly than catcher-processor operations (assuming a catcher-processor vessel and a mothership vessel are made up of the same capital). The higher cost associated with mothership operations may come in the form of purchasing fish from catcher vessels, or if the mothership and catcher vessel are vertically integrated, higher operational costs from operating both a catcher vessel and a mothership. The following figure illustrates, conceptually, the difference between a mothership operation's cost structure and a catcher-processor's cost structure. Both operations could theoretically have the same minimum cost point of production quantity, where the same production quantity is their minimum cost level, but the cost of producing at that minimum point is less for a catcher-processor operation than a mothership operation.



The next figure illustrates yet another conceptual view of how allowing catcher-processors to engage in mothership operations can impact a vessel's cost structure.[10] Assuming the existing average cost of mothership activity in the mothership sector is at point A, motherships can theoretically decrease average costs by engaging in fleet consolidation and increasing production per vessel. This can be done up to a point representing the MS usage limit, or point B. Allowing a catcher-processor to engage in mothership activity allows that vessel to spread even more production quantity across that same platform, providing opportunities for that vessel to achieve point C. The concept here is two-fold. This concept allows catcher-processors to engage in mothership activity, providing an opportunity for that platform to increase production and decrease average costs, meaning an increase in efficiency. It also allows a vessel that engages in both sectors to not be held to production quantities defined by the MS usage limit. It is only held to a production quantity defined by the usage limit while it is participating within the mothership sector. Vessels that remain in the mothership sector are restricted by regulation from producing quantities above point B, meaning that vessels only engaging in mothership activity do not have opportunities to access as much fish as a vessel producing in both the catcher-processor and mothership sector, therefore their ability to increase efficiency is more limited. This is particularly important when considering that some mothership vessels do not have the opportunity to engage in catcher-processor activity because of flagging requirements. This means that those entities which can only participate as a mothership do not have the opportunity to decrease average costs like entities that can participate in both sectors for at least

[10] This figure illustrates a single average cost curve for both mothership activity and catcher-processor activity. While both of these activities would be better represented by different cost curves, one is presented in the interest of easily communicating the concept.

two reasons: one being that they cannot engage in catcher-processor activity, and another being that their production is limited by the mothership sector usage limit.



When a catcher-processor operates as a mothership, it may have the same variable cost per unit of production as a mothership that only operates as a mothership. However, a vessel which has engaged in catcher-processor activity may have covered costs and generated revenue through that, meaning that participation in the mothership sector would simply be an additive benefit above the revenue generated through catcher-processor activity. This is not unlike the concept identified by Pinkerton and Edwards (2009), where they found that initial recipients of quota share pay high rates to lease quota above the amounts that they own, simply because the leased quota is an additive amount of revenue which is above that revenue generated through their own quota. In this case, catcher-processors may be in a similar situation where the catcher-processor cooperative governing contract acts similarly to the initial allocation described in Pinkerton and Edwards (2009) and participation in the mothership sector is similar to the leasing of quota also described in that research. Catcher-processors in this example have generated revenue and covered costs through catcher-processor activity and view mothership activity as an added benefit, or "icing on the cake." In a cumulative sense, catcher-processors also operating as a mothership generate cumulatively more revenue than a pure mothership operation producing the same quantity even if the marginal cost of engaging in mothership sector activity is the same.

The fact that mothership activity by a catcher-processor may be viewed as an added benefit brings up a second point. Following the concept outlined in the research done by Pinkerton and Edwards (2009), catcher-processors engaging in mothership activity may tend to bid up the price of engaging in mothership activity if more than one catcher-processor participates in the mothership sector. This would take the form of paying catcher vessels higher prices for deliveries as those catcher-processors compete among one another for deliveries from catcher vessels. Meanwhile, motherships that only engage in mothership activity are likely to find it difficult to follow suit and pay those higher prices for deliveries because they have an overall higher cost structure. This is because they generate their income from mothership activity alone, which has a smaller profit margin than catcher-processor activity, and cannot afford to follow the higher prices that are created as the catcher-processors compete among themselves for deliveries from mothership catcher vessels. Over time, the mothership operations become out-competed by those catcher-processors that also engage in mothership operations, unless those motherships decide to become a catcher-processor and take on the same business model. However, it is

important to point out again that several motherships would be prohibited from taking this action due to flagging requirements.

♦ *Institutional Factors and Catcher-Processors Operating as a Mothership*

The ability for a catcher-processor/mothership vessel to acquire deliveries from mothership catcher vessels is related to the time at which a catcher-processor can engage in mothership activities. Since a catcher-processor vessel has a defensible harvest privilege in its participation in the catcher-processor sector (either in the form of an IFQ, or as part of the cooperative agreement), it can elect to harvest its share of the catcher-processor allocation at a time of its choosing without fear that another catcher-processor will take its catch. This is different from a mothership operation, which is not granted a defensible resource access privilege, but may be granted a linkage to a vessel with a harvest privilege in a cooperative program that can be broken over the long-term. This structure takes on some of the characteristics of a limited access privilege in the short-term, but means the mothership linkage is not ultimately defensible because it can be broken and moved to another processing vessel. This same concept holds true for the declaration process.

While motherships with processor linkages or a declaration have more stable and predictable production volumes than motherships without linkages, they must negotiate arrangements with catcher vessels in order to accept deliveries from those vessels. Such negotiations will undoubtedly take into account the timing of opportunities in Bering Sea Pollock and the shoreside whiting sector. At times, the objectives of the two vessel types may be at odds. If an agreement is not reached, a mothership can lose that catcher vessel, if not in the current year, then in the subsequent year. This is different from the catcher-processor sector, where a catcher-processor does not risk losing catch privileges if it participates in other fisheries or sectors. A catcher-processor's catch privileges are protected by a cooperative contract. This allows catcher-processors to better accommodate the harvest timing of mothership catcher vessels, because they do not risk losing their catcher-processor opportunity. This flexibility may make a catcher-processor/mothership operation more attractive than a pure mothership operation that is constrained by its participation in other fisheries, especially since not participating in those other fisheries may mean foregoing deliveries from catcher vessels. For example, motherships that participate in the BSAI Pollock fishery do not have processor linkages, so that mothership must balance Pollock catcher vessels with whiting catcher vessels. Should there be a time when those fisheries are in competition for timing, the mothership may risk losing catcher vessels in one of those fisheries. This catcher-processor timing advantage is true regardless of whether catcher-processors can operate as a mothership simultaneously, or cannot operate in the same month, though the timing advantage is certainly larger if a catcher-processor can operate as a mothership simultaneously.

♦ *Motherships Operating as a Catcher-Processor*

One way in which a mothership could more easily attain a cost minimization strategy, and attain a cost minimization structure that is comparable to a catcher-processor, would be to acquire a catcher-processor endorsed permit and also operate as a catcher-processor. In this way, the mothership would take on the (arguably more efficient) operation of a catcher-processor model for a portion of that vessel's production. If the cost efficiency that vessel can attain is greater than the cost of the catcher-processor permit, that vessel would find participation in the catcher-processor sector profitable. However, a mothership also operating as a catcher-processor raises a question about how that participant may impact the existing catcher-processor cooperative. Depending on the catcher-processor cooperative agreement, a mothership that acquires a catcher-processor permit and participates in the catcher-processor sector may introduce some aspect of "new entry" that causes instability in that voluntary cooperative. However, it is important to note that this instability is no different than that caused by any other new participant that acquires a

catcher-processor permit. Another possible model is the lease of a catcher-processor permit by a mothership capable of engaging in catcher-processor activity. This could occur if a catcher-processor company does not desire to participate in the whiting fishery and instead allows a mothership operation to fill their role in the catcher-processor sector. This may prove less disruptive to the existing catcher-processor cooperative because, presumably, the cooperative agreement would still apply to the entity leasing a catcher-processor permit from an entity that has signed the cooperative agreement. However, only three existing motherships would be allowed to engage in catcher-processor activities because of flagging requirements. Other existing mothership operations cannot engage in the harvest of Pacific whiting.[11] This is contrary to the catcher-processor vessels that exist in the fishery – all of which could potentially engage in mothership activity.

- *Entities Qualifying for Catcher-processor and Mothership Permits*

The qualification rules for receiving a catcher-processor endorsed permit and a mothership permit result in one entity receiving both a catcher-processor permit and a mothership permit. Other entities involved in the catcher-processor or mothership sectors would receive a mothership permit or a catcher-processor permit, but no other entity would receive both. This means that other entities that may desire to participate in the other sector would face a barrier to entry in the form of the cost of a permit.

- *Effect on Efficiency from Allowing Catcher-processors to Engage in Mothership Activity*

While the information above indicates that allowing catcher-processors to operate as a mothership may tend to benefit vessels capable of engaging in catcher-processor activity at the expense of some pure mothership vessels, net benefits and the efficiency of a rationalization program are expected to be greater if catcher-processors are allowed to engage in mothership activity. This increase in net benefit and efficiency is a result of breaking down the barriers between the two sectors that will tend to eliminate less efficient vessels in favor of the more efficient vessels and result in consolidation overall. Unfortunately no empirical information is readily available with which to estimate the relative effect on net benefits and efficiency.

B-2.2 Permits/Endorsement Qualification and Characteristics

B-2.2.1 Catcher Vessel Mothership Whiting Endorsement (CV(MS) Whiting Endorsement)

a. Endorsement Qualification and History Assignment

Permits with a qualifying history will be designated as CV(MS) permits through the addition of an endorsement to their LE groundfish permit. At the time of endorsement qualification, each permit will also be assigned a catch history that will determine the share of the mothership whiting allocation associated with that permit.

Qualifying for a CV(MS) Whiting Endorsement. An LE permit will qualify for a CV(MS) whiting endorsement if it has a total of more than 500 mt of whiting deliveries to motherships from:
Qualification Option 1 (Preferred Alternative): 1994 through 2003
Qualification Option 2: 1997 through 2003

[11] Since 1995, eleven vessels have engaged in mothership activity. Six vessels have participated between the years of 1997 and 2004.

Catch History Assignment (Identification of Endorsement Related Catch History). The following are options for the initial calculation to be used in determining NMFS distribution to co-op and non co-op fishery pools. A CV(MS) whiting endorsement calculated catch history will be based on whiting history during the related permits.

Catch History Assignment Option 1: The initial catch history calculation for CV(MS) whiting endorsements will be based on whiting history of the permit for 1997 through 2003, dropping one year.
Catch History Assignment Option 2 (Preferred Alternative): The initial catch history calculation for CV(MS) whiting endorsements will be based on whiting history of the permit for 1994 through 2003, dropping two years.[12]

A permit's history for each year will be measured as a share of the fleet history for that year (i.e., "relative pounds" will be used). The Council also considered but rejected using a straight sum of pounds in the allocation formula ("absolute pounds").

(Note: the Council considered but rejected a requirement that permit qualifying in both the shoreside and mothership co-op programs would have to drop the years from their allocation calculation.)

For the purpose of the endorsement and initial calculation, catch history associated with the permit includes that of permits that were combined to generate the current permit.

b. Whiting Endorsement Transferability and Endorsement Severability

Transfer Option 1 (Preferred Alternative): The CV(MS) whiting endorsement (together with the associated catch history) may not be severed from the groundfish LE trawl permit.
Transfer Option 2: The CV(MS) whiting endorsement (together with the associated catch history) may be severed from the groundfish LE trawl permit and transferred to a different LE trawl permit. Catch history associated with the whiting endorsement may not be subdivided.

Added as part of the Preferred Alternative: CV(MS) permits may be transferred two times during the fishing year, provided the second transfer is back to the original catcher vessel (i.e., only one transfer per year to a different catcher vessel).

c. Accumulation Limit

CV(MS) Permit Ownership: No individual or entity may own CV(MS) permits for which the allocation totals greater than the following percentage of the total mothership sector whiting allocation:

Option 1: 10 percent,
Option 2: 15 percent,
Option 3: 25 percent,
Option 4: the amount of the largest current owner (no grandfather clause), or
Option 5 (Preferred Alternative): 20 percent**.**

Added as part of Preferred Alternative:

Catcher Vessel Usage Limit: No vessel may catch more than 30 percent of the mothership sector's whiting allocation.

[12] February 2010: The word "worst" was removed in line with the Council's April 2009 action specifying that the permit owner would be allowed to select the years dropped from the calculation.

d. Combination

CV(MS) Permit Combination to Achieve a Larger Size Endorsement. When a CV(MS)-endorsed permit is combined with another permit, the resulting permit will be CV(MS) endorsed, except when the CV(MS) permit is combined with a CP permit, in which case the CV(MS) endorsement will not survive on the resulting permit.[13]

❖ Interlinked Elements

Permit length endorsement. If the permit length endorsement is eliminated, bullet D above is irrelevant.

The definition of "largest current owner" should be better defined. If "current" is interpreted to mean the date immediately before rationalization goes into effect, there will likely be a race to accumulate permits prior to the implementation of the rationalization program.

❖ Rationale and Policy Issues

- Qualifying Years Formula

Two options exist for years making up the catch history formula. One option includes the time period between the separation of the at-sea sectors (1997) and the control date (2003), while the other includes the time between the establishment of limited entry (1994) and the control date. Both options require at least 500 mt of deliveries to motherships in order to ensure that the permit has substantially participated in the fishery.

- Catch History Formula

Two options exist for years making up the catch history formula. One option is intended to reflect participation during the years between the time the at-sea sectors were separated and the control date. This time period is intended to be more reflective of existing mothership fishery participation patterns while taking into account the control date. The second option (1994 to 2003) is intended to reflect participation in the mothership sector between the time of limited entry and the control date. This option reflects participation by catcher vessels delivering to processing vessels after limited entry. Going back to 1994 is arguably reasonable because catcher vessels that delivered to processing vessels prior to 1997 still operated in mothership activity, and the separation of the at-sea sectors in 1997 affected mothership vessels and catcher-processors, not catcher vessels necessarily.

Dropping the worst year, or worst two years, is intended to excuse a poor year or two a vessel may have had for a variety of issues including the possibility that a vessel may have broken down within the catch history calculation period.

[13] Specifically, a CV(MS)-endorsed permit that is combined with an LE trawl permit that is not CV(MS)-endorsed or one that is CV(SS)-endorsed will be reissued with the CV(MS) endorsement. If the other permit is CV(SS)-endorsed, the CV(SS) endorsement will also be maintained on the resulting permit. However, CV(MS) and CV(SS) catch histories will be maintained separately on the resulting permit and be specific to participation in the sectors for which the catch histories were originally determined. If a CV(MS) permit is combined with a CP permit, the CV(MS) endorsement and history will not be reissued on the combined permit. The size endorsement resulting from permit combinations will be determined based on the existing permit combination formula.

A variety of other dates were considered but dropped. These other options included the year 2004 as the end year for the qualifying period, and 1998 as the start year for the qualifying period. The year 2004 was dropped because it was after the control date, while the year 1998 was dropped because the at-sea sectors were separated in 1997, not 1998. Further explanation of other catch history formulas and supporting rationale can be found in Appendix A, Section 2.1.3.a.

The Council also considered whether to use "relative pounds" (i.e., an entity's catch history for a particular year measured as its share [percent] of the total catch for that year) or "absolute pounds" (i.e., an entity's catch history for a particular year measured as the total pounds for the year). The Council chose to use relative pounds because it was consistent with how landings history was measured for the IFQ program, it puts a heavier emphasis on more recent landings (consistent with the MSA) and the Council felt it was likely to better reflect the distribution of capitol in that fishery.

- Endorsement Transferability and Endorsement Severability

The rationale for not allowing endorsements to be severed from the limited entry trawl permit is that it stabilizes the membership of harvesters in the mothership sector and this helps foster better relationships among cooperative members.

Allowing endorsements to be severed from the permit is a mechanism which allows for more fluid transfer of access to the mothership sector while retaining a limitation on participation. If an existing bottom trawl vessel were to desire to participate in the mothership fishery, that vessel could participate by purchasing a CV(MS) endorsement, and this may be less costly than having to purchase the entire CV(MS)-endorsed permit.

- Accumulation Limits

Limits on the accumulation of catch history are intended to prevent excessive control by any single entity. A range from 10 percent to 25 percent analyzes the effect of requiring a minimum of 10 to 4 entities controlling harvest privileges in the fishery. Establishing an accumulation limit that is equal to the amount of the largest current owner is intended to recognize existing ownership and participation in the fishery, but not allow an entity to acquire more. In order to implement an accumulation limit that is equal to the amount of the largest current owner, the term "current" will need to be defined, presumably as a particular date.

The consideration of appropriate accumulation limits for catcher vessels is done while simultaneously considering accumulation limits for motherships. These accumulation limits are considered simultaneously in order to help balance the number of motherships with the number of catcher vessels. This balance is arguably important in a cooperative-based mothership fishery because the relationships that exist between motherships and catcher vessels can impact what occurs in a cooperative. Arguably, an appropriate balance entails establishing catcher vessel accumulation limits that result in more than one catcher vessel per mothership, and enough motherships in the fishery that catcher vessels have alternative markets.

As part of the preferred alternative the Council added a "usage limit" which restricts the amount of fish any catcher vessel can catch. This is different from a vessel limit specified as part of the IFQ program. Where a vessel limit restricts the amount of quota pounds that can be registered to a vessel, a usage limit restricts the amount of fish a vessel can catch. This differentiation is necessary since a cooperative program does not include provisions for tracking the trading of catch history among vessels during the course of a season. The reason for having a usage limit is to place a limit on the amount of consolidation that can occur in the harvesting portion of the fishery. This limit on consolidation is important in

maintaining a balance between motherships and catcher vessels. Mothership operators have indicated that they need at least two catcher vessels to make a mothership operation work. Alternatively, catcher vessel operators have indicated that some fleet consolidation may be necessary – at least in some years – to achieve desired levels of efficiency. The Council considered the appropriate size of the usage limit and specified their desire to allow some growth while maintaining a balance between catcher vessels and motherships. The adopted limit is slightly higher than the percent of catch of some catcher vessels in recent years, meaning it allows for some growth of the largest operators, even though the initial allocation of catch history will be far less than this number.

- CV(MS) Permit Combination to Achieve a Larger Size Endorsement

In cases where permits are combined to achieve a larger size endorsement, the permit will be CV(MS)-endorsed (except if a permit is combined with a CV[SS] permit, in which case it will have both endorsements). This is intended to ensure that a permit cannot become dually endorsed and be able to participate in another sector. This restriction is intended to act as a capacity control measure.

The consideration of permit qualification years and catch history years is related to disruption and fairness and equity goals found within the MSA and groundfish FMP because it grants permits and catch history to certain entities based on historic participation in the fishery. Endorsement transferability is related to disruption, fairness and equity, and harvester and sector health, while accumulation limits are related to excessive share guidance found with the MSA and groundfish FMP.

Element of Cooperative Alternative	Conservation	Net Benefits	Disruption	Excessive Shares	Fairness and Equity	Harvester and Processor Sector Health	Labor	Communities	Small Entities and New Entrants	General Public
Qualifying years formula			X		X					
Catch history formula			X		X	X				
Endorsement transferability and severability			X		X	X				
Accumulation limits				X						

❖ Analysis

- Endorsement Qualification and History Assignment

The issuance of permits with CV(MS) endorsements is necessary to limit access to the mothership sector. A limitation on participation in the mothership sector is necessary for a cooperative-based fishery to rationalize itself. Otherwise new participants may enter the fishery and introduce an element of competition which is intended to be eliminated through rationalization. This was described in more detail under Section B.2.1. Catch history assignments are a resource access privilege. The collective catch history of a cooperative determines the pool available to that cooperative, while the collective catch history of participants in the noncooperative fishery determines the pool available to that fishery. Catch history assignments help solve resource sharing problems among cooperative members, thus helping to stabilize relations among participants in cooperatives. This effect was described previously under Section B.1.1.

- Qualification for a CV(MS) Endorsement and Catch History

In order to receive a CV(MS) endorsement, vessels must have a total of more than 500 mt of whiting deliveries to motherships from either 1994 through 2003, or 1997 through 2003. Applying a 500 mt filter excludes two permits that participated in the fishery. One participated in 1994, while the other participated in 1995. Of those permits that harvested more than 500 mt, only one permit is affected by the choice of qualification formulas. The inclusion of this permit and associated catch history into the initial allocation does not appear to substantially affect the total amount of catch history available to the other permits because the amount of quota allocated to this permit is small. However, these other permits are affected by the years upon which catch history calculations are made.

Table B-7. Permit level participation in the mothership whiting fishery and the effect of qualification years (only includes permits that meet the minimum metric ton threshold for CV(MS) endorsement qualification).

	AD-HOC	Qualification Years Considered for Receiving a Mothership CV Endorsement									
	PERMIT ID	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Permits Included/ Excluded by Formula	A		X								
Permits Not Affected by Formula	B		X		X						
	C			X	X	X					
	D			X			X	X			
	E	X		X	X						
	F	X	X		X	X					
	G	X			X	X					
	H	X	X	X	X		X		X		
	I	X			X	X	X				
	J			X	X	X	X	X			
	K					X	X	X	X		
	L					X	X	X	X	X	X
	M	X	X	X	X	X	X	X			
	N	X	X	X	X	X	X	X			
	O	X		X	X	X	X	X	X		
	P	X	X	X	X	X	X	X			X
	Q	X	X		X	X	X	X	X		
	R	X		X	X	X	X	X	X	X	
	S	X	X	X	X	X	X	X	X		
	T					X	X	X	X	X	X
	U	X	X	X	X	X	X	X	X		X
	V	X	X	X				X	X	X	X
	W	X	X	X	X	X	X	X	X		
	X	X	X	X	X	X	X	X	X	X	X
	Y	X		X	X	X	X	X	X	X	X
	Z	X	X	X	X	X	X	X	X	X	X
	AA	X	X	X	X	X	X	X	X	X	X
	BB	X	X	X	X	X	X	X	X	X	X
	CC	X	X	X	X	X	X	X	X	X	X
	DD		X	X	X	X	X	X	X	X	X

- Effect of Catch History Calculation Formulas

The effect of the catch history calculation formulas is shown in the figures below. The difference between the catch history formulas is slight for most permits, though some permits see differences of several percentage points. When compared to catch during the recent periods (the period after the control date), some permits receive catch shares that differ very little, while others receive catch shares that are several percentage points different (Figure B-3 and Figure B-4).

Amendment 15 created mothership and shoreside whiting sector catcher vessel endorsements, which vessels are required to have in order to participate in each of the designated sectors. Amendment 15 endorsements are required in addition to limited entry trawl permits. There are a total of 30 catcher vessels with Amendment 15 endorsements for the mothership sector and 25 of these have limited entry trawl permits. Of the 25 permits currently associated with an Amendment 15 mothership-endorsed catcher vessels, 24 would receive an initial mothership sector catch history allocation. The total allocation for these 24 permits would be 90.18 percent. There are six other permits that will receive an initial allocation that are not currently associated with Amendment 15 mothership-endorsed catcher vessels. These permits will receive the remaining 9.82 percent of the allocation. Three of the permits are assigned to vessels that, under Amendment 15, are qualified to participate in the shoreside whiting fishery. The remaining three permits are associated with vessels that are not qualified to participate in either the shoreside or mothership whiting fisheries. With the implementation of trawl rationalization, the Amendment 15 vessel endorsement system will sunset.

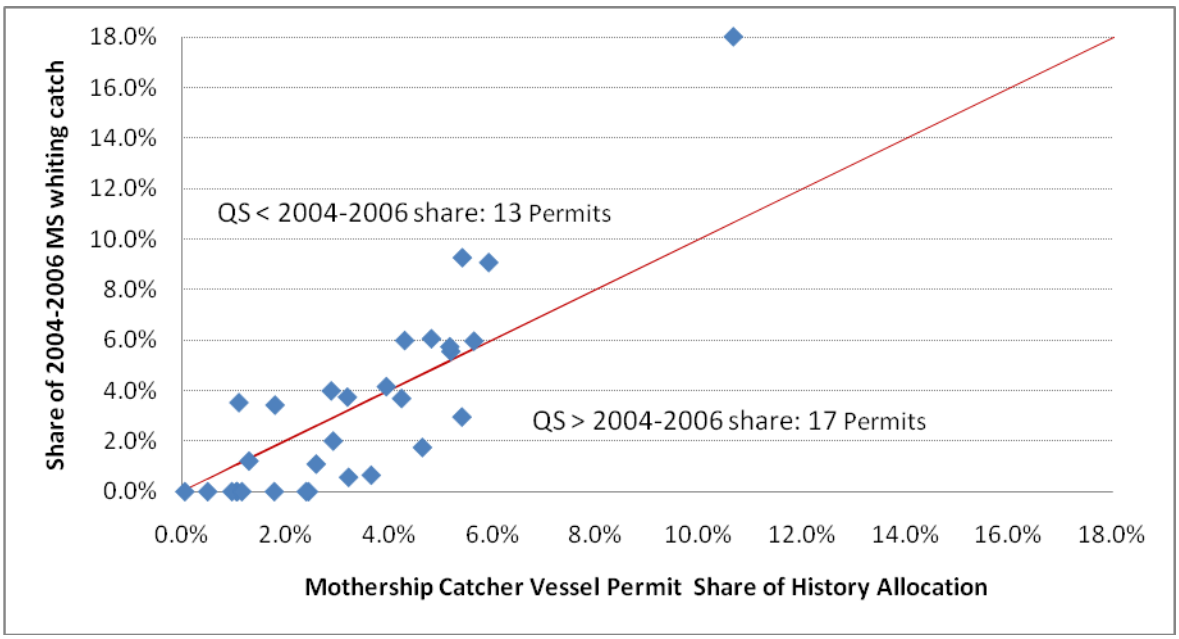


Figure B-3. Initial mothership sector allocation shares to catcher vessel permits in comparison to 2004-2006 average share of harvest for the each permits.

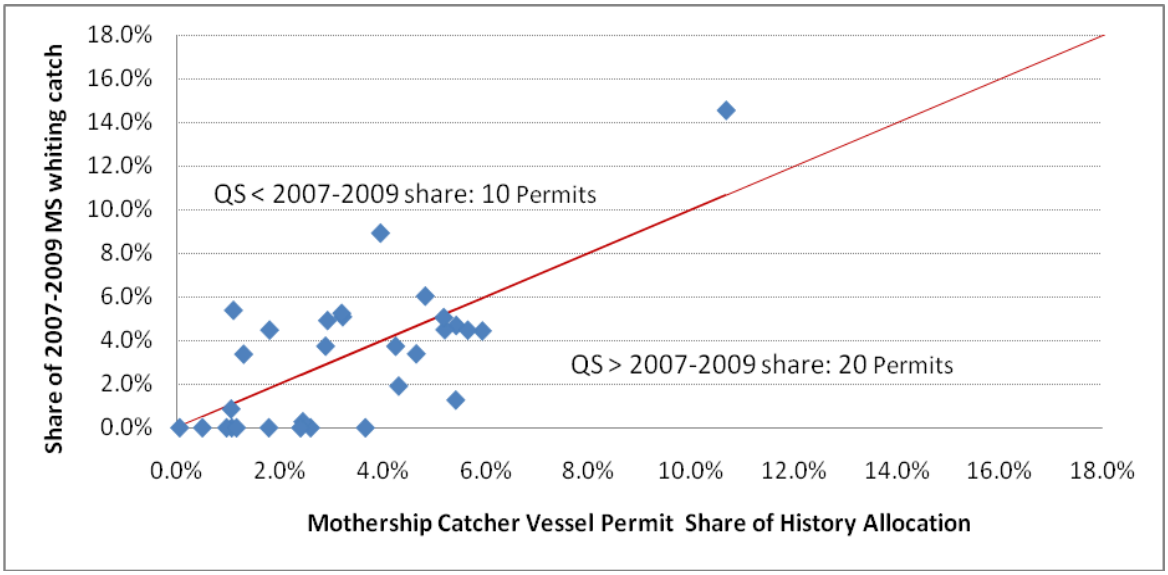


Figure B-4. Initial mothership sector allocation shares to catcher vessel permits in comparison to 2007-2009 average share of harvest for the each permits.

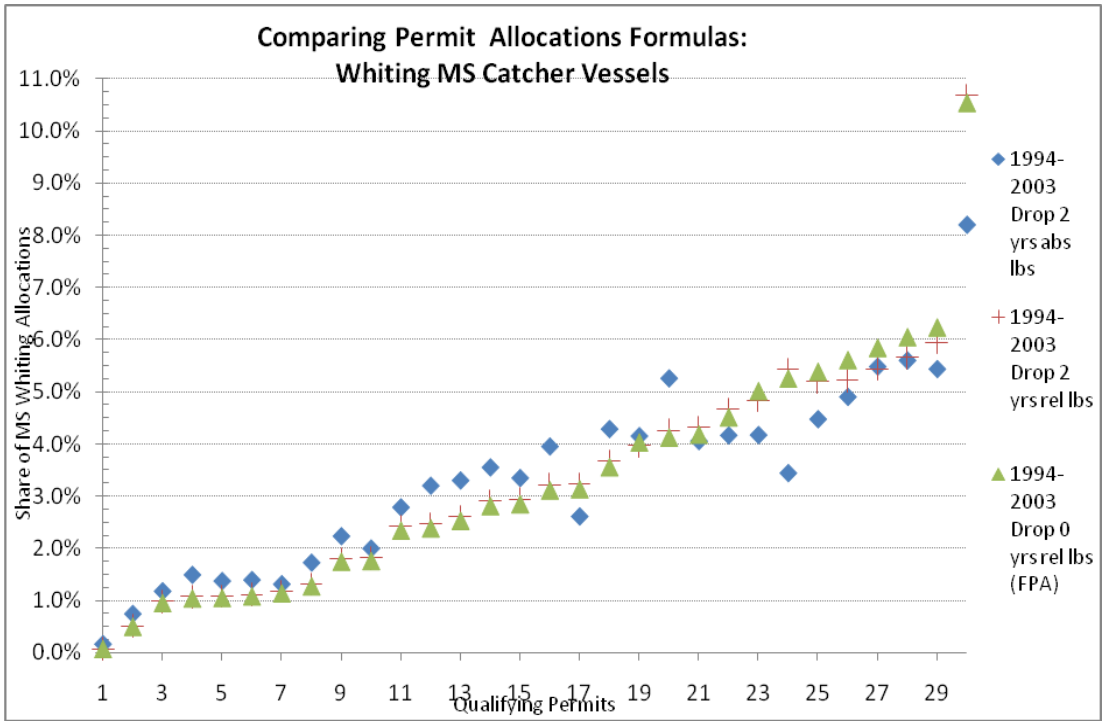


Figure B-5. Catch history distributions to permits by relative versus absolute history calculation formula.

When catch history distributions are estimated at the business entity level, the effect is somewhat different than when examined at the permit level. Some entities receive catch histories that are several percentage points different than their recent catch shares regardless of the allocation formula, though all entities are below the accumulation limits.

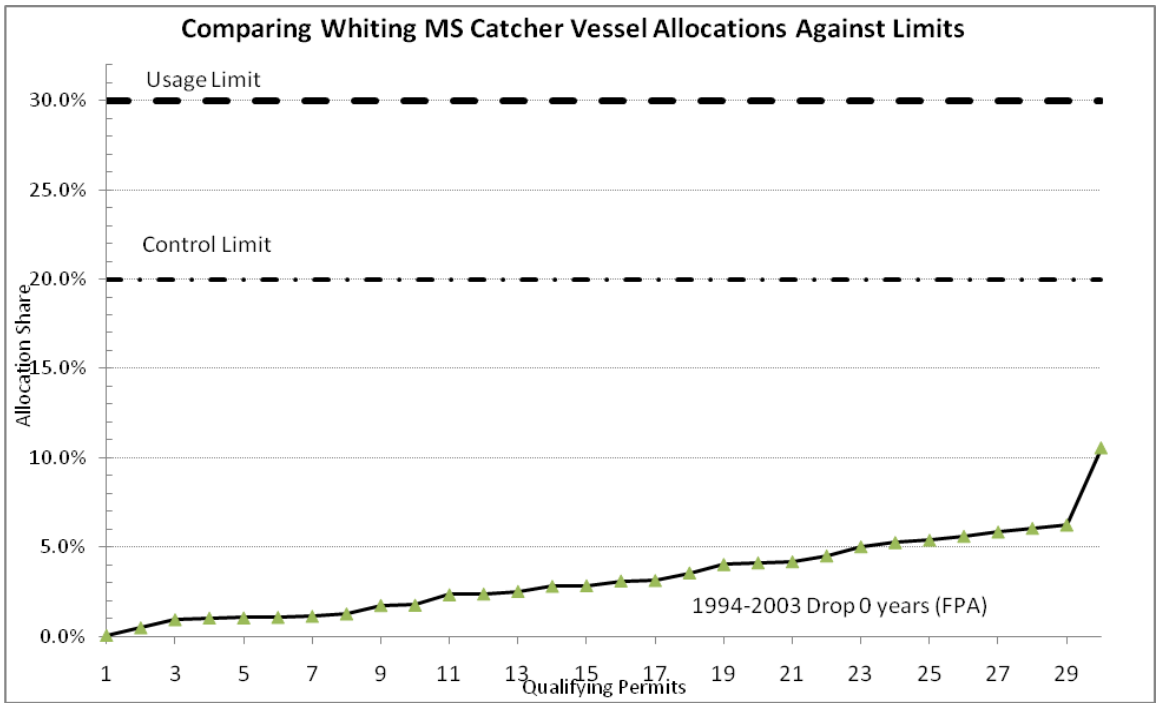


Figure B-6. Catch history distributions and accumulation limits to entities.

The trade-offs between use of relative pounds and absolute pounds are discussed for the IFQ Program in Section A-2.1.3.a of Appendix A. Those that are relevant to the allocation of catch history to mothership catcher vessels are summarized here. One impact of using a relative history (annual shares) to calculate an allocation is to weigh each year's catch. For example, a pound of whiting caught in the mothership sector in 1998 would give a permit about half as much credit toward an allocation as a pound caught in 2003 (Table B-8).

Table B-8. (Rows Excerpted from table in Appendix A Section A-2.1.3.a). Illustration of relative lb "weights" (sector catch in year 2003 divided by annual catch): 1994 to 2004.

Stocks or Stock Complex	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Pacific Whiting											
Shoreside Whiting	0.70	0.68	0.60	0.59	0.58	0.61	0.60	0.70	1.12	1.00	0.55
At-Sea Whiting (MS)	0.45	0.29	0.56	0.53	0.54	0.55	0.63	0.73	0.98	1.00	1.08
At-Sea Whiting (CP)	0.48	0.67	0.63	0.58	0.59	0.61	0.71	0.70	1.13	1.00	0.56

On the one hand, relative history may be considered more fair and equitable because it weighs each vessel's performance each year based on how it did in its competition with the rest of the fleet given the opportunities present that year (its relative effort level). On the other hand, the amount and distribution of private and community capital involved in the fishery may be more related to total harvests than the proportion of harvest each year. It should also be noted that under a relative weighting scheme, as compared to a straight summing scheme, catch histories that diverge from the pattern exhibited by the entire fleet tend to be rewarded when determining an initial allocation.

The relative pounds (annual share) measure of history puts a heavier emphasis on more recent landing history because landings of whiting have declined during the 1994-2003 allocation period. This may be consistent with MSA language that encourages consideration of current harvests when making an initial allocation. Increasing the emphasis on more recent years through the mechanism of relative weighting could better reflect the distribution of capital and labor in the fishery, depending on how long the capital

persists in a particular use after the investment is made. The MSA also encourages consideration of historic harvests. In a situation where the harvest in recent years has diminished, as is the situation here, recent year harvest could be less of a driver of the current distributions of capital than older history. Because capital is generally a long-lived asset, harvests during years of higher production may drive the current distribution of capital in the fishery more than years of lower harvest, even if those higher years of harvest were in the more distant past.

Alignment of the initial allocation to existing patterns of investment and participation in the fishery reduces disruption to labor, capital, the fishing sector, and communities. Reduced disruption implies greater net benefits because there will be less need for transactions to bring the distribution of capital and labor into line with the distribution of QS.

For the mothership catcher vessel allocation, a choice to use relative pounds (annual shares) will benefit those expected to receive the largest amount of the initial allocation (those with the most catch history) while a choice to use a straight summing of the pounds (absolute pounds) will tend to benefit those that would receive a lesser initial allocation. This pattern of effect on initial allocation is likely a result of a harvest pattern whereby those receiving more have a greater catch history from having participated more consistently over a larger number of years (including significant participation in more recent years) while those receiving less tend to have stronger participation in earlier years relative to their participation in more recent years.

- Endorsement Transferability and Endorsement Severability

Making the CV(MS) endorsement transferable makes the endorsement, or the permit to which it is tied, take on value that is reflected by the amount of revenue that could be generated from CV(MS) activity. Transferability means that the market will be able to determine the participants in the fishery as the more efficient operators purchase those permits and less efficient operators drop out. Transferability also helps ensure that there are harvesters engaged in the fishery over the long run. If, for example, the owner of a permit is deceased, allowing the estate to transfer that permit to another owner will ensure that participation in the fishery remains. If permits could not be transferred, participation in the fishery may eventually disappear.

While a restriction on endorsement severability is intended to maintain stability in the participation of catcher vessels in the sector, it is not immediately clear that restricting the endorsement from being severed from the permit would make participation in the fishery more stable. To the extent that holding endorsements and permits together creates "stickiness" in the market and makes it more difficult for those permits to be transferred, then restricting endorsement severability may make participation more stable.

❖ Accumulation Limits

The ownership limits of 10 to 25 percent could allow for a minimum of 10 to 4 entities to control the mothership sector allocation of Pacific whiting (though it seems unlikely that these minimums would be realized as doing so would mean entities would need to consolidate up to the limit). Under some catch history calculations, one permit may be restricted by the 10 percent ownership limit. Other ownership limits do not appear to be restrictive.

One expected effect of rationalization is fleet consolidation. This is expected to occur because doing so reduces the cost of engaging in fishing opportunity. The usage limit restricts the degree to which fleet consolidation can occur, while the ownership limit restricts the amount of consolidation that can occur among owners of catcher vessel permits. Past information is useful for illustrating the annual catch capability that harvesters in the mothership sector have, and this information is useful for illustrating one potential effect of possible usage limits.

Since 1995, several vessels have caught more than 4,600 mt of whiting in the mothership sector. When compared to the metric tonnage that would be restricted by a 10 percent usage limit under a US whiting OY of 269,545, the catch of some of these vessels would exceed that accumulation limit. It is reasonable to expect that the average catch of mothership catcher vessels would increase as a result of rationalization due to the associated fleet consolidation. A usage limit of 15 to 30 percent does not appear to be as restrictive.

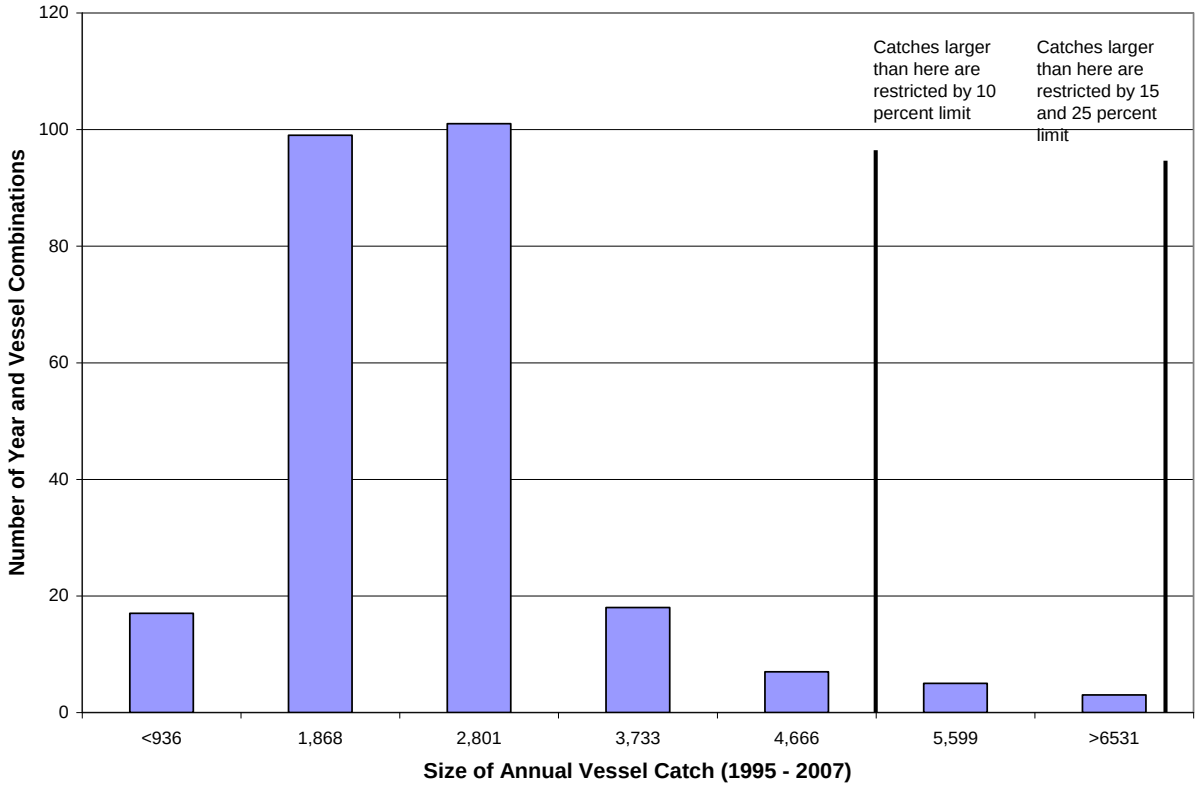


Figure B-7. Frequency of annual vessel catches by metric tonnage category (1995 through 2007).

The information shown above can be complimented with information showing the tonnage associated with the various accumulation limits and two possible whiting OYs. These OYs reflect a range of future whiting OYs based on ranges specified in the recent past. This information shows that in years where the whiting OY is relatively large, most accumulation limits are larger than the annual size of catch by vessels over the past several years. When the OY is relatively small, a 10 percent ownership limit may restrict some entities and a 10 percent usage limit may restrict some vessels.

When viewed in the context of consolidation among the entire fishery (rather than the effect on individual entities and/or vessels), the effect of accumulation limits is different. It is difficult to determine the degree to which rationalization will affect accumulation of catch history at the entity level and the number of entities that will control that catch history. However, the ownership limits of 10, 15, and 25 percent would result in a minimum of 10, 7, and 4 entities owning the catcher vessel catch history in the mothership sector. The usage limit of 30 percent would result in a minimum of four catcher vessels in the mothership sector, though it seems unlikely that any of these minimums would actually be realized.

Table B-9. Mothership catcher vessel accumulation limits and associated metric tonnage based on two hypothetical whiting OYs.

Hypothetical mothership Sector Allocation (mt)	Associated US Whiting OY (mt)	Accumulation Limit and Associated Metric Tonnage			
		10%	15%	25%	30%
63,120	300,000	6,312	9,468	15,780	18,936
34,320	170,000	3,432	5,148	8,580	10,296

B-2.2.2 Mothership Processor Permit

a. Qualifying Entities

Option 1 (Preferred Alternative): The owners of qualifying motherships will be issued MS permits. In the case of bareboat charters, the charterer of the bareboat will be issued the permit.
Option 2: The owners of qualifying motherships will be issued MS permits.

b. Qualification Requirements

A qualifying mothership is one which processed at least 1,000 mt of whiting in each of any two years from 1997 through 2003.

c. Transferability

1. MS permits will be transferable.
2. MS permits may be transferred to a vessel of any size (there will be no size endorsements associated with the permit).
3. **Option 1 (Preferred Alternative):** MS permits may not be transferred to a vessel engaged in the harvest of whiting in the year of the transfer.
   Option 2: MS permits may be transferred to a vessel engaged in the harvest of whiting in the year of the transfer.
4. Limit on the Frequency of Transfers:
   Option 1: MS permits may not be transferred during the fishing year.
   Option 2: MS permits may only be transferred one time during the fishing year.
   Option 3 (Preferred Alternative): MS permits may be transferred two times during the fishing year, provided that the second transfer is back to the original mothership.

d. Usage Limit

No individual or entity owning an MS permit(s) may process more than the following percentage of the total mothership sector whiting allocation:

Option 1: 20 percent,
Option 2: 30 percent,
Option 3: 40 percent,
Option 4 (Preferred Alternative): 45 percent, or
Option 5: 50 percent.

❖ Interlinked Elements

There do not appear to be any components that are substantially interlinked with the mothership permit provisions. However, the sub-options may have a wide ranging array of effects depending upon which sub-option is chosen. The reader is referred to the subsequent options for a more in-depth discussion of these effects.

❖ Rationale and Policy Issues

- Owner of the Vessel or Bareboat Charterer

Eligible entities may include the bareboat charterer of a mothership or the owner of the mothership. The rationale for granting permits to the bareboat charterer is that the chartering entity has engaged in effort and operation of the vessel that has generated historical participation. Therefore, if a permit is to be granted to historical participants, it is the bareboat charterer that has participated in the fishery and that participation should be recognized. Furthermore, granting a permit to the bareboat charterer does not necessarily mean that the charterer will seek out another mothership vessel, so granting a permit to the charterer does not imply the owner of the vessel will be adversely affected.

The rationale for granting the permit to the owner of the vessel is that the owner of the vessel has made an investment in that vessel, and that investment should be recognized and protected by granting a permit to the owner. Granting such a permit to the owner increases the likelihood of that vessel remaining in the fishery and/or protecting the investment of the vessel owner.

- Processing of 1,000 metric tons between 1997 and 2003

Minimum processing requirements are intended to recognize those participants that have substantially participated as a mothership in the Pacific whiting fishery. Using the years 1997 to 2003 is intended to reflect the time period between the date the catcher-processor sector and the mothership sector were separated in regulation (1997) and to be consistent with the control date (2003).

- Transferability

The ability to transfer to a vessel engaged in the harvest of whiting is covered in previous sections documenting the effect of allowing a catcher-processor to operate as a mothership.

The ability to transfer a mothership permit to another mothership may be necessary if, for example, a mothership vessel breaks down. It may also allow mothership vessels to take advantage of unexpected opportunities in other fisheries (such as BSAI Pollock). Allowing a mothership to transfer its permit to another mothership in such a case would provide a way for one mothership to fill the role of the original mothership.

A restriction on the number of transfers ensures that participation in the mothership processing portion of the fishery remains limited. This helps maintain stable relations between motherships and catcher vessels. In a fishery managed with processor linkages, stable relations between processors and catcher vessels translate into more stable operation of cooperatives.

- Usage Limit

A usage limit protects against excessive consolidation of operations among mothership entities. The range of usage limits of 20 to 50 percent examines the effect of allowing a minimum of two to five entities to process the entire mothership sector whiting allocation in a season.

Element of Cooperative Alternative	Conservation	Net Benefits	Disruption	Excessive Shares	Fairness and Equity	Harvester and Processor Sector Health	Labor	Communities	Small Entities and New Entrants	General Public
Owner of the vessel or bareboat charterer			X		X					
Minimum processing requirements					X	X				
Transferability		X				X				
Usage limit				X						

❖ Analysis

- Qualifying Entities

Two options exist for identifying a qualifying entity. One grants the permit to the "bareboat charterer," while the other grants the permit to the owner of the mothership vessel. The decision of which entity to allocate the permit to is, to a large degree, a distributional decision. However, there are some implications associated with this decision, described below.

As described previously, a cooperative program relies heavily on relationships between participants in a cooperative. Relationships between motherships and catcher vessels will likely affect relationships among catcher vessels in a cooperative. The charterer of a mothership vessel operates the mothership, and in this capacity has established relations with catcher vessels. Maintaining this relationship helps make the transition to a cooperative-based fishery more seamless, while disrupting the relationship may make the transition to a cooperative fishery (especially one where linkages are established based on past delivery patterns) more difficult. Therefore, granting a permit to the bareboat charterer of a mothership should help make the transition to a cooperative-based fishery easier than it would be if the permit were granted to the owner of the mothership. Granting a permit to the mothership owner means a different entity could operate that mothership and could have different objectives or relationships with catcher vessels than the previous mothership operator.

On the other hand, granting a permit to the mothership owner makes it more likely that the owner will continue to see his/her investments (in the form of the mothership) participate in the whiting fishery. If the owner is not granted the permit, the charterer could move the permit to another mothership vessel, and the mothership owner could find his/her mothership investment less active, or inactive, in the fishery.

This could lead to a loss of revenue and a devaluation of the mothership as an asset. The likelihood of this outcome is unknown.

- Qualification Requirements

The requirement that a mothership must have processed at least 1,000 mt in each of any two years between 1997 and 2003 means that six motherships, owned by five different entities, would qualify. The following table shows the participation of vessels and entities that have taken deliveries from catcher vessels from the years 1995 to 2007. This indicates that five of those vessels would not receive a mothership permit. Two of these vessels may be better described as catcher-processors that have taken deliveries from catcher vessels in the past, two other vessels are no longer present on the west coast, and the remaining vessel only participated in a single year, after the control date. Based on the information shown below, the qualification requirement eliminates one mothership that only participated in a single year after the control date. Other vessels that have received deliveries from catcher vessels have either left the west coast or are better defined as catcher-processors, meaning the qualification formula does not affect their activities.

Table B-10. Historic participation and mothership qualification.

Company	Vessel Name	Qualify/Does Not Qualify	Year												
			95	96	97	98	99	00	01	02	03	04	05	06	07
All Alaskan	Heather Sea	Does Not	X												
	Saga Sea	Does Not	X												
American Seafoods	American Dynasty	Does Not		X											
	American Triumph	Does Not		X											
	Ocean Rover	Qualifies	X	X	X	X	X	X	X	X	X	X	X	X	X
Arctic Storm	Arctic Fjord	Qualifies	X	X	X	X	X	X	X	X	X	X	X	X	X
	Arctic Storm	Qualifies	X	X	X	X	X	X	X	X	X	X	X	X	X
Peter Pan/ Nichiro	Golden Alaska	Qualifies	X	X	X	X	X	X							X
Premier Pacific	Ocean Phoenix	Qualifies	X	X	X	X	X	X	X				X	X	X
MV Savage Inc/ Cascade Fishing/ Suisan	Sea Fisher	Does Not												X	
Supreme Alaska	Excellence	Qualifies	X	X	X	X	X	X	X	X	X	X	X	X	X

- Transferability

Making an asset transferable allows it to take on value. A transferable mothership permit acts as a capital asset to the permit holder. The value of the permit is theoretically equivalent to the net present value of a future stream of profits associated with engaging in activities allowed by that permit. Unfortunately, no data is available with which to calculate the potential value of a transferable permit. Furthermore, the amount of value a processor permit can generate depends on whether processor linkages exist, and to what degree. Greater processor linkages will tend to make the transferable permit more valuable, as they provide more certainty over future deliveries and grant processors more leverage in negotiations with catcher vessels over profit sharing.

Wide-spread transferability of mothership permits can affect the relations between catcher vessels and motherships, with repercussions to a fishery managed with harvest cooperatives if processor linkages exist. As stated previously, harvest cooperatives rely heavily on long-term, stable relationships among catcher vessels. In a cooperative-based fishery with processor linkages, catcher vessels must negotiate

arrangements with processors. When negotiating arrangements with other catcher vessels in a cooperative, each catcher vessel implicitly brings the interests and arrangements made with the processing entity to the cooperative. In order for the arrangements made with the processing entity to work, it is important that the cooperative agreements allow for those arrangements between the catcher vessel and the processor. If mothership permits are transferred frequently, this can lead to a change in arrangements between processors and catcher vessels, and may change or disrupt the relationships and agreements made among catcher vessels in a cooperative. Therefore, fewer transfers of mothership permits during a fishing year will help stabilize relations between processors and catcher vessels, leading to more stable operations among cooperative members if processor linkages exist.

An annual declaration provision (one year obligation) acts similarly to the linkage case described above. While the declaration can be easily switched in the next year by the catcher vessel, within a particular year the declaration acts like a linkage provision: the declaration means that the interest of the mothership is indirectly brought to the cooperative by the catcher vessel and frequent transfers of mothership permits may cause changes in the relationships between catcher vessels and motherships, thus affecting the cooperative.

Allowing a permit to be transferred to a vessel of any size allows capital in the mothership portion of the fishery to be determined by market conditions, rather than by regulation. This makes it more likely that capital in a rationalized fishery will attain a level that is near, or at, a cost efficient condition (so long as processor ties exist in the program). This is different than an Olympic fishery, where excess capital is more likely to exist. However, if limited entry is put in place but processor linkages are not established, competition would occur among processors for catcher vessel deliveries and this may inhibit the ability of processors to effectively match capital to production volume due to a variety of reasons. One reason is because processors will not be able to plan for delivery volumes as effectively because they will have relatively uncertain expectations about those delivery volumes in any given year.

Allowing a permit to be transferred to a vessel engaged in whiting harvest is covered under the section describing the effect of allowing catcher-processors to also operate as motherships. While it is theoretically possible for a catcher vessel to acquire a mothership permit and engage in mothership activities, the most likely type of vessel that would engage in harvesting and mothership activities (if allowed) is a catcher-processor, because of the amount of capital required to process and handle deliveries of Pacific whiting.

- Transfer Restrictions

Restricting mothership permits from being transferred during the fishing year helps foster stability in relationships between motherships and catcher vessels, and, by extension, the cooperatives. This is especially true if arrangements have been made between motherships and catcher vessels prior to the start of the fishing period. If a mothership permit is transferred during the fishing period to another entity, there is no certainty that the arrangements initially made between the mothership and catcher vessel would remain in place. If those arrangements are not maintained, that can cause instability in the plans of the catcher vessel and the new owner of the mothership permit, especially if linkages between the mothership and the catcher vessel are established, and those linkages follow the permit when it is transferred. By extension, allowing mothership permits to be transferred twice during a fishing year would cause greater instability than a single transfer during a year.

If a mothership experiences a breakdown or other similar event, the ability to transfer permits would allow for another mothership to take its place.

- Usage Limit on Motherships

A usage limit affects the amount of consolidation that can occur in the mothership processing portion of the whiting fishery. Consolidation can affect ex-vessel price negotiations and/or revenue sharing. The fewer mothership processors, the more leverage each mothership processor has in negotiating over ex-vessel prices or profit sharing arrangements. In addition, consolidation can improve the efficiency of the mothership processing sector. If greater quantities per mothership vessel result in greater cost efficiencies, then consolidation may result in a more efficient use of capital resources and greater net benefits to society. Consolidation also depends on fluctuations in the whiting OY. During a low OY year, it may be appropriate to allow fewer motherships to process whiting compared to a year when the whiting OY is relatively high.

Assuming the entire mothership whiting allocation is attained, then the five options for usage limits of 20, 30, 40, 45, and 50 percent could result in a minimum of 5 to 2 mothership vessels processing in the year, respectively. Unfortunately, no data is available with which to estimate the cost efficiencies associated with this number of vessels, nor is data available with which to estimate the potential leverage over ex-vessel prices and profit sharing arrangements that may be associated with these numbers of vessels.

The following information, which uses a reasonable high and low bound for mothership sector allocations of whiting based on the range of Pacific Whiting OYs specified in recent years, may help determine the appropriate usage limit. Historical fishery information was reviewed in an attempt to establish a potential amount of daily mothership capacity (estimated at 450 mt), and this was used to establish an estimate of season length based on a) a possible number of motherships, and b) two possible mothership sector allocation tonnages. For reference purposes, the mothership fishery predominately operates over a month and a half. From this information, it appears that a single mothership may mean the season could last nearly five months long in years where the whiting OY is large, though this seems unlikely given that catcher vessels may not be able to access whiting during the fall months. With two motherships, the season may last just over two months during years when the whiting OY is large. With three motherships, the season may last just over a month if all motherships operated at daily capacity. This is similar to status quo, though the season length under status quo occurs with four to five mothership vessels, suggesting that every mothership is not operating at capacity. If this is true, then establishing an accumulation limit restricting the minimum number of motherships to three may still result in/allow for some consolidation among motherships.

If consolidation limits are set at a level that allows for a single mothership, it is likely that more than one mothership would continue to participate. This is because it is unlikely that a single mothership would have the capacity to handle that volume within the seasonal time constraints. However, it is possible that those motherships operating could be owned by a single company depending on whether the limit applies to the mothership platform or to the mothership company. Therefore, an accumulation limit that restricts the amount of mothership consolidation but does not restrict the number of companies operating those motherships may result in a single entity engaging more than a single mothership.

Table B-11. Potential mothership sector season length based on number of motherships and two hypothetical mothership sector allocation amounts.

Hypothetical Mothership Sector Allocation (Mt)	Associated US Whiting OY	Season Length With 1 Mothership (In Days)	Season Length With 2 Motherships (In Days)	Season Length With 3 Motherships (In Days)
63,120	300,000	140	70	47
34,320	170,000	76	38	25

Even if aggregate consolidation occurs among motherships, individual mothership entities may be restricted by the accumulation limits. Past information shows the amount of volume handled by mothership processing entities/companies, and shows the potential constraint on mothership processing activity from each of the usage limits depending on the mothership whiting allocation. Though not readily apparent from this information, a usage limit of 50 percent may restrict the amount of processing of some motherships in some years. This is especially true in years when the whiting OY may be relatively low.

Table B-12. Range of mothership usage limits in mt based on two hypothetical mothership sector allocation amounts - compared to historic mothership company usage amounts.

Hypothetical Mothership Sector Allocation (Mt)	Associated US Whiting OY (Mt)	Usage Limit and Associated Metric Tonnage				Historic Mothership Activity	
		20%	30%	40%	50%	Max Mothership Company % (1997 - 2006)	Average Mothership Company Mt (1997 - 2006)
63,120	300,000	12,624	18,936	25,248	31,560	36%	9,764
34,320	170,000	6,864	10,296	13,728	17,160		

B-2.3 Co-op Formation and Operation Rules.

B-2.3.1 Who and Number of Co-ops

Co-ops will be formed among CV(MS) permit owners.

Co-op Formation Option 1 (Multiple Co-ops): Multiple co-ops would be organized around motherships. Permit owners choosing to participate in the co-op fishery must form a separate co-op based on the mothership where the CV(MS) permit holders delivered the majority of their most recent year's catch.

Co-op Formation Option 2: Multiple co-ops are not required. Catcher vessels may organize a single co-op or multiple co-ops but are obligated to deliver to the processors as proscribed in B-2.4.

Co-op Formation Option 3 (Preferred Alternative): Co-ops are not required but may be voluntarily formed among CV(MS) permit owners. The number of co-ops will be indirectly limited by the limit on the number of vessels able to form a co-op (see Section 2.3.3-b).

B-2.3.2 When

Each year at a date prior to the start of the fishery, mothership and CV(MS) permit holders planning to participate in the mothership sector must register with NMFS. At that time CV(MS) permit holders must identify which co-op they will participate in or if they plan to participate in the non co-op fishery.

B-2.3.3 Co-op Agreement Standards

a. Submissions to NMFS and the Council

Co-op permit and agreement. Federal co-op permits will be issued for co-op agreements approved by NMFS. Signed copies of the cooperative contracts must be filed with the Council and NMFS and available for public review before the co-op is authorized to engage in fishing activities (DURING COUNCIL DISCUSSION THIS WAS FLAGGED BY NOAA GC AS A POTENTIAL LEGAL

PROBLEM.) Any material changes or amendments to the contract must be filed annually with the Council and NMFS by a date certain.

Letter to Department of Justice. Co-ops must also file with the Council and NMFS a copy of a letter from the co-op requesting a business review letter on the fishery cooperative from the Department of Justice and any response to such request.

b. Number of Participants in Each Co-op (Including Inter-co-ops)

Option 1: Two or more permits may form a co-op for harvesters, but participation must conform to the requirements of Section B-2.3.1.
Option 2 (Preferred Alternative): CV permits may join together in separate harvester co-ops. A minimum of 20 percent of the CV(MS) permit holders are required to form a co-op.[14]

For both options, co-ops may form co-ops with other co-ops. Within one of the whiting sectors, these co-ops may be formed to manage directed catch and/or bycatch.

c. Catch History Distributions among Permits

Co-op agreements must stipulate that catch allocations to members of the co-op be based on their catch history calculation distribution to the co-op by NMFS.

d. Participation by NonCV (MS) Endorsed Permits

Through temporary arrangements, a co-op allocation may be harvested by any catcher vessel holding a valid limited entry trawl permit which has joined the co-op (including one that does not have a CV[MS] endorsement).[15]

e. Other Required Co-op Agreement Provisions:

1) A list of all vessels and permit holders participating in the co-op and their share of allocated catch which must match the amount distributed to individual permit holders by NMFS.
2) Signature by all permit holder owners participating in the co-op.
3) A plan to adequately monitor catch and bycatch.
4) Adequate enforcement and penalty provisions to ensure that catch and bycatch overages do not occur.
5) Measures designed to reduce bycatch of overfished species.
6) Obligation to manage inseason transfers of catch history.
7) A requirement that at least a majority of the members are required to dissolve a co-op, (DURING COUNCIL DISCUSSION, THIS WAS FLAGGED BY NOAA GC AS A POTENTIAL LEGAL PROBLEM.).
8) An obligation to produce an annual report to the Council and NMFS by a date certain documenting the co-op's catch and bycatch data and inseason transfers (the report is to be available for review by the public).
9) Identification of a co-op manager who will

[14] The minimum threshold number of participants required to form a co-op balances the potential advantages for multiple co-ops while limiting implementation and management costs and administrative requirements for managing this sector.

[15] As a member of the co-op, such a vessel would be subject to paragraph B-2.4 and the indicated processor obligations.

a. serve as the contact person with NMFS, the Council and other co-ops,
b. be responsible for the annual distribution of catch and bycatch,
c. oversee transfers,
d. prepare annual reports, and
e. be authorized to receive or respond to any legal process against the co-op.

10) Provisions that prohibit co-op membership by permit holders that have incurred legal sanctions that prevent it from fishing groundfish in the Pacific Fishery Management region.

11) A provision that requires new owners to comply with membership restrictions in the co-op agreements.

f. Additional Provisions for Inter-co-op Agreements

1) In the case of two or more cooperatives entering into an inter-cooperative agreement, the inter-co-op agreement must incorporate and honor the provisions of the individual co-op agreements unless all such agreements (or modifications thereof) are resubmitted for approval.

2) The requirements of paragraph a through e apply to the inter-co-op agreement, except that for the purpose of subparagraph e.7, the members of the inter-co-ops are the co-ops and not the participants in each co-op.

B-2.3.4 Annual Allocation Transferability

a. The annual allocations received by a co-op based on catch history of the whiting endorsements held by its members may be transferred among co-op members and from one co-op to another so long as obligations to processors are met (as per Section B-2.4). Additionally, in order to transfer annual allocation from one co-op to another, there must be a NMFS-approved inter-co-op agreement.

b. Allocations may not be transferred from the mothership sector to another sector.

❖ Interlinked Elements

A requirement that cooperatives are/are not required to form around the motherships to which they deliver is related to ongoing processor ties and movement between processors. If a catcher vessel can switch processors simply by switching the processor to which they deliver the majority of their catch, then not requiring cooperatives to be formed around motherships may erode the benefits motherships can realize from an ongoing processor tie. If a single cooperative is formed for the mothership sector, then a catcher vessel with linkages to processor B can lease catch history from a catcher vessel linked to processor A. Through that simple voluntary lease agreement, the catcher vessel could switch processors because it will have delivered the majority of its catch to another processor in that year. Compared to a requirement that catcher vessels fish in the noncooperative portion of the fishery in order to change processors, this simple switching arrangement provides little disincentive to catcher vessels considering switching processors and may reduce the benefits processors see from rationalization. It is important to note that this interlinkage is not applicable to the mothership declaration provision adopted as part of the Council's final preferred alternative.

❖ Rationale and Policy Issues

- Who Can Form Co-ops

Cooperatives are intended to coordinate members' harvest. Allowing entities that are not harvesters to join a cooperative may affect the performance of those cooperatives. This may mean a different manner of harvesting than if just left up to harvesters. In order to optimize the harvesting performance (both bycatch and economic) of those cooperatives, it is important that those cooperatives be formed by those engaged in harvesting.

Alternatively, requiring cooperatives to form around motherships helps ensure that cooperatives are formed by a like-minded group of individuals, and protects the interests of the mothership by allowing more certainty about who is providing deliveries. This helps motherships facilitate delivery coordination and timing, allowing the mothership to optimize business operations.

Allowing harvesters to form cooperatives that are not necessarily associated with a particular mothership allows harvesters to determine the most appropriate composition of the cooperatives and ensures that they are comprised of like-minded individuals, which is important to their success. Since cooperatives are voluntary and rely on agreed-upon standards by members, having like-minded members increases the potential for cooperative success and long-term cohesion. This helps ensure optimal performance of the cooperative and of the fishery as a whole.

- When

Requiring harvesters to state their intention to participate in a cooperative or in the noncooperative portion of the fishery by a particular date facilitates the administration of the cooperative program on the part of the agency.

- Cooperative Agreement Standards

Requiring standards for cooperative agreements (and requiring that they be filed with and reviewed by NMFS) assures that goals and objectives specified by the Council are being met through a legally binding agreement by cooperative members. Requiring these agreements be filed with NMFS assures that a review process exists to verify that the Council's goals and objectives are likely to be met by the agreement.

Requiring that cooperatives develop a report that is made publicly available aids in the transparency of the cooperative program and allows the Council and NMFS to verify the success of management tools used by the cooperative. If those tools are specified as part of a cooperative agreement, the production of annual reports allows the public and NMFS to determine whether the tools described in that cooperative agreement are likely to be successful in meeting the cooperative's intentions. This helps inform future approval/disapproval decisions on the part of NMFS reviewers and whether particular elements of the cooperative agreement are likely to meet the goals specified by the Council.

Element of Cooperative Alternative	Conservation	Net Benefits	Disruption	Excessive Shares	Fairness and Equity	Harvester and Processor Sector Health	Labor	Communities	Small Entities and New Entrants	General Public
Who can form co-ops	X	X	X			X				
Number of co-ops	X	X	X			X				
When co-ops must be formed										
Cooperative agreement standards	X	X	X	X	X	X	X	X	X	X

❖ Analysis

- Who Can Form Co-ops and Number of Co-ops

Two general options exist for co-op formation. One option requires that co-ops form around the mothership processor to which they deliver. The second option allows a single cooperative to form among all catcher vessels in the sector, but participants in that single cooperative may deliver to several different motherships.

One intention of establishing the multiple co-op requirement was the idea that if multiple co-ops were required, they would more likely be made up of like-minded individuals. The other rationale was that operational timing between the mothership and associated catcher vessels would be improved if multiple co-ops were required.

In regards to the first rationale, theory would indicate that requiring multiple co-ops to be formed may actually restrict the ability for like-minded individuals to co-op with one another. This is because harvesters may have more in common with other harvesters that deliver to another mothership, but those harvesters may have formed a relationship with different motherships for business reasons. Contrary to theory, the logistical operations of the mothership sector will likely lead to a set of catcher vessels that deliver to a mothership to be fairly similar in their goals and objectives and in their relationships with that mothership. Such similarities would tend to lead to those catcher vessels belonging to the same cooperative. This is because cooperatives are formed among parties that can agree to a set of terms. If those parties are similarly minded, it is much more likely they will form cooperatives and agree to terms. The reason similarly minded catcher vessels are likely to have the same mothership in common is because of the relative degree of coordination that occurs among motherships and catcher vessels. In order for the entire mothership operation to be successful, that coordination activity must be successful and be reasonably agreed-upon by both catcher vessels and motherships. Furthermore, agreed-upon delivery timing and delivery rotation is related to coordination of harvest activity among catcher vessels. If catcher vessels delivering to the same mothership also belong to the same cooperative, those catcher vessels can engage in catch history leasing agreements that align with the coordination that occurs with the mothership.

However, allowing catcher vessels to form a broader cooperative that stretches across multiple mothership operations may further enhance the ability of catcher vessels to optimize their operations. A broad cooperative that includes vessels linked to multiple motherships would allow catcher vessels delivering to various motherships to coordinate harvest activity across a wider number of participants. Enhanced flexibility in harvest activity coordination may lead to more desirable results. However, this enhanced flexibility could also be achieved through an inter-cooperative agreement.

In addition to the above factors, not requiring that cooperatives form around motherships may make it more difficult for the mothership to engage in coordination with catcher vessels and this may reduce the ability for motherships to successfully plan business activities for the year. If cooperatives are formed around motherships, those motherships know which entities and catcher vessels they should expect deliveries from during the year, and they know which entities and catcher vessels to coordinate with over operational issues. If catcher vessels form a single cooperative that stretches across the entire mothership sector, motherships may not know which catcher vessels are delivering to them. This is because of the private lease agreements that exist as part of the cooperative and the ability that gives catcher vessels to have another vessel(s) fish their catch and deliver to their obligated processor. This type of uncertainty may make it difficult for the mothership to plan and coordinate delivery activity with catcher vessels. In addition, this makes the processor tie obligations (and the catcher vessels which have those obligations at any given time) less visible. This may reduce the ability for motherships to negotiate with catcher vessels over delivery timing and prices, because they may not know who is planning to fish those obligated deliveries. The result may be a reduction in the benefits motherships may otherwise expect to see from rationalization.

- Co-op and Non Co-op Fishery Declaration

Filing the intention to fish in the co-op or non co-op portion of the fishery is likely to be a necessary rule for administration and implementation of a cooperative-based fishery. In addition, requiring that harvesters state their intention to fish in the cooperative or noncooperative portion of the fishery for that entire season means that cooperative membership will be more stable. Stability in membership during a year increases the incentives for harvesters in a cooperative to work with one another to resolve any potential issues. If harvesters could leave cooperatives or enter cooperatives as the season progresses, substantial administrative workload could result in order to track and modify membership, track appropriate catch histories, and attribute ongoing catch to appropriate cooperatives. In addition, if membership of cooperatives can change throughout the year, there is far less incentive for cooperative members to jointly resolve any unforeseen and problematic issues.

- Cooperative Agreement Standards

In general, requiring that cooperative agreements meet certain standards increases the chances that cooperatives will operate in a manner that achieves objectives stated by the Council. For example, requiring that cooperatives have a bycatch management plan which includes monitoring and penalty provisions means that harvesters in that cooperative will be striving to reduce bycatch. This behavior is consistent with objectives specified by the Council and found in the MSA. In addition, requiring that cooperative agreements be validated by NMFS ensures that those standards are being met.

B-2.4 Processor Ties

Permits will be obligated to deliver:

Option 1: all (the preferred alternative does not include an ongoing obligation but does include a one year obligation)
Option 2: 90 percent[16]
Option 3: 75 percent
Option 4: 50 percent

of their catch (the permits' "obligated deliveries") to certain motherships, as specified in the following sections. Catch that is not so obligated may be delivered to any mothership with an MS permit.

B-2.4.1 Formation and Modification of Processor Tie Obligations

Option for One Year Obligations (Preferred Alternative). There will not be a processor tie that carries from one year to the next. CV(MS) permits participating in a cooperative will be obligated to a single MS permit for an entire year but may change to a different MS permit through a preseason declaration of intent.

Between September 1 and December 31 of the year prior to implementation and every year thereafter, each CV(MS) permit is required to contact NMFS and indicate whether the CV(MS) permit will be participating in the co-op or non co-op fishery in the following year. If participating in the co-op fishery, then the CV(MS) permit must also provide the name of the MS permit that the CV(MS) permit will be linked to in the following year (i.e., annual catcher vessel, mothership linkage that may be changed each year without requirement to go into the non co-op fishery). Once established, the catcher vessel, mothership linkage shall remain in place until changed by the CV(MS) permit. By September 1 of the year prior to implementation and every year thereafter, if the CV permit would be participating in the co-op fishery in the following year, then the CV permit must notify the MS permit that the CV permit QP will be linked in the following year.[17]

Option for Ongoing Obligations. In the first year of the program, the CV(MS) permit owner's choice

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[16] 90 percent was the Council's preliminary preferred alternative, along with a year-to-year processor tie obligations (Section B-2.4.1). *NOTE: During discussion of processor linkage provisions at the Council's June 2008 meeting, the Council members expressed that by selecting a 90 percent linkage option as part of their preliminary preferred alternative it was their intent to provide a means for vessels to move between motherships without entering into the non-co-op fishery. In order to achieve this intent, additional modifications will be required. Specifically, in the last paragraph of the following section, the sentence*

> *"*Thereafter, each year, CV(MS) permit owners choosing to participate in a co-op will deliver their obligated catch to the same mothership to which they were obligated in the previous year."

would need to be changed to read:

> *"*Thereafter, each year, CV(MS) permit owners choosing to participate in a co-op will deliver their obligated catch to the mothership to which they delivered the majority of their catch in the previous year."

[17] February 2010: The last sentence of this paragraph was part of the November 2008 Council motion and was inadvertently omitted from previous drafts of the Council's final preferred alternative. At its April 2010 meeting, the provision was modified to specify September 1st as the notification date. Previously, the date was July 1st.

will be between delivering in the non co-op fishery and making deliveries as part of a co-op. If the permit chooses to participate in a co-op, its obligated deliveries must go to the licensed mothership to which the permit delivered the majority of its whiting catch in:
Option 1: The most recent year that it fished before the program was implemented
Option 2: From 1997 through 2004
Option 3: From 1994 through 2003
Option 4: If the permit chooses to participate in a co-op, its obligated deliveries must go to the licensed mothership to which the permit made a majority of its whiting deliveries in 2009.

If a mothership does not qualify for an MS permit in the first year of the program,[18] the catcher vessel which delivered to that mothership in the previous year may deliver its obligated catch to the qualified mothership to which it last delivered the majority of its catch. If none of the motherships to which the permit would be obligated qualify for an MS permit, the permit may participate in the co-op and deliver to a licensed mothership of its choosing. Alternatively, the permit may choose to participate in the non co-op fishery.

Thereafter, each year, CV(MS) permit owners choosing to participate in a co-op will deliver their obligated catch to the same mothership to which they were obligated in the previous year. However, if the CV(MS) permit owners chose to participate in the non co-op fishery in the previous year, or did not participate in the mothership whiting fishery, they are released from their obligation to a particular mothership and may deliver to any mothership with an MS permit.

Mothership Permit Transfer (applied to both Obligation Options). If a mothership transfers its MS permit to a different mothership or different owner, the CV(MS) permit obligation remains in place and transfers with the MS permit to the replacement mothership unless the obligation is changed by mutual agreement or participation in the non co-op fishery.

B-2.4.2 Flexibility in Meeting Processor Tie Obligations

a. Temporary Transfer of the Annual Allocation within the Co-op or from One Co-op to Another

Temporary Transfer with One Year Obligation (Preferred Alternative). When CV(MS) permit owners transfer co-op allocations from one co-op member to another within the co-op or from one co-op to another within an inter-co-op, such allocations must be delivered to the mothership to which the allocation is obligated through the preseason declaration, unless released by mutual agreement.

Temporary Transfer with Ongoing Obligation. When CV(MS) permit owners transfer co-op allocations from one co-op member to another within the co-op or from one co-op to another within an inter-co-op, **and the allocation that is transferred is part of the obligated deliveries**, such allocations must be delivered to the mothership to which the allocation is obligated, unless released by mutual agreement.

[18] If a mothership that does not qualify for a permit acquires such a permit (i.e., arranges for the transfer of a permit) by the time co-ops are established for the first year of the program, would it be the Council's intent that the catcher vessel obligation to that mothership remain in place?

b. Mutual Agreement Exception

By mutual agreement of the CV(MS) permit owner and mothership to which the permit is obligated, and on a year-to-year basis, a permit may deliver its obligated deliveries to a licensed mothership other than that to which it is obligated.

The following applies only if there is an ongoing obligation to processors (which is not part of the Preferred Alternative): Such an agreement will not change the permit's future-year obligation to the mothership (i.e., the permit will still need to participate in the non co-op fishery for one year in order to move its obligated deliveries from one mothership to another).

B-2.4.3 Mothership Processor Withdrawal

Mothership Withdrawal with One Year Obligation (Preferred Alternative). If a mothership withdraws subsequent to quota assignment, then the CV(MS) permit that it is obligated to is free to participate in the co-op or non co-op fishery. The MS permit shall notify NMFS and linked CV(MS) permits of its withdrawal, and CV(MS) permits shall notify NMFS of their intent to participate in the co-op or non co-op fishery thereafter. If continuing in a co-op fishery, then the CV(MS) permit shall provide NMFS with the name of the new MS permit to which it will be obligated for that season.

Mothership Withdrawal with an Ongoing Obligation. If a mothership does not participate in the fishery and does not transfer its permit to another mothership, or does not agree to transfer delivery to another mothership, the CV(MS) permit holders obligated to that mothership may:

Option 1: participate in the non co-op fishery.
Option 2: join a different co-op and deliver their obligation to a different mothership; or the entire co-op which delivered to that mothership may deliver its obligated catch to a different mothership. The permits will not be required to participate in the non co-op fishery in order to shift from one mothership to another.

SubOption 2a: If the mothership returns within two years, any permit with an obligation to that mothership prior to its departure will have the obligation reinstated, unless the permit has participated for one year in the non co-op fishery. After two years, the permit's obligation will become linked to the mothership to which it most recently delivered its obligated catch.

SubOption 2b: The permit will become obligated to the mothership that it delivers its obligated catch to subsequent to the withdrawal of the mothership to which it was previously obligated.

❖ Interlinked Elements

Processor limited entry. See earlier section on processor licensing.

Processor ties are associated with the mutual agreement exception and whether a catcher vessel must fish in the noncooperative fishery in order to switch motherships, or whether a vessel can fish the unlinked portion of catch history of other vessels in his cooperative and establish a new linkage without ever going into the noncooperative fishery. While each of these elements can technically work together, there may be a substantial cumulative effect that occurs through the combined selection of a number of these sub-options.

Elements Interlinked with Long Term Obligations (not part of the preferred alternative)

Ongoing processor ties (not part of the preferred alternative) and the ability for catcher vessels to move processors by delivering the majority of their catch to a different processor in a given year is substantially related to the decision of whether to require cooperatives to be formed around motherships or whether a

single cooperative could form which delivers to multiple motherships. If a single cooperative is allowed and a catcher vessel can switch motherships by delivering the majority of their catch to a different mothership in a given year, then catcher vessels could simply lease catch history (and the associated linkages) between one another regardless of the processor those catch histories are tied to. Through a simple voluntary lease agreement with catcher vessel B (who is connected to another processor), catcher vessel A could switch processors because it will have delivered the majority of its catch to another processor by leasing catcher vessel B's catch history. If cooperatives are required to be formed around motherships to which they deliver, but can still switch processors by delivering the majority of their catch to a different processor, then movement is relatively more difficult (though still easier than if a vessel is required to fish in the noncooperative fishery). This movement would require a catcher vessel desiring to switch processors to fish the unlinked portion of other vessel's catch history in that cooperative and deliver to a different processor. If that catcher vessel does so, it would need to leave the original cooperative in order to join the new cooperative linked to that new processor and effectively reduce the pool of catch available to that original cooperative. This means that catcher vessels in the original cooperative may be against the idea of a catcher vessel switching motherships because it would involve a departure from the cooperative and a reduction in the pool of catch available to that cooperative. Therefore, other catcher vessels in a cooperative may be reluctant to allow a single catcher vessel to fish their unlinked catch history in order to switch motherships and this may make it more difficult for processor switching to occur.

Mothership withdrawal and the mutual agreement exception are inter-related. The selection of sub-option 2b for mothership withdrawal may affect the good faith negotiations over a possible mutual agreement exception. This could be avoided through the selection of sub-option 2a for mothership withdrawal.

Mutual agreement and the ability for processors to switch motherships by fishing the unlinked portion of other catcher vessels are inter-related and may directly conflict with one another. A mutual agreement allows a catcher vessel to deliver all of its catch to a different processor during the year a mutual agreement is in effect. However, if catcher vessels can switch processors by fishing the unlinked portion of other vessels' catch histories, then language regarding the establishment of a mothership linkage would state:

> Thereafter, each year, CV(MS) permit owners choosing to participate in a co-op will deliver their obligated catch to the mothership to which they delivered the majority of their catch in the previous year.

For more detail, the reader is referred to B-2.4 above. This language is in direct conflict with the intention of a mutual agreement exception. A mutual agreement would allow another vessel to deliver the majority of its catch to another processor, but the quoted language shown above would imply that doing so would result in the permanent switching of processor linkages. This result would be in conflict with the intention of a mutual agreement exception. In order to resolve this issue, Council staff is interpreting the intention to be the following:

> If a mutual agreement is established between a catcher vessel and a mothership, that linkage is not permanently broken regardless of the mothership(s) which the catcher vessel delivers to during the year(s) the mutual agreement exception is in place. Those linkages may be broken, however, if the catcher vessel participates in the non co-op fishery. This provision effectively supersedes the language above describing the rules for switching motherships by delivering the majority of one's catch in a given year to another mothership.

Mothership withdrawal and the subsequent treatment of processor linkages if the processor return is related to the ability for catcher vessels to switch processors by fishing the unlinked portion of catch history of other catcher vessels. If the language shown above is used for determining the processors to

which a catcher vessel is linked to, then this could be in direct conflict with some of the processor withdrawal and return provisions. Council staff is interpreting the interlinkage of these two provisions as the following:

> If a mothership withdraws from the fishery, and Option 2a is chosen for the mothership withdrawal topic, then the linkages will be re-established with the original mothership if that mothership returns within two years. Other sub-options would result in a permanent switching of processor linkages. This provision effectively supersedes the language above describing the rules for switching motherships by delivering the majority of one's catch in a given year to another mothership.

If a provision to allow mutual agreement exceptions is selected, these mutual agreements may need to be filed with NMFS prior to a date certain. This may be necessary in order to adequately monitor the fishery.

❖ Rationale and Policy Issues

- Processor Ties (Ongoing Obligations)

Processor ties help to ensure that processors benefit from rationalization in addition to harvesters. Processor ties increase the certainty that processors have over deliveries from catcher vessels and helps ensure that both processors and harvesters have negotiation power when deliberating over profit sharing arrangements.

- Processor Declaration (Annual Obligations)

Annual declarations are intended to help motherships develop business plans for the coming season. The declaration procedure allows a mothership to develop expectations of catch volume that the mothership will handle during the upcoming season. From this expectation, the mothership company can find markets, purchase adequate supplies (such as packaging), and hire labor that is appropriate for the upcoming fishery.

The Council and several advisory bodies spent a noteworthy amount of time deliberating over whether to have processor ties and in what form. The Council heard substantial amounts of testimony and considered analysis which indicated that rationalization would tend to benefit harvesters, but without a provision to specifically address the interest of the processors, opportunities existed to shift the balance of power in the industry toward the harvesters' favor at the expense of processors. A processor tie was viewed as one mechanism which may work at striking a balance between the harvester and the processor when a fishery moves to rationalization.

During deliberation and consideration over processor ties, NOAA GC indicated that the ongoing processor tie provision raised some issues that may make it difficult for NOAA Fisheries to approve of such a provision. The Council and its advisory bodies considered the appropriateness of other types of tools that may provide an opportunity for motherships to benefit from rationalization, or at least minimize some potentially adverse impacts on motherships that may occur as a result of rationalization. During public testimony over this matter, the Council heard that the lack of any type of tie in the BSAI Pollock fishery nearly led to the bankruptcy of one mothership company involved in that fishery after the fishery was rationalized. The reason for this near bankruptcy was the sudden departure of several catcher vessels from that mothership company after that company had made plans and purchased supplies for that upcoming year. The mothership company was unable to attract deliveries from other catcher vessels and thus was unable to cover the up-front costs that had been assumed by that company prior to the start of the year. Following this testimony, the Council considered an alternative to an ongoing obligation that would

come in the form of an annual declaration. This declaration would act in a manner that would tend to avoid the scenario that occurred in the BSAI mothership Pollock fishery by providing both the mothership and the catcher vessel several months of advance time with which to develop business plans. The Council adopted this annual declaration provision as its preferred alternative.

- Formation and Modification of Processor Tie Obligations

The years considered for the formation of the ongoing processor tie reflects periods intended to match with catch history assignments and also to reflect recent relationships that exist in the fishery prior to rationalization. Maintaining recent relationships is intended to make the transition to a rationalized fishery easier, while aligning linkages to catch history calculation years is intended to match processor participation and receipt of linkages to the catch history that catcher vessels receive.

Making mothership permits transferable while maintaining the ongoing obligations that exist during that transfer is intended to help ensure that processors have a means of benefiting from rationalization and that the purchaser or seller of a mothership permit has a reasonable expectation of having catcher vessel deliveries associated with that permit.

Making the mothership permits transferable while maintaining the annual obligation does very little except in the year during the period of the annual obligation. If a declaration is made to a mothership permit and that permit is transferred prior to the season starting or during the season, that obligation remains and this allows the owner of the MS permit the ability to engage in a short-term arrangement with another mothership company. This arrangement may be beneficial to the original MS permit owner because the transfer occurs with the obligations in place, allowing the original MS permit owner the ability to capitalize on the benefit that comes from those obligations.

- Flexibility in Meeting Processor Ties

Requiring that ties remain in effect even if catch histories are leased to another catcher vessel in a cooperative, or to another cooperative through an inter-co-op agreement, helps to maintain the relative degree of certainty motherships have over whiting deliveries in the current year. If catcher vessels could avoid ties by temporarily leasing catch history to another vessel, the relative certainty that ties are intended to provide to processors would not be meaningful because the ability to avoid processor obligations would be relatively easy.

The mutual agreement exception is a tool intended to allow mothership participation to vary appropriately according to the size of the whiting OY while also allowing catcher vessels to temporarily fish for a different mothership vessel without having to go into the noncooperative fishery. Motherships with a mutual agreement exception option are not liable to find it necessary to participate in the fishery during years when the whiting OY is low, and potentially lose money as a result, just to maintain the existing linkages with catcher vessels. Inversely, catcher vessels with a mutual agreement option can deliver to another mothership temporarily while still being part of a cooperative and realizing the benefits of cooperative membership.

- Mothership Withdrawal

There are two options for dealing with the withdrawal of a mothership from the fishery. One option would require that the catcher vessel fish in the noncooperative fishery in order to deliver to another mothership. The other option explores different ways of leaving the catcher vessel relatively harmless from such a withdrawal.

Element of Cooperative Alternative	Conservation	Net Benefits	Disruption	Excessive Shares	Fairness and Equity	Harvester and Processor Sector Health	Labor	Communities	Small Entities and New Entrants	General Public
Processor ties			X		X	X				
Formation and modification of processor ties	X		X		X	X				
Flexibility in meeting processor ties		X	X		X	X				
Mothership withdrawal		X	X			X				

❖ Analysis

- Ongoing Processor Ties

Ongoing processor ties act differently than an initial allocation of quota shares. Where an initial allocation of quota shares to processors can directly reduce the quota share that may otherwise be allocated to harvesters (or to some other potential group), a processor tie provision does not impact the amount of catch history, or quota share, a harvester may receive. Furthermore, an ongoing processor linkage takes on some of the characteristics of a defensible resource access privilege (like quota shares), but with less "defensibility" on the part of the processor. This is because catcher vessels can switch motherships and break that tie.

Through a processor tie, mothership processors become a more interested party in the harvesting activities of a linked catcher vessel. This linkage provides the processor more certainty over delivery volumes and more leverage in negotiations with catcher vessels over delivery timing and profit sharing compared to a case where no tie or no initial allocation of quota shares exists. The arrangements created between the catcher vessel and the linked processor may influence the manner in which the catcher vessel prosecutes fishery resources, and because of this influence, the creation of processor linkages means that processors have some indirect bearing on the operations of members of a harvest cooperative. However, because that linkage can be broken by the actions of the catcher vessel, such a linkage does not appear to resemble the conditions of a property right (like a quota share does) where assets must be defensible from the actions of others. In other words, the mothership processor cannot "defend" and maintain the linkage if a catcher vessel wishes to switch mothership processors.

Processor ties in a cooperative program may serve several different purposes. One goal of the AFA was to construct a rationalization system that benefited both harvesters and processors, and the ongoing processor tie provision that exists in the shoreside portion of the Pollock fishery appears to have been one means of achieving that goal. The cooperative structure possible under the mothership alternative resembles those created for the shoreside sector of the Pollock fishery under the AFA. Establishing a processor tie makes the harvester and processor both strong entities in the negotiation over profits and the likely outcome is one where profits are shared between both the harvester and processor. In addition, a processor linkage creates a relationship between a harvesting and processing operation that takes on the characteristics of a vertically integrated firm where the harvester and processor work in concert toward a

similar goal. However, as the degree of the processor tie diminishes, it is reasonable to expect the amount of profit sharing to move more toward the harvester's favor because the harvester has more influence over negotiations and can "shop around" for the highest price for the un-tied catch history.

In addition to profit sharing, processor ties influence stability in the relationships between harvesters and processors. It may also affect the willingness of a catcher vessel to remain in a co-op if a catcher vessel and a mothership are at odds, and this may influence the manner in which the fishery is prosecuted. This issue is addressed in more detail in a following sub-section.

The effect of processor ties, and the appropriate degree of processor ties, should be considered along with the degree of vertical integration that exists in a sector. Relatively high degrees of vertical integration may reduce the need for processor ties since a processor that owns a catcher vessel effectively buys fish from itself and can direct the harvest activity of that catcher vessel. In the mothership sector, available information indicates that five trawl permits are "owned" by mothership processing companies and these five permits catch approximately 25 percent of the sector's catch in any year. Anecdotal information indicates that partial ownership of other permits and vessels exist, making vertical integration even larger.

- Annual Declaration

An annual declaration provision, or annual obligation, provides for some business planning certainty for the mothership. The business planning certainty comes from knowing which catcher vessels a mothership will receive deliveries from. Because each catcher vessel receives an annual "catch history," the mothership knows the quantity of fish that it can expect to receive during the course of the upcoming fishing season. With this knowledge, the mothership company can find markets for the processed product and purchase supplies and hire labor that is appropriate for the upcoming season. Making an effective match between supplies and delivery volumes provides for an opportunity for that mothership company to minimize costs.

The declaration provision is likely to lead to the development of relations between catcher vessels and processors that is similar to an ongoing linkage provision; however, these relations may not be as strong. Because the declaration can be broken easily by the catcher vessel, the relations between the processor and catcher vessel are likely to be fairly cohesive within a given year, but those relations may not hold through time.

- Effect of Ongoing Processor Ties on Profit Sharing

If properly constructed, processor ties are likely to result in profits being shared between harvesters and processors. This appears to have been one objective of the AFA and the cooperative structure formed through that legislation. The mothership and shoreside whiting cooperative alternatives resemble AFA cooperatives. One of the most notable differences between processor ties and an initial allocation of shares to processors is the fact that issuing ties results in an outcome between harvesters and processors that begins to resemble the operation of a vertically integrated firm. This is because both the harvester and processor are bound to one another and cannot operate independently, at least in one year. The processing entity cannot process fish without an action on the part of the harvester, and the harvester cannot sell fish without an action on the part of the processor. Furthermore, the harvesting entity cannot move to another processor, and the processor cannot acquire harvest from a vessel that is linked to another processor. This construct leads to two powerful entities involved in negotiation over profits generated by the collective harvest and processing activity, and this type of mutual negotiation power may result in profits being shared between both harvesters and processors. However, over the long term, the harvester can fish in the non co-op fishery and break the tie, thus potentially leaving the initial processor or mothership with no guaranteed catch. This ability on the part of the harvester to un-link themselves

from a mothership by participating in the non co-op fishery provides some long-term flexibility and also provides some negotiation power over motherships simply through the threat of breaking the linkage.

Establishing a partial tie between a harvester and a mothership or processor can alter the relationship that results in profit sharing by playing toward the hands of the harvesters. If shares are allocated to harvesters and processors in an IFQ program, both harvesters and processors can attempt to reach an agreement, but if one is not made, then both the processor and harvester can walk away and fish their quota share independently. In a cooperative system with a processor tie, the processor and harvester cannot walk away from negotiations unless the harvester participates in the non co-op fishery. If that tie is only partial, then the harvester can fish the un-tied portion of the allowable catch and deliver to any processor or mothership. However, both the harvester and the processor are still linked to one another through the tied portion of the catch. Such a situation with a partial mothership tie is likely to shift the balance of power into the harvester's favor, and that balance of power will increase as the percent of linked catch history decreases. The harvester gains power by being able to "shop around" with the un-tied portion of the catch history and to leverage higher prices from mothership processors. Motherships are likely to bid among one another for the un-tied catch history, resulting in higher prices paid to harvesters and eroding profits motherships might otherwise realize if all catch history is linked. Inversely harvesters are likely to realize greater profits and operational flexibility if less catch history is linked to a mothership.

- Effect of Annual Declaration on Profit Sharing

An annual declaration provision does not make it difficult for the catcher vessel to move motherships from year to year. Because of this, the mothership tends to have much smaller amounts of leverage over price negotiations and profit sharing compared to an ongoing processor tie. However, the fact that the declaration must be made several months in advance of the upcoming season is likely to do a couple of things. Since the declaration is made prior to the setting of the Pacific whiting allowable catch level and also well in advance of what may be known about the Pacific whiting market that year, the declaration is likely to result in a profit sharing arrangement of some type rather than an agreement over actual ex-vessel prices. This agreement is likely to be in favor of catcher vessels, as they can shop around for the most beneficial arrangement with relative ease prior to the start of the season.

Degree of Mothership Linkage	Benefit to Catcher Vessel	Benefit to Mothership	Effect on Mothership/Catcher vessel relationship
100%	Smallest profit negotiation scenario to catcher vessel	Greatest certainty over deliveries and price negotiation	Most stable relations between mothership and catcher vessel
90%	Moderately low profit negotiation	Moderately high	Moderately high stability in relations
75%	Moderately high profit negotiation	Moderately low	Moderately low stability in relations
50%	High profit negotiation scenario to catcher vessel	Lowest certainty over deliveries and price negotiation	Lowest stability over mothership and catcher vessel relations
Annual Declaration	Highest profit negotiation scenario to catcher vessel	Greatest certainty over delivery volumes in current year. Low profit negotiation	Relationships may not last over long term, but may be cohesive in a given year

- Effect of Ongoing Processor Ties on Cooperative and Fishery Stability

Stability in the relationship between the catcher vessel and mothership has an economic effect through increased levels of business planning. Establishing a full processor tie creates a relationship that resembles a vertically integrated firm, and operations between the harvester and processor become more aligned as a result. However, reducing the degree of processor tie may stabilize cooperative membership and make it less likely that a catcher vessel will fish in the non co-op fishery in order to break the tie with a mothership. If a catcher vessel is at odds with a mothership, but needs to fish in the non co-op fishery in order to break that tie, the catcher vessel may continue to remain in the co-op if that catcher vessel can deliver part of his catch to someone else. Since the non co-op fishery is inherently less stable than the co-op fishery (because of competition among noncooperative participants), increasing the chances that a catcher vessel will remain within a cooperative may result in more rational fishing practices among participants in a fishery.

On the other hand, if a catcher vessel is engaged in a noncooperative mode, but is intending to establish a linkage with a new mothership, that mothership and catcher vessel will have established relations even though that catcher vessel is in the noncooperative mode. This will undoubtedly affect the behavior of a catcher vessel in that non co-op fishery and may temper some of the irrational behavior theoretically expected of participants in the noncooperative fishery. This is simply because that catcher vessel will need to take into account the needs of the to-be-linked mothership, and that mothership will effectively pace the operations of the catcher vessel to some degree by folding that vessel into its delivery rotation.

Therefore, a cooperative fishery with processor linkages helps ensure that processors benefit from rationalization by giving processors some negotiation power. Furthermore, processor linkages affect the operations of catcher vessels in a cooperative based fishery because negotiations between catcher vessels and processors will include such topics as delivery timing. These linkages also affect the behavior of participants in the noncooperative fishery if those catcher vessels are attempting to establish new relations with processors, and these participants are likely to fish in a more paced manner than simple theory would suggest.

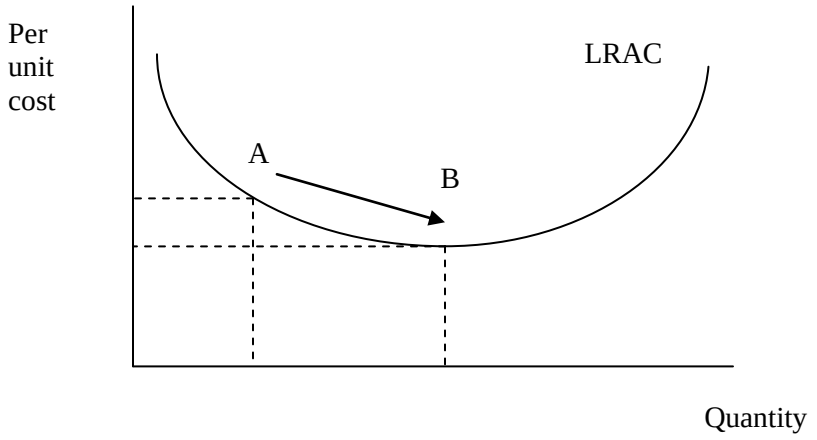
- Effect of Annual Declarations on Cooperative and Fishery Stability

An annual declaration provision may make the relations between motherships and catcher vessels less long term, but it may increase the stability of a cooperative and the fishery as a whole. Since changing the declaration does not require participation in the noncooperative mode, it is reasonable to expect that less participation will occur in the noncooperative fishery under a system with an annual declaration compared to a system with an ongoing tie.

Degree of Linkage	Effect on Profits and Stability
Full processor linkage	Profits likely to be shared between harvesters and mothership processors. Stability exists between the harvester and mothership leading to paced harvest timing. Increases the probability that a catcher vessel will fish in the non co-op fishery to break a processor linkage if the catcher vessel and mothership are at odds.
Partial processor linkage	Profits may be shared, but more heavily weighted toward the harvester than in the case of a full linkage. Reduces the probability that a catcher vessel will fish in the non co-op fishery if they are at odds with a mothership because that catcher vessel can deliver some catch to someone else.
Annual Declaration	Profit sharing arrangements likely to result, but will most likely favor harvesters. Lowest probability of a catcher vessel participating in the noncooperative fishery.

- Processor Ties and the Potential for Rationalization of the Processing Sector

The issuance of harvest privileges grants fishery participants, and their invested capital, the potential to reach the minimum point on the long run average cost (LRAC) curve. Long run average cost is defined as the total cost in the long run divided by output. As shown in the diagram below, a potential cost structure for capital in a fishery prior to rationalization is to the left of the lowest point on the long run average cost curve (depicted as point A). This is because of overcapitalization in the fishery. With the implementation of rationalization, excess capital drops out of the fishery and remaining capital is able to increase production, tending toward the point of cost minimization (point B). Production beyond the minimum point is possible, but is in the realm of "diseconomies to scale" where increasing production begins to increase cost.



Generally speaking, the ability for participants in a rationalized fishery to move toward the minimum point on their LRAC curve is one principal factor determining the reduction of capacity in an over-capitalized fishery. Participants in a rationalized fishery can acquire shares of the allowable catch (either through IFQ transfers or through sharing of catch history) and match production volume to capital capacity. This is possible because those privileges are defensible from others and this eliminates the aspect of competition in the fishery that was originally responsible for build up of excess capital. The tendency is for the amount of capital in a fishery to decrease in order for capital to move toward a point of cost minimization, reflected as the minimum point on the LRAC curve. This is done by reducing the amount of capital in the fishery so that the remaining capital experiences an increase in production. The

amount of capital remaining in the fishery after it is rationalized is partially determined by the tendency toward the point where cost is minimized in the fishery.

The combination of processor ties, transferable mothership limited entry permits, and a mutual agreement exception allows cost efficiencies to be created in the processing portion of the fishery. The effect of these three elements works at reducing the amount of competition among processors for deliveries from catcher vessels and allows processing capital to vary appropriately with variations in the Pacific whiting OY. In a highly competitive structure with no linkages, processing entities would have incentives to participate in the fishery up to a point where economic profits for processing entities approach zero (processors would continue to enter as long as profits can be generated from doing so). The result would be more processing capital than necessary for the fishery. This is cost inefficient. The establishment of a linkage provision with mothership limited entry and a mutual agreement exception makes it possible for processing capital to vary according to conditions in the fishery and tend toward a more cost efficient level. This occurs for a handful of reasons:

- Due to processor limited entry, processors are not concerned that a new processor may enter into the fishery and compete with them for deliveries;
- Processors have more certainty over delivered catch levels through the linkage provision;
- Processors can stack more than one mothership permit, and associated linkages, onto a single mothership, thus allowing consolidation to occur while retaining some certainty over the volume of catcher vessel deliveries; and
- Processors can agree to allow catcher vessels to deliver to other processors through the mutual agreement thereby allowing processor B to take deliveries from processor A's linked catcher vessels without processor A permanently losing those linked catcher vessels and their future deliveries.

This structure starts to resemble the conditions often necessary to confer a defensible and transferable limited access privilege, though it does not meet these requirements fully because the processor linkage can be broken by the catcher vessel. Nevertheless, these similarities facilitate the development of a more cost efficient level of participation among processors in a fishery because it reduces competition among processors for catcher vessel deliveries. This makes it possible for motherships to reduce costs through consolidation (if necessary) and better business planning. Implied in this concept is that linkages exist between the mothership permit and the catcher vessel permit, rather than the physical mothership vessel and catcher vessel.

An annual declaration provision allows for some of these same cost minimization strategies to occur among motherships; however, the situation may be more tenuous than compared to an ongoing obligation. The elements described above also exist for an annual declaration provision, such as allowing transfers of mothership permits to occur with the declared catcher vessels remaining obligated to that permit creating conditions where motherships can stack mothership permits with their catcher vessel obligations and reduce costs. However, since the obligation can be broken easily by the catcher vessel by simply declaring a different mothership in the next year, the mothership company that transfers a mothership permit (and associated catcher vessel obligations) to another mothership will need to carefully consider whether doing so will increase the chances of catcher vessels declaring a different mothership in the next year. If this risk seems evident, motherships may be less willing to engage in the types of behavior that may lead to rationalization of the mothership sector as described above.

● Switching Motherships under an Ongoing Obligation

This section does not apply to the Council's preferred alternative.

Different ways exist for allowing catcher vessels to switch motherships with an ongoing processor tie, or obligation. One option would be to require that catcher vessels participate in the noncooperative portion of the fishery for one year. Another option is related to the unlinked portion of a catcher vessels catch history. This second option would give catcher vessels the ability to switch processors without participating in the noncooperative fishery. Catcher vessels could fish the unlinked catch history of other vessels in a cooperative. If that unlinked catch history resembles the majority of catch of that vessel, and it is delivered to another processor, that catcher vessel is linked to that new processor the following year, effectively switching processors without participating in the noncooperative portion of the fishery. The effect of this provision is that less participation in the noncooperative portion of the fishery may occur. This can have an impact on the success of bycatch management since the noncooperative fishery is a derby fishery and harvesters in such a mode may be less likely to fish cleanly. However, the logistics of a mothership sector operation may mean that the potential for a catcher vessel in a noncooperative fishery to race for fish (and therefore not fish cleanly) is minimized if that catcher vessel is attempting to establish a new linkage with a mothership. This concept was discussed in the above subsection. A catcher vessel in the noncooperative fishery attempting to establish a new linkage with a mothership would still need to operate alongside other catcher vessels that may be in a cooperative fishery but delivering to that mothership. In doing so, that noncooperative fishery catcher vessel would be subject to delivery rotations and would need to travel with that mothership and the cooperative fishery catcher vessels as that mothership operation moves. Furthermore, a catcher vessel attempting to establish a new linkage with a mothership will undoubtedly take into account the needs of the mothership even while that catcher vessel is in a noncooperative fishery mode where they are competing with other catcher vessels for catch. These conditions would tend to pace the fishing effort of the catcher vessel to some degree and result in less "irrational" behavior than may be theoretically expected.

Switching Motherships under an ongoing tie and the requirement to have multiple cooperatives are substantially related. If catcher vessels can switch processors by delivering the majority of their catch to another processor rather than fishing in the noncooperative fishery, then the decision of whether to require multiple cooperatives around motherships can have a substantial effect. If a cooperative can be formed around multiple processors, and catcher vessels can switch processors by simply delivering the majority of their catch to another processor in a year, then the effect of a processor tie may be substantially reduced. Under this scenario, a catcher vessel could enter into a lease agreement with another catcher vessel that is linked to another mothership. If deliveries from that catcher vessel to that other mothership constitute the majority of that vessel's catch, then the catcher vessel (and associated catch history) would be linked to that new mothership in the following year. This provides little disincentive to a catcher vessel considering the possibility of switching motherships and substantially reduces the effect of a processor tie. The outcome is one where catcher vessels have substantially more leverage in negotiations over prices and other matters. Some processor leverage could be established if cooperatives are required to form around the mothership to which they are tied and even more processor leverage could be established if catcher vessels must fish in a noncooperative fishery to switch processors.

- Summarization of the Effect of Processor Ties on Mothership and Catcher Vessel Relations and Profit Sharing

In summary, a cooperative system with ongoing processor ties should theoretically result in two powerful entities negotiating over profits in the fishery. The outcome is likely to be one where the operation of the mothership and the catcher vessel resemble the operation of a vertically integrated firm, and profits are shared between the harvester and processor. Furthermore, when combined with processor limited entry and a mutual agreement exception, linkages decrease the amount of competition among processors and make it possible for the processing sector to rationalize itself and to match the amount of processing capital in the fishery to the whiting OY.

If an ongoing processor tie is established and that tie is less than 100 percent, harvesters are likely to experience greater negotiation power over mothership processors when negotiating over profits compared to a case where ties are 100 percent. As the tie provisions decrease from 100 percent, negotiation power on the part of harvesters is likely to increase.

If harvesters are able to switch processors without participating in the noncooperative portion of the fishery, processor switching may be more likely, reducing the certainty that processors have over future deliveries, increasing the negotiation power that catcher vessels have over profit sharing arrangements, and therefore skewing profits more toward the harvester's favor. However, not requiring that catcher vessels participate in the noncooperative fishery in order to switch processors is likely to lead to fewer occurrences of vessels in the non co-op fishery. While theory would suggest that minimal participation in the noncooperative fishery will improve the performance of the fishery, the effect of processor linkages may carry into the noncooperative fishery and influence catcher vessel behavior in that fishery. The likely result is a more measured pace of fishing among noncooperative fishery participants than theory would suggest. However, it is still likely that the noncooperative fishery will have a lower degree of economic bycatch, and general fishery management performance compared to the cooperative fishery.

If catcher vessels switch processors without participating in the noncooperative fishery as described above, and single cooperatives can span multiple motherships, then the effect of the processor tie may be minimal. Through simple leasing of catch histories, catcher vessels can move processors by "delivering the majority of their catch" to another processor in a year through that lease agreement. The result is one where the processor tie may be largely ineffective in helping processors benefit from rationalization, but on the other hand, is likely to result in greater economic benefits and flexibility to harvesters.

An annual declaration provision works differently than an ongoing processor tie. The declaration provision allows the mothership entity to develop business plans for the upcoming year, but because switching motherships simply requires the catcher vessel to declare a different mothership in a subsequent year, the mothership entity has far less negotiation power over profits compared to a case where there is a full and ongoing processor tie. Since switching motherships is relatively easy under a declaration provision, participation in the noncooperative portion of the fishery is expected to be less than a fishery with ongoing processor tie provisions where the way to break those ties is through participation in the noncooperative fishery. This means that fishery performance may be greater under a fishery with declarations than a fishery with ongoing ties.

Method of Switching Motherships	Effect on Catcher Vessel	Effect on Mothership
Requirement to fish in non co-op fishery	Results in less negotiation power over prices and other aspects of mothership/CV relationship	Provides motherships relative certainty over future deliveries and some leverage over negotiations with CVs
Can switch motherships by fishing unlinked catch history of other co-op participants	Increases CV negotiation power over prices and other aspects of mothership/CV relationship	Reduces certainty over deliveries and minimizes leverage over negotiations with CVs
Can switch motherships by leasing a catcher vessel's catch history that is linked to another mothership	Increases CV negotiation power over prices and other aspects of mothership/CV relationship to a greater degree than above method	Minimizes the potentially beneficial outcome processors may realize from processor ties
Annual Declaration	High CV negotiation power over profits and other aspects of mothership/CV relationship	Allows for business planning on the part of the mothership. Provides little leverage in negotiation over profits and other matters

- Formation and Modification of Ongoing Processor Ties

This section does not apply to the Council's preferred alternative.

Each option for tie formation creates a relationship between a catcher vessel and a mothership based on patterns that exist prior to the implementation of a rationalization program. Implementing a system that maintains past relationships between harvesters and motherships may ease the transition from status quo management to a rationalized fishery. However, each of these options may result in some implications that, although short-term, may have mixed effects.

Option 1 has potential benefits in that it maintains the most recent relationships between motherships and catcher vessels, and therefore the transition from status quo management to a rationalized fishery may be made easier, at least theoretically. However, Option 1 may inadvertently result in a race for catch history among motherships in the year immediately prior to the implementation of the rationalization program. This could mean that harvesters receive higher prices for their fish that year, but it also may end up stimulating race for fish conditions in the mothership sector above those which already exist. Furthermore, those vessels that are less active in the fishery, but stand to gain catch history due to historic participation in the fishery, will find it necessary to participate in the fishery prior to rationalization in order to establish a processor linkage. Such participation by participants relatively unfamiliar with the fishery may make bycatch management in the fishery in the year prior to rationalization problematic. However, a failure for these participants to make a delivery to a mothership prior to rationalization may mean that participation in the noncooperative portion of the fishery is necessary for these vessels to establish a linkage with a mothership and participate in a cooperative. Option 4 is likely to result in the same outcome, except that the competitive behavior described above would tend to occur in 2009.

Potential ways of avoiding such a scenario are to allow vessels that do not fish in the year prior to rationalization, or in 1999, to establish a linkage with a mothership through a mutual agreement at the start of the program. A second method is to allow vessels that do not fish in the year prior to rationalization to join a cooperative and to deliver to a mothership of its choosing in the first year of the rationalization program. The processor linkage would be established in the second year of the program based on the mothership to which that vessel delivered the majority of its catch in the first year of rationalization. This type of situation would avoid the race for fish potential in years prior to rationalization as well as avoid the relatively high rate of participation in the fishery by unfamiliar

operators in years prior to implementation. The outcome may be more successful management of bycatch in years prior to implementation of a rationalization program.

Options 2 and 3 implement a program that maintains historic relations between motherships and catcher vessels; however, these historic delivery patterns will be several years removed by the time a rationalization program goes into effect. If the rationalization program goes into effect in 2011, for example, Option 2 would be 7 years removed, while catch patterns under Option 3 would be 8 years removed. These options may not result in the possibility of race for history conditions like under Option 1, but the relationships established under Options 2 and 3 may not be the same as those that exist immediately prior to the implementation of a rationalization program, potentially making the transition to rationalized fishery conditions somewhat difficult.

- Mothership Permit Transfers

Maintaining the ongoing tie between catcher vessels and motherships during the transfer of a mothership permit provides additional certainty to the purchaser of the mothership permit and increases the certainty a potential buyer has regarding the expected returns associated with that permit. Under an annual declaration procedure, this relative certainty over future returns associated with the permit does not exist as the obligation can be easily moved to another mothership by the catcher vessel. However, if that transfer occurs during the period of the declaration, then that new permit owner has some relative certainty in the current year.

Maintaining the obligation during the permit transfer also provides a mechanism for mothership entities to trade linked catch history among one another, and if permits are stacked on more than one mothership, to allow for a form of rationalization in the processing portion of the fishery.

As stated previously, constructing a cooperative-based system with processor ties implicitly makes mothership interests part of the harvesting activity. This implicit interest becomes evident because of the relationships that exist between the owner or operator of the catcher vessel and the owner or operator of the mothership. When a new owner acquires a mothership permit, that owner's interests will influence the relations between the catcher vessel and mothership. If interests and objectives are similar to the old owner of the mothership permit, then the transition from the old mothership permit owner to the new mothership permit owner – and the effect that transition has on linked catcher vessels – may be relatively seamless. However, if the new owner of the mothership permit has substantially different interests and objectives than the old owner of the mothership permit, then the sale of a mothership permit may cause some adverse effects on catcher vessels linked to that permit and make the transition to the new owner somewhat difficult. Since linkages make processing interests implicit in the behavior of cooperative members, a difficult transition could adversely affect the operation of a cooperative. However, under a declaration procedure, the effect of that interest is likely to be short-term, as the catcher vessel can easily switch motherships in the subsequent year.

- Flexibility in Meeting Processor Tie Obligations

If CV(MS) permit owners transfer catch privileges to another participant in the same co-op or one co-op establishes an inter-cooperative agreement with another cooperative to transfer catch, then the original processor tie obligation still remains. Requiring that the original tie be adhered to retains the mothership's expected deliveries and allows processors to realize other benefits from rationalization described previously, while also allowing harvesters the flexibility to share and transfer catch history in order to maximize harvest potential and net revenues.

♦ *Mutual Agreement Exception*

By mutual agreement, the processor tie can be broken temporarily. If both the CV(MS) permit owner and the mothership agree, then the catcher vessel may deliver its catch to another mothership. This mutual agreement exception is temporary and allows catcher vessels to deliver to another mothership if a case arises where the original mothership does not elect to participate in the fishery. The fact that the mutual agreement exception is temporary means that the future expectation of catch being received by the first mothership can still be reasonably expected if that mothership returns to the fishery, if that fishery has an ongoing obligation rather than a declaration. If a declaration exists, the mutual agreement exception allows the catcher vessel to deliver to another mothership should the declared mothership not participate in the fishery. That catcher vessel can simply switch to another mothership the next year, meaning the mutual agreement exception has no long-term effect if a processor declaration procedure is established.

This mutual agreement exception allows capital in the processing portion of the fishery to be more in line with the available harvest in the fishery. In a fishery with ongoing obligations, this is due to the fact that processors with linkages to catcher vessels do not fear losing those catcher vessels in subsequent years if they can temporarily release them to another mothership through that mutual agreement. This means that the ongoing processor linkage is somewhat "defensible" even if the mothership does not participate in the fishery. The presence of this defensibility means the mothership is at a minimized risk of losing linked catcher vessels and can elect to not participate in the fishery during years where the available harvest of whiting is low. Instead, some motherships may allow another mothership to take the deliveries of their linked catcher vessels. In effect, this allows the amount of capital in the processing side of the fishery to become more aligned with the available harvest, and this results in the minimization of processing costs (relative to the available harvest) and enhanced efficiency. If such a mutual agreement does not exist, it would be more likely that all motherships would be engaged in the fishery each year, at times leading to excess processing capacity and cost inefficiencies. Inversely, if motherships did not participate in the fishery and a mutual agreement provision does not exist, catcher vessels linked to that mothership may be required to fish in the noncooperative fishery, though not necessarily (the reader is referred to the next section on processor withdrawal for further discussion of this topic).

In a fishery with a declaration procedure, the mutual agreement exception also allows for a form of processor sector rationalization. While the obligations are short-term, the processing entity may find that participation in the fishery cannot be justified after the declarations have been made. This could be for a variety of reasons, including the possibility that after the declarations are made, the Pacific whiting stock assessment results in a relatively low allowable harvest level. In a case where less processing capital is necessary, the mutual agreement exception provides the processor with some say over where the catcher vessel delivers its fish. This could prove to be more beneficial to that processor than compared to a case where the processor has no say in where the catcher vessel goes.

In the event that a processor withdrawal would otherwise require catcher vessels to fish in the noncooperative fishery to deliver to another mothership, then the mutual agreement exceptions allow catcher vessels to continue operating in cooperatives if a mothership does not wish to participate in the fishery. This would tend to maintain the benefits catcher vessels have from rationalization of the fishery.

● Mothership Processor Withdrawal

A mothership's withdrawal from the fishery without a permit transfer or without a mutual agreement exception can affect catcher vessels with catch history that is linked with that mothership's permit. Several options exist for catcher vessels in this situation. One option would require that the catcher vessel participate in the noncooperative fishery. The second option would allow the catcher vessel to join another cooperative and deliver to another mothership. Two sub-options to the second option exist in the event the original mothership returns, but these sub-options only apply to a fishery with ongoing

obligations. One option states that if the original mothership returns within two years, the original linkages (if the fishery has ongoing obligations) would be reestablished, while the other option states that the catcher vessel will be linked to a new mothership (if ongoing obligations are in place) and will not be affected if the original mothership returns. If the fishery includes a declaration procedure rather than an ongoing obligation, then the effect on the linkage when the processor returns does not apply.

The effect of these provisions impact catcher vessels linked to the withdrawn mothership in several ways depending on the option. If the catcher vessel is forced to participate in the noncooperative fishery, then the mothership withdrawal from the fishery effectively penalizes the catcher vessel because that vessel must fish in a competitive fishery. On the other end of the spectrum is the option which would allow the catcher vessel to stay within the cooperative fishery and deliver to a mothership of its choosing. This leaves the catcher vessel harmless, but it may mean that a catcher vessel is not as liable to engage in a mutual agreement if a mothership does not wish to participate in the fishery, but is seeking out a mutual agreement with a catcher vessel. If, for example, a mothership does not plan to participate in the whiting fishery and seeks out a mutual agreement with a catcher vessel, that catcher vessel may be more inclined to refuse any agreement. If that mothership then withdraws from the fishery anyway, that catcher vessel would then be free to deliver to any mothership and be released from the linkages to the prior mothership. In the middle of the spectrum (but only if an ongoing processor obligation is included) is one which would allow the catcher vessel to continue participating in the cooperative fishery if a mothership withdraws, but require that the original linkage be established if a mothership returns. This may make it more likely that both catcher vessels and motherships would seek out mutual agreements in good faith because they would both expect to be re-linked in the future if a mothership withdraws from the fishery. However, this option would not penalize the catcher vessel if the mothership withdraws from the fishery. Therefore, Option 2a for mothership withdrawal may help maintain good faith in relationships between catcher vessels and motherships (and good faith in dialogue over mutual agreement exceptions) while avoiding any penalizing impacts on catcher vessels in the event a mothership withdraws from the fishery.

B-2.5 NMFS Role

B-2.5.1 Permit and Endorsement Issuance

NMFS will issue all necessary permits and endorsements under the rules specified under this program. Appeals processes will be provided as appropriate and necessary.

B-2.5.2 Fishery Registration and Co-op Approval

NMFS will announce a deadline before which all co-op agreements must be received for the coming year. NMFS will review and approve or reject co-op agreements based on standards provided here and other standards which it deems necessary to achieve the policy intent of the Council's actions.

B-2.5.3 Annual Allocation to Co-ops and the Non Co-op Fishery

a. Co-op Allocation

Each year NMFS will determine the percent of the mothership sector's harvest allocation to be given to each co-op based on the catch history calculation of CV(MS) permits registered to participate in the co-op that year. NMFS does not allocate to the individual permit holder, but rather allocates an aggregate amount of harvest tonnage annually to the co-op, based on the catch histories associated with the members of the co-ops.

b. Non Co-op Allocation

Each year NMFS will determine the distribution to be given to the non co-op fishery based on the catch history calculation of permit holders registered to participate in that fishery.

c. Adaptive Management Allocation *(not part of preferred alternative)*

In determining the amounts available for co-ops and the non co-op fishery, subtractions will be made, as necessary, for the adaptive management set aside described in Section B-1.6.

B-2.5.4 Fishery Management and Co-op Monitoring

a. NMFS will track all permit and endorsement transfers (if endorsement transfers are allowed) and the invocation of mutual agreement exceptions. Permit and endorsement transfers will not be valid until registered and acknowledged by NMFS.
b. NMFS will monitor catch and close segments of the fishery as necessary to ensure catch limits are not exceeded for:
    1. the whiting mothership co-op fishery,
    2. the whiting mothership non co-op fishery, or
    3. the mothership whiting sector as a whole,
c. NMFS will not necessarily monitor but will investigate and enforce as it deems necessary the permit and co-op obligations to processors.
d. NMFS will not necessarily monitor or enforce (except as it deems necessary):
    1. an individual permit's progress towards its catch allocations (permit level catch control will be at the co-op level and enforced through execution of the private contract),
    2. a co-op's progress toward its catch allocation,[19] or
    3. actual performance on the co-op agreement (the parties to the contract will resolve through private contract and remedies any deviation from provisions such as that requiring that a vessel have the opportunity to harvest the catch allocated to the co-op based on that vessel's permit, Section B-2.3.3.c).
e. NMFS will monitor other program provisions as needed. In some situations, there may need to be a declaration procedure for determination where a permit is delivering its obligated catch, for example, if a mothership withdraws without transferring its permit or reaching a mutual agreement for the transfer of obligated deliveries to a different mothership.
f. ***Not part of preferred alternative:*** NMFS will administer the adaptive management program, allocating the set aside for that program as needed based on the adaptive management goals, objectives and adjustment measures recommended by the Council.

❖ Rationale, Policy Issues, and Analysis

The current Pacific whiting fisheries are managed at the sector and fleet level. Managers monitor fleet harvests attempting to time their closure announcement with either the full harvest of the sector allocation of OY or the attainment of a common bycatch limit (beginning in 2009, bycatch limits are managed at the sector level). The level of management specified in the mothership sector cooperative alternative would require that the agency monitor catches at a lower, cooperative level, and take action when a cooperative, or inter-cooperative, is projected to reach its allocation. Furthermore, season timing is expected to change under rationalization and agencies will need to modify resources to monitor the fisheries over different time periods than what occurs under status quo.

[19] This assumes that there is an inter-co-op agreement in place that covers the entire co-op fishery. If such an agreement is not in place covering both catch and bycatch, NMFS may need to monitor catch by each individual co-op (but not by the individual vessels in the co-op).

The implementation of a cooperative system for the mothership sector will require that agencies develop resources necessary for reviewing cooperative agreements, developing infrastructure and programming necessary for estimating the collective catch history of various cooperatives, estimating the amount of catch each cooperative is available to catch each year, and debiting the appropriate amount of catch from the various cooperative pools as the fishery progresses.

The role of NMFS as specified in the options assures that the agency remains in a relatively strong position over the management of fishery resources and assures that the objectives of the Council are being met by participants in a cooperative-based fishery.

In order to administer the program effectively, it is necessary to establish a date by which cooperative agreements must be submitted and participants must state their intention to fish in a cooperative or in the noncooperative portion of the fishery. Establishing a date by which such filings must be made allows the agency the time necessary to review and approve/disapprove cooperative agreements prior to the start of the fishery and set up the appropriate systems for tracking catch and managing the fishery.

B-3 Whiting Shoreside Sector Co-Op Program

The cooperative alternative for the shoreside whiting fishery is identical, in many respects, to the mothership sector alternative which was analyzed in the previous section. Therefore, analyses of many elements of the shoreside whiting alternative are not repeated here. However, some differences do exist between the shoreside whiting alternative and the mothership whiting alternative, most notably in the processor licensing and linkage provisions. The principal differences between the shoreside whiting cooperative proposal and the mothership proposal include:

- Shoreside processor licenses expire after two years.
- Shoreside processor linkages may link a catcher vessel to more than one processor.
- Any shoreside processor may receive deliveries from vessels in the noncooperative fishery during the first two years of the program.
- The number of years a catcher vessel must participate in the noncooperative fishery in order to break a processor linkage may be one to five years.

The effects of a shoreside whiting cooperative alternative may differ from the effects of a mothership whiting cooperative alternative, particularly when considering the behavior of catcher vessels in a noncooperative fishery. This is due, in large part, to the characteristics and logistical differences that exist in the shoreside and mothership sectors of the whiting fishery. Much of this difference was illustrated in previous sections at the start of this document, so these effects are mentioned only briefly here:

- Participation in a noncooperative portion of the fishery may be more frequent in a shoreside cooperative program than a mothership cooperative program. This appears to be the case because of the apparent frequency at which shoreside catcher vessels tend to switch processors under status quo conditions. If this frequency underlies motivation for switching processors under a cooperative fishery, the result may mean more frequent participation of shoreside catcher vessels in a noncooperative fishery. This can have implications for economic performance of the sector as a whole and for management concerns if behavior in such a fishery is less “rational” and leads to higher bycatch than in the cooperative side of the fishery.

- The relations that exist between mothership catcher vessels and mothership processors may temper the behavior that catcher vessels in the noncooperative portion of the fishery have in that

sector. This may mean greater economic and bycatch performance in the mothership noncooperative fishery than pure theory would indicate. It is possible that such a tempering effect exists in the shoreside fishery as well, but information indicates that it may not exist to the same degree in the shoreside whiting sector, if at all.

- When the above factors are combined with a requirement that a shoreside catcher vessel may need to participate in the noncooperative fishery for more than one year in order to switch processors, the economic and bycatch performance of the shoreside fishery as a whole is likely to be less than the performance of the mothership fishery operating under a similar cooperative structure.

Before considering the particular elements of the shoreside whiting cooperative program that differ from the mothership cooperative program, it is important to point out several factors that are related to the decision of whether to manage the shoreside sector with cooperatives. These include:

- Shoreside processor licensing and linkages do not appear to be authorized under MSA. This differs from the mothership sector because a legal opinion has identified mothership operations as fishing whereas shoreside processing is not defined as fishing.
- The selection of harvest cooperatives as a tool for rationalizing the shoreside whiting fishery necessitates the selection of four distinct trawl sectors as opposed to three trawl sectors (which would be possible if the shoreside whiting and nonwhiting sectors were both managed with IFQs).

B-3.1 Participation in the Shoreside Whiting Sector

a. Catcher Vessels

Vessels with CV(SS)-endorsed permits may participate in either the co-op or non co-op portion of the shoreside fishery. They will choose annually which portion of the fishery they will participate in for the coming year. Additionally, any groundfish LE trawl permitted vessels may participate in the co-op portion of the fishery if they join a co-op (as described in Section B-3.3.3).[20] No other catcher vessels may participate in the shoreside whiting sector.

[20] When such permits participate in a co-op, the co-op will not be allocated any additional fish based on participation by such a vessel.

b. Processors

Any processor may receive fish from vessels participating in the shoreside non co-op fishery. In the first two years, only co-op qualified shoreside processors[21] that have declared their intent to participate may receive deliveries from catcher vessels in a shoreside co-op (Section B-3.3). Thereafter, any shoreside processor may receive deliveries from co-ops.

c. Catcher Vessels and Processors in the Nonwhiting Fishery

This program does not affect vessels or processors receiving whiting taken incidentally in the nonwhiting fishery.

B-3.2 Permits/Endorsement Qualification and Characteristics

B-3.2.1 Catcher Vessel Shoreside Whiting Endorsement (CV(SS) Endorsement)

a. Endorsement Qualification and History Assignment

Permits with a qualifying history will be designated as CV(SS) permits through the addition of a CV(SS) endorsement to their LE groundfish permit. At the time of endorsement qualification, each permit will also be assigned a catch history that will determine the share of the shoreside whiting allocation associated with that permit.

Qualifying for a CV(SS) Endorsement. An LE permit will qualify for a CV(SS) endorsement if it has a total of more than 500 mt of whiting deliveries to shoreside processors from 1997 through 2003.

Catch History Assignment. An initial calculation will be used to determine NMFS's distribution to co-op and non co-op fishery pools. A CV(SS) permit calculated landings history will be based on whiting history during the related permit's best 6 out of 7 years from 1997 through 2003. (Note: for vessels qualifying in both the shoreside and mothership co-op programs, the same year must be dropped.)

For the purpose of the endorsement and initial calculation, landing history associated with the permit includes that of permits that were combined to generate the current permit.

c. Accumulation Limits

CV(SS) Permit Ownership. No individual or entity may own CV(SS) permits for which the allocation totals greater than 15 percent of the total whiting shoreside allocation.

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[21] **A shoreside processor** is an operation, working on U.S. soil, that takes landings of trawl-caught groundfish that has not been processed at-sea or previously processed shoreside, and that thereafter subjects those groundfish to shoreside processing. Entities that received fish that have not undergone at-sea processing or shoreside processing (as defined in this paragraph) and sell that fish directly to consumers shall not be considered a processor for purposes of the shoreside co-op program.
"Shoreside processing" is defined as any activity that takes place shoreside; and that involves:
a) cutting groundfish into smaller portions; or
b) freezing, cooking, smoking, drying groundfish; or
c) packaging that groundfish for resale into 100 pound units or smaller for sale or distribution into a wholesale or retail market.

Element of Cooperative Alternative	Conservation	Net Benefits	Disruption	Excessive Shares	Fairness and Equity	Harvester and Processor Sector Health	Labor	Communities	Small Entities and New Entrants	General Public
Catcher vessel participation in SS whiting sector		X	X		X	X		X		
Processor participation in SS whiting sector			X		X	X		X		
Endorsement qualification			X		X	X		X		
Catch history formula			X		X	X		X		
Accumulation limits				X	X	X		X		

❖ Analysis

A total of 54 permits have reported deliveries of shoreside whiting during the 1997 to 2003 period. Of these, 45 permits have made landings larger than the 500 mt minimum for qualification of a CV(SS) permit. When examined on a year to year basis, the number of permits in the fishery is much smaller. During this period, a range of 38 to 29 permits participated in the fishery in any given year. Of the 54 permits that reported deliveries between 1997 and 2003, only 15 reported deliveries of shoreside whiting in each of the 7 years. On average, the 54 permits reporting deliveries were active 4 out of the 7 years.

Table B-13. Summary statistics on shoreside whiting permit participation from 1997-2003.

Total number of permits reporting SS whiting deliveries (1997 – 2003)	Total number of permits delivering at least 500 metric tons (1997 – 2003)	Number of permits active in the fishery in any given year (1997 – 2003)	Number of permits active in all 7 years	Average number of years each permit was active in the fishery
54	45	29 to 38	15	4

The number of active permits in the fishery over the time period appears to be affected by the variations that existed in the Pacific whiting OY and the Pacific whiting market during that time period. During 2002 and 2003, the fewest number of permits were active in the fishery compared to the previous years, and this was a time of relatively low whiting OYs and poor market conditions.

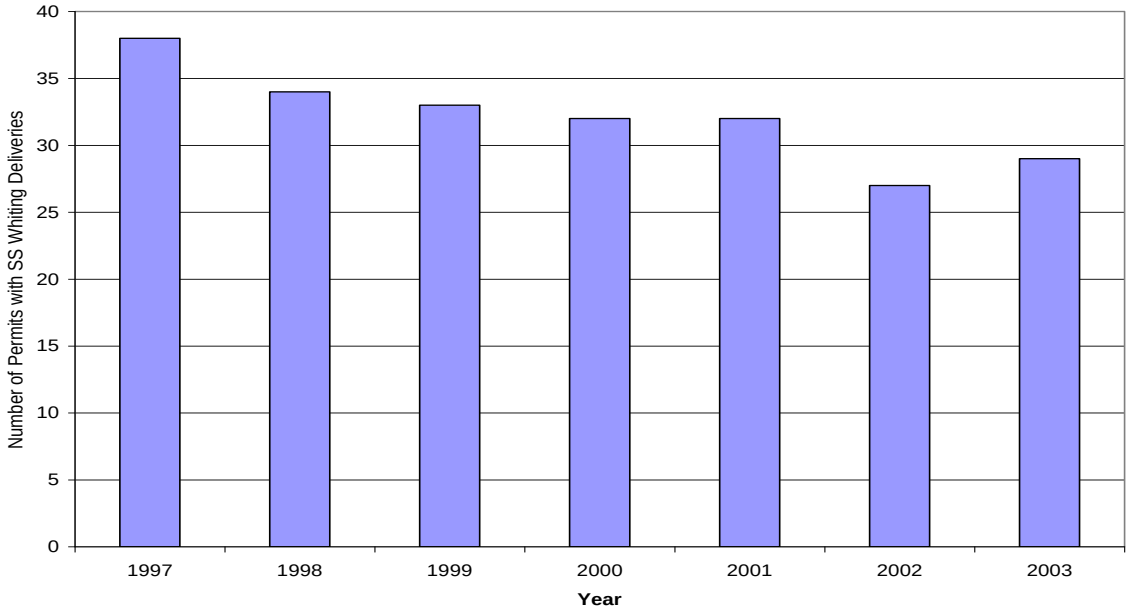


Figure B-8. Number of permits reporting shoreside whiting deliveries by year.

The following table is a more detailed set of information indicating the years particular permits have participated in the fishery and whether or not those permits qualify under the year and minimum metric tonnage criteria. This information includes data through the year 2006. From this data, it is apparent that several permits recently entered the fishery (in 2006) that would not qualify and this is most likely due to the improvement in market conditions for Pacific whiting.

Table B-14. Participation of limited entry trawl permits in the shoreside whiting fishery by year and qualification criteria.

Qualification Category	Ad Hoc Permit	Year									
		1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Does Not Qualify	1										x
	2								x	x	x
	3										
	4							x			
	5										x
	6	x									
	7		x								
	8					x	x		x		
	9										x
	10					x					
	11			x							
	12		x								
	13	x									
	14	x									
	15										x
	16										x
	17				x	x					
	18										
Qualifies	19	x	x	x	x	x	x	x	x	x	x
	20	x	x	x	x	x	x	x	x	x	x
	21	x	x	x	x	x	x	x	x	x	x
	22	x	x	x							
	23	x									
	24	x	x	x		x		x	x	x	x
	25	x	x								
	26	x	x	x	x	x	x	x	x	x	x
	27						x		x	x	x
	28	x	x	x	x	x	x	x	x	x	x
	29	x	x	x	x	x	x	x	x	x	x
	30		x	x	x	x	x	x	x	x	x
	31	x	x	x	x	x					
	32	x	x	x	x	x	x	x	x	x	x
	33		x	x		x	x	x	x	x	x
	34	x	x	x	x	x	x	x	x	x	x
	35	x		x	x						
	36	x	x		x			x	x	x	x
	37	x	x	x	x	x	x	x		x	x
	38	x	x	x	x	x	x	x	x	x	x
	39	x	x	x	x	x	x	x		x	x
	40	x	x	x	x	x	x	x	x	x	x
	41	x		x	x	x	x	x	x	x	x
	42	x	x			x	x		x	x	x
	43	x	x	x		x	x	x			
	44					x	x	x	x	x	x
	45	x	x		x	x	x	x	x	x	x
	46	x									
	47	x	x	x	x	x	x	x	x	x	x
	48	x			x	x	x	x	x	x	x
	49	x	x			x		x			x
	50	x		x				x			
	51	x	x	x	x						
	52			x	x						
	53	x	x	x	x	x	x	x	x	x	x
	54	x	x								
	55	x	x	x	x	x	x	x	x	x	x
	56	x			x						
	57	x	x	x	x						x
	58			x	x						
	59	x		x	x	x	x		x	x	x
	60					x		x	x	x	x
	61		x	x	x	x	x	x	x	x	x
	62		x	x	x						
	63	x	x	x	x						

The effect of the catch history formula is relatively inclusive of past participants in the fishery. The majority of permits reporting directed landings of Pacific whiting qualify to receive catch history designations. The assignment of catch history to permits ranges from just under 6 percent of the shoreside allocation to approximately 0.1 percent of the shoreside whiting allocation. When examined on a business entity level, the high to low distribution is more pronounced with the largest entity receiving over 12 percent of the shoreside whiting allocation. This indicates that the accumulation limit may not be restrictive if compared to existing ownership, but when considering the possibility of fleet consolidation (making it likely that fewer entities will hold permits) the accumulation limits may become restrictive to some entities.

When examined next to the catch shares that have occurred over the 2004 to 2006 time period, the catch history assignments deviate substantially (in some cases) from the percent of catch generated by some permits during this period. This can be explained by the recent increase in interest in the whiting fishery, driven in large degree by improvements in market conditions, but also because several permits have not participated in the fishery in recent years.

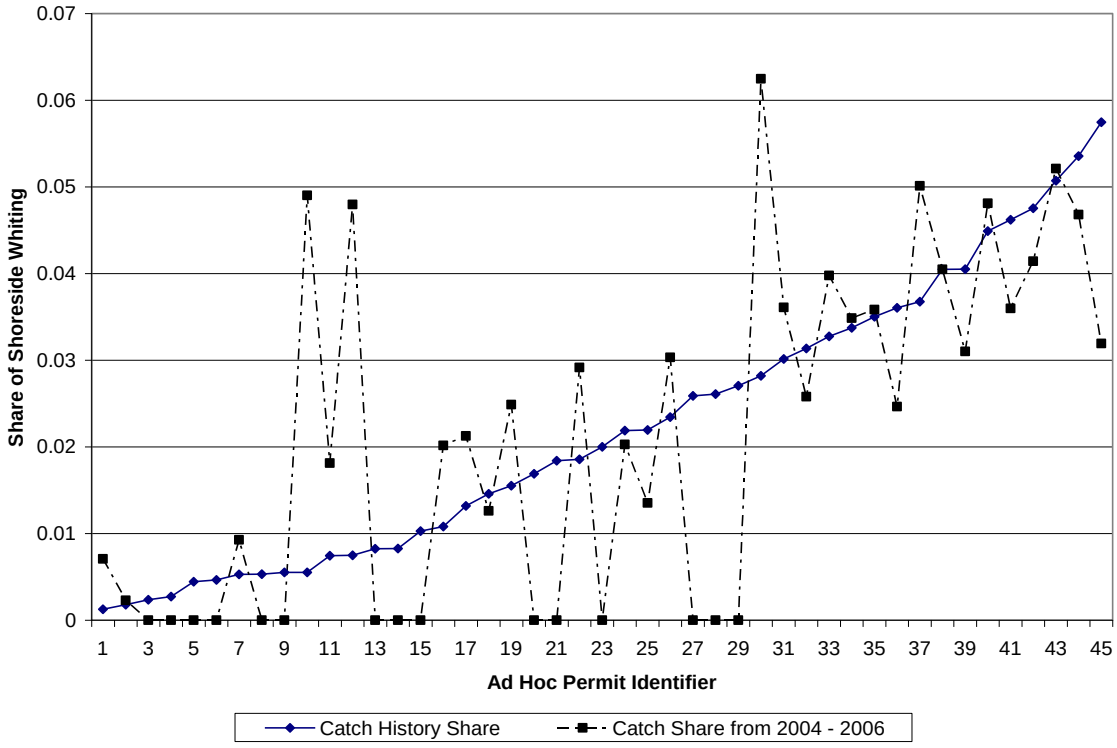


Figure B-9. Share of shoreside whiting allocated to permits.

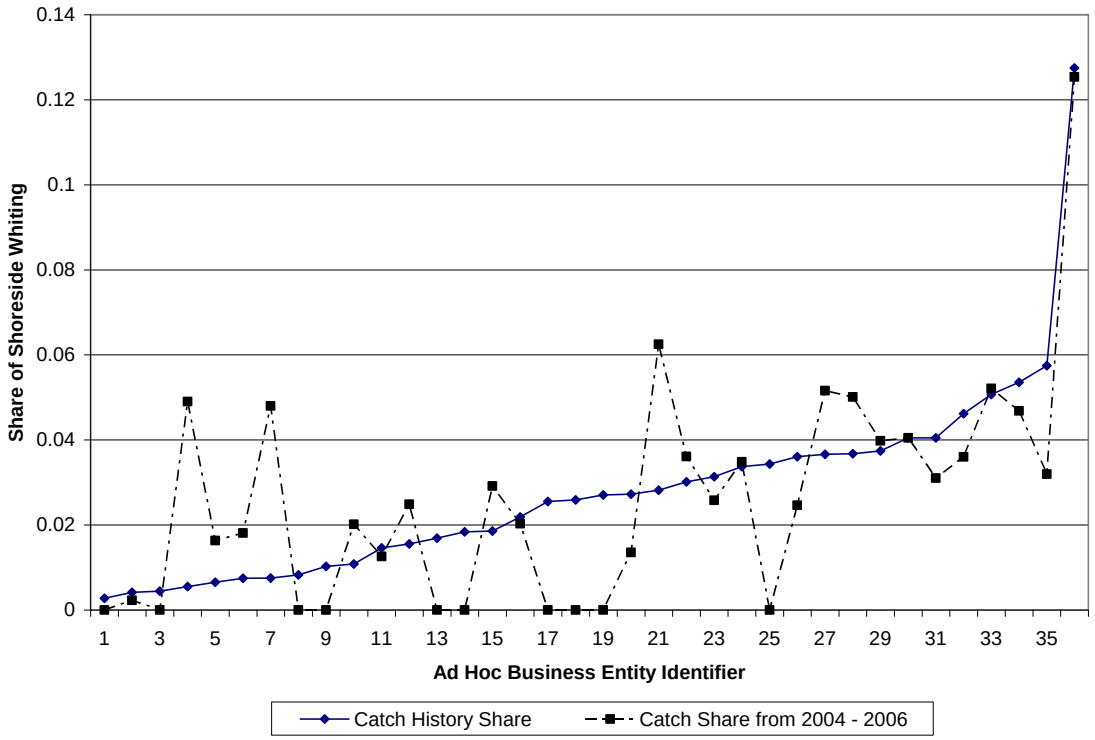


Figure B-10. Share of shoreside whiting allocated to business entities.

B-3.2.2 Shoreside Co-op Eligible Processor Permit

a. Activities Requiring this Permit

Only processing entities with a shoreside co-op processor permit (SSP) are eligible to receive whiting fish from whiting cooperatives in the first two years of the program. Thereafter, any processing corporation could be eligible to receive whiting from participants in a whiting cooperative, subject to the other provisions of this plan. Processors without SSPs may receive whiting from participants in the non co-op fishery and whiting harvested incidentally in the nonwhiting fishery at any time, including within the first two years of the program.

b. Qualification Requirements

An initial co-op-qualified shoreside processing entity is one that processed at least 1,000 mt of whiting in each of any two years from 1998 through 2003.

d. Duration of this Section

Since SSP permits are only in effect for the first two years of the program, this section is also in effect only for the first two years of the program.

❖ Rationale and Policy Issues

The justification for processor licensing is so that the interests of processors are protected when the fishery moves to rationalization. Such licensing would restrict the ability for new processor participants

to come into the fishery and compete with existing processors which may tend to result in excess processing capacity. Limiting this competition would tend to protect the interests of existing processors for several reasons including: A) volume per processor would not risk being diminished due to new processors entering the fishery, and B) fewer numbers of processors would tend to enhance processor leverage during negotiations over ex-vessel prices and other matters.

The licensing restrictions described here, which are only in effect for two years, were originally meant to serve the role of a transition period for processors with the idea that processors would have ample time to adapt and change business plans to work with the newly rationalized fishery. The original intention of the two year time limit established as part of the licensing program was based on the notion that such a provision may be able to be implemented under the authority of the MSA; however, it appears that is not the case.

Element of Cooperative Alternative	Conservation	Net Benefits	Disruption	Excessive Shares	Fairness and Equity	Harvester and Processor Sector Health	Labor	Communities	Small Entities and New Entrants	General Public
Shoreside co-op processor permit			X			X		X		

❖ Analysis

The effect of processor licensing would be relatively inclusive of those processors that have participated in the fishery on a relatively steady basis, but would exclude many processors that have not participated in more recent years, or have recently entered into the fishery. In total, 18 companies have participated in whiting activity, with three non-qualifying companies participating in 2006. Under the qualification criteria, eight processing companies would receive licenses to process shoreside whiting. Those companies not qualifying would have their participation in the fishery restricted, disrupting operations that exist under current conditions. Information regarding participation and qualification by processing entities is illustrated in the table below.

Table B-15. Shoreside whiting processing company participation by year and qualification criteria.

Qualification Filter	Ad Hoc Processor ID	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Qualifies	A	x	x	x	x	x	x	x	x	x	x	x	x	x
	B	x	x		x	x	x	x	x	x	x	x		
	C	x	x	x	x	x	x	x	x	x	x	x	x	x
	D	x	x	x	x	x		x	x		x	x	x	x
	E	x	x	x	x	x		x	x	x	x	x	x	x
	F				x	x	x	x	x	x	x	x	x	x
	G					x	x	x						
	H	x	x	x	x	x	x		x					
Does not qualify	I													x
	J													x
	K			x										
	L		x	x	x									
	M										x			x
	N							x						
	O	x	x	x	x	x	x	x	x					
	P	x	x	x										
	Q								x					
	R					x								

In general, instituting processor licensing and linkages allows the processing sector to rationalize itself to some degree and generate higher levels of revenue than would be the case without such provisions. This topic was discussed in more detail in previous sections describing the effect of this provision on mothership processors. When processor licensing requirements are only in effect for two years, the ability for processors to realize some gains as a result of rationalization will begin to erode at the end of that two year window, and that erosion should occur gradually over time. After those licensing provisions expire, processor engagement in the fishery will almost certainly change. Competition among processors should be expected to increase over time as new companies enter the fishery, the amount of capital processing Pacific whiting may increase if new processors enter into the processing sector, and catcher vessels may assume greater leverage in negotiations with processors over prices and other matters as a result of that competition among processors. The result is likely to be one where processors assume less revenue from processing activity over time compared to a case where processor licenses are in effect over the long-term. As a result, the expiration of processor licenses is likely to mean that processors will not benefit as greatly from rationalization of the fishery compared to a case where processor licenses exist over the long-term.

The way in which processor ties are constructed will have secondary impacts on communities where whiting deliveries and processing take place. Depending on the way in which the ties are established, community engagement in the fishery could change as delivery patterns are altered to meet processor obligations.

B-3.4 Processor Ties

B-3.4.1 Initial Formation of Ties

During the first two years of co-op formation, permit owners that join a co-op shall be required to deliver their whiting catches to the co-op qualified processors that were the basis of their landing history during the following period on a pro rata basis:

Years Option 1: 2001
Years Option 2: 2000
Years Option 3: 2000-2003

Determination of the processor(s) to which a permit owner is obligated will take into account any of the processor's(s') successors in interest. (Note: Several permits would not be tied to processors under the above options. It is unclear how ties would be established for those permits.)

Processor Successor in Interest. In determining the processor to whom a permit owner that participates in a co-op is required to deliver in the first two years of the program, a processor's successor in interest will be taken into account. If a processor's assets were purchased and the landing history expressly identified as an asset in the purchase agreement, then any permit owner obligation based on those landings will accrue to the processor making the purchase. For landings history associated with a defunct or non-qualifying processor, that portion of a permit's allocation will be linked to the permit's initially-assigned landing history on a pro rata basis.

B-3.4.2 Duration and Modification of Processor Ties (Options 1 and 2)

A permit's obligation to a processor will remain in place from one year to the next unless modified through the following process.

Option 1: Once a CV(SS) permit has participated in the non co-op fishery for [***Options: 1 to 5 consecutive years***], it is released from its delivery obligations to the processor(s) that were the basis of its history, and may join any of the various co-ops, or join with other permit holders who have also been released from delivery obligations to form a new co-op, and deliver to any shoreside processor in the subsequent years after the SSPs have expired.

Option 2: Any CV(SS) permit participating in a co-op is linked indefinitely to the processor they are delivering to under the initial linkage requirements. The permit can sever that linkage by participating in the non co-op fishery for a period of [***Options: 1 to 5 years***]. After completing their non co-op obligation, the permit is then free to reenter the co-op system and deliver to a processor of their choosing. Once the permit reenters the co-op system and elects to deliver their fish to a processor, a new linkage is then established with that processor. Should the permit later choose to break that new linkage, the non co-op participation requirements again apply.

Should a permit elect to enter the non co-op fishery within the first two years of this program, that permit must participate in the non co-op fishery for a minimum of [***Options: 2 to 5 years***], regardless of other non co-op participation requirements applying elsewhere in this document. Once the permit meets that obligation and later elects to enter a co-op, all provisions of co-op participation, including the processor linkage provisions, apply.

❖ Interlinked Elements

The possibility that a catcher vessel could be linked to more than one processor potentially creates complexities in bycatch management and in breaking and establishing new linkages with processors.

If a catcher vessel is linked to more than one processor and the fishery is closed upon attainment of a bycatch limit, there may be conflict over whether a permit's obligations to various processors have been met. At this time it is unclear whether a processor could seek compensation from a harvester if a harvester is tied to more than one processor, but fails to deliver the specified proportion of deliveries to all obligated processors. Even if a processor could not seek such compensation, being tied to multiple processors may still create unintended consequences. If processors believe there is likely to be a premature closure of the fishery because of the attainment of a bycatch limit, those processors may fight over the timing of deliveries from that catcher vessel, resulting in a variety of effects outlined in more detail in the analysis section of this element.

Modifying and breaking processor ties are related to the possibility of a catcher vessel being linked to more than one processor. If a catcher vessel desires to break a tie with one of its linked processors, that catcher vessel would need to undergo the same action as if it wanted to break ties with all linked processors by fishing in the noncooperative fishery. Furthermore, when a new tie is established, that catcher vessel will only be tied to a single processor. This means that if a catcher vessel wants to break a tie with a single processor, it would need to fish in the noncooperative fishery and the participation of that catcher vessel in the noncooperative fishery would put all processor ties connected to that vessel at risk. Therefore, the relationships between one processor and that catcher vessel may indirectly affect the ties that exist between that catcher vessel and other processors.

❖ Rationale and Policy Issues

The rationale for establishing processor ties is largely the same as that rationale found in the parallel section on the mothership alternative. The years for establishing processor ties in the shoreside sector are different from those years used in the mothership sector. The rationale for shoreside sector ties are based on the idea that the processors and harvesters engaged during each of the possible time periods for establishing linkages are the processors that have been most engaged in the fishery and/or elected to knowingly participate during years when conditions were poor. During the possible time periods for establishing ties, the market for whiting was depressed and the whiting OY was low. Initial ties based on patterns during this period recognize the participation of processors that have consistently participated in the fishery, especially during times of relatively little economic benefit from participating in the fishery.

- Successor in Interest

The rationale for recognizing a successor in interest is that the purchase of assets by a processing entity may have included in the purchase price the historical involvement of that original processing entity in the fishery. If the buyer and the seller believe such historic participation may lead to the receipt of quota, a license, or processor linkages, that historic participation is likely to influence the sales price of those assets. In order to get a return on the investment made in those assets, it is therefore necessary for the successor in interest to be the recipient of the processor tie. Furthermore, recognizing a successor in interest of the processing assets would result in the recognition of the current owner of those assets, and this is consistent with the concept of granting quota share or catch history to the current owner of a limited entry trawl permit.

● Duration and Modification of Processor Ties

The rationale behind the requirement to participate in the noncooperative fishery in order to break processor ties is largely the same as that rationale provided in the analysis of the mothership cooperative alternative. However, the shoreside whiting alternative includes a possible range of years (one to five) in which a vessel would need to participate in the noncooperative fishery in order to break the processor linkage. Furthermore, if the vessel elects to break processor ties in the first two years of the program, that vessel would need to participate in the noncooperative fishery for a minimum of two years. These years are intended to provide a range of possible disincentives to vessels for breaking ties. Requiring that vessels participate in the noncooperative fishery for one year has the lowest relative disincentive (although that disincentive may be relatively large), while requiring that vessels participate for five years provides the highest degree of disincentive to a vessel that is considering breaking a tie with a processor.

Element of Cooperative Alternative	Conservation	Net Benefits	Disruption	Excessive Shares	Fairness and Equity	Harvester and Processor Sector Health	Labor	Communities	Small Entities and New Entrants	General Public
Processor ties			X			X		X		
Initial Formation of Ties			X			X		X		
Duration and Modification of Processor Ties			X			X		X		

❖ Analysis

● Initial Formation of Ties

The options for processor linkages result in a varying degree of linked catch history percentages to each qualifying processing entity. This information is shown in the figure below. Using the years 2000 to 2003 assures that all of the qualifying processors receive some linked catch history. Using 2000 or 2001 results in one qualifying processor not having linked catch history.

The way in which processor ties are established would tend to impact participants in the fishery and where deliveries are made, thus affecting communities. Establishing ties based on a historic period may disrupt relationships that exist in current conditions, if harvesters and processors have an existing relationship that is broken through the establishment of a tie during a period when a different relationship existed.

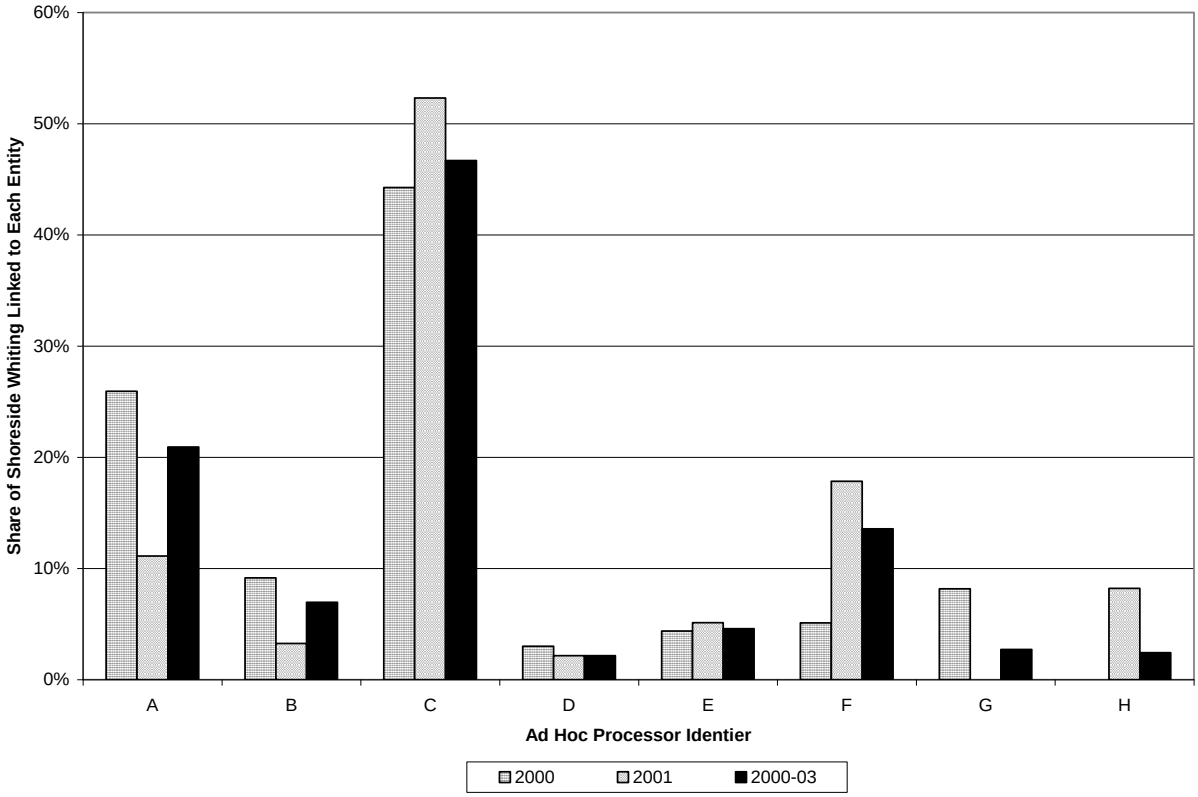


Figure B-11. Share of linked shoreside whiting catch history by processing entity and linkage formula.

The number of catcher vessels linked to each processing entity is shown in the following figure. Based on this information, the number of catcher vessels linked to each processing entity varies widely depending on the formula used for establishing initial linkages. In addition, catcher vessels can be linked to more than one processing entity if the 2000 to 2003 processor linkage formula is used. Using the other two linkage formulas means that those catcher vessels that have linkages established appear only to be linked to one processing entity. However, multiple permits that receive catch histories would not be linked to processors through application of the 2000 or 2001 processor tie formula. As illustrated previously, 45 permits would receive shoreside whiting catch histories, yet according to information shown below, three permits would not be linked through the 2000 to 2003 formula, 15 permits would not be linked through the 2000 formula, and 16 would not be linked through the 2001 formula.

The effect of choosing these years for establishing linkages means that linkages may be created for permits and processors that have had relationships prior to the implementation of a rationalization program. However, the years used for these linkage formulas may be more than 10 years old by the time rationalization is implemented, and if catcher vessels and processors have not had relations since that time, reestablishing them through a linkage provision may introduce disruption to the fishery. This can have significant implications for a fishery managed with cooperatives, as cooperatives rely heavily on relationships to operate successfully. Even though processors are not cooperative members (unless they own a permit which is part of a cooperative) the relationships between catcher vessels and processors may affect the way in which catcher vessels prosecute fishing activity.

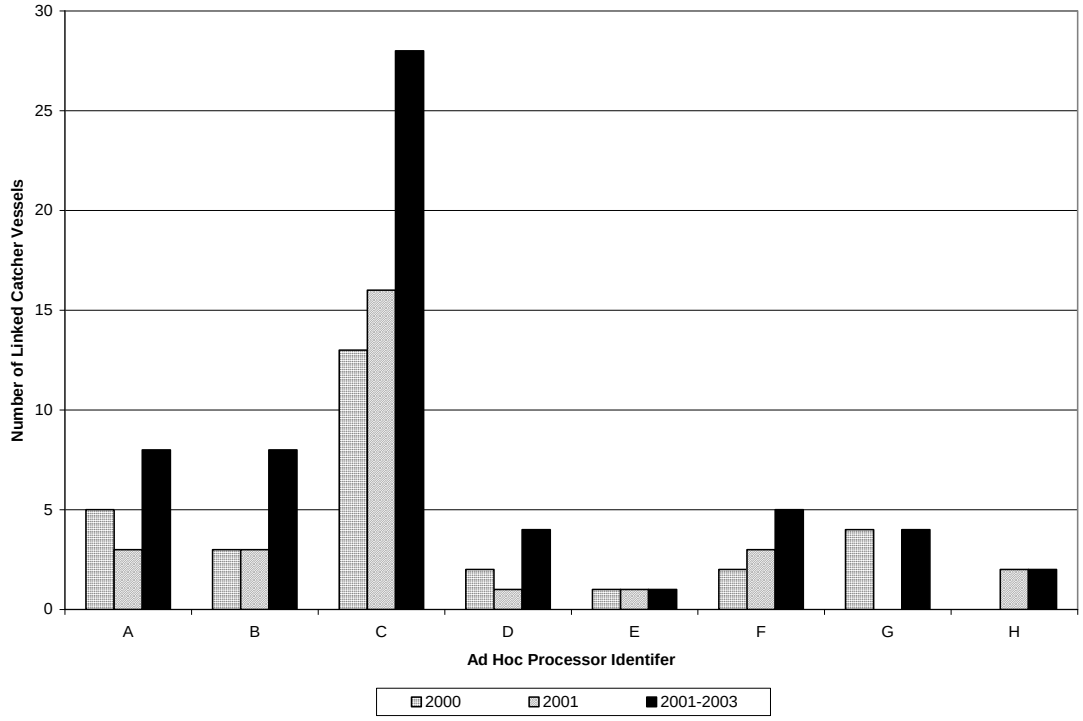


Figure B-12. Number of linked catcher vessels by processing entity and linkage formula.

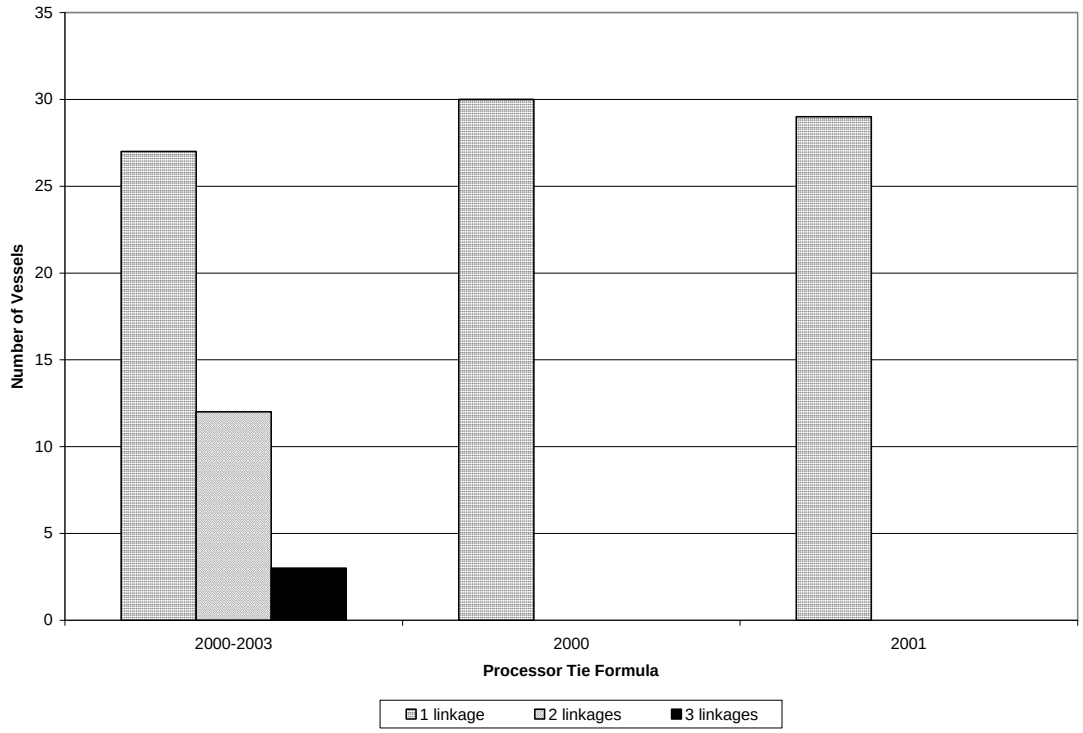


Figure B-13. Count of vessels by number of processing linkages and processor linkage establishment formula.

♦ *Potential Implications of Having a Catcher Vessel Tied to Multiple Processors*

The possibility of having a catcher vessel tied to more than one processor means that the activities of one processor can put all processors tied to that catcher vessel at risk if that catcher vessel wants to abandon a tie with only one of those processors. In order to break a processor tie, a catcher vessel would need to participate in the noncooperative fishery, and when the catcher vessel rejoins the cooperative fishery, that catcher vessel will be tied to one processor. When that catcher vessel engages in the noncooperative fishery, it could elect to permanently abandon ties with all of its tied processors and develop a tie with a completely different processor. In addition to this concept, establishing ties between a catcher vessel and more than one processor could mean that processors tied to that catcher vessel will try to influence delivery patterns in a way that benefits them. In the worst case scenario, processors may desire to have their deliveries during a particular time window, and if the catcher vessel is pressured to a great enough degree by those processors, that catcher vessel may elect to engage in a type of race, or excessive effort, to accommodate and appease the multiple processors that are seeking deliveries during a specific time window. When compared to a case where a single processor is tied to a catcher vessel, the pressure that catcher vessel has to meet the desired timing of a single processor may be less than the pressure a catcher vessel has in meeting the desired timing of multiple processors.

In addition to the above examples, having catcher vessels tied to more than one processor raises several questions about what would happen in the event that a fishery is closed based on attainment of a bycatch limit before the sector allocation is reached. Closing on the attainment of a bycatch limit will mean that catcher vessels have not harvested their full quota for the year and this means that the deliveries various processors may have expected during the year would not be achieved. If a catcher vessel is linked to more than one processor, but delivers catch to only one processor prior to the closure of the fishery, other linked processors may not feel that their obligated deliveries have been received. This raises some questions about whether those processors would pursue some financial compensation from that catcher vessel since it will have delivered all of its catch to one processor even if it was scheduled to deliver to multiple processors later in the season. Even if this type of compensation cannot be sought, the fear of not catching quota or of receiving obligated deliveries may induce a race for fish spurred by the processors as well as the catcher vessel in order to catch their whiting quota before the fishery is closed. This is likely to have negative implications to the performance of the fishery.

● Duration and Modification of Processor Ties

The general rationale for allowing vessels to break processor ties by participating in the noncooperative fishery is that it makes the processor ties voluntary to some degree while providing a strong incentive to keep processor ties intact. It is acknowledged that participation in the noncooperative fishery is less economically beneficial (and may indeed be costly) to those engaged in that mode. Furthermore, because of the structure of the fishery, participants in a noncooperative mode may fish less carefully and this may result in higher rates of bycatch. Because of reasons explained in the introductory portions of this document, the potential for this type of behavior to occur may be higher for a noncooperative fishery vessel in the shoreside sector than a noncooperative fishery vessel in the mothership sector. This means that the requirement that vessels in the shoreside sector participate in a noncooperative fishery to break a processor tie is likely to result in diminished economic and bycatch performance compared to a vessel in a cooperative fishery. The result of requiring that vessels participate in the noncooperative fishery for several years in order to break a tie is likely to be one of much greater participation in that mode in any given year, resulting in lower economic benefits and diminished bycatch performance. This outcome would tend to be exacerbated as the required number of years of noncooperative fishery participation in order to break a processor tie is increased.

- *Implications of Multiple Years of Noncooperative Participation in Breaking a Processor Tie*

In addition to the above factors, the ability for catcher vessels to realistically break a processor tie may be necessary for the successful operation of a fishery managed with cooperatives. As mentioned previously, harvest cooperatives are formed by harvesters and it is important to maintain this distinction in order for the fishery to operate successfully. It is ultimately the harvesters that eliminate the race for fish currently responsible for much overcapitalization and inefficiency, and it is ultimately the harvesters that achieve other benefits such as bycatch reduction.

Processor ties help ensure that processors benefit from rationalization, but the establishment of such ties implicitly make the processing entity an involved party in the fishing practices of the linked catcher vessel. This is because processor ties result in a type of mutual dependence on the part of the harvester and the processor, and the outcome is one where the activities of the harvester and processor take on the characteristics of a vertically integrated firm. Through these characteristics of vertical integration, the processor tie makes the processor an influential party in the harvesting activities of a catcher vessel. If a relationship between the catcher vessel and a processor become strained, this can have a negative effect on the fishing practices of the catcher vessel, and this can mean less economic efficiency and less improvement in other management goals. It is because of this potential that the catcher vessel be able to break the tie. Being able to realistically break the tie and form a new tie with another processor allows catcher vessels and processors the ability to find other processors and catcher vessels with goals and similarities that make for the efficient operation of both the catcher vessel and the processor. Being able to establish ties between processors and catcher vessels that are similarly minded makes for a more efficient operation for both parties.

While processor ties provide a disincentive to vessels that are considering switching processors (and therefore help ensure that processors benefit from rationalization), switching processors must be a realistic possibility to those catcher vessels. This is necessary to ensure good faith and balanced relations between catcher vessels and processors and operating in good faith may be important to the overall economic health and performance of participants in the fishery. Good faith relations may be affected if a processor knows that a catcher vessel cannot realistically break the tie. This can result in increasing demands placed on a catcher vessel in the form of delivery timing, profit sharing, and other matters that may be at odds with other goals of that catcher vessel. If a catcher vessel is required to participate in the noncooperative fishery for more than one year, it is likely that the ability to switch processors will become increasingly unrealistic, and at some point, switching processors may not be a realistic possibility at all, especially if participation in the noncooperative fishery results in a loss of revenue.

B-3.6 Exclude Processor Ties and Processor Licensing (Option)

Option: Exclude from the above all references to processor ties and processor licensing. This option includes the following changes to Section B-3:

Section B-3.1.b. Processors. Delete "non co-op" from the first sentence and delete the remainder of the section. This section constrains processor participation in the first two years of the program.
Section B-3.2.2. Shoreside Co-op Eligible Processing Permit. Delete the entire section.
Section B-3.3.4 Annual Allocation transferability. Delete the last sentence (refers to the handling of permit obligations to processors when allocations are transferred).
Section B-3.4. Processor Ties. Delete the entire section.
Section B-3.5.2.b. Delete the entire paragraph (addresses preseason registration of processors with shoreside processing permits).
Section B-3.5.3.a. Delete the last sentence (refers to the NMFS need to make determinations on permit

links to processors).
Section B-3.5.3.c. Delete "and co-op obligations to processors."

❖ Rationale and Policy Issues

Dropping processor linkages from the cooperative program is intended to serve as an analysis of a cooperative based fishery that can be implemented under the authority of the MSA. Based on input from NOAA GC, the processor licensing and linkage provisions specified in earlier portions of this alternative are outside the existing authority of the MSA.

Element of Cooperative Alternative	Conservation	Net Benefits	Disruption	Excessive Shares	Fairness and Equity	Harvester and Processor Sector Health	Labor	Communities	Small Entities and New Entrants	General Public
Exclude Processor Ties and Licensing			X		X	X				

❖ Analysis

Processor licensing and linkages are tools intended to protect the interests of processors that exist in the fishery. The lack of processor licensing and linkages would therefore be expected to have an opposite effect where processor interests are not protected. The expected outcome would be one where new processors may enter the fishery and processors would compete with one another for catch from catcher vessels. Processors would theoretically enter into the fishery as long as profits can be generated from doing so. The result may be one where there is more processing capital in the fishery than is necessary to process the available harvest. However, establishing a cooperative-based management program without processor ties is expected to result in efficiencies at the catcher vessel level from slower paced harvest activity and fleet consolidation, among other factors described earlier in this section and in Chapter 4. Furthermore, the lack of processor ties would tend to result in more processor competition than a case with processor ties and harvesters can use that competition to their advantage when negotiating over ex-vessel prices and other matters. The result is one where harvesters see benefits from increased cost efficiency and also from enhanced negotiation power over ex-vessel prices.

One additional outcome of not having a processor linkage provision is that the noncooperative fishery may not exist. While catcher vessels could still elect to participate in the noncooperative portion of the fishery, it is highly unlikely they would do so because catcher vessels would not need to break any processor linkages and because participation in the noncooperative fishery is expected to be relatively inefficient. The lack of participation in the noncooperative fishery may improve some management goals of the fishery related to management performance, bycatch performance, and economic efficiency.

B-4 Co-ops for Catcher-Processors

Catch by the catcher-processor sector will be controlled primarily by closing the fishery when a constraining allocation is reached.[22] As under status quo, vessels may form co-ops to achieve benefits that result from a slower-paced, more controlled harvest. The main recommendations are the creation of a limited number of catcher-processor endorsements, the requirement that a catcher-processor co-op qualify for a Federal co-op permit, and the specification in regulation of the amounts that will be available for harvest by the voluntary co-op. A new entrant will have to acquire a permit with a catcher-processor endorsement in order to enter the fishery.

B-4.1 Participation in the Catcher-Processor Sector and Endorsement Qualification.

Catcher-Processor Endorsement. The class of catcher-processor endorsed permits (catcher-processor permits) will be limited by an endorsement placed on an LE permit. LE permits registered to qualified catcher-processor vessels will be endorsed as catcher-processor permits. A qualified permit is one that harvested and processed in the catcher-processor sector of the Pacific whiting fishery sometime from 1997 through 2003. Only catcher-processor vessels with a catcher-processor endorsed limited entry permit will be allowed to catch and process whiting at-sea as part of the CP sector. Limited entry permits with catcher-processor endorsements will continue to be transferable.

Participation as Mothership (Preferred Alternative). A catcher-processor cannot operate as a mothership during the same year it participates in the CP fishery.

Catcher-processor Permit Combination to Achieve a Larger Size Endorsement. A catcher-processor permit that is combined with an LE trawl permit that is not catcher-processor endorsed will result in a single catcher-processor permit with a larger size endorsement (a CV[MS] or CV[SS] endorsement on one of the permits being combined will not be reissued on the resulting permit. ***The reference to the CV[SS] endorsement is not relevant under the preferred alternative.***) The resulting size endorsement will be determined based on the existing permit combination formula.

CP Permit Transfers to Smaller Vessels. Length endorsement restrictions on LE permits endorsed for groundfish gear will be retained; however, the provision that requires that the size endorsements on trawl permits transferred to smaller vessels be reduced to the size of that smaller vessel will be eliminated (i.e., length endorsements will not change when a trawl endorsed permit is transferred to a smaller vessel). **(Added as part of preferred alternative.)**

Number of Transfers per Year. CP permits may be transferred two times during the fishing year, provided that the second transfer is back to the original CP (i.e., only one transfer per year to a different CP). **(Added as part of preferred alternative.)**

B-4.2 Co-op Formation and Operation Rules

Annual registration. As under status quo, the co-op(s) will be formed among holders of permits for catcher-processors. Participation in the co-op will be at the discretion of those permit holders. If eligible participants choose to form a co-op, the catcher-processor sector will be managed as a private voluntary cooperative and governed by a private contract that specifies, among other things, allocation of whiting among CP permits, catch/bycatch management, and enforcement and compliance provisions. The co-op will submit an application to NMFS for a Federal co-op permit. NMFS will not establish an allocation of

[22] All references to catcher-processors in this section references to vessels operating in the catcher-processor sector. Vessels under 75' which catch and process at-sea as part of the shoreside sector are not covered here.

catch or catch history among permits unless the sector fails to organize itself under a single co-op agreement that qualifies for a Federal co-op permit. **Added as part of the preferred alternative:** If the co-op system fails, it will be replaced by an IFQ program and the initial issuance of IFQ will be divided equally among all CP endorsed permits (see B-4.3.2, Option 2).

Annual Reporting Requirements. The catcher-processor cooperative will submit an annual report to the Council at their November meeting. The report will contain information about the current year's catcher-processor fishery, including the catcher-processor sector's annual allocation of Pacific whiting; the catcher-processor cooperative's actual retained and discarded catch of Pacific whiting, salmon, rockfish, groundfish, and other species on a vessel-by-vessel basis; a description of the method used by the catcher-processor cooperative to monitor performance of cooperative vessels that participated in the catcher-processor sector of the fishery; and a description of any actions taken by the catcher-processor cooperative in response to any vessels that exceed their allowed catch and bycatch. The report will also identify plans for the next year's catcher-processor fishery, including the companies participating in the cooperative, the harvest agreement, and catch monitoring and reporting requirements.

B-4.3 NMFS Role

B-4.3.1 Permit and Endorsement Issuance

NMFS will issue all necessary permits and endorsements under the rules specified under this program. Appeals processes will be provided as appropriate and necessary.

B-4.3.2 Annual Allocation

Option 1: There will be no government-directed subdivision of the catcher-processor sector quota among participants.
Option 2: Harvest amounts for the co-op will be specified in regulation. If the co-op breaks up, IFQ will be issued and divided equally among the 10 permits.

However, up to 10 percent of the allocation to the catcher-processor may be set aside as necessary for the adaptive management set aside described in Section B-1.6. **(This paragraph is not part of the preferred alternative.)**

The catcher-processor sector allocation may be divided among eligible catcher-processor vessels (i.e., those catcher-processor vessels for which a CP permit is held) according to an agreed catcher-processor cooperative harvest schedule as specified by private contract.

B-4.3.3 Fishery and Co-op Monitoring

a. NMFS will track all permit transfers. Permit transfers will not be valid until registered and acknowledged by NMFS.
b. NMFS will monitor catch and close the catcher-processor sector fishery as necessary to ensure catch limits are not exceeded.
c. NMFS will administer the adaptive management program, allocating the set aside for that program as needed based on the adaptive management goals, objectives and adjustment measures recommended by the Council. **(Paragraph c is not part of the preferred alternative.)**

❖ Rationale and Policy Issues

The catcher-processor sector currently operates as a rationalized fishery through the formation of the voluntary cooperative. This cooperative is managed by a governing contract which spells out such things as catch sharing arrangements among members of the cooperative. The result of this contract has meant that the effects attributed to a rationalization program have already occurred in the catcher-processor sector and therefore there is little reason to change the way that sector is managed.

In the event the catcher-processor cooperative breaks apart, the issuance of quota shares to permits in the catcher-processor fishery is intended to ensure that the fishery continues to operate as a rationalized fishery. Granting each permit 10 percent of the quota share is intended to result in a distribution of fishing opportunity that is highly similar to the catch sharing agreement that exists in the existing cooperative contract.

During the Council's consideration of rationalization of the catcher-processor sector, the Council discussed the issue of whether the preferred alternative for the catcher-processor sector was a limited access privilege program. During the Council's debate over the preliminary preferred alternative in June of 2008, the Council explicitly voted down a motion that would have made the catcher-processor a limited access privilege. During the November 2008 final action, the Council adopted measures that were highly similar to the preliminary preferred alternative adopted in June of 2008. Following this motion, NOAA Fisheries indicated its preliminary intent to treat both the mothership and catcher-processor portions of the fishery as a limited access privilege program effectively meaning that both sectors may be charged for cost recovery in order to implement the program. At its April 2010 meeting, the Council revised its final preferred alternative such that a permit would be required for the catcher-processor co-op and it would be clear that the system was a LAPP. The method for determination of the appropriate fees for cost recovery for the catcher-processor sector LAPP was left for a later action.

Element of Cooperative Alternative	Conservation	Net Benefits	Disruption	Excessive Shares	Fairness and Equity	Harvester and Processor Sector Health	Labor	Communities	Small Entities and New Entrants	General Public
Participation and Endorsement Qualification			X		X	X			X	
Co-op formation and operation rules			X			X				

❖ Analysis

The existing alternative for cooperative management in the catcher-processor sector is essentially the continuation of the No Action alternative for this sector, with the added provision that the sector would be managed with IFQs if the voluntary cooperative falls apart. Amendment 15 established sector specific limited entry for that sector and an allocation of whiting for the sector already exists. These two tools make it possible for a sector to establish and sustain a voluntary cooperative if they can agree to catch sharing arrangements. The one factor that may put the voluntary cooperative at risk is the management of

bycatch in a common fashion across the three sectors. This can put the voluntary cooperative at risk because members of that cooperative do not have control over catch of vessels outside that cooperative and catch from those vessels outside the cooperative can affect opportunities in the catcher-processor sector since all three sectors close when that limit is reached.

Beginning in 2009, bycatch limits for the whiting fishery will be applied to specific whiting sectors, which is a departure from the three sector common bycatch limit which has been used since 2004. This change is expected to protect the catcher-processor sector from other sectors which could inadvertently pre-empt opportunities in the catcher-processor sector. As a result, this change enhances the likelihood of the catcher-processor sector maintaining the existing voluntary cooperative.

As indicated in earlier sections of this analysis, cooperatives may need to have resource sharing arrangements solved for them. In cases where participants in the fishery are relatively diverse and have different levels of historic participation and reliance on the fishery, requiring that those participants decide on catch sharing arrangements themselves may prove difficult and problematic. If catch sharing arrangements are reached, they may be unstable and lead to frequent revisions of the cooperative contract and instability in the cooperative. In cases where participants are relatively diverse, solving catch sharing arrangements by issuing catch history and implementing a golden rule provision may be necessary for cooperatives to form and/or help to ensure that cooperatives are sustained. However, this is not necessary in all cases. In instances where participants have similar characteristics and have similar historic participation and reliance on a fishery, solving catch sharing arrangements may be relatively easy. This appears to have been the case in the catcher-processor sector as that sector was able to form the voluntary cooperative and solve catch sharing arrangements without Council intervention. This cooperative has been maintained for 11 years, suggesting that the catch sharing arrangements that were agreed to have not led to much disruption or instability across cooperative members. In spite of this, the break up of the voluntary cooperative is not outside the realm of possibility. Several events could lead to the break up of the cooperative including the transfer of an existing catcher-processor permit to another entity that is not currently part of the cooperative or disputes over catch sharing. In such an instance, one option would automatically grant IFQ to catcher-processor participants in order to ensure that fishery remains "rationalized."

The following sub-parts analyze each of the elements comprising the catcher-processor cooperative alternative.

- Catcher-processor Endorsement

Endorsing permits for participation in the catcher-processor sector is an extension of measures established through Amendment 15. An endorsement establishes a barrier to entry to the catcher-processor sector and provides one of the necessary ingredients for a cooperative to form. The barrier to entry established by the sector endorsement prevents other potential participants from entering into the catcher-processor sector and competing with existing participants for catch. If competition for catch arises, a breakdown in "rational" fishing practices should be expected to occur. This is because it results in the elimination of competition for catch that eliminates the race for fish. The elimination of the incentives that exist in a race for fish reduces effort in the fishery, reduces capital in the fishery, and slows down the pace of harvesting. These effects reduce cost and increase value, resulting in a net improvement in the economics of the fishery.

- Catcher-processor Permit Combination to Achieve a Larger Size Endorsement

If the permit length endorsement is retained, a catcher-processor would need to acquire an additional permit in order to increase vessel size. The alternative for combining permits indicates that, in such an event, the catcher-processor endorsement would remain, but other endorsements would not. This effectively limits the relatively large catcher-processor vessel to the catcher-processor sector. If other sector endorsements remained on that permit, that relatively large catcher-processor vessel could theoretically participate in other sectors. That possibility would not occur under the existing permit combination option.

- Annual Reporting Requirements

An annual reporting requirement enhances transparency of a cooperative-based fishery. Since many of the outcomes and events in a cooperative fishery occur through private agreements and negotiations, the annual reporting requirement provides information on those activities to the public and management agencies. This helps to ensure that those groups are relatively informed about the activities occurring within a cooperative and helps the public and management agencies to understand cooperative management more thoroughly. This can be important if changes to required cooperative standards or regulations are deemed necessary by the Council in order to meet new challenges or management goals.

The requirement that the annual report submit a record of catch by each vessel may violate confidentiality provisions of the MSA.

- NMFS Role

The role of NMFS in administering this cooperative program is effectively no change from status quo. The exception to this is in the event the voluntary cooperative breaks apart and IFQ is issued to catcher-processor permits. Furthermore, if an adaptive management provision is utilized in the catcher-processor sector, the role of NMFS in managing the catcher-processor portion of the fishery may change in order to implement that provision. Since the adaptive management provision and associated specifics on how that provision would work are necessarily general, it is not possible to determine the amount of workload or infrastructure that may be required of NMFS if that adaptive management provision is used.

- Annual Allocation

Two options exist in the existing catcher-processor alternative that pertains to annual allocation. One option would continue to allocate Pacific whiting to the catcher-processor sector with no subdivision of the allocation within that sector. The other option would allocate to the catcher-processor cooperative instead of the sector. In practice, there does not appear to be any difference between the two options because the amount of fish allocated will be the same and the participants that have access to that fish will be the same. Therefore, there is not expected to be any difference in the effects of either option. However, the Council's preferred alternative specifies measures which would be taken if the voluntary cooperative breaks apart.[23]

Under the Council's preferred alternative, the break up of the voluntary cooperative would trigger an automatic issuance of quota shares to catcher-processor participants, creating an IFQ program for that sector. Each participant would receive 10 percent of the catcher-processor quota and this amount is

[23] The term "break apart" in this context is assumed to apply to cases where a single catcher processor permit leaves the cooperative but other permit owners agree to maintain a voluntary cooperative agreement.

intended to be reflective of the catch sharing agreement that currently exists in the voluntary catcher-processor cooperative. The reader is referred to Appendix A for a description of an IFQ program and outcomes from managing a sector using that tool.

DESCRIPTION AND RESULTS OF ANALYTICAL TOOLS

Appendix C

TO THE
RATIONALIZATION OF THE PACIFIC COAST
GROUNDFISH LIMITED ENTRY TRAWL FISHERY
FINAL ENVIRONMENTAL IMPACT STATEMENT

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JUNE 2010

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C.1 A Comparative Advantage Analysis Illustrating the Potential for Regions to be Made Better or Worse Off by Rationalization of the Non-Whiting Trawl Fishery

Several variables determine the amount of fishing activity occurring in different ports, including access to fishing grounds, port infrastructure, and fish purchasing and processing, among other things. In a rationalized fishery, the incentives created by market-based management and individual accountability may impose additional forces that will alter the decision that vessel operators make regarding the location of fishing activity, the delivery location, and home-port location for a given vessel. Assuming profit is the motivating factor for fishermen engaged in commercial fisheries, the decision framework created by a rationalized fishery will tend to shift the location of fishing and delivery activity.

Under status quo management, vessels are not held individually accountable for the amount of fish they catch, provided their landings are within their cumulative landing limit. In addition, operators cannot choose to grant their cumulative limit to another, potentially more profitable, operator. Under a rationalized fishery, both scenarios change, and fishermen are held individually accountable and can transfer their fishing privilege to another vessel. The aspect of individual accountability will tend to put pressure on operators to fish in areas with lower encounter rates of constraining overfished species. The ability to transfer catch privileges also allows the fleet to consolidate to fewer, but more profitable, vessels as the market directs quota in a more economically efficient manner.

In a rationalization program, more economically efficient vessels are expected to remain in the fishery, while less efficient vessels are expected to drop out of the fishery. Economic efficiency is determined by several variables including the ability of the operator to generate gross revenues and the vessel's cost structure. Cost structure is determined by variable costs such as fuel, fixed costs, "transfer costs," and day-to-day operations. Ports that have a higher degree of fishing support business (agglomeration) tend to make it easier and more efficient for operators to conduct day-to-day activities. This makes the cost of running a fishing business, acquiring parts, and negotiating work relationships lower than in other ports.

Given these arguments, it is reasonable to expect ports with vessels that have a relatively long travel time to fishing grounds, relatively unsuccessful operators, relatively costly vessels, and relatively few support businesses to be at a disadvantage when compared to other regions. In addition, ports that are adjacent to fishing grounds with high constraining overfished species abundance would also tend to be at a disadvantage as the presence of constraining overfished species would encourage operators to move to areas with lower abundance. Given enough disadvantaging (or advantaging) factors in a port, that port may find itself losing (or gaining) trawl groundfish activity after rationalization, absent some mitigation tool that the Council may elect to implement as part of the program.

Information is available to illustrate these relationships and provide information indicating which ports or areas may be at a relative advantage or disadvantage. Available information includes the following:

- Logbook data can be used to show the preferred fishing grounds of trawl vessels categorized by homeport (e.g., we can identify the preferred grounds for Astoria-based trawlers). This information can be combined with west coast groundfish observer program data to show whether preferred fishing grounds of vessels in some ports are in areas with relatively high bycatch rates of constraining overfished species. Those ports with vessels fishing in areas with relatively lower bycatch rates may be at an advantage in a rationalized fishery.

- West coast fishing community profiles provide information about community business and infrastructure. In addition, industry members, extension agents, and extension publications are

sources of this information. Using the theory of agglomeration, those communities with larger amounts of support business and infrastructure may be at an advantage in a rationalized fishery.

- The fleet consolidation model can be used to identify the geographic effects of consolidation based on the most likely vessels to drop out of the fishery and the most likely vessels to stay in the fishery.

- The initial distribution of quota can be used to show which ports will receive more or less quota relative to status quo and relative to the initial distribution made to other ports. This will determine the initial state of harvest privileges on a regional basis, and this initial state may influence the future location of fishing activity.

The output of this analysis illustrates the relative advantage or disadvantage each port has with respect to several variables. These variables include 1) bycatch rates of constraining stocks that are in preferred fishing grounds of various ports, 2) relative economic efficiency of vessels in that port, 3) the relative amount of fishing business and infrastructure that exists in that port, and 4) the initial distribution of quota shares to those ports relative to status quo and relative to the distribution made to other ports.

C.1.1 Geographic Assessment of Constraining Bycatch

In this analysis, bycatch rates in various areas are assessed based on the constraining nature of the bycatch species. An area with a relatively high bycatch rate of a highly constraining species is assessed differently than an area with a moderately constraining overfished species. For example, since canary rockfish is a highly constraining species to fishing opportunity, an area with a relatively high canary bycatch rate will be labeled as a high bycatch area. An area with a relatively high bycatch rate of a less constraining species, like darkblotched, will be labeled as a moderately high bycatch area. This labeling scheme creates three categories for bycatch areas that are A) not a relatively constraining bycatch area, B) a moderately constraining bycatch area, and C) a highly constraining bycatch area.

The effect of these areas on the comparative advantage of a port relies on the integration of the preferred fishing grounds of various ports with those areas. If vessels from a port fish exclusively in a high bycatch area, then that puts that port at a disadvantage, whereas if vessels from a port spend only some of their time fishing in a high bycatch area, then the presence of that high bycatch area may not necessarily influence the comparative advantage of that port. In this analysis, we determine whether a port is at an advantage or disadvantage based on where the majority of the catch has occurred. If greater than 50 percent of a port's catch has occurred in a high bycatch area, then we determine that port to be at a disadvantage.

The following figures illustrate the preferred fishing grounds of non-whiting trawlers based on their port of landing. These figures also identify areas of relatively high bycatch of constraining overfished species. Areas that are highly constraining are indicated by the presence of a shaded box with hash marks. An area with an overfished species that is not typically as constraining is indicated by a shaded box without hash marks. This figure shows one moderately constraining area off Oregon and three highly constraining areas off the west coast.

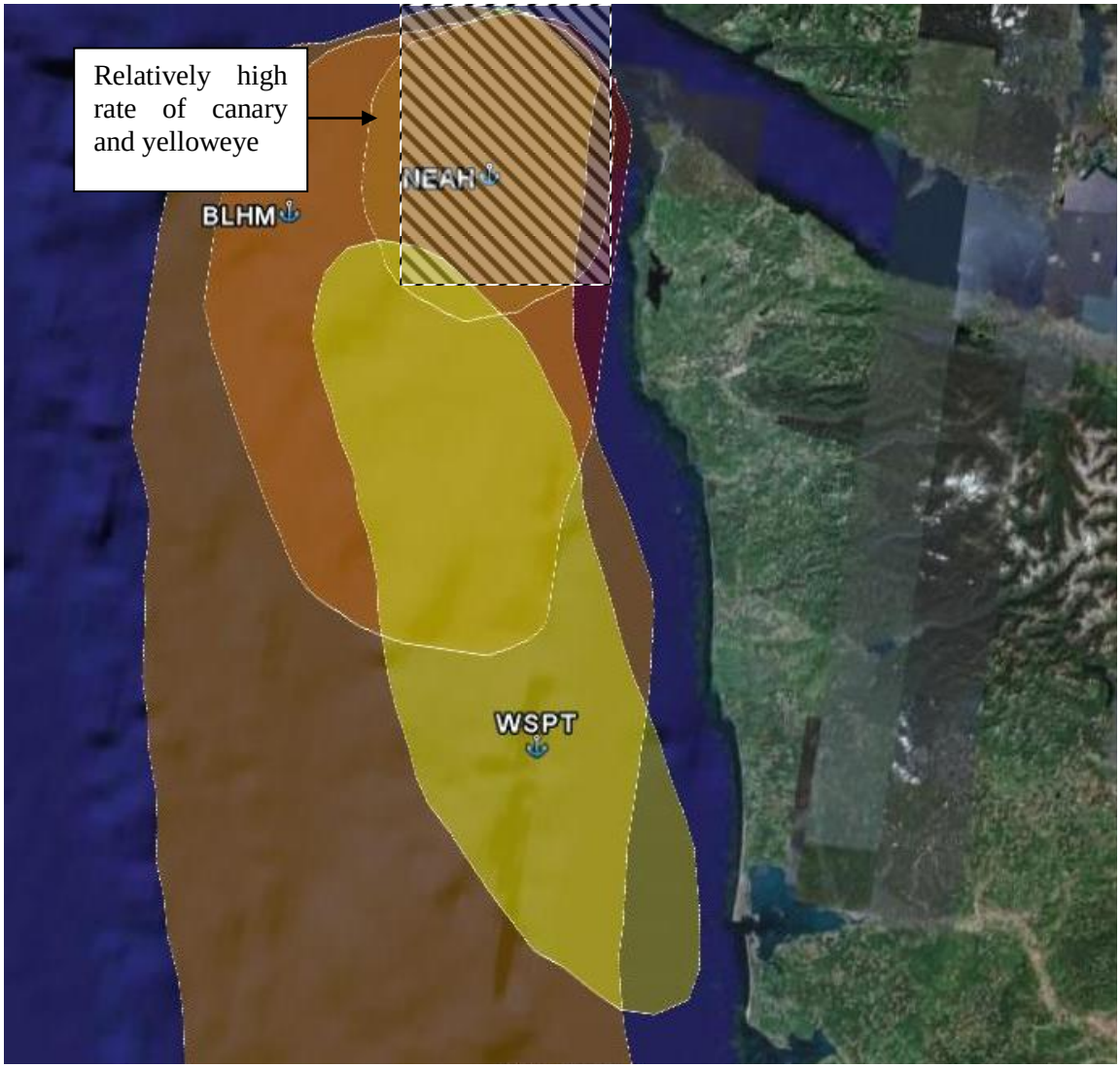


Figure C-1. Preferred fishing grounds of non-whiting trawlers based on their port of landing, Washington.

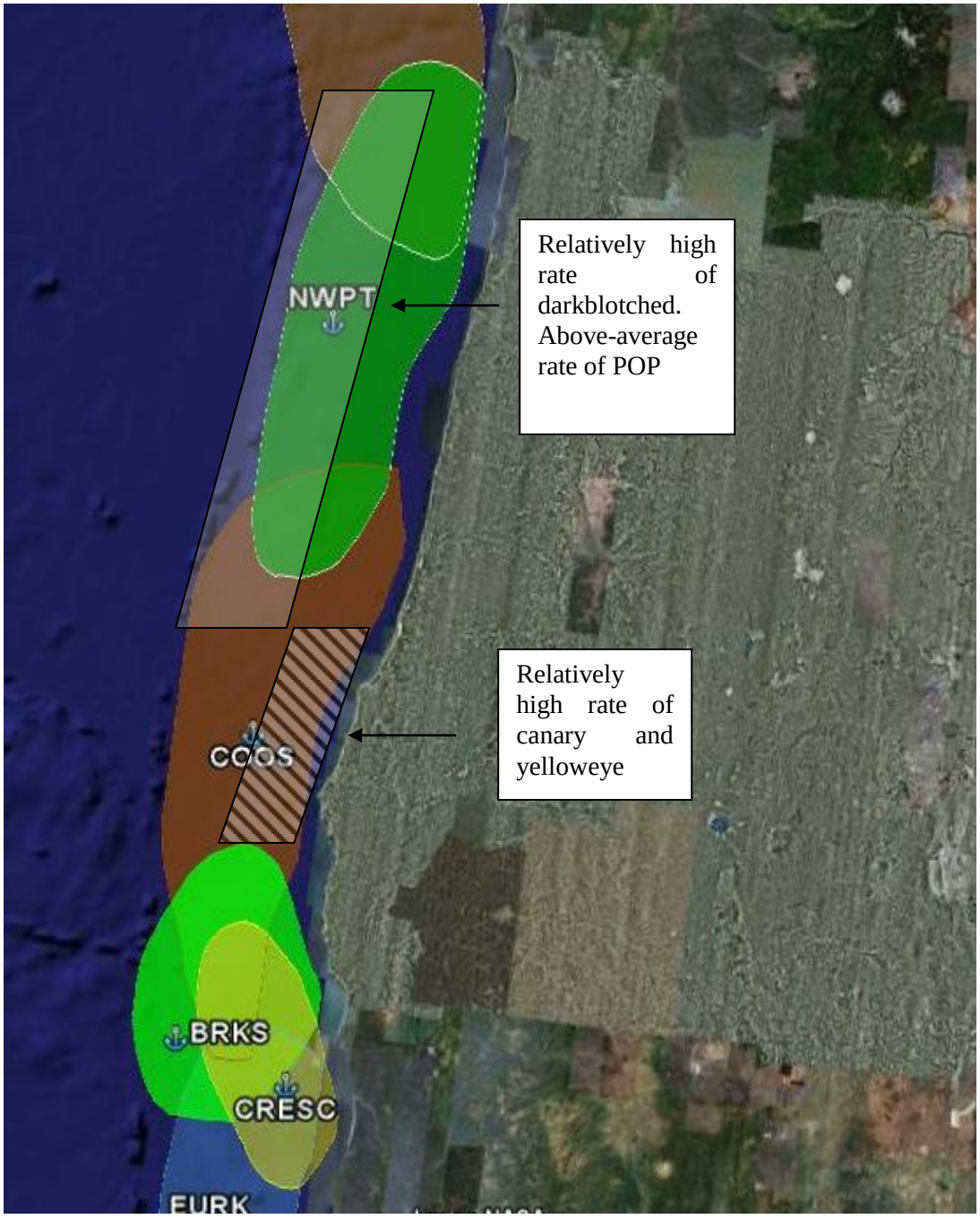


Figure C-2. Preferred fishing grounds of non-whiting trawlers based on their port of landing, Oregon and northern California.

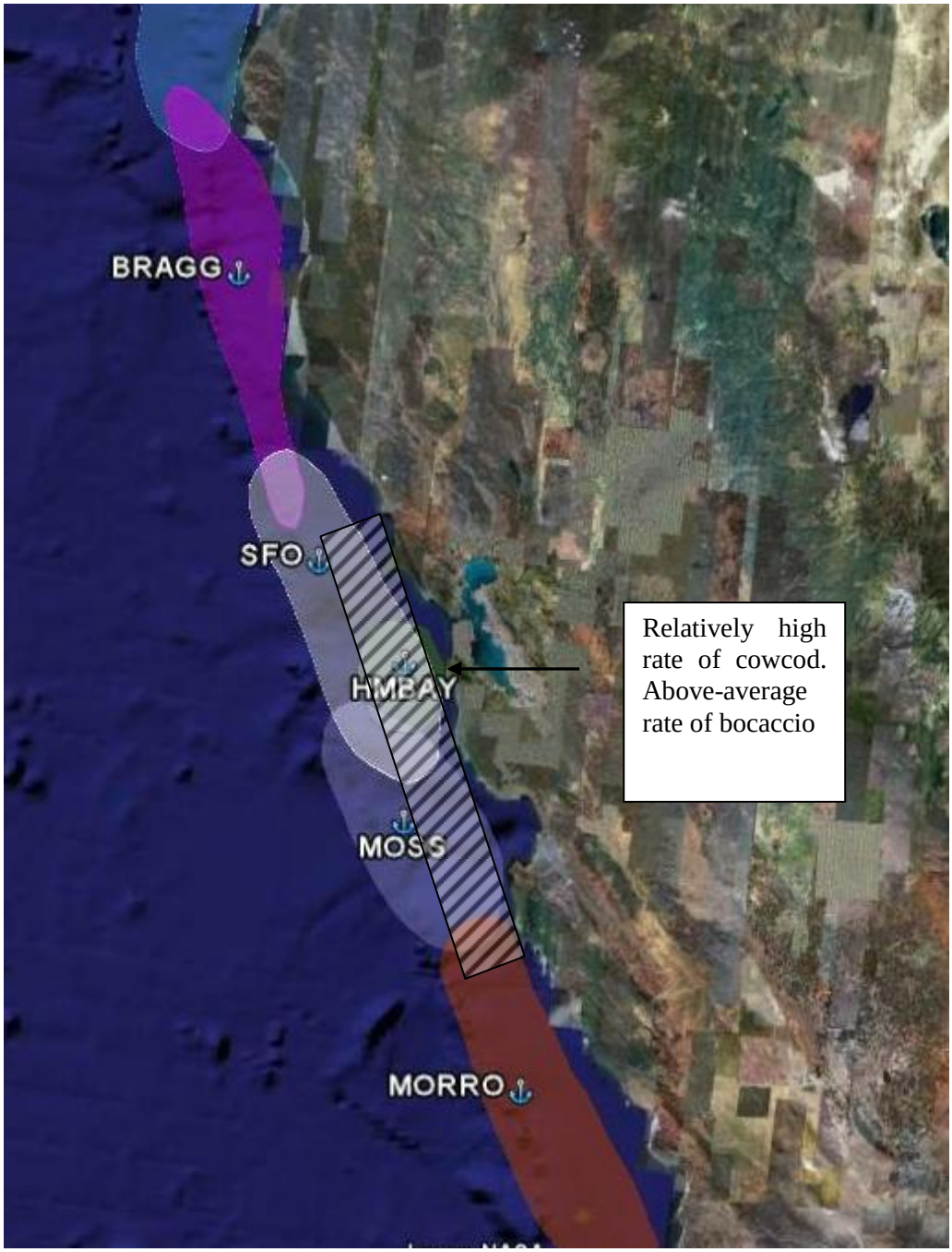


Figure C-3. Preferred fishing grounds of non-whiting trawlers based on their port of landing, central California.

By using logbook data, we assess the percentage of catch that has occurred within several areas of the coast (defined by seaward or shoreward of the RCA, and by latitude). We then trace each vessel's catch to a port of landing based on the port of landing associated with a trawl logbook record. If 50 percent of a port's landings are associated with a high bycatch area, we assign a double negative score for that port because the majority of its catch can be considered "at risk" due to the relative difficulty vessels will have in accessing their target species relative to vessels fishing in other areas. For ports with activity in a moderately high bycatch area, we assign a single negative score. However, it is important to keep in mind that other variables influence the amount of fishing activity that will occur in a port, and the

presence of a high bycatch area can be overcome by other variables such as an efficient fleet or substantial presence of shoreside infrastructure. The following table illustrates the data constructed as a result of this exercise. Areas shaded in grey are moderately high and high bycatch areas. This information shows that Bellingham, Neah Bay, Newport, and Princeton/Half Moon Bay have greater than 50 percent of their non-whiting trawl catch occurring in areas identified as a moderately high or high bycatch area. It is also important to note that the high bycatch area where the Newport fleet fishes is a moderately high bycatch area because it is made up of species that are less constraining to harvest activity (POP and darkblotched) than the other grey shaded areas.

Table C-1. Percent of non-whiting trawl catch by port and area.

Depth	Port	LATITUDE AREA							
		N 47.40	45.35 - 47.40	43.55 - 45.35	42.3 - 43.55	40.10 - 42.3	38.25 - 40.10	36.08 - 38.25	34.25 - 36.08
Sea-Ward Of The RCA	Bellingham/ Blaine	29.8%							
	Neah Bay								
	Westport	26.9%	9.9%						
	Astoria	16.9%	36.1%						
	Newport			58.4%					
	Coos Bay			28.6%	48.5%				
	Brookings				55.4%	41.8%			
	Crescent City					57.6%			
	Eureka					77.1%			
	Fort Bragg						85.9%		
	Moss Landing							72.0%	
	Princeton / Half Moon Bay								
	San Francisco						12.2%	74.4%	
	Morro Bay								97.6%
Shore-Ward Of The RCA	Bellingham/Blaine	69.9%							
	Neah Bay	95.5%							
	Westport		59.6%						
	Astoria	12.0%	34.0%						
	Newport			28.4%					
	Coos Bay				14.6%				
	Brookings								
	Crescent City					40.7%			
	Eureka					13.7%			
	Fort Bragg								
	Moss Landing							25.1%	
	Princeton / Half Moon Bay							94.7%	
	San Francisco							11.8%	
	Morro Bay								

Note: Totals may not sum to 100 percent because of confidentiality.

While the above information shows that several ports are engaged in relatively high constraining bycatch areas, other factors will influence the comparative advantage that vessels have in a rationalized fishery. These other factors include the relative efficiency of vessels that deliver to the various ports, the amount of agglomeration in shoreside business and infrastructure that exists in various ports, and the initial state of harvest privileges in each port as determined by the initial distribution of fishing quota.

C.1.2 Assessment of Industry Agglomeration by Port

The concept of agglomeration is used routinely in regional economic literature. When similar businesses are located near one another, the cost of doing business tends to decrease. Agglomeration cost savings come from the clustering of economic activity, that is, an attraction for other firms affected by noncollusive proximity economies once a cluster begins to form (Maki and Lichty 2000). Several sources of agglomeration exist including the folowing:

- Internal agglomeration. Internal sources of agglomeration typically occur as a firm increases in size and is able to specialize and use standardized inputs.
- Localization economies. These types of economies include situations where a business locates near its suppliers.
- Urbanization economies. These economies stem from a diverse labor force found in metropolitan areas, a large number of people, frequency of communication, and research and development in a populated area that may spur new ideas.
- Industry linkages. These linkages create cost savings from such things as transportation. These linkages typically occur in close proximity to one another.
- Public facilities and infrastructure. Government facilities and infrastructure comprise a set of units that can complement clustering of private enterprise.

In this section, we describe a series of factors that lead to an assessment of whether a port has a relatively high or relatively low level of agglomeration that would benefit a trawl sector. The concept that agglomeration results in cost savings can have implications as a trawl fishery is rationalized and quota flows toward the greatest return.

Table C-2. Description of port infrastructure.

Community	Infrastructure
Bellingham/ Blaine	Bellingham is home to 2 processors of trawl groundfish. Bellingham also has access to a large seafood cold storage facility and has a relatively well-developed level of port infrastructure. Bellingham is located on the I-5 corridor, which enhances access to distribution facilities in the Seattle area.
Neah Bay	There are no known processing facilities of trawl groundfish in Neah Bay. Port and harbor facilities are limited, and the location is considered remote and removed from distribution and transportation networks.
Westport	Westport has one known processing facility engaged in trawl groundfish. This facility concentrates primarily on Pacific whiting. Westport is somewhat removed from distribution centers.
Astoria	Astoria has several processing facilities engaged in trawl groundfish. In addition, several support businesses are known to exist in the area, and dock and harbor facilities are fairly well developed. Astoria is fairly removed from distribution centers.
Newport	Newport has several processing facilities engaged in trawl groundfish. In addition, several support businesses are known to exist in the area and dock and harbor facilities are fairly well developed. Newport is fairly removed from distribution centers.
Coos Bay	Coos Bay has several processing facilities engaged in trawl groundfish. In addition, support business and fabrication services are known to exist in the area, and dock and harbor facilities are fairly well developed. Coos Bay is fairly removed from distribution centers.
Brookings	Brookings has no known processing facilities of trawl groundfish. Brookings is fairly removed from distribution networks, but has a well-developed shallow draft port. Infrastructure necessary to service the trawl sector is limited with one icehouse and some small metalworking capabilities.
Crescent City	Available information shows that Crescent City has one processing facility that has engaged in small quantities of trawl groundfish in recent years. Crescent City is fairly removed from distribution centers. Crescent City has one of the principal vessel fabrication companies used by trawlers on the west coast. Crescent City has a number of fish hoists.
Eureka	Eureka has one large processing facility engaged in trawl groundfish. An icehouse exists in the area, as well as a new yard with several hoists. A ship hoist (cradle) exists that can service moderately sized trawl vessels.
Fort Bragg	Fort Bragg has one known processing facility engaged in trawl groundfish. Fort Bragg is relatively close to the distribution centers in San Francisco. An icehouse exists as well as a fuel dock.
Moss Landing	Moss Landing is not known to have any processing facilities engaged in trawl groundfish. Transportation networks are nearby. Limited infrastructure exists to service trawl vessels.
Princeton / Half Moon Bay	Princeton/Half Moon Bay is known to have three processing facilities engaged in trawl groundfish, but limited processing of trawl groundfish occurs. Several fish hoists exist in the area.
San Francisco	San Francisco has several small processing facilities engaged in trawl groundfish. San Francisco has a relatively developed port and harbor infrastructure. San Francisco is one of the primary distribution centers on the west coast.
Morro Bay	Morro Bay has no known processing facilities engaged in trawl groundfish. Morro Bay is relatively removed from distribution facilities. Infrastructure exists in the harbor area to support commercial fishing operations.

Sources: A) Northwest Fisheries Science Center. 2007. Community Profiles for West Coast and North Pacific Fisheries. Washington, Oregon California, and other U.S. States. NOAA Technical Memorandum NMFS-NWFSC-85
B) Leipzig, Peter. 2008. Personal Communication.

C.1.3 Cost Efficiency of Harvesters

The cost efficiency of the local fleet will likely have an impact on how a port fares as a result of rationalization and the consolidation that occurs as a result. Using information from the cost efficiency and fleet consolidation model, we are able to identify the relative efficiency of vessels delivering to various ports. While this information is based on vessels that currently exist in the fishery (and in the longer run, we would expect newer vessels to be constructed that are in the efficient range), the initial state can have long-term impacts. In other words, ports with relatively efficient trawl vessels at the start of a rationalization program may end up better off than ports with relatively inefficient vessels. The following tables show the number of non-whiting trawl vessels delivering to each groundfish trawl port over the 2004 to 2007 period and the weight of catch being delivered by efficient and inefficient vessels.

Table C-3. Number of non-whiting vessels making deliveries by port and efficiency category (2004 to 2007).

Port	Efficient Size	Inefficient Size
Astoria	13	25
Bellingham*	4	7
Brookings	5	8
Charleston (Coos Bay)	13	14
Crescent City	2	10
Eureka	6	21
Fort Bragg*	0*	12
Monterey	1	4
Morro Bay	5	8
Moss Landing	5	16
Neah Bay	3	4
Newport	11	19
Princeton / Half Moon Bay	1	17
San Francisco	5	15
Westport	1	6

* Fort Bragg has four vessels that are very near the efficient size category. It may be reasonable to assume that these vessels will remain in the fishery. Bellingham vessels must travel long distances to reach fishing grounds. While there are several vessels that deliver to Bellingham in the "efficient range," this travel distance suggests these vessels may be more appropriately categorized as "inefficient."
Note: These are not unique records, and they should not be summed.

Table C-4. Weight of non-whiting groundfish landed by port and vessel efficiency category (2004 to 2007).

Port	Efficient Size	Inefficient Size
Astoria	16,310,277	34,106,827
Bellingham Bay	4,596,540	5,876,909
Brookings	2,382,507	3,998,491
Charleston (Coos Bay)	15,820,364	7,013,554
Crescent City	C	2,854,037
Eureka	6,293,634	11,831,280
Fort Bragg		11,474,450
Monterey	C	1,054,166
Morro Bay	383,468	1,403,130
Moss Landing	2,034,403	1,118,074
Neah Bay	515,476	2,921,366
Newport	4,841,903	11,630,108
Princeton / Half Moon Bay	C	1,901,957
San Francisco	591,719	3,963,064
Westport	C	3,032,000

C.1.4 Initial Allocation of Quota Shares

The initial allocation of quota will likely tend to favor some geographic areas more than others, and such geographic differences are likely to extend to the level of fishing activity expected for a given location. Using the initial allocation rules being considered, the following table was developed. This

information shows the amount of quota pounds that would be allocated to each port if existing harvest volumes were maintained. This information is broken into two major fields with one field reflecting an initial allocation rule where the buyback history is allocated equally across recipients. The second field reflects an initial allocation made based purely on catch history. This information shows that clear patterns exist regardless of the initial allocation, and they tend to put a large share of quota into some ports. Using the average across all ports as an indicator of those standing to be successful, all ports shown in the table from Astoria to Moss Landing stand to be successful regardless of the initial allocation. Princeton/Half Moon Bay may be successful depending on the initial allocation rule. It is important to note that the average in this case is the average across all ports, including those that were aggregated into the "other" category in the table below. The "other" category consists of 12 ports. These averages result in 600 to 640 mt being allocated to ports on average under the equal sharing of buyback options, while 1,400 mt is the approximate average for the catch-history-based options.

Table C-5. Quota pounds attributed to west coast ports (assume status quo harvest amounts).

Port	Initial Allocation made with Equal Sharing of Buyback History			Initial Allocation made Based Entirely on Catch History		
	75% Hvstr ES	87.5% Hvstr ES	100% Hvstr ES	100% Hvstr HS	87.5% Hvstr HS	75% Hvstr HS
Astoria	4,497	4,472	5,068	4,248	4,150	4,115
Coos Bay	2,313	2,365	2,648	2,043	1,944	1,876
Newport	1,891	1,949	1,529	1,046	1,003	999
Eureka	1,573	1,594	1,425	1,005	1,000	1,008
Fort Bragg	1,144	1,180	1,357	966	919	873
Bellingham/ Blaine	1,054	991	1,372	1,192	1,197	1,216
San Francisco	754	808	961	744	689	636
Brookings	714	743	724	517	495	477
Moss Landing	695	717	769	611	588	567
Princeton/Half Moon Bay	568	612	459	428	409	391
Neah Bay	472	519	550	483	440	401
Morro Bay	447	414	412	317	340	364
Crescent City	363	355	300	226	238	252
Westport	292	304	355	303	288	275
Monterey	209	203	200	176	180	185
Other	497	502	456	389	383	380

C.1.5 Development of the Assessment Tool

Based on the information described above, we established the following summary of relative comparative advantage. While this information does not allow us to quantify the relative degree of comparative advantage in each port, several patterns seem apparent from this information. In particular, the port of Neah Bay appears as one community that may be at a disadvantage in a rationalized fishery

because of fleet efficiency, the lack of shorebased infrastructure, and the high degree of dependence that vessels in this port have on areas defined as "high bycatch." Inversely, the ports of Astoria and Coos Bay appear to be at a relative advantage compared to other ports. Astoria has the benefit of a relatively large number of efficient vessels, a relatively large presence of shorebased infrastructure, and a low dependence on fishing grounds located in high bycatch areas. Coos Bay also appears to be at a relative advantage because of fleet efficiency and the relatively large amount of shorebased infrastructure. While catch landed in Coos Bay historically has been caught in high bycatch areas, this amount of catch does not constitute the majority. Therefore, it is likely that vessels originating in Coos Bay will adjust fishing practices to avoid bycatch, but the community is not likely to suffer as a result.

Other communities are less certain. Bellingham and Half Moon Bay may experience their vessels bearing a relatively high degree of constraint because of their reliance on fishing grounds in high bycatch areas. The efficiency of vessels in Half Moon Bay is relatively low; while Bellingham has a number of vessels that fall within the efficient range, vessels from that area have a much longer travel distance to and from fishing grounds relative to vessels from other ports. This raises cost for those vessels relative to vessels from other ports, suggesting that these vessels may be more appropriately categorized as inefficient.

The effect on Fort Bragg and Crescent City is also somewhat uncertain. While several scores appear to work in Fort Bragg's favor, this community does not score in the top bracket on any of the determinant variables and may have a fleet consisting of inefficient vessels, though several vessels are close to the efficient range. Crescent City scores in the negative category on several variables and positively in others. The overall effect on Crescent City may depend on the relative importance of the variables. If bycatch dependency is the overall, driving factor, then Crescent City may actually be at an advantage, even though it has a relatively inefficient fleet and a relatively small amount of quota initially allocated to it.

Table C-6. Summary of ports' relative comparative advantage.

Port	Fleet Efficiency Score	Bycatch Dependent Area Score	Shorebased Infrastructure	Initial Allocation of Grndfish	Score
Astoria	+	+	+ +	+ +	+
Bellingham	?	− −	+ +	+	
Brookings	+	+	−	+	
Charleston (Coos Bay)	+	+	+ +	+	+
Crescent City	−	+	+	−	
Eureka	+	+	+	+	+
Fort Bragg	−	+	+	+	
Morro Bay	?	+	−	−	
Moss Landing	−	− −	+	+	
Neah Bay	−	− −	− −	−	−
Newport	+	−	+ +	+	
Princeton/Half Moon Bay	−	− −	+	+	
San Francisco	−	−	+ +	+	
Westport	−	+	+	−	

C.1.6 The Potential for Geographic Shifts in Fishery Patterns

The regional comparative advantage structure will also influence the geographic nature of fish harvesting activities. When the variables described above are combined, the comparative advantage of different regions will influence the level of fishing effort occurring in the fishing grounds of those ports.

Individual accountability in a rationalization program is likely to result in cleaner fishing practices. In particular, the individual accountability associated with constraining overfished species will encourage vessels to modify gears as well as to fish in areas where overfished species are less abundant. In addition, the rationalization program will tend to slow the pace of Olympic style fisheries that exist in the shorebased and mothership sectors of the whiting fishery. Both of these measures will tend to adjust fishing patterns at a geographic level. Cleaner fishing practices are likely to result in some pressure to move away from areas where there are relatively high encounters of constraining species like canary, yelloweye, and cowcod. A rationalized whiting fishery will tend to slow the pace of harvesting, and, given that the whiting stock tends to migrate north over the course of the year, this is likely to result in more midwater trawl effort occurring further to the north than under an Olympic style fishery. These effects may be enhanced or restrained by the economic activity and efficiency of fishing fleets that focus on certain areas. For example, if the fleet originating in a particular port tends to concentrate its effort in an area with a relatively high abundance of overfished stocks, we would expect that fleet to move or for quota shares from that fleet to be sold to other areas of the coast because it would be more profitable to do so[1]. However, if that fleet is relatively efficient, and there are shoreside support businesses and infrastructure in ports adjacent to those grounds that make fishing activity in those areas more attractive, vessels may continue to fish in those areas, even though constraining stocks are relatively more abundant. This is because the economic effectiveness that exists because of an efficient fleet and the presence of shoreside infrastructure can outweigh the effect that a relatively high presence of constraining stocks can have on regional fishing patterns.

Geographic shifts in fishing effort in the non-whiting trawl fishery are assessed by whether a port is at a relative advantage or disadvantage. If a port is at a disadvantage, then it is inferred that their fishing grounds are likely to be trawled less intensively than under status quo. In addition to the port-based comparative advantage structure, areas defined as relatively high bycatch are assumed to have less trawl effort than under status quo. This is true even if a port is at a relative advantage. The rationale is that ports with a relative advantage may gain trawl activity compared to status quo, but vessels fishing out of those ports are still likely to avoid high bycatch areas in order to stay away from constraining stocks and attain higher catch rates of target species. This analysis uses the same information as described in the above section. This information shows that several areas may be trawled less intensively than status quo, including sites off northern Washington, central Oregon, southern Oregon, and Central California.

<u>Areas Likely to be Trawled Less Intensively than Under Status Quo</u>

- Northern Washington
  – shoreward of the RCA
- Northern and North/Central Oregon – seaward of the RCA
- Central Oregon
  – shoreward of the RCA
- Central California
  – shoreward of the RCA

[1] Moving or selling quota to another area of the coast would be more profitable in this case because more target species could be accessed per unit of constraining overfished species in a relatively low bycatch area. For example, if vessels can leverage 100 pounds of target species per pound of canary rockfish in one area, but 500 pounds of target species per pound of canary rockfish in another area, more effort would be expected to occur in the second area in order to maximize harvest potential.

C.2 An Analysis Illustrating the Potential to Reduce the Catch Rate of Overfished Species and the Associated Potential for Increased Target Species Catch and Revenue

The reduction in the bycatch rate of overfished species is envisioned as one of the principal outcomes of a trawl rationalization program. One large implication of reductions in the bycatch rate of overfished species is the ability to access more target species and generate higher levels of revenue than under status quo. Under status quo management, fishing opportunities have been reduced to protect overfished species. In some cases, opportunities to catch species that have historically been large targets of the trawl sector have been eliminated because of their relatively high degree of correlation with overfished species (yellowtail and chilipepper rockfish, for example). In many cases, those species that are not highly correlated with overfished species have also seen target opportunities reduced. For example, the catch of sablefish (one of the primary targets for the trawl sector) has been less than the total trawl allocation by several hundred tons in recent years, and this represents a substantial economic loss in ex-vessel revenue. It is envisioned that a rationalization program will encourage fishermen to operate in a manner that avoids overfished species more effectively than the command and control type of management that exists in the status quo regime. This expected change in behavior is directly related to the individual accountability aspect of a rationalization program and the fact that there are individual rewards (because of access to target species) result from decreases in the bycatch rate. Some changes in the way fishing opportunities are prosecuted to change bycatch rates include changing the location of fishing, changing the gear that is used to prosecute those activities, and changing the time of fishing.

C.2.1 Non-Whiting Fishery Bycatch

Several sources of information can be used to show how the bycatch rate of overfished species can change in a rationalized fishery and the implications of that bycatch rate reduction. This information can be used to modify the NMFS/GMT trawl bycatch model[2] that predicts overfished species catch, target species catch, and ex-vessel revenue given an estimated overfished species bycatch rate and a set of assumed ex-vessel prices. By modifying the bycatch rate, the model can be used to simulate potential changes in harvest outcomes that will occur in a rationalized fishery.

Information that can be used to estimate changes in the bycatch rate of overfished species in a rationalized fishery includes exempted fishing permit (EFP) fisheries have been conducted with requirements that are nearly identical to what would likely be required under a rationalized fishery.

The Washington Arrowtooth Flounder EFP was a project that occurred over four years with requirements nearly identical to what would be expected under a rationalized fishery. In this EFP, vessels carried observers and were given an overall cap on the amount of overfished species. Vessels were also given individual vessel limits on overfished species. Vessels that could avoid overfished species and stay within their limits had access to arrowtooth flounder and petrale sole in excess of the normal two-month limits that were in place and to areas within the trawl Rockfish Conservation Area (RCA). When a vessel reached or exceeded the individual cap, that vessel was no longer allowed to participate in the EFP and was required to fish under normal two-month limits and RCA restrictions while still carrying an EFP observer. In other words, observations were collected while fishing under the EFP and while the vessel was fishing under status quo regulations (the latter serves as the control on

[2] The Trawl Bycatch Model was originally developed by staff at the Northwest Fisheries Science Center for use in setting regulations that manage the non-whiting trawl fishery. This model was reviewed and endorsed by the Scientific and Statistical Committee (SSC) in 2003.

the experiment). In addition to information collected on overfished species and target species catch, information on non-marketable discards was collected during the first year of the program. This information can be used to show order of magnitude estimates regarding the amount of regulatory discard occurring under status quo management and the increased amount of revenue that can be attributed to the fishery via an elimination of regulatory discards.

The information collected when vessels fished outside the EFP is directly comparable to bycatch information collected from the West Coast Groundfish Observer Program in a fishery that is not rationalized, while information collected in the EFP illustrates the bycatch rates that would be expected in a rationalized fishery. While the actual bycatch rates collected in this area cannot be used on a coast wide basis (the EFP occurred off northern Washington, which has different overfished species interactions than other areas of the coast), the percentage difference between EFP-based observations and non-EFP observations using the same observers can be used to show the reduction in bycatch rates that can be expected, and to estimate how coast wide bycatch rates collected through the WCGOP should be modified to reflect bycatch under a rationalized fishery.

The figure below illustrates the recorded canary bycatch rates for vessels participating in the EFP by year. The information below shows the bycatch rate when those vessels were participating in the EFP and the bycatch rate when those vessels were fishing under normal (non-EFP) fishing conditions. As is shown on the figure, in 2001 and 2002, the difference in EFP and non-EFP bycatch rates was substantial, while in 2003 and 2004 the difference was less, though still very noticeable. The explanation for this change is indicated in the figure. In 2003, gear modifications were required of vessels participating in the EFP, and those gears (which had demonstrably lower bycatch rates) were used outside the EFP as well. In 2004, those vessels became more accustomed to using those gears, and only gears that had demonstrated "satisfactory" results were used (which further reduced bycatch rates). In 2003 and 2004, the RCAs were in place during the months when observations were recorded; thus, the bycatch rate for non-EFP observations fell because vessels were no longer fishing in areas with high canary bycatch.

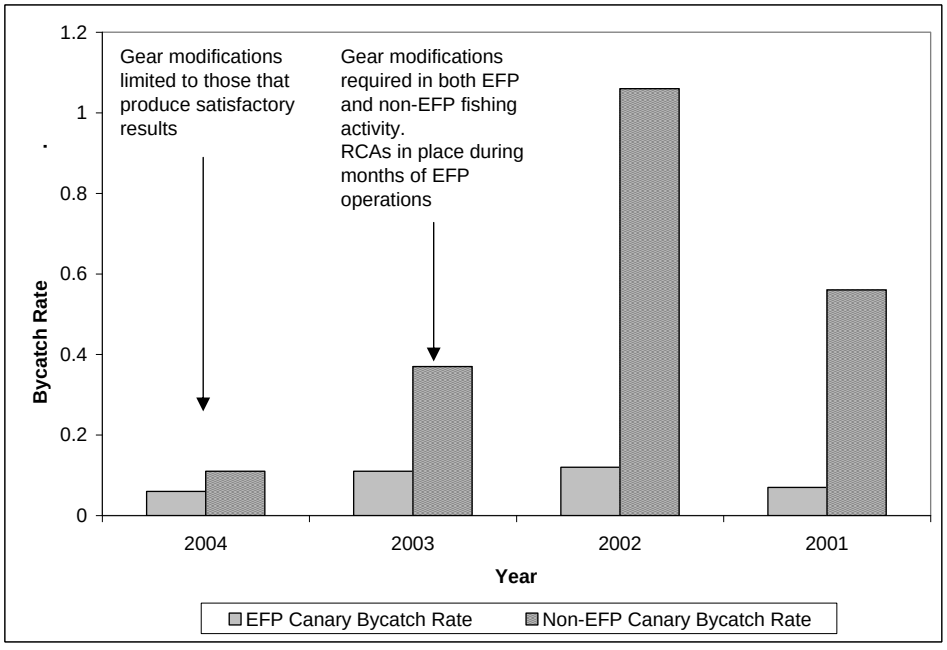


Figure C-4. Observed canary bycatch rates in the Washington arrowtooth EFP.

Table C-7. Summary statistics reflecting differences between EFP and non-EFP fishing activity.

	Canary Rockfish Bycatch Rates by Year and EFP vs. Non-EFP Activity Bycatch rate = (kg Canary / kg target species)*100%			
	2001	**2002**	**2003**	**2004**
Non-EFP Canary Bycatch Rate	0.56%	1.06%	0.37%	0.11%
EFP Canary Bycatch Rate	0.07%	0.12%	0.11%	0.06%
EFP as a % of Non-EFP	13%	11%	30%	55%
P(T<=t)	(insufficient data)	(0.002)	(0.206)	(0.135)

Comments received during the review of proposed methodology questioned whether the bycatch rates in the arrowtooth EFP changed because overfished species were being avoided, or whether they changing because the denominator, or set of target species, was shifting between EFP and non-EFP fishing activity. If the denominator, or set of target species, differs between EFP and non-EFP activity, then the argument was that the results shown above may not be indicative of what could occur under a rationalization program because they could be explained by differences in targeting behavior. To examine this question, bycatch rates were estimated in several additional ways: the first method examined canary bycatch relative to the amount of revenue generated by fishing activity; the second method examined canary bycatch relative to the amount of shelf target species; and the third method examined canary relative to the amount of shelf target revenue. All three additional approaches show substantial differences in the bycatch of canary rockfish in directed EFP activity compared to non-EFP activity. Canary rockfish is examined in this case because it was the most constraining species to target fishing activity during the four years of the EFP (because of the individual accountability measures of the program). Along other portions of the coast, other species such as darkblotched rockfish would likely be more constraining; therefore, substantial reductions in darkblotched would be expected instead.

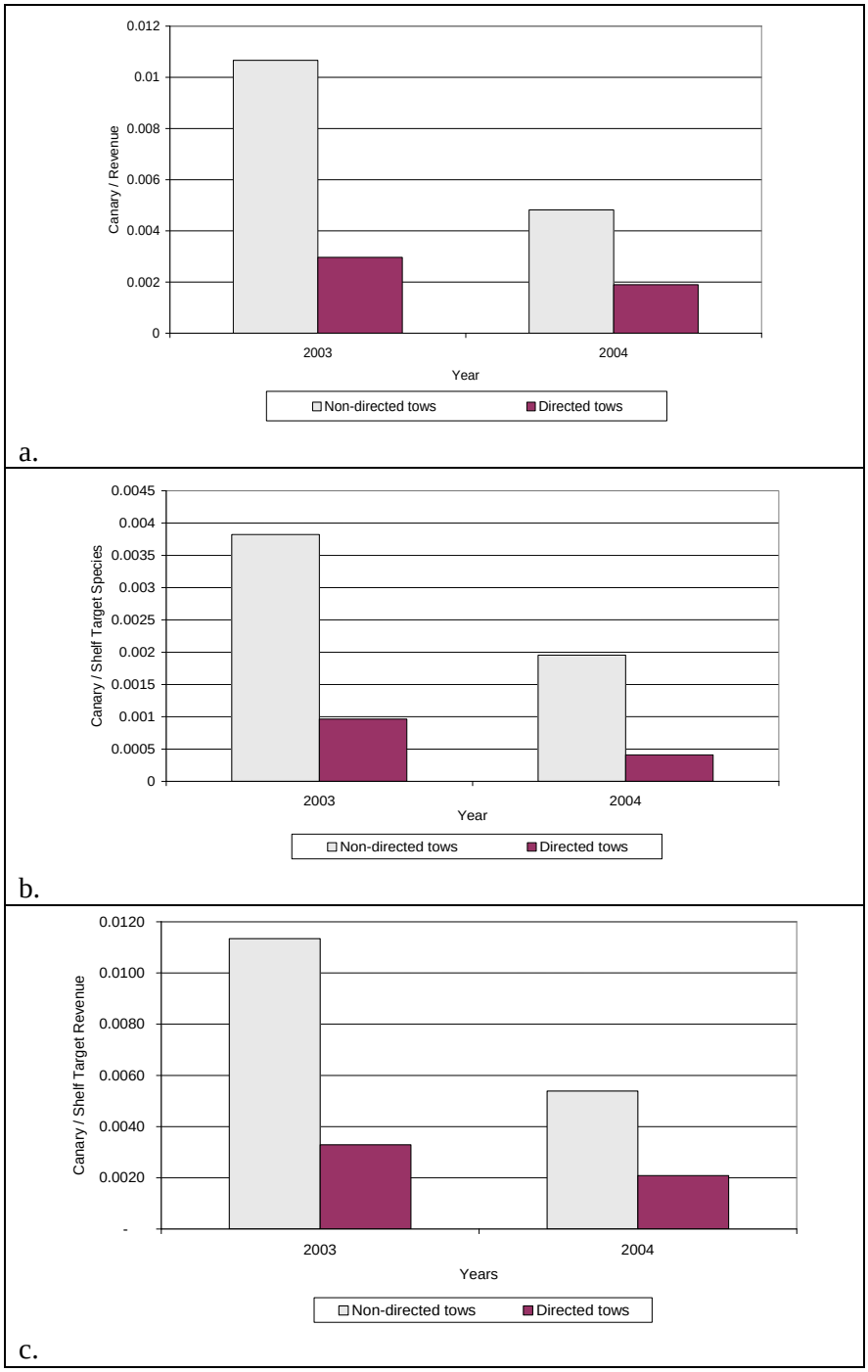


Figure C-5. Rate of canary rockfish encounters where (a) ex-vessel revenue is the denominator, (b) retained pounds of shelf target species is the denominator, (c) ex-vessel revenue of shelf target species is the denominator.

Looking into the data further, we compare canary bycatch rates at the haul level and stratify those hauls based on the dominant target strategy.[3] Target strategy is estimated at a species level and is determined

[3] Although the EFP was designed primarily to test targeting of arrowtooth flounder (and to a lesser extent, petrale sole), there is evidence in the data to suggest that some hauls were directed at different species.

based on the species that makes up the majority of catch in a tow. We establish nine different target species strategies from the project: arrowtooth flounder, Dover sole, petrale sole, "other flatfish," Pacific cod, sablefish, shortspine, arrowtooth and petrale combined, and a mixed target species strategy.[4] Of these, we find that the arrowtooth strategy is the largest category by weight for both directed and non-directed EFP activity, followed by Pacific cod. The third through sixth largest strategies by weight are the mixed stock strategy, the combined arrowtooth and petrale strategy, the Dover sole strategy, and the petrale strategy, respectively. After categorizing the data in this fashion, we compare canary rockfish bycatch rates in directed and non-directed activity. At this point, it is worthwhile to reiterate that canary rockfish is used because that was the constraining bycatch limit species in this EFP, so canary rockfish was the primary species with which fishermen were concerned.

After categorizing data according to a species-specific target strategy, we find insufficient observations to compare directed and non-directed bycatch rates in cases where the haul appears directed at sablefish and shortspine. This is not surprising, however, given that shortspine and sablefish are found along deep areas of the continental shelf and along the continental slope and that the EFP was conducted in areas along the shelf where flatfish are more common. Because there were insufficient observations to compare directed and non-directed tows from these species, we do not include a comparison of bycatch rates for these target strategies.

Finally, bycatch rates for canary rockfish were stratified according to whether they occurred in depths outside the RCA or both inside and outside of the trawl RCA. This separation is intended to isolate the effect of bycatch reduction measures that could be implemented via regulation (implementation of an RCA) from those bycatch reductions that would occur because of fishermen's behavior. We do not show a comparison of directed and non-directed activity within the RCAs because non-directed activity was conducted according to regular management measures, and, therefore, data do not exist on non-directed activity within the RCA. We do, however, compare directed EFP activity that occurred in all areas (both inside and outside the RCA) with non-directed activity outside the RCA. This is intended to provide an order of magnitude estimate that compares the effect on bycatch reduction from fishermen's behavior versus a bycatch reduction as a result of regulation. This comparison is labeled in the following table as "Inside and Outside RCA."

The following table shows the result of the categorizations described above. This table shows canary bycatch rates by directed EFP activity and non-directed activity. Those data are further stratified according to bycatch rates that occurred by target species strategy outside the RCA and a comparison of target species strategies for all areas (directed EFP activity took place within and outside the RCA). These data show that, for all target strategies listed, the bycatch rate of canary rockfish was lower in directed-EFP activity in every case except when petrale sole target tows in directed EFP activity that occurred inside the RCA are included in the comparison. This suggests that fishermen's behavior was more effective at reducing bycatch than regulatory mechanisms in all cases except for when those vessels targeted petrale sole. In the case of petrale sole targeting, fishermen's behavior would tend to reduce the bycatch rate of canary rockfish (as shown in the comparison between directed and non-directed activity outside the RCA), but the implementation of RCAs would result in a lower canary bycatch rate during petrale sole targeting activity than relying on fishermen's behavior alone.

[4] A mixed target strategy is a tow where a dominant species does not appear to be caught in the tow.

Table C-8. Canary bycatch rate in arrowtooth flounder EFP by target strategy and relation to RCA.

Strategy	Non-Directed Bycatch Rate Outside RCA	Directed Bycatch Rate Outside RCA	Directed Inside And Outside The RCA
Mixed Species Strategy	0.011	0.000	0.001
Arrowtooth/ Petrale	0.003	0.002	0.002
Pacific Cod	0.002	0.001	0.001
Dover Sole	0.001	0.000	0.000
Petrale	0.002	0.000	0.003
Arrowtooth	0.002	0.001	0.001

The data used from the Arrowtooth EFP project compare observed bycatch rates that occurred in depths outside (deeper or shallower than) the trawl RCA. Including observations outside the RCA is consistent with the expectation that RCAs will remain in place under a rationalization program and provides a more direct comparison between a rationalized fishery and status quo management (which relies on RCAs). This involves using observations from 2003 to 2004 that occurred outside the RCA. The percentage difference between EFP and non-EFP rates are applied to coast wide bycatch rates estimated from the West Coast Groundfish Observer Program. These modified rates are then used in the NMFS/GMT bycatch model for estimating the change in target species catch and ex-vessel revenue that would be expected in a rationalized fishery given the expected reduction in the encounters of constraining overfished species.

It is important to note the uncertainty associated with using the Arrowtooth EFP data in a manner for predicting coast wide changes in the bycatch rate. While available information clearly shows that changes in the bycatch rate of constraining stocks should be expected to occur under a rationalized fishery, the degree to which the quantitative results can be extended along the entire coast is uncertain. It is likely that other areas of the coast will be constrained by a different set of overfished species than the northern Washington coast (where the EFP was conducted), and it is not entirely clear how bycatch rates will change when another species is the constraining factor on target opportunity. For example, darkblotched rockfish do not tend to aggregate in the same fashion as canary rockfish (Steve Parker, personal communication), and, therefore, a different approach may be necessary in order to avoid darkblotched compared to canary rockfish, which tend to aggregate to a greater degree. Furthermore, bycatch rates in status quo management are representative of status quo fishing opportunity. Using the EFP results to modify bycatch rates collected under the status quo regime may be reasonable to inform bycatch rate associated with species that are currently targeted such as flatfish, sablefish, and thornyheads. The bycatch rate associated with species that are not currently targeted (such as chilipepper and yellowtail rockfish) is not well understood; therefore, the change in the bycatch rate associated with these species that should be expected in a rationalized fishery is also not well understood. In light of these uncertainties, the prediction of coast wide catch and ex-vessel revenue is displayed as a range, and that range should be treated as an order of magnitude.

In addition to the change in target species catch that may occur as a result of changes in bycatch rates, the catch of one target species may be limited by the catch of another target species. This is particularly the case for target species that co-occur with sablefish and petrale sole because these two species are caught at levels near their OY under status quo management. In other words, any increase in co-occurring stocks will mean successful avoidance of sablefish and petrale to some degree, to facilitate increased catch of co-occurring target species. Based on available information, the target species most limited by sablefish and petrale sole are "other flatfish," Dover sole in areas seaward of the RCA, shortspine thornyheads to some degree, and arrowtooth flounder to some degree. To assess the likely change in the co-occurrence of target species catch, we turn to recent patterns of landings and discard

relative to catch limits, permit-specific fish tickets, and the expertise of analysts who have been involved in structuring and proposing fishing opportunity for the limited entry trawl fleet. Based on these data sets and information, it appears that the "other flatfish" category, Dover sole, and thornyheads are limited by the OYs of petrale sole and sablefish, though increases in the catch of those species still occur under a rationalization program. The following table shows a range in the modeling results that is meant to bracket the range of uncertainty and to provide target species catch estimates that fall within a realistic order of magnitude.

Table C-9. Estimated catch of select groundfish in the non-whiting trawl sector by bycatch reduction scenario.

Species	Low Catch	Med Catch	High Catch
Sablefish	2,371	2,371	2,371
Longspine	2,071	2,071	2,071
Shortspine	1,536	1,536	1,536
Dover	11,985	11,985	15,000
Arrowtooth	4,943	4,943	4,943
Petrale	2,223	2,223	2,223
Other Flatfish	2,547	2,547	4,800
Yellowtail	51	51	1,000
Chilipepper	46	2,000	2,000
Pacific cod	723	1,200	1,200
Lingcod	220	670	855
Slope Rockfish	680	1,120	1,120

C.2.2 Pacific Whiting Fishery Bycatch

It is likely that overfished species bycatch rates will also change in the mothership and shorebased sectors of the whiting fishery because those fisheries are operating as an Olympic fishery under status quo management. The whiting fishery operates under sector-wide bycatch limits that can close all sectors of the fishery if reached. Each sector has demonstrated a reduction in bycatch rates since bycatch limits were put in place, however the catcher-processor sector has demonstrated a lower rate of canary rockfish bycatch (the species that was most constraining from 2004 to 2006). From this information, we can infer that changes in the bycatch rates in the mothership and shorebased sectors of the whiting fishery are likely to occur if those sectors of the fishery are rationalized. It is important to note that it is not appropriate to assume the mothership and shorebased sectors of the whiting fishery would have the same bycatch rates as the catcher processor sector.

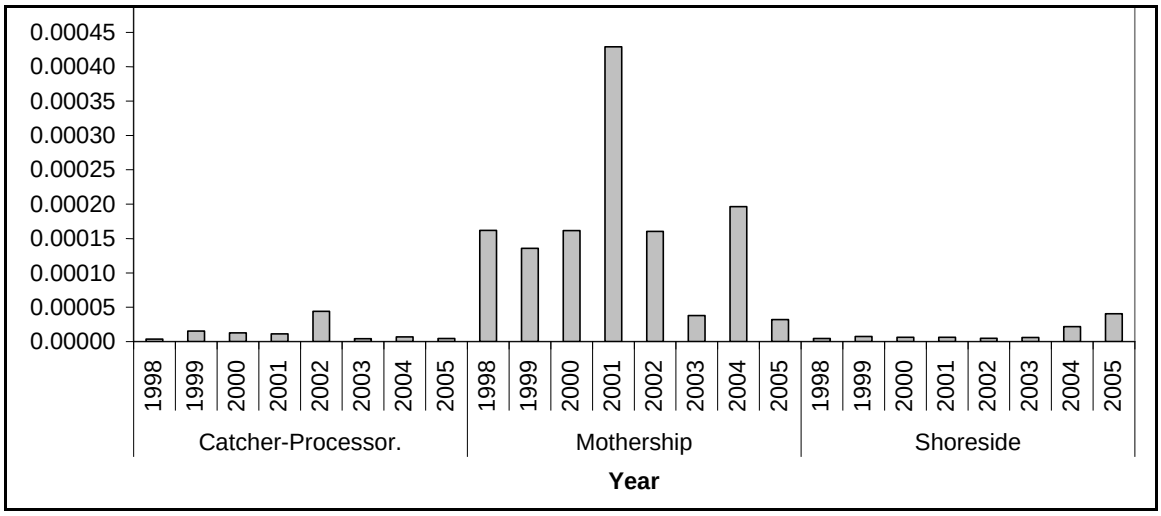


Figure C-6. Canary bycatch rate by year and whiting sector.

While it appears that bycatch rates in the mothership and shorebased sectors of the Pacific whiting fishery may decrease as a result of rationalization, such decreases are not expected to result in the same effect on the fishery as in the non-whiting fishery. Namely, the quantity of Pacific whiting harvested in the fishery has not been historically constrained by overfished species, with the exception of the 2007 season. Therefore, reductions in the bycatch rate of overfished stocks in the shoreside and mothership whiting sectors may not have an overall, aggregate economic impact in and of itself, though it is likely to change the behavior of harvesters in this fishery. Such behavior may have an indirect effect on the economics of the fishery if, for example, the timing of the fishery changes in order to respond to bycatch concerns.

C.3 Allocating Overfished Species on a Bycatch Rate (Proxy Species)

C.3.1 Introduction

This document describes a proposed methodology for allocating overfished species quota to LE trawl permits in the non-whiting sector based on a bycatch rate. This concept was originally proposed by the Groundfish Management Team (GMT) as a mechanism to allocate overfished species in a manner that would allow for the prosecution of current fishing practices given the constraints overfished species place on access to target species.

Empirical evidence from other quota programs throughout the world have shown that initial allocations of IFQ that differ substantially from current or recent fishing practices result in some negative consequences during the initial years of the program (dislocation of fishermen, high discard rates). Over time, these consequences are fixed through the natural trading of quota on the market, but a more refined initial allocation may still be able to avoid such negative consequences in the first place.

Preliminary analysis of initial allocation options has shown that, in general, if allocations of overfished species are made based on landings history, the distribution of overfished species quota would be heavily weighted toward a relatively few number of permits. This is because those were the permits that had previously targeted those species when they were abundant and because, under more recent regulations, catch of overfished species in the shoreside non-whiting fishery has been largely discarded rather than landed. For the near future, overfished species will constrain access to target species, so an

argument can be made for a more refined and equitable distribution of overfished species to allow permits to gain access to target species. While the market is likely to end up making necessary adjustments to the ownership of quota, overfished species quota is likely to be extremely costly because it will constrain access to target species. This means that those permits not receiving enough overfished species quota would essentially be forced to buy into the fishery again at a high cost, or leave the fishery all together. Allocating overfished species based on a bycatch rate is an attempt at making the initial allocation more equitable and avoiding such negative consequences.

C.3.2 General Description

The objective of allocating based on a bycatch rate is to allocate those species in a way that accommodates the current and recent spatial fishing patterns of LE non-whiting trawl vessels, to the extent possible. The bycatch rate of overfished species exhibits clear patterns across depth and latitude, and matching those patterns in the bycatch rate against relevant target fishing patterns can result in allocations that better accommodate recent fishing practices. Several sources of information are available for making allocations in a manner that accommodates these fishing practices:

- Logbooks are required of LE trawl vessels that deliver shoreside. Logbook information shows location, depth, and quantity of species that have been harvested by a particular vessel, among other things.
- The West Coast Groundfish Observer program samples the LE trawl fishery and records depth and location of species caught in observed fisheries.
- Information from these two data sets can be merged to allocate overfished species based on the spatial distribution of catch by LE trawl vessels and the corresponding spatial bycatch rates as estimated from WCGOP data.

During a 2007 meeting of west coast fisheries management agencies, it was revealed that logbook compliance in the shoreside trawl fishery was over 90 percent in recent years for all three west coast states. This information was contrary to the belief that logbook compliance was around 60 to 70 percent in some cases. Based on this information, the GMT recommended using permit-specific logbook information to determine a vessel's spatial and temporal catch history in recent years. In cases where there are no logbook records for a particular permit, then the fleet average would be used.

C.3.3 Data used in Application

The information used in this application includes fish ticket data, logbook data, and overfished species bycatch rates from the observer program. Fish ticket data are used because they are treated as the record of landed catch made by a vessel. Logbook data are used to stratify landed catch recorded on fish tickets into shoreward or seaward of the RCA locations in order to apply an overfished species bycatch rate and to identify the latitudinal area of catch. Observer program data are used for estimating shoreward and seaward bycatch rates of overfished species that are differentiated by latitudinal area. Several different latitudinal areas were considered, including 1) stratifying north and south of 40° 10' North latitude and south of 40° 10' North latitude, and 2) stratifying at 47° 40' North latitude, 43° 55' North latitude, 40° 10' North latitude, and 38° North latitude. The Council's decision resulted in a hybrid of those two options, using latitudinal stratifications at 47° 40' North latitude, 43° 55' North latitude, and 40° 10' North latitude.

Logbook records are used for estimating the location of catch. Location of catch in this case is defined as a latitudinal area, and whether the area was shoreward or seaward of the RCA. These estimates of catch location are developed for those species categorized as "target species" in existing trawl

management. Hypothetical catch location percentages (in terms of seaward and shoreward of the RCA) are shown in the table below.

Table C-10. Hypothetical percentage of target species catch that were caught shoreward and seaward of the RCA (2003 to 2006).

	Shoreward Catch Percentage	Seaward Catch Percentage
Dover	48%	52%
Longspine	5%	95%
Shortspine	12%	88%
Sablefish	11%	89%
Petrale	22%	78%
Other Flatfish	98%	2%
English sole	95%	5%
Splitnose	35%	65%
Pacific cod	88%	12%
Slope Rockfish	3%	97%
Arrowtooth	12%	88%

C.3.4 Model Development and Application

The model for this approach uses fish ticket data during the qualifying period, logbook data from 2003 to 2006, and observer data from 2003 to 2006. Quota shares of target species are first calculated from the fish ticket data, then target species quota shares are split by latitudinal area and by shoreward and seaward amounts based on catch depth recorded in 2003 to 2006 logbook data. This information is then multiplied by the trawl allocation amount of target species in place during the implementation year to get an estimate of implementation year quota pounds that are stratified by latitudinal area, and by seaward and shoreward of the RCA. These depth-stratified quota pounds are then multiplied by West Coast Groundfish Observer Program bycatch rates that are stratified by latitudinal area and by shoreward and seaward of the RCA from 2003 to 2006. The result is then converted to an overfished species quota share by dividing each permit's overfished species calculation by the sum of all non-whiting overfished species calculations.

1. The first step is to estimate each permit's target species quota shares.
2. The second step is to estimate the latitudinal area and depth of target species catch from logbooks for determining what each permit has caught by area from 2003 to 2006.
3. The third step is to stratify each permits' target species quota shares by latitudinal area and shoreward and seaward catch amounts based on each permits' depth stratified catch from step 1.
4. The fourth step is to multiply the depth and area stratified quota shares by the trawl allocation amounts during the initial implementation year to get quota pounds for the initial implementation year.
5. The fifth step is to multiply the corresponding latitudinal area and shoreward and seaward fleet average overfished species bycatch rates by the implementation year quota pounds of target species given to each permit.
6. The final step is to calculate overfished species quota shares by summing together the shoreward and seaward implementation year quota pounds for each permit and dividing that

amount by the total non-whiting trawl sector amount of implementation year quota pounds for those overfished species. This final step calculates the overfished species share.

The following tables illustrate the development and application of the proposed method. The table above (Table C-10) shows the first step in the model. The second step is to stratify each permit's target species quota shares into shoreward and seaward of the RCA portions and then estimate shoreward and seaward implementation year quota pounds. The following table shows an example of splitting quota shares for a hypothetical permit into seaward and shoreward areas.

Table C-11. Derivation of seaward and shoreward quota shares to a hypothetical permit.

Area	Species	Quota Share to Permit X	Shoreward Share	Seaward Share
North of 47 40	Dover	1%	48%	52%
	Longspine	2%	5%	95%
	Shortspine	3%	12%	88%
	Sablefish	3%	11%	89%
	Petrale	1%	22%	78%
	Other Flatfish	1%	98%	2%
	Pacific cod	1%	88%	12%
	English sole	1%	95%	5%
	Splitnose	0%	0%	0%
	Slope Rockfish	4%	3%	97%
	Arrowtooth	3%	12%	88%

The table below shows hypothetical quota shares for a permit that has only caught fish north of 47° 40' N latitude. Target species quota shares are differentiated as seaward and shoreward of the RCA from logbook information, as shown in the table above. The trawl allocation is then multiplied by those shares to derive an implementation year quota poundage of target species for that permit. This amount is shown in the right two columns of the table.

Table C-12. Hypothetical development of seaward and shoreward implementation year target species quota pounds.

Area	Species	Shoreward Share	Seaward Share	Implementation Year Trawl Allocation (mt)	Shoreward Lbs	Seaward Lbs
North of 47 40	Dover	48%	52%	16000	169,315	183,424
	Longspine	5%	95%	2000	4,409	83,776
	Shortspine	12%	88%	1200	9,524	69,842
	Sablefish	11%	89%	2600	15,763	127,537
	Petrale	22%	78%	2500	12,125	42,990
	Other Flatfish	98%	2%	7000	151,237	3,086
	Pacific cod	88%	12%	1000	19,401	2,646
	English sole	95%	5%	14000	293,214	15,432
	Splitnose	0%	0%	460	-	-
	Slope Rockfish	3%	97%	800	1,852	59,877
	Arrowtooth	12%	88%	10000	79,366	582,020

After determining a seaward and shoreward implementation year quota poundage, seaward and shoreward bycatch rates are applied to determine hypothetical darkblotched poundage. That poundage is then divided by the sum of all permits' poundage to derive a quota share of overfished species. The following table illustrates this method by continuing the use of shoreward and seaward implementation year quota pounds. Hypothetical darkblotched bycatch rates are multiplied by this amount in order to determine a darkblotched poundage. That poundage is then divided by a hypothetical fleetwide poundage to derive that permits quota shares of darkblotched rockfish.

Table C-13. Hypothetical derivation of darkblotched quota shares using proposed method.

Area	Species	Shoreward Lbs	Seaward Lbs	Shoreward bycatch rate	Seaward bycatch rate	Shoreward Drkbltchlbs	Seaward Drkbltch lbs	Total	Fleet total	Darkblotched QS
North of 47 40	Dover	169,315	183,424	0.0001	0.02	16.93	3,668.49			
	Longspine	4,409	83,776	0.0001	0.02	0.44	1,675.51			
	Shortspine	9,524	69,842	0.0001	0.02	0.95	1,396.85			
	Sablefish	15,763	127,537	0.0001	0.02	1.58	2,550.75			
	Petrale	12,125	42,990	0.0001	0.02	1.21	859.80			
	Other Flatfish	151,237	3,086	0.0001	0.02	15.12	61.73			
	Pacific cod	19,401	2,646	0.0001	0.02	1.94	52.91			
	English sole	293,214	15,432	0.0001	0.02	29.32	308.65			
	Splitnose	-	-	0.0001	0.02	-	-			
	Slope Rockfish	1,852	59,877	0.0001	0.02	0.19	1,197.55			
	Arrowtooth	79,366	582,020	0.0001	0.02	7.94	11,640.39			
								23,488	705,478	3%

C.4 Allocating Pacific Halibut to LE Trawl Permits in the Non-Whiting Trawl Fishery Based on a Bycatch Rate

C.4.1 Introduction

The catch of Pacific halibut may be regulated by way of individual bycatch quota in the trawl fishery after a rationalization program goes into place. Allocating Pacific halibut to individual trawl permits may prove to be difficult because there are no permit-specific records available with which to make an allocation based on catch history (outside the whiting fishery). This is because regulations prohibit the retention of Pacific halibut with gears other than hook and line gear. An initial allocation can be made to permits if it is done based on a bycatch rate to target species that have been landed and by the area that was fished. This paper describes a method for allocating Pacific halibut based on a proxy, or a bycatch rate.

C.4.2 General Description

Pacific halibut are encountered incidentally in trawl fisheries. Pacific halibut are a prohibited species, meaning their retention is not allowed in fisheries using trawl gear, so there are no permit-specific records of Pacific halibut catch. The incidental catch of Pacific halibut is documented through the West Coast Groundfish Observer Program, which samples the non-whiting trawl fishery. This information is used to estimate the total catch of Pacific halibut in the non-whiting trawl fishery based on an encounter rate to a target species. The approach described here proposes a method that is similar to the approach used for estimating total trawl mortality, but includes additional stratifications based on International North Pacific Fishery Commission (INPFC) area and whether a vessel was fishing seaward or shoreward of the trawl RCA. For practical purposes, seaward and shoreward are identified as being deeper or shallower than 115 fathoms. These additional stratifications are proposed to consider the known spatial abundance and encounter rates of Pacific halibut that exist, as well as the spatial fishing patterns exhibited by fishermen.

C.4.3 Data Used in Application

Several sources of information exist for deriving permit-specific catch histories of Pacific halibut. These sources of information include logbook data, West Coast Groundfish Observer Program data, and fish ticket data. These sources of information can be used similarly to the approach described for allocating overfished species based on a bycatch rate, however the approach described here has several of differences. The first difference is that the approach for allocating Pacific halibut uses two species that have been shown to have positive correlations with Pacific halibut—arrowtooth flounder and petrale sole—while the method for allocating overfished species uses all target species. The second difference is that this approach uses an area stratification that is based on landings of target species that have occurred north of 40° 10’ N latitude, and stratifies that area into two sub-areas. One sub-area is a combination of the Eureka and Columbia INPFC areas, and the other sub-area is the Vancouver INPFC area. These areas were chosen because available observer information shows a clear difference in encounters of Pacific halibut off northern Washington compared to areas to the south, and this INPFC area-based stratification can be readily accommodated with logbook data.

Limited-entry trawl logbook data are used in the same fashion as the approach taken for allocating overfished species, although the number of target species is lower because arrowtooth and petrale sole show positive correlations with Pacific halibut. Depth-based landings are used to distribute the fish ticket landings of individual permits between shoreward and seaward of the trawl RCA. In addition to

using logbooks to determine depth of catch, logbook data are also used to determine latitudinal area of catch.

Table C-14. Hypothetical vessel average depth-based catch proportion of target species that were caught by a vessel fishing in the Vancouver area (2003 to 2006).

Area	Target Species	Average Seaward Catch Percentage	Average Shoreward Catch Percentage
Vancouver INPFC Area	Arrowtooth Flounder	48%	52%
	Petrale Sole	11%	89%

C.4.4 Model Development and Application

The model for this approach uses fish ticket data during the qualifying period. Petrale sole and arrowtooth flounder from these fish ticket records are split into shoreward and seaward amounts based on permit-specific catch depth from logbook data from 2003 to 2006 as shown in the above table, and by the Vancouver INPFC area and the combined Columbia and Eureka INPFC area based on logbook data. Where fish ticket records exist for a particular species, but logbook records do not, the fleet average depth or area distribution for harvests of that species is used. This information is matched against West Coast Groundfish Observer Program data that are stratified shoreward and seaward of the RCA for the years 2003 to 2006 and also stratified between the Vancouver and combined Columbia/Eureka INPFC areas. Quota shares for petrale sole and arrowtooth are then calculated for each permit and applied to the trawl allowable catch during the implementation year of IQs to estimate the implementation year quota pounds. These implementation year quota pounds are stratified by shoreward and seaward amounts and INPFC area, based on catch history. Each of these quota pound estimates are matched up to a corresponding depth and area Pacific halibut bycatch rate, and the result is summed. The result is a poundage estimate for Pacific halibut for each permit. That estimate is then divided by the fleet total to estimate each permit's quota share of Pacific halibut.

The following tables illustrate how the quota shares of arrowtooth and petrale sole are separated into shoreward, seaward, and latitudinal amounts. The table below uses the above table showing depth-based catch from logbooks. The first column of the table shows the species, and the second column of the table shows the quota share that permit would receive of arrowtooth and petrale sole. The third, fourth, and fifth columns then show the source area and depth of catch. In this case, the particular permit only has catch history from the Vancouver area. This hypothetical permit would receive 1 percent of the arrowtooth flounder share, 0.476 percent of which was caught seaward of the trawl RCA in the Vancouver area.

Table C-15. Hypothetical development of area-specific seaward and shoreward quota shares of target species.

Permit XXLE Catch History				
Target Species	Quota Shares to Permit X	Area	Seaward Share	Shoreward Share
Arrowtooth Flounder	1.00%	Vancouver	0.476%	0.524%
		Columbia/Eureka	0.0%	0.0%
Petrale Sole	3.00%	Vancouver	0.317%	2.683%
		Columbia/Eureka	0.0%	0.0%

The next table uses the information from the previous table to estimate the quota pounds a permit would get during the implementation period. This calculation uses the shoreward and seaward delineation of target species shares to estimate a shoreward and seaward quota poundage amount during the implementation year.

Table C-16. Hypothetical development of shoreward and seaward implementation year quota pounds.

Target Species	Area	Seaward Share	Shoreward Share	Implementation Year Trawl Allocation (mt)	Seaward Pounds	Shoreward Pounds
Arrowtooth Flounder	Vancouver	0.476%	0.524%	5,000	52,464	57,767
	Columbia/ Eureka	0%	0%			
Petrale Sole	Vancouver	0.317%	2.683%	16,000	111,744	946,474
	Columbia/ Eureka	0%	0%			

The next table then matches the shoreward and seaward quota pounds with the corresponding bycatch rates of Pacific halibut. That amount is then summed and divided by the fleet total to derive each permits' quota shares of Pacific halibut, shown in the last column.

Table C-17. Derivation of Pacific halibut quota shares.

Target Species	Area	Sea-ward lbs	Shore-ward lbs	Sea-ward Bycth Rate	Shore-ward Bycth Rate	Sea-ward Pacific Halibut LBS	Shore-ward Pacific Halibut LBS	Permit P. halibut Total	Fleet P. halibut Total	P. Halibut Share
Arrowtth Flounder	Vncvr	52,464	57,766	0.001	0.04	52	2,311			
	Colum/ Eureka	0	0	.00005	0	0	0			
Petrale Sole	Vncvr	111,744	946,473	0.001	0.04	112	37,859			
	Colum/ Eureka	0	0	.00005	0	0	0			
								40,334	**1,800,000**	**2.2%**

C.5 References

Maki, W. and R. Lichty. 2000. *Urban Regional Economics*: Iowa State University Press.

COUNCIL FINAL PREFERRED GROUNDFISH TRAWL RATIONALIZATION ALTERNATIVE

Appendix D

To The
Rationalization of the Pacific Coast
Groundfish Limited Entry Trawl Fishery
Final Environmental Impact Statement

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Acronyms and Abbreviations

Acronym	Definition
Council	Pacific Fishery Management Council
CP	catcher processor
CV(MS)	mothership-endorsed catcher vessel permit
EIS	environmental impact statement
FMP	fishery management plan
IBQ	individual bycatch quota
IFQ	individual fishing quota
MS	mothership
MSA	Magnuson-Stevens Fishery Conservation and Management Act
NMFS	National Marine Fisheries Service
OY	optimum yield
RCA	Rockfish Conservation Area
QP	quota pound
QS	quota share

D.1 Overview of Recommendations by Sector

The Pacific Fishery Management Council's (Council) sector specific recommendations for rationalizing the trawl fishery are provided here and will be finalized and forwarded to the National Marine Fisheries (NMFS) for approval later in 2009. The recommendations were adopted at the Council's November 2008 meeting. In general, the Council recommends the following:

Shoreside Trawl Sector (nonwhiting groundfish species and whiting):

Manage with individual fishing quotas (IFQs).

Provide 90 percent of the initial allocation of nonwhiting IFQ to holders of vessel permits; and

set aside 10 percent of the initial allocation for an adaptive management program that may benefit processors and communities, among others.

Provide 80 percent of the initial allocation of whiting IFQ to holders of vessel permits; and

provide 20 percent of the initial allocation of whiting to processors.

Mothership (MS) Trawl Sector (whiting and groundfish bycatch species):

Manage with a harvester co-op system and limited entry for MS processors.

Require that vessels declare preseason the MS processor for which they will fish in a coming year.

Catcher Processor (CP) Sector (whiting and groundfish bycatch species):

Create a permit endorsement to prevent expansion of the number of participants.

Allocate whiting and bycatch to the existing voluntary co-op.[1]

Provide an IFQ program if the voluntary co-op fails (initially allocate IFQ equally among all permit holders).

The amount of allocation available for these sectors will be determined through the intersector allocation process. IFQ for the shoreside fishery may not be delivered to at-sea processors, nor may quota allocated to the mothership (MS) or CP sectors be delivered shoreside.

The following sections provide a general summary of the program for each sector, followed by a complete description that also identifies trailing actions the Council has been working on in 2009. These actions will be completed prior the time it submits the package to NMFS for approval.[2] *The trailing actions pertain to eligibility to own IFQ, accumulation limits, and adaptive management. Implementation is not expected earlier than 2011.*

D.2 Shoreside Trawl Sector: IFQ Program (Appendix A of the Environmental Impact Statement [EIS])

This section details the IFQ program that the Council is recommending for the shoreside sector of the groundfish fishery. The first part of the section describes major components of the program. Table D-1, which starts on page 5, presents complete details on elements of the recommended IFQ program.

[1] When the Council took final action, NMFS indicated its preliminary intent to license the voluntary co-op. However, this was not part of the Council's final action.

[2] During its March and April 2009 meetings, the Council also clarified a number of its recommendations. These clarifications are reflected in the version of the trawl rationalization recommendation provided here.

D.2.1 Overview of the IFQ Program Elements

Under this program, most status quo management tools would remain in place. The main exceptions are cumulative landing limits for nonwhiting groundfish species and a closure period to control whiting harvest at the start of the year.[3] Other measures, such as Rockfish Conservation Area (RCA) boundaries, may be adjusted as experience is gained with the IFQ program.

An IFQ will grant an entity the privilege to catch a specified portion of the trawl sector's allocation. Within the IFQ program, vessels will be allowed to use a variety of directed groundfish commercial gear (including nontrawl gear) to take the shoreside trawl sector allocation, which will enable "gear switching." IFQs will be created for most species of groundfish under the Groundfish Fishery Management Plan (FMP) (although some will still be managed collectively at the stock complex level, e.g., remaining minor slope rockfish). Some groundfish species rarely caught by trawl gear and dogfish will be excluded from the IFQ program. To ensure that optimum yields (OY) for species not covered by IFQ are not exceeded, catch of those species will be monitored and deductions made from the OY in anticipation of the expected level of shoreside trawl sector catch. For trips targeted on whiting, IFQ will be required only for whiting and the main bycatch species.

Halibut individual bycatch quota (IBQ) will be required to cover the incidental catch[4] of Pacific halibut in the groundfish trawl shoreside fishery. Under an IBQ program, retention would not be allowed.

The following sections describe the major provisions of the IFQ program.

D.2.1.1 Initial Allocation

The program will initially allocate IFQ as quota share (QS) to fishery participants based mainly on their historic involvement in the fishery. Following the initial allocation, transfers (described below) will also allow others to participate in the fishery as quota holders. The initial allocation can be viewed in two segments:

First, in developing its recommendation, the Council considered the groups that should be included in the initial allocation and the proportional split among the groups. The Council recommended that harvesters (those holding limited entry permits for trawl vessels) be given an initial allocation of 90 percent of the nonwhiting QS and 80 percent of the whiting QS. Ten percent of the QS for nonwhiting species would be made available for an adaptive management program and processors would receive 20 percent of the whiting QS.

Second, the Council considered specific allocation formulas to determine the amount of QS each eligible entity will receive. These calculations are based primarily on the delivery history associated with a vessel permit or processing company over a set number of years. For the allocation to permits, the QS associated with the history of permits retired in the buyback program will be distributed equally among the remaining qualified permits (about 44 percent of the QS will be allocated in this fashion). A special calculation is provided for incidentally caught overfished species. For these species, the allocation will be based on the QS recipient's need to cover incidental catch under current fishing practices (as measured by bycatch rates, individual permit logbooks for recent years, and the amount of target species QS that an entity receives). None of the QS for overfished species will be allocated equally among harvesters, with the exception of canary rockfish. A similar approach would be used for the allocation of halibut IBQ.

[3] This closure period is necessary because of Endangered Species Act concerns related to salmon.

[4] At its June meeting, the Council will consider a recommendation by the Groundfish Allocation Committee to interpret previous Council action under Amendment 21 as creating an IBQ program to cover incidental mortality rather than catch.

D.2.1.2 Stock Management Units for IFQs

QS will be issued for the species groups and areas for which there are OYs (management units). However, QS will not be required for some rarely caught species. Catch of these species would be monitored to ensure that they do not exceed any established allocations. There may be further area subdivisions for species for which there is an area specific precautionary harvest policy. There are also provisions that provide for both species group and area subdivision of QS after initial allocation.

D.2.1.3 Annual Issuance, Holding Requirements, and Transfer Rules

In designing the management regime for the IFQ program, the Council is balancing the benefits of flexibility and individual accountability with program costs and the constraints of the very low allowable catch levels of overfished species. Prior to the start of each fishing year, NMFS will issue quota pounds (QP) to entities based on the amount of QS they hold and the shoreside trawl sector allocation. The QP would have to be transferred to a vessel account in order to be used. When a vessel goes fishing under the IFQ program, all catch must be recorded (including discards), and it must be matched by an equal amount of QP from the vessel's QP account. If there is not enough QP to cover the catch from a trip, there is a 30-day grace period during which adequate QP must be transferred into the vessel's account. A vessel's fishing will be limited, and its permit cannot be sold, until the overage is covered. A carryover provision will allow for an overage in one year to be covered by up to 10 percent of the following year's QP; likewise, the provision also will allow QP that were not used in one year to be carried over into the following year, up to 10 percent.

Bycatch reduction and greater efficiency are expected to occur in the groundfish fishery under the IFQ program because of the transferability of QS and QP. Through the transfer of QS/QP (bought and sold or leased through private contract), it is anticipated that those best able to avoid catching overfished species and those who are most efficient will increase the amount of QS/QP registered to them. Those who consistently have high bycatch rates or operate less efficiently might choose to sell their QS and leave the fishery. Generally, anyone eligible to own a U.S.-documented fishing vessel could also acquire QS and QP, and the QS and QP could be acquired in very small increments.[5] These provisions will allow for new entrants into the fishery; for example, a crewmember could slowly purchase amounts of quota. They also allow for ownership of QS by entities that do not otherwise participate in the fishery. *In early 2009, during its trailing actions the Council considered but rejected substantially modifying provisions pertaining to who is eligible to own the QS.*

While transferability is an important component, some provisions limit transferability in order to protect against unintended consequences. For example, there will be accumulation limits on the amount of QS or QP that can be controlled by an entity and accumulation limits on the amount of QP registered to a vessel. The intent of these limits is to prevent excessive control of quota by a participant. *The exact percentages that will be used in these limits will be determined through a trailing action.*

An adaptive management provision will allow the Council to use 10 percent of the trawl allocation to provide incentives, support, or other compensation to offset adverse impacts of the program. This program may benefit communities and processors, among others. *Details will be the subject of a trailing action.*

[5] To be eligible to own QS, the person need not actually own a U.S. documented fishing vessel.

D.2.1.4 Tracking and Monitoring

A tracking and monitoring program is necessary to ensure that all catch (including discards) is documented and matched against QP. At-sea observers would be required on all vessels, as well as shoreside monitoring during all off-loading (100 percent coverage). Cameras may be used to augment the observers and ensure compliance. Compared to status quo monitoring, this will be a significant increase for a large portion of the trawl fleet, particularly nonwhiting shoreside vessels. More accurate estimates of total mortality will benefit stock conservation goals. Discarding will be allowed, though all fish discarded will also have to be covered by QP. There would be 100 percent shoreside monitoring; and there may be limited landing hours to control costs. Additionally, a program for the mandatory submission of economic data is included to facilitate monitoring program performance.

D.2.1.5 Costs and Fee Structure

Program costs are of concern and ongoing Federal administrative costs are discussed in Appendix A and in Appendix H.. Program benefits are expected to exceed costs One of the major sources of costs is associated with industry payments for observers and catch monitors. To help mitigate against these costs, NMFS has announced its intent, subject to available Federal funding, that participants would initially be responsible for 10 percent of the cost of hiring observers and catch monitors. The industry proportion of the costs of hiring observers and catch monitors would be increased every year so that, once the fishery has transitioned to the rationalization program, the industry would be responsible for 100 percent of the cost of hiring the observers and catch monitors by 2014. Fee structures will be proposed to recover program costs from industry, up to the limit of 3 percent of ex-vessel value.

D.2.1.6 Program Monitoring, Review and Future Auction

The Council will conduct a formal review of program performance no later than five years after implementation and every four years thereafter. The result of the evaluation could include dissolution of the program, revocation of all or part of quota shares, or other fundamental changes to the program. At the time of its first review, the Council will also consider the use of an auction or other non-history-based method when distributing quota share that may become available after the initial allocation.

D.3 Detailed Specification of IFQ Program Elements and Options

Table D-1 provides a complete description of the IFQ program.

Table D-1. Full description of the IFQ Program for shoreside trawl deliveries.

	Element	Sub-element	
A. Trawl Sector Management			
A-1.1	Scope for IFQ Management, Including Gear Switching		For trips delivered shoreside, QP will be required to cover catch of all groundfish (including all discards) by limited entry (LE) trawl vessels with certain gear and species exceptions. Gear Exception: Vessels with an LE trawl permit using the following gears would not be required to cover their groundfish catch with QP: exempted trawl, [a] gear types defined in the coastal pelagic species FMP, gear types defined in the highly migratory species FMP, salmon troll, crab pot, and LE fixed gear when the vessel also has a LE permit endorsed for fixed-gear (longline or fishpot) AND has declared that they are fishing in the LE fixed-gear fishery. Species Exception: The following would be an exception from the QP requirement longspine thornyheads south of 34º27' N latitude, minor nearshore rockfish (north and south), black rockfish (WOC), California scorpionfish, cabezon, kelp greenling, shortbelly rockfish, and the "Other Fish" category of groundfish. *This definition of the scope allows an LE trawl vessel to switch between trawl and nontrawl groundfish gears, including fixed-gear, for the purpose of catching their QP ("gear switching"). It also allows a nontrawl vessel to acquire a trawl permit, and thereby use trawl QP to catch the LE trawl allocation using nontrawl gear*.[b]
A-1.2	IFQ Management Units, Including Latitudinal Area Management		QS will carry designations for the species/species group, area, and trawl sector to which it applies (see A-1.3 for the list of trawl sectors). The QP will have the same species/species group, area, and sector designations as the QS on the basis of which the QP was issued. QP will not be used in a trawl sector other than that for which it was issued,[c] and will not be used in a nontrawl sector (i.e., by vessels without trawl permits).[d] QP will not be used in a catch area or for a species/species group other than that for which it is designated. For those species within the scope of the program, the QS/QP species groupings and area subdivisions will be those for which OYs are specified in the acceptable biological catch (ABC)/OY table that is generated through the groundfish biennial specifications process and those for which there is an area-specific precautionary harvest policy[e] QS for remaining minor rockfish will be aggregated for the shelf and slope depth strata (nearshore are excluded from the scope, see Section A-1.1). Changing the management units. After initial QS allocation the Council may alter the management units by changing the management areas or subdividing species groups. Section A-2.1.6 provides methods for reallocating QS when such changes are made after initial implementation of the program.[f] *Hereafter, all references to species include species and species group, unless otherwise indicated.*

Table D-1 cont. Full description of the IFQ program

	Element	Sub-element	
A-1.3	General Management and Trawl Sectors		Unless otherwise specified, status quo regulations, other than trip limits for species within the scope of the IFQ program, will remain in place. If individual vessel overages (catch not covered by QP) make it necessary, area restrictions, season closures, or other measures will be used to prevent the trawl sector (in aggregate or the individual trawl sectors listed here) from going over allocations.[g] The IFQ fishery may also be restricted or closed as a result of overages in other sectors. There will be three trawl sectors: shoreside, MS, and CP. However, as per Section A-1.1, IFQ will be required only for the shoreside trawl sector. The MS and CP sectors will be managed using co-ops, as specified in the co-op section of the trawl rationalization program. If the industry organized voluntary co-op program for the CP sector collapses, IFQ will be required for the CP sector, as specified in the co-op program described for that sector. *Allocation among trawl sectors has been determined in FMP Amendment 21. Those allocations not covered by Amendment 21 will be addressed in the biannual specifications process.* *Trawl vessels fishing IFQ with nontrawl gear will be required to comply with the RCA lines applicable for that gear. Such restrictions, as necessary, will be determined in a separate process.*
A-1.4	Management of Nonwhiting Trips		Nonwhiting trips are those with less than 50 percent whiting. No changes to management measures, other than those identified in Section A-1.3, have been identified at this time.
A-1.5	Management of Whiting Trips[h]		Whiting seasons will not be changed under the IFQ program, and so the current spring openings will be maintained to control impacts on ESA-listed salmon.[i] When the primary whiting season is closed for shoreside deliveries, cumulative whiting catch limits will apply and shoreside QP will be required to cover whiting incidental catch.
A-1.6	Groundfish Permit Length Endorsements		Length endorsement restrictions on LE permits endorsed for groundfish gear will be retained; however, the provision that requires that the size endorsements on trawl permits transferred to smaller vessels be reduced to the size of that smaller vessel will be eliminated (i.e., length endorsements will not change when a trawl-endorsed permit is transferred to a smaller vessel).

Table D-1 cont. Full description of the IFQ program

	Element	Sub-element	
A-2. IFQ System Details			
A-2.1	Initial Allocation and Direct Reallocation		
A-2.1.1	Eligible Groups	a Groups and Initial Split of QS	***Eligible Groups*** The initial allocation of QS will be made either only to permit owners and processors, as follows. Whiting QS: 80 percent to permits, 20 percent to processors and zero percent for adaptive management. Nonwhiting QS: 90 percent to permits, zero percent to processors, and 10 percent for adaptive management. *After initial allocation, trading will likely result in changes in the distribution of shares among permit owners and processors. Additionally, entities that are neither permit owners nor processors may acquire QS (see below: "IFQ/Permit Holding Requirements and IFQ Acquisition").*
		b Permits	Landing history will accrue to the permit under which the landing was made. The owner of a groundfish LE permit at the time of initial allocation will receive the QS issued based on the permit. (Also, see Section A-2.1.4 on permit combinations and other exceptional situations.)
		c Processors and Processing Definition	A special definition of "processor" and "processing" will be used for initial QS allocation. A main intent of the definition is to specify that only the first processor of the fish be credited for the history of that delivery when the initial allocation formula is applied (see footnote for definition).[j]
		d Attributing and Accruing Processing History	For an allocation for **shoreside processors (applies only to whiting):** attribute history to the receiver reported on the landing receipt (i.e., the entity responsible for filling out the state fishticket), except history may be reassigned to an entity not on the landings receipt, if parties agree or through an agency appeals process. *The intent of this option is to provide an opportunity for catch history to be assigned to the entity that actually processed the fish.* For shoreside processors, allocations go to the processing business and successor-in-interest will be recognized. NMFS will develop criteria for use in determining the successor in interest with respect to the entities listed on the landings receipts or otherwise eligible for an initial QS allocation based on being the first processor of the fish.[k]
A-2.1.2	Recent Participation	a Permits (including CP permits)	Recent participation is not required in order for a permit to qualify for an initial allocation of QS.
		b Processors (motherships)	Not applicable because a co-op program was provided for this sector rather than IFQs. *(This header is being left in the document so that paragraph numbering will correspond to numbering in the analysis.)*
		c Processors (shoreside)	Recent participation is required to qualify for an initial allocation of whiting QS: 1 mt or more of deliveries from whiting trips in each of any two years from 1998-2004.

Table D-1 cont. Full description of the IFQ program

	Element	Sub-element	
A-2.1.3	Allocation Formula	a Permits with catcher vessel history	QS will be issued for all fish management units within the scope of the program (see Section A-1.2) based on equal division and permit history, as follows:[l] **Equal Division:** There will be an equal division of the buy-back permits' pool of QS among all qualifying permits *(except the incidentally caught overfished species other than canary)*. Qualifying permits include all catcher vessel permits, including those that have been used only in the MS sector. (The QS pool associated with the buyback permits will be the buyback permit history as a percent of the total fleet history for the allocation period. The calculation will be based on total absolute pounds with no other adjustments and no dropped years.) **Permit History:** The remaining QS *(the QS left after setting aside amounts for equal allocation)* will be allocated based on each permit's history (see following formulas). **For the portion of the allocation based on each permit's history.** For **nonwhiting** trips, permit history used for QS allocation will be calculated: **For nonoverfished species**: using an allocation period of 1994-2003. Within that period use relative history and drop the three worst years.[m] **For overfished species taken incidentally:**[n] using target species QS as a proxy based on the following approach: Apply fleet average bycatch rates to each permit's depth and latitude distributions and target species QS allocations. Fleet average bycatch rates for latitudinal areas[o] divided shoreward and seaward of the RCA will be developed from West Coast Observer Program data for 2003-06. For the purposes of the allocation, a permit's QS for each target species will be distributed shoreward and seaward of the RCA and latitudinally based on the permit's logbook information for 2003-06. If a permit does not have any logbooks for 2003-06, fleetwide averages will be used.[p] For **whiting** trips, permit history used for QS allocation will be calculated as follows: **For whiting**, use an allocation period of 1994-2003. Within that period, use relative history and drop the two worst years. [q] **For bycatch species** (if IFQ is used for bycatch species): use the whiting history as a proxy (i.e., allocation will be pro rata based on the whiting allocation). **Area Assignments:** Landings history will be assigned to catch areas based on port of landing.[r] **Relative history (percent).** For each sector, the permit history for each year is measured as a percent of the sector's total for the year. **Initial allocations will be constrained by accumulation limits.** See Section A-2.2.3.e for a discussion of the limits and divestiture requirements.
.		b Permits with CP history	Not applicable because a co-op program was provided for this sector rather than IFQs. *(This header is being left in the document so that paragraph numbering will correspond to numbering in the analysis).*
		c Processors (motherships)	Not applicable because a co-op program was provided for this sector rather than IFQs *(This header is being left in the document so that paragraph numbering will correspond to numbering in the analysis).*
		d Processors (shoreside)	For whiting: • Allocate whiting QS based on the entity's history for the allocation period of 1998 [s]-2004 (drop two worst years) and use relative history. **Initial allocations will be constrained by accumulation limits.** See Section A-2.2.3.e for a discussion of the limits and divestiture requirements.

Table D-1 cont. Full description of the IFQ program

	Element	Sub-element	
A-2.1.4	History for Combined Permits and Other Exceptional Situations		Permit history for combined permits will include the history for all the permits that have been combined. For history occurring when two or more trawl permits were stacked, split the history evenly between the stacked permits. History for illegal landings will not count toward an allocation of QS. Landings made under nonwhiting Experimental Fishing Permits (EFPs) that are in excess of the cumulative limits in place for the nonEFP fishery will not count toward an allocation of QS. Compensation fish will not count toward an allocation of QS.
A-2.1.5	Initial Issuance Appeals		There will be no Council appeals process on the initial issuance of IFQ. NMFS will develop a proposal for an internal appeals process and bring it to the Council for consideration. Any revisions to an entity's fishtickets must be approved by the state in order to be accepted. Any proposed revisions to fishtickets should undergo review by state enforcement personnel prior to finalization of the revisions.
A-2.1.6	Direct Reallocation and Future Allocations After Initial Issuance		**Reallocation With Change in Overfished Status**: When an overfished species is rebuilt or a species becomes overfished there may be a change in the QS allocation within a sector (allocation between sectors is addressed in the intersector allocation process). When a stock becomes rebuilt, the reallocation will be to facilitate the re-establishment of historic target fishing opportunities. When a stock becomes overfished, QS may be reallocated to maintain target fisheries to the degree possible. That change may be based on a person's holding of QS for target species associated with the rebuilt species or other approaches deemed appropriate by the Council. **Reallocation With Changes in Area Management** (Changes in management lines are expected to be rare; however, when they occur the following provides for the reallocation of QS in a manner that will give individual QS holders with the same amounts of total QP before and after the line changes.) **Area Subdivision**: If at any time after the initial allocation an IFQ management unit is geographically subdivided, those holding QS for the unit being subdivided will receive an amount of QS for each newly created area that is equivalent to the amount they held for the area before it was subdivided. **Area Recombination**: When two areas are combined, the QS held by individuals in each area will be adjusted proportionally such that (1) the total QS for the area sums to 100 percent, and (2) a person holding QS in the newly created area will receive the same amount of total QP as they would if the areas had not been combined.

Table D-1 cont. Full description of the IFQ program

	Element	Sub-element	
A-2.1.6	Continued		**Area Line Movement**: When a management boundary line is moved, the QS held by individuals in each area will be adjusted proportionally such that they each maintain their same share of the trawl allocation on a coastwide basis (a fishing area may expand or decrease, but the individual's QP for both areas combined wouldn't change because of the change in areas). In order to achieve this end, the holders of QS in the area being reduced will receive QS for the area being expanded, such that the total QP they would be issued will not be reduced as a result of the area reduction.[t] Those holding QS in the area being expanded will have their QS reduced such that the total QP they receive in the year of the line movement will not increase as a result of the expansion (nor will it be reduced). **Reallocation With Subdivision of a Species Group**: If at any time after the initial allocation an IFQ management unit for a species group is subdivided, those holding QS for the unit being subdivided will receive an amount of QS for each newly created IFQ management units that is equivalent to the amount they held for the species group before it was subdivided. For example, if a person holds one percent of a species group before the subdivision, that person will hold one percent of the QS for each of the groups resulting from the subdivision. **Future Allocation of Groundfish Outside the Scope of the IFQ Program:** For the "Other Fish," category of groundfish, if at some time in the future the Council adds it to the IFQ system, the initial allocation would be determined using the same history criteria as was used for other IFQ species (i.e., 1994-2003 history), unless otherwise specified by a future Council action.
A-2.2	Permit/IFQ Holding Requirements and Acquisition (after initial allocation)		
A-2.2.1	Permit/IFQ Holding Requirement		1. Only vessels with LE trawl permits are allowed to fish in the trawl IFQ fishery. 2. For a vessel to use QP, the QP must be in the vessel's QP account. 3. All catch a vessel takes on a trip must be covered with QP within 30 days of the time that data or documentation from the trip shows there is an overage unless the overage is within the limits of the carryover provision (Section A-2.2.2.b), in which case the vessel has 30 days or a reasonable time (to be determined) after the QP for the following year are issued, whichever is greater.[u] 4. For any vessel with an overage (catch not covered by QP), fishing that is within the scope of the IFQ program (Section A-1.1) will be prohibited until the overage is covered, regardless of the amount of the overage. Vessels which have not adequately covered their overage within the time limits specified in paragraph 3, must still cover the overage before resuming fishing, using QP from the following year(s), if necessary. If a vessel covers its overage, but coverage occurs outside the specified time limit (paragraph 3), the vessel may still be cited for a program violation. 5. For vessels with an overage, the LE permit may not be sold or transferred until the deficit is cleared.

Table D-1 cont. Full description of the IFQ program

	Element	Sub-element	
A-2.2.2	IFQ Annual Issuance	a Annual Quota Pound Issuance	QP will be issued annually to QS holders based on the amount of QS held.[v] *As specified above, QS holders will have to transfer their QP to a vessel account in order for those QP to be used.*
		b Carryover (Surplus or Deficit)	To the extent allowed by the conservation requirements of the Magnuson-Stevens Fishery Conservation and Management Act (MSA), a carryover allowance will allow surplus QP in a vessel's QP account to be carried over from one year to the next or allow a deficit in a vessel's QP account for one year to be carried over and covered with QP from a subsequent year. Surplus QP may not be carried over for more than one year. A vessel with a QP **surplus** at the end of the current year will be able to use that QP in the immediately following year, up to the limit of the carryover allowance (see below). However, if there is a decline in the OY, the amount of QP carried over as a surplus will be reduced in proportion to the reduction in the OY. A vessel with a QP **deficit** in the current year will be able to cover that deficit with QP from the following year without incurring a violation if (1) the amount of QP it needs from the following year is within the carryover allowance (see below), and (2) the QP are acquired within the time limits specified in A-2.2.1.[w] **Carryover Allowance**: Limit of up to 10 percent carryover for each species. This applies to both nonoverfished species and overfished species. The percentage is calculated based on the total pounds (used and unused) in a vessel's QP account for the current year. The percentage used for the carryover provision may be changed during the biennial specifications process.
		c QS Use-or-Lose Provisions (Deleted)	*This section has been deleted but the numbering is being maintained as a placeholder so as not to change section numbering and corresponding references in the analysis.*[x]
		d Entry Level Opportunities	Under the MSA, the Council is required to consider entry level fishermen, small vessel owners, and crew members, and in particular the possible allocation of a portion of the annual harvest to individuals falling in those categories. No special provisions have been identified for analysis. New entry is addressed indirectly by allowing crew, captains and others to acquire QS in small increments.
A-2.2.3	IFQ Transfer Rules	a Eligible to Own or Hold	No person can acquire quota shares or quota pounds other than 1) a United States citizen, 2) a permanent resident alien, or 3) a corporation, partnership, or other entity established under the laws of the United States or any State, that is eligible to own and control a U.S. fishing vessel with a fishery endorsement pursuant to 46 USC 12113 (general fishery endorsement requirements and 75 percent citizenship requirement for entities). However, there is an exception for any entity that owns a MS that participated in the west coast groundfish fishery during the allocation period and is eligible to own or control that U.S. fishing vessel with a fishery endorsement pursuant to sections 203(g) and 213(g) of the AFA.

Table D-1 cont. Full description of the IFQ program

	Element	Sub-element	
A-2.2.3	continued	b Transfers and Leasing	QS/QP will be transferable and transfers must be registered with NMFS. NMFS will not differentiate between a transfer for a lease and a permanent transfer.[y] Each year, all QP must be transferred to a vessel account. A penalty for not meeting this transfer requirement has not been recommended; however, this requirement is intended to encourage its availability for use by the fleet. QP can only be transferred into vessel accounts. Once in a vessel account QP can be transferred from one vessel account to another.
		c Temporary Transfer Prohibition	NMFS may establish temporary prohibitions on the transfer of QS, as necessary to facilitate program administration. QS will not be transferred in the first two years of the program (QP will be transferable).
		d Divisibility	QS will be highly divisible and the QP will be transferred in whole pound units (i.e., fractions of a pound may not be transferred).
		e Accumulation Limits (Vessel and Control)	Limits[z] may vary by species/species group, areas, and sector. The values for the limits are provided in Table D-2. The vessel unused QP limits may be revisited in the first biennial specifications process after implementation of the program. **Vessel Use Limit (Vessel Limit)**: A limit on the total QP that may be registered for a single vessel during the year. This element will mean that a vessel could not have more used and unused quota pounds registered for the vessel than a predetermined percentage of the QP pool. **Vessel Unused QP Limit**: A limit on the amount of unused QP that may be registered to the vessel at any time. This limit applies only for overfished species and Pacific halibut. **QS Control Limit:** A person, individually or collectively, may not control QS in excess of the specified limit (because there is no the grandfather clause). QS controlled by a person shall include those registered to that person, plus those controlled by other entities in which the person has a direct or indirect ownership interest, as well as shares that the person controls through other means.[aa] The calculation of QS controlled by a person will follow the "individual and collective" rule. Individual and Collective Rule: The QS that counts toward a person's accumulation limit will include 1) the QS or QP owned by them, and 2) a portion of the QS owned by any entity in which that person has an interest. The person's share of interest in that entity will determine the portion of that entity's QS that counts toward the person's limit.[bb] **Grandfather Clause and Divestiture:** There will not be a grandfather clause for the QS control limits, however, an adjustment period is provided through the following divestiture rules. QS will be issued for amounts in excess of aggregate and species control limits only for holders of permits transferred by November 8, 2008, if such transfers have been registered with NMFS by November 30, 2008. The holder of any permit transferred after that time will be eligible to receive an initial allocation for that permit of only those QS that are within the aggregate and individual species control limits. Anyone who qualifies for an initial allocation of QS in excess of the control limits will be allowed to receive that allocation but required to divest themselves of that excess QS sometime during years three and four of the IFQ program (the two years after the QS transfer moratorium specified in Section A-2.2.3.c). Holders of QS in excess of the limits

Table D-1 cont. Full description of the IFQ program

	Element	Sub-element	
		e Accumulation Limits (Vessel and Control) (continued)	may receive and use the QP associated with that excess, up to the time their divestiture is completed. However, QP for year five of the program will not be issued for QS held in excess of the limits. At the end of year four, any QS still held in excess of the species or aggregate limits in place at the time of the initial QS allocation will be revoked and redistributed to the remainder of the QS holders in proportion to their QS holdings. No compensation will be due for any revoked shares. Divestiture transfers will be allowed in accordance with the provisions established here and the transfer rules and processes implemented by NMFS. Permit transfers will not be limited or required by the divestiture provision. **Calculation of Aggregate Nonwhiting QS Holdings:** To determining how much aggregate nonwhiting QS an entity holds, an entity's QS for each species will be converted to pounds. This conversion will always be conducted using the trawl allocations applied to the 2010 OYs, until such time as the Council recommends otherwise. Specifically, each entity's QS for each species will be multiplied by the shoreside trawl allocation for that species. The entity's pounds for all nonwhiting species will then be summed and divided by the shoreside trawl allocation of all nonwhiting species to get the entity's share of the aggregate nonwhiting trawl quota. *Note: QS that is not allocated because of the accumulation limits and absence of the grandfather clause will be distributed to other eligible recipients in a manner that maintains the distribution among groups specified in A-2.1.1 and based on the allocation formulas specified in A-2.1.3.*
A-2.3	Program Administration		
A-2.3.1	Tracking, Monitoring and Enforcement		It is the Council intent to provide NMFS flexibility sufficient to design and implement a tracking and monitoring program that will achieve the goals and objectives of the trawl rationalization program. **Discarding by Shoreside Sector** Nonwhiting – Discarding of IFQ species allowed, discarding of IBQ species required, discarding of nongroundfish species allowed. Whiting Maximized retention vessels: Discarding of fish covered by IFQ or IBQ, and nongroundfish species prohibited. Vessels sorting at-sea: Same as for nonwhiting. **At-Sea Catch Monitoring for Shoreside Sector** Nonwhiting – The sorting of catch, the weighing and discarding of any IBQ and IFQ species, and the retention of IFQ species must be monitored by the observer. Whiting For maximized retention vessels: video monitoring as proposed under Amendment 10. Observers would be required in addition to or as a replacement for video monitoring. For vessels that sort at-sea: The sorting, weighing and discarding of any IFQ or IBQ species must be monitored by an observer with supplemental video monitoring. Shoreside Landings Monitoring The sorting, weighing and reporting of any IFQ species must be monitored by a shoreside landings monitor (IBQ will have been discarded at sea).

Table D-1 cont. Full description of the IFQ program

	Element	Sub-element	
A-2.3.1	continued		**Catch Tracking Mechanisms for Shoreside Sector** **Electronic vessel logbook report** VMS-based electronic logbook required to be transmitted from vessel. At-sea entry by vessel personnel required including catch weight by species and if retained or discarded. **Vessel landing declaration report** Mandatory declaration reports. **Electronic ITQ landing report** Mandatory reports completed by processors and similar to electronic fishticket report. **Processor production report** Mandatory reports (possible inclusion of proprietary data included to be recommended as option is fleshed out). **Cost Control Mechanisms for Shoreside Sector** **Shoreside landing hour restrictions** Landing hours may be restricted. **Shoreside site Licenses** Mandatory license for shoreside deliveries. License can be issued to any site that meets the monitoring requirements. **Vessel Certification** Mandatory certification. Certificate can be issued to any vessel that meets the monitoring requirements. **Program Performance Measures for Shoreside Sector** Integrate into the tracking and monitoring program the collection of data on cost, earnings and profitability; economic efficiency and stability; capacity measures; net benefits to society; distribution of net benefits; product quality; functioning of quota market; incentives to reduce bycatch; market power; spillover effects into other fisheries; contribution to regional economies (income and employment); distributional effects/community impacts; employment in seafood catching and processing; safety; bycatch and discards; administrative, enforcement, and management costs. (See A-2.3.2)
A-2.3.2	Socio-Economic Data Collection		The data collection program will be expanded and submission of economic data by harvesters and processors will be mandatory. Random and targeted audits may be used to validate mandatory data submissions. See footnote for a full description[cc] Information on QS transaction prices, will be included in a central QS ownership registry. *NOTE: Data collection started before the first year of implementation would be beneficial, in order to have a baseline for comparison.*
A-2.3.3	Program Costs	a Cost Recovery	Fees up to three percent of exvessel value, consistent with 303A(e) of the MSA may be assessed. Cost recovery shall be for costs of management, data collection, analysis, and enforcement activities.
		b Fee Structure	To be determined. The TIQC recommended a fee structure that reflects usage. A fee structure that allows for equitable sharing of observer costs for smaller vessels may be developed.

Table D-1 cont. Full description of the IFQ program

	Element	Sub-element	
A-2.3.4	Program Duration and Modification		The Council shall begin a review of the IFQ program no later than 5 years after implementation of the program. The review will evaluate the progress the IFQ program has made in achieving the goal and objectives of Amendment 20. The result of this evaluation could include dissolution of the program, revocation of all or part of quota shares, or other fundamental changes to the program. Holders of quota shares should remain cognizant of this fact when making decisions regarding their quota shares, including buying selling, and leasing of these shares. The Council shall consider the use of an auction or other nonhistory based methods when distributing quota share that may become available after initial allocation. This may include quota created when a stock transitions from overfished to nonoverfished status, quota not used by the adaptive management program, quota forfeited to "use it or lose it" provisions, and any quota that becomes available as a result of the initial or subsequent reviews of the program. The specific form of the auction or other method of distribution shall be designed to achieve the goals of Amendment 20, specifically including minimizing the adverse effects from an IFQ program on fishing communities to the extent practical. After the initial review, there will be a review process every four years. A community advisory committee will take part in the review of IFQ program performance.
A-3	**Adaptive Management (also see Section A-9)**		Ten percent of the nonwhiting QS will be reserved to facilitate adaptive management in the shoreside nonwhiting sector. Therefore, each year 10 percent of the shoreside trawl sector nonwhiting quota pounds will be available for use in adaptive management (adaptive management QP). The set aside will be used to address the following objectives. o Community stability o Processor stability o Conservation o Unintended/Unforeseen consequences of IFQ management. o Facilitating new entrants. **Years One and Two.** During the first two years in which the IFQ program is in place, the method to be used in distributing QP in years three through five will be determined, including. o The decision making and organization structure to be used in distributing the QP set aside[dd] o The formula for determining community and processor eligibility, as well as methods for allocation, consistent with additional goals. o The division of QP among the states. o Whether to allow the multi-year commitment of QP to a particular project. **Years Three through Five.** QP will be distributed through the organizational structure, decision process, formulas and criteria developed in years one and two and implemented through subsequent Council recommendation and NMFS rule making processes. Consideration will be given to the multiyear commitment of QP to particular projects (three year commitments). **Review and Duration.** The set aside of QP for the identified objectives will be reviewed as part of the year five comprehensive review and a range of sunset dates will be considered, including 10, 15, 20 year and no sunset date options.

Table D-1 cont. Full description of the IFQ program

	Element	Sub-element	
A-4	**Pacific Halibut IBQ—nonretention**		IBQ for Pacific halibut bycatch in the trawl fishery will be established. The IBQ will be required to cover legal and sublegal sized Pacific halibut bycatch mortality in the area north of 40°10 N latitude. It is the intent of the Council that halibut IBQ mortality be estimated on an individual vessel basis. Such IBQ will be issued on the basis of a bycatch rate applied to the target species QS an entity receives in a manner similar to that described in Section A-2.1.3.a, for overfished species caught incidentally. Area-specific bycatch rates may be used for allocation but halibut IBQ will not be geographically subdivided.

[a] California halibut gear of 7.5" or greater used in state waters would be exempted.

[b] Mandatory gear conversion (the permanent switching from trawl to some other gear) was considered but not included at this time.

[c] Since the shoreside trawl sector covers all shoreside deliveries, this implies that IFQ issued for the shoreside trawl sector may not be used for at-sea deliveries (i.e., may not be used to cover deliveries made to motherships or catch by catcher-processors).

[d] Not withstanding this provision, a vessel with a LE trawl permit may catch the trawl QP with a nontrawl gear, as per Section A-1.1.

[e] At present there are no groundfish species for which the harvest in the trawl fishery is managed differently by geographic area. An example of an area specific precautionary policy from outside trawl fishery management is the geographic differential recommended by the Scientific and Statistical Committee for lingcod. Lingcod is monitored and managed differently in different geographic areas though there is a single coastwide ABC and OY for lingcod. Since there are no geographic subdivisions in the trawl management measures for lingcod, it is assumed that lingcod trawl IFQ will not be geographically subdivided.

[f] Such changes in latitudinal area management may occur as a result of changes in the management areas for species/species complexes in the ABC/OY table or as a result of separate Council action to change the trawl QS by area. In either case, specific Council action will be required to change the management areas and such action will be accompanied by appropriate supporting analysis and public comment opportunity.

[g] The Council authority to establish or modify RCAs will not be changed by this program.

[h] A whiting QP rollover provision was considered but rejected from further analysis. This provision would have allowed unused QP to be reclassified so that they could be used in any whiting sector.

[i] The current process for changing the whiting fishery opening dates involves a regulatory amendment developed under the FMP through a framework process. Implementation of an IFQ program should not change this process.

[j] "**Processors"** are defined as follows:
An at-sea processor is a vessel that operates as a mothership in the at-sea whiting fishery or a permitted vessel operating as a catcher-processor in the at-sea whiting fishery.

A shoreside processor is an operation, working on US soil, that takes delivery of trawl-caught groundfish that has not been "processed at-sea" and that has not been "processed shoreside"; and that thereafter engages that particular fish in "shoreside processing." Entities that received fish that have not undergone "at-sea processing" or "shoreside processing" (as defined in this paragraph) and sell that fish directly to consumers shall not be considered a "processor" for purposes of QS allocations.

"Shoreside Processing" is defined as either of the following:

1. Any activity that takes place shoreside; and that involves: cutting groundfish into smaller portions; OR freezing, cooking, smoking, drying groundfish; OR packaging that groundfish for resale into 100 pound units or smaller for sale or distribution into a wholesale or retail market.

Table D-1 cont. Full description of the IFQ program

OR

2. The purchase and redistribution into a wholesale or retail market of live groundfish from a harvesting vessel.

[k] Transfer of physical assets alone should not be considered a basis for successor in interest. Business relationships such as transfer of the company name and customer base might be reasonable evidence of successor in interest.

[l] Due to the divestiture provision of Section A-2.3.2.e, it is relatively unlikely that accumulation limits will constrain the amount of QS an entity receives in the initial allocation. However, if an entity qualifies for QS in excess of accumulation limits and is does not qualify to receive that QS under the divestiture provision, the initial allocation will be constrained by first applying the aggregate limits and then, if necessary, the individual species limits. In using this approach, the entity's QS allocation should not be scaled back more than necessary to stay within limits and any QS not allocated will be reallocated to other QS recipients.

[m] State landings receipts (fishtickets) will be used to assess landings history for shoreside deliveries. In some cases, fishticket records do does not identify species to the same level of detail used for the IFQ management units (e.g., reports "unspecified rockfish"). Under such circumstances standard species composition routines usually used at the port level have been applied to vessel level data to estimate the species composition of such landings. In some instances, even after applying species composition information there may be some fishticket records with a species groundfish categorization that does not match with one of the IFQ management units. Under such circumstances, when the initial allocations are made, other information on the landings records and in logbooks might be used to assign the landing to its most probable species category.

[n] The intent is to provide an allocation method for QS for overfished species which addresses the vessel's need to have the QS to cover incidental catch in fisheries that target healthy stocks. The method would attempt to allocate the species to those who will be receiving QS for related target species. By allocating overfished species QS to those most in need of it, such an allocation would be expected to reduce transition costs. Currently, the list of overfished species that fall into this category is as follows: canary rockfish, darkblotched rockfish, Pacific Ocean perch, widow rockfish, and yelloweye rockfish. This list may change by the time the program is ready to be implemented. If a major target species became overfished, it would not be intended that such a species would be allocated via an alternative method (for example species such as Dover sole, sablefish, or Pacific whiting).

[o] The four areas are as follows: (1) north of 47°40 N latitude; (2) between 47°40 N latitude and 43°55 N latitude; (3) between 43°55 N latitude and 40°10 N latitude; and (4) south of 40°10 N latitude.

[p] In order to determine an amount of aggregate target species to which bycatch rates will be applied, each vessel's QS will be multiplied by the trawl allocation at the time of implementation.

[q] State landings receipts (fishtickets) will be used to assess landings history for shoreside deliveries.

[r] Catch area data on fishtickets are not considered appropriate for this purpose. The catch area field is often filled out by fish receivers that do not know the area in which the vessel fished. Additionally catch area is often left unspecified. Therefore, it will be assumed that all catch comes from ocean areas near the port of landing.

[s] March 2010. Changed from 1994-2004 to 1998-2003 to reflect Council action of November 2008.

[t] Unless there is a change in the total OY or other factors affecting trawl allocation for the areas involved, in which case their change in QP would be proportional to the change in the trawl allocation.

[u] QP from a subsequent year may not be accessed until such QP have been issued by NMFS.

[v] Including QS that an entity received in excess of accumulation limits in place at the time of initial allocation (see Section A-2.2.3.e).

[w] Carryover of deficits provides some flexibility to use pounds from a year to cover a deficit from a previous year. Without a carryover provision, a vessel would still need to use pounds in a subsequent year to cover an overage but would incur a violation.

[x] The following is the text deleted from this section: "No QS use-or-lose provision has been specified. The need for this provision will be evaluated as part of program review process, and the provision could be added later, if

necessary. *Section A-2.2.3.b contains a provision mandating the transfer of QP to vessels each year. This is intended to encourage QP use."*

[y] QS may be transferred on a temporary basis through private contract (leased) but NMFS will not track lease transfers differently than any other transfer.

[z] The "vessel" accumulation limit was originally termed a "permit" limit. The term "permit" was changed to "vessel" to be consistent with Section A-2.1.3, which indicates that QP go into vessel accounts, not permit accounts. The term "own or control" was shortened to "control" for simplicity. "Control" includes ownership and therefore is inclusive of "ownership."

[aa] It is the Council intent that control limits should not constrain the formation of risk pools to help the fishermen deal with overfished species constraints, so long as the pools do not undermine the effectiveness of the accumulation limits. A risk pool is one in which two or more people enter into an agreement whereby if one person does not have the QP the others would agree to provide the QP, if they have them. Whether these kinds of agreements are informal or formal, as other considerations and conditions are added to the agreements they may begin to constitute control. It is the Council intent to allow for these pooling agreements, so long as they do not become control.

[bb] For example, if a person has a 50 percent ownership interest in that entity, then 50 percent of the QS owned by that entity will count against the individual's accumulation limit unless it is otherwise determined that have effective control of a greater or lesser amount.

[cc]**Expanded data collection** would include:

mandatory submission of economic data for LE trawl industry (harvesters and processors),

voluntary submission of economic data for other sectors of the fishing industry,

transaction value information in a centralized registry of ownership, and

formal monitoring of government costs.

Mandatory Provisions: The Pacific Fishery Management Council and NMFS shall have the authority to implement a data collection program for cost, revenue, ownership, and employment data, compliance with which will be mandatory for members of the west coast groundfish industry harvesting or processing fish under the Council's authority. Data collected under this authority will be treated as confidential in accordance with Section 402 of the MSA.

A mandatory data collection program shall be developed and implemented as part of the groundfish trawl rationalization program and continued through the life of the program. Cost, revenue, ownership, employment and other information will be collected on a periodic basis (based on scientific requirements) to provide the information necessary to study the impacts of the program, including achievement of goals and objectives associated with the rationalization program. These data may also be used to analyze the economic and social impacts of future FMP amendments on industry, regions, and localities. The program will include targeted and random audits as necessary to verify and validate data submissions. Additional funding (as compared to status quo) will be needed to support the collection of these data. The data collected would include data needed to meet MSA requirements (including antirust).

The development of the program shall include: a comprehensive discussion of the enforcement of such a program, including discussion of the type of enforcement actions that will be taken if inaccuracies are found in mandatory data submissions. The intent of this action will be to ensure that accurate data are collected without being overly burdensome on industry in the event of unintended errors.

Voluntary Provisions: A voluntary data collection program will be used to collect information needed to assess spillover impacts on nontrawl fisheries.

Table D-1 cont. Full description of the IFQ program

Central Registry: Information on transaction prices will be included in a central registry of QS owners. Such information will also be included for LE permit owners/lessees.

Government Costs: Data will be collected and maintained on the monitoring, administration, and enforcement costs related to governance of the trawl rationalization program.

[dd] The following are three options for the sequences of agency involvement in decision making for the distribution of adaptive management QP after year 2..

1. NMFS
2. State → Council →NMFS
3. Council →NMFS

Table D-2. Control and vessel limit options: Council preferred alternative.

Species Category	Vessel Limit (Applies to all QP in a Vessel Account, Used and Unused)	Vessel Unused QP Limit	QS Control Lim
Nonwhiting Groundfish Species	3.2%		2.7%
Lingcod - coastwide	3.8%		2.5%
Pacific Cod	20.0%		12.0%
Pacific whiting (shoreside)	15.0%		10.0%
Pacific whiting (mothership)	30.0%		20.0%
Sablefish			
N. of 36° (Monterey north)	4.5%		3.0%
S. of 36° (Conception area)	15.0%		10.0%
PACIFIC OCEAN PERCH	6.0%	4.0%	4.0%
WIDOW ROCKFISH *	8.5%	5.1%	5.1%
CANARY ROCKFISH	10.0%	4.4%	4.4%
Chilipepper Rockfish	15.0%		10.0%
BOCACCIO	15.4%	13.2%	13.2%
Splitnose Rockfish	15.0%		10.0%
Yellowtail Rockfish	7.5%		5.0%
Shortspine Thornyhead			
N. of 34°27'	9.0%		6.0%
S. of 34°27'	9.0%		6.0%
Longspine Thornyhead			
N. of 34°27'	9.0%		6.0%
COWCOD	17.7%	17.7%	17.7%
DARKBLOTCHED	6.8%	4.5%	4.5%
YELLOWEYE	11.4%	5.7%	5.7%
Minor Rockfish North			
Shelf Species	7.5%		5.0%
Slope Species	7.5%		5.0%
Minor Rockfish South			
Shelf Species	13.5%		9.0%
Slope Species	9.0%		6.0%
Dover sole	3.9%		2.6%
English Sole	7.5%		5.0%
Petrale Sole	4.5%		3.0%
Arrowtooth Flounder	20.0%		10.0%
Starry Flounder	20.0%		10.0%
Other Flatfish	15.0%		10.0%
Other Fish	7.5%		5.0%
Pacific Halibut	14.4%	5.4%	5.4%

* If widow rockfish is rebuilt before initial allocation of QS, the vessel limit will be set at limit will be 1.5 times the control limit.

D.4 Whiting At-sea Trawl Sector: Cooperative Program (Appendix B of the EIS)

The at-sea whiting sector co-op program is described generally below. Table D-3 provides an outline of the sections of the program. A full description of the co-op programs follows Table D-3, beginning with a section on management of the whiting fishery and followed by sections on the MS and CP sectors of the whiting fishery (the "at-sea" sectors).

The Council considered but did not adopt a co-op program for the shoreside whiting fishery. Instead, the shoreside whiting sector was merged with the nonwhiting sector, both to be managed with IFQs. However, section placeholders for the shoreside whiting co-op program are maintained in this document so that the numbering system will correspond to the numbering of the alternatives and sections of the analysis as they are laid out in the EIS.

D.5 Overview of Co-op Program Elements

D.5.1 At-sea Whiting Sector Management under Co-ops

While co-ops will be used to control the harvest within the at-sea whiting sectors, a number of management measures will still be required to control competition between the whiting sectors. This section covers those measures along with other measures that will apply to all sectors managed under co-ops, such as observer requirements and mandatory submission of economic data. The description of the co-op management program for each at-sea whiting sector starts in Section D.5.2.

The existing allocation of whiting between the shoreside, MS, and CP sectors will not change under the rationalization program (42, 24, and 34 percent, respectively).

Provisions also address bycatch in the at-sea whiting fishery (particularly that of certain overfished species). The Council is recommending incidental groundfish species caps for each of the whiting sectors, for the co-op and non-co-op fisheries within the MS sector, and for the co-ops within the MS sector. Within sectors, bycatch allocations would be pro rata, based on the amount of whiting allocated to that sector.

Area closures may be used to control the pace of the fishery. For the MS sector, the fishery will be divided into a co-op fishery and a non-co-op fishery (for those who do not desire to take part in a co-op). Participants in the non-co-op fishery will not have a claim to a particular amount of the fish allocated to that fishery; therefore the vessels will likely race to harvest the available allocation.

NMFS will close the whiting fishery, a particular sector, the co-op or non-co-op fishery within a sector, or individual co-ops, as appropriate, when it is projected that a whiting catch or bycatch limit will be reached. With respect to co-ops, inseason monitoring and closure will be needed only at the highest level of aggregation of the co-ops. For example, if individual co-ops join together to form an inter-co-op that covers the entirety of one of the whiting sectors, then NMFS will track and close at the sector level. Nevertheless, vessel level monitoring will still be required to ensure that catch is accurately recorded.

Given the high level of monitoring already in place in the whiting fishery, only moderate changes in monitoring are needed to implement this program for the at-sea whiting fishery. For the at-sea segment of the fishery, 100 percent coverage aboard MS and CP will continue. A program for the mandatory submission of economic data is also included to facilitate monitoring program performance.

D.5.2 Co-ops for Catcher Vessels Delivering to Motherships

Under this program, those who hold whiting-endorsed permits for catcher vessels in the MS sector will choose each year whether to be part of a co-op or to register to fish in the non-co-op portion of the fishery. The holders of catcher vessel permits with mothership whiting endorsements will form the co-ops. Based on its catch history, each permit that qualifies for a mothership whiting endorsement will be capped at a portion of the history (endorsement share) of the MS sector allocation of whiting and bycatch species. Each year, NMFS will distribute a catch allocation to each catcher vessel co-op based on the sum of the endorsement shares for the permits registered to that co-op. NMFS will also distribute a catch allocation each year to the non-co-op portion of the fishery, based on the collective endorsement shares of the permits opting to participate in the non-co-op fishery.

The co-op organization will coordinate harvest by its members. Although co-op agreements will include a mandatory clause that the catch allocation made to a member must equal the amount that the member brings into the co-op, co-op members may transfer catch allocations among themselves. Similarly, if multiple co-ops join to form an inter-co-op, one co-op will be have to transfer catch allocation to another co-op within that inter-co-op. NMFS will not necessarily have to track transfers among co-op members or within an inter-co-op.

The class of motherships will be closed by creating a LE permit for mothership vessels. There will be restrictions limiting a vessel's ability to both catch and operate as a mothership in the whiting fishery in the same year. This will limit the ability of processing vessels to move between the CP and MS sectors.

Prior to the start of each season, each catcher vessel permit desiring to participate in the co-op fishery will obligate itself to deliver its catch to a particular MS. The obligation to a particular co-op or MS will not carry over from one year to the next, it may be changed at the catcher vessel permit owners discretion based on its preseason declaration. While catch may be transferred among participants in a co-op or inter-co-op, such transfers would not change the MS to which the catch is obligated, unless a mutual agreement is reached.

As in the IFQ program, accumulation limits will be imposed to prevent excessive concentration of catch allocations. They will cap the proportion of whiting that an individual or entity can process, the proportion of whiting an individual or entity could accumulate via ownership of catcher vessel permit(s), and the amount that can be landed by any catcher vessel.

D.5.3 Co-ops for Catcher-Processors

Under the CP co-op program, as under status quo, a voluntary CP co-op may continue to be formed by CP permit holders. This system will continue as long the existing co-op system continues to operate successfully, or until the FMP is otherwise amended. If the voluntary co-op system fails, it will be replaced with an IFQ system. Currently the co-op operates under a private contract that includes division of the harvest among participants according to an agreed schedule. If the co-op system fails, IFQ will be allocated equally to each CP permit (equally divided among all CP endorsed permits).

Under the CP co-op program, the main Council recommendations are the creation of a CP endorsement to close the CP fishery to new entrants and the assignment of an allocation to the voluntary CP co-op. The endorsement will be granted to LE permits registered to CP vessels if the vessels meet specified qualification criteria. Only vessels with a CP LE permit will be allowed to harvest fish from the CP sector's allocation. LE permits with CP endorsements will continue to be transferable. NMFS will not establish an allocation of catch or catch history among CP permits unless the co-op fails. NMFS will

specify the assignment of the CP sector allocation to the CP sector co-op in regulation. If necessary, a closure will be used to keep the CP sector from exceeding its allocation of whiting and bycatch species.

D.6 Detailed Specification of Co-op Program Elements

Table D-3 Overview of the co-op program.

B.1	***Whiting Sector Management Under Co-ops***
B-1.1	Whiting Management
B-1.2	Annual Whiting Rollovers
B-1.3	Bycatch Species Management
B-1.4	At-sea Observers/Monitoring
B-1.5	Mandatory Data Collection
B-1.6	Adaptive Management—Not included in recommendation. *(This section header is being maintained as a place holder so that numbering will correspond to that of the alternatives and analysis in the EIS).*
B-1.7	Length Endorsement
B-2	***Whiting Mothership Sector Co-op Program***
B-2.1	Participation in the MS Sector
B-2.2	Permits/Endorsement Qualification and Characteristics
B-2.3	Co-op Formation and Operation Rules
B-2.4	Obligations to Processors
B-2.5	NMFS Role
B-3	***Whiting Shoreside Sector Co-op Program***
	Not included in recommendation. *(This section header is being maintained as a place holder)*.
B-4	***Catcher-Processors Co-op Program***
B-4.1	Participation in the Catcher-Processor Sector and Endorsement Qualification
B-4.2	Co-op Formation and Operation Rules
B-4.3	NMFS Role

B-1 Whiting Sector Management Under Co-ops

B-1.1 Whiting Management

Under the co-op program, catcher vessel permits for the MS sector will be endorsed for deliveries to motherships and amounts of history assigned to each catcher vessel permit based on past harvest in the fishery. Catcher-processor permits will be endorsed for participation in the CP sector.

The whiting catch history calculation for each mothership-endorsed catcher vessel permit [CV(MS)] will be assigned to a pool for the co-op in which the permit will participate, or to a pool for the mothership non-co-op fishery. NMFS will make an allocation assignment to the CP sector co-op based on the allocation to the CP sector. Co-ops are responsible for monitoring and enforcing the catch limits of co-op members.

NMFS will monitor the catch in the mothership non-co-op fishery, the mothership co-op fishery, the CP fishery, and the overall whiting catch of all at-sea sectors. NMFS will close each segment of the fishery based on projected attainment of whiting catch. Additionally, all at-sea sectors will be subject to closure based on attainment of the overall trawl whiting allocation.

B-1.2 Annual Whiting Rollovers

There will not be a rollover of unused whiting from one sector to another.

B-1.3 Bycatch Species Management

For the near future, the whiting fishery will be managed under bycatch limits (hard caps) for widow, canary, darkblotched rockfish, and Pacific ocean perch. The catch of all groundfish will be accounted for and tracked against the OY.

The ESA-listed salmon bycatch management measures—that is, the 11,000 Chinook threshold, 0.05 rate threshold, and triggered 100 fathom closure—will also continue to be in place.

The goal of bycatch management is to control the rate and amounts of rockfish and salmon bycatch to ensure that each sector is provided an opportunity to harvest its whiting allocation.

There will be a set aside of Pacific halibut for the at-sea whiting fishery, as specified in the intersector allocation process (Amendment 21).

B-1.3.1 Bycatch Allocation Subdivision

Subdivide bycatch species managed with hard caps (widow, canary, darkblotched rockfish, and Pacific Ocean perch) among each of the whiting sectors; within the sectors subdivide between the co-op fishery and non-co-op fishery (subdivision for the non-co-op fishery does not apply to the CP co-op program); and subdivide among co-ops.

Only those species with hard caps will be subdivided for bycatch management, and bycatch will be allocated to each permit and co-op pro rata in proportion to its whiting allocation. The MS sector's bycatch allocation will be divided between its co-op and non-co-op fishery, based on the allocations made to the permits participating in each portion of the fishery.

B-1.3.2 Bycatch Management

All sectors and co-ops will close based on projected attainment of the at-sea whiting fishery bycatch cap for any one species. The mothership co-op fishery, non-co-op fishery, and CP fishery will each be closed based on projected attainment of their individual allocation. Additionally, each co-op will cease fishing when its bycatch allocation is reached.

The Council may also use area closures (seasonal or year-round) to manage overfished stocks in the co-op and non-co-op fisheries. The area closures may be the same or different for different species. Area closures may be year-round, seasonal, or triggered automatically by the attainment of certain levels of catch.

Unused bycatch may be rolled over from one sector to another if the sector's full allocation of whiting has been harvested or participants in the sector do not intend to harvest the remaining sector allocation.

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B-1.4 At-sea Observers/ Monitoring

At-sea Whiting Fishery: 100 percent observer coverage aboard MS and CP will continue. Observers would be required in addition to or as a replacement for video monitoring.[6]

For some coverage, cameras may be used in place of observers (feasibility to be determined). It is the Council's intent to provide NMFS flexibility sufficient to design and implementation a tracking and monitoring program that will achieve the goals and objectives of the trawl rationalization program.

B-1.5 Mandatory Data Collection

The following are the central elements of the data collection program that will be implemented as part of the co-op program.

- Mandatory submission of economic data for LE trawl industry (harvesters and processors).
- Voluntary submission of economic data for other sectors of the fishing industry.
- Include transaction value information in a centralized registry of ownership.
- Formal monitoring of government costs.

Mandatory Provisions. The Council and NMFS shall have the authority to implement a data collection program for cost, revenue, ownership, and employment data, compliance with which will be mandatory for members of the west coast groundfish industry harvesting or processing fish under the Council's authority. Data collected under this authority will be treated as confidential in accordance with Section 402 of the MSA.

[6] February 2010: The second sentence of this paragraph was adopted as part of the Council's November 2008 motion, but it was located under the section on the IFQ program rather than the section on the mothership co-op program.

A mandatory data collection program shall be developed and implemented as part of the groundfish trawl rationalization program and continued through the life of the program. Cost, revenue, ownership, employment and other information will be collected on a periodic basis (based on scientific requirements) to provide the information necessary to study the impacts of the program, including achievement of goals and objectives associated with the rationalization program. These data may also be used to analyze the economic and social impacts of future FMP amendments on industry, regions, and localities. The program will include targeted and random audits as necessary to verify and validate data submissions. *Data collected under this authority will be treated as confidential in accordance with Section 402 of the MSA*. Additional funding (as compared to status quo) will be needed to support the collection of these data. The data collected would include data needed to meet MSA requirements (including antirust).

The development of the program shall include a comprehensive discussion of the enforcement of such a program, including discussion of the type of enforcement actions that will be taken if inaccuracies are found in mandatory data submissions. The intent of this action will be to ensure that accurate data are collected without being overly burdensome to industry in the event of unintended errors. Annual reports will be provided to the Council.

Voluntary Provisions: A voluntary data collection program will be used to collect information needed to assess spillover impacts on nontrawl fisheries.

Central Registry: Information on transaction prices will be included in a central registry of whiting endorsed permit and MS permit owners. Such information will also be included for sales and lessees.

Government Costs: Data will be collected and maintained on the monitoring, administration, and enforcement costs related to governance of the rationalization program.

B-1.6 Adaptive Management

There will not be an adaptive management set aside for the at-sea whiting fisheries. *(This section is being maintained as a placeholder so that numbering will correspond to that used in the alternatives and analysis of the EIS.)*

B-1.7 Length Endorsement

Length endorsement restrictions on LE permits endorsed for groundfish gear will be retained; however, the provision that requires that the size endorsements on trawl permits transferred to smaller vessels be reduced to the size of that smaller vessel will be eliminated (i.e., length endorsements will not change when a trawl endorsed permit is transferred to a smaller vessel).

B-2 Whiting Mothership Sector Co-Op Program

Overview. Qualified permits will be endorsed for MS co-op participation. Each year the holders of those permits will choose whether their vessels will fish in the co-op fishery, in which individual co-ops will direct harvest, or fish in a non-co-op fishery that will be managed by NMFS as an Olympic style fishery. The co-op will be obligated to deliver its fish to specific MS processors based on the obligations of each permit in the co-op determined based on preseason declarations. LE permits will be issued for motherships and required for a mothership to receive whiting from catcher vessels.

B-2.1 Participation in the Mothership Sector

a. Catcher Vessels

Vessels with CV(MS)-endorsed permits may participate in either the co-op or non-co-op portion of the mothership fishery. They will choose annually which fishery they will participate in for the coming year. Additionally, any groundfish LE trawl permitted vessels may participate in the co-op portion of the fishery if they join a co-op (as described in Section B-2.3.3).[7] No other catcher vessels may participate in the mothership fishery.

A vessel may not engage in the processing of whiting during any year in which a catcher vessel (mothership) (CV[MS]) endorsed permit is registered for use with the vessel.

b. Processors

Only motherships with a mothership LE permit may receive deliveries from catcher vessels participating in the co-op or non-co-op portions of the MS sector whiting fishery. [Note: motherships may acquire such permits by transfer; see Section B-2.2.2.]

c. Vessels Excluded[8]

Motherships also operating as a CP may not operate as a mothership: during a year in which it also participates as a CP.

[7] When such permits participate in a co-op, the co-op will not be allocated any additional fish based on participation by such a vessel.

[8] A vessel that has been under foreign registry after the date of the AFA and that has participated in fisheries in the territorial waters or exclusive economic zones of other countries will not be eligible to participate as a mothership in the mothership sector of the Pacific whiting fishery, as per the AFA's modification of Section 12102(c)(6) of the USC. Section 12102(c)(6) of the USC has since been renumbered.

B-2.2 Permits/Endorsement Qualification and Characteristics

B-2.2.1 Catcher Vessel Mothership (CV[MS] Whiting Endorsement)

a. Endorsement Qualification and History Assignment

Permits with a qualifying history will be designated as CV(MS) permits through the addition of an endorsement to their LE groundfish permit. At the time of endorsement qualification, each permit will also be assigned a catch history that will determine the share of the mothership whiting allocation associated with that permit.

Qualifying for a CV(MS) Whiting Endorsement. A LE permit will qualify for a CV(MS) whiting endorsement if it has a total of more than 500 mt of whiting deliveries to motherships from 1994 through 2003.

Catch History Assignment (Identification of Endorsement Related Catch History). The initial catch history calculation for CV(MS) whiting endorsements will be based on whiting history of the permit for 1994 through 2003, dropping two[9] years. A permit's history for each year will be measured as a share of the fleet history for that year (i.e., "relative pounds" will be used). This catch history will be used by NMFS to assign both whiting and bycatch species allocations to the co-ops and non-co-op fishery pools, as per section B.1.3.2.

For the purpose of the endorsement and initial calculation, catch history associated with the permit includes that of permits that were combined to generate the current permit.

b. Whiting Permit and Endorsement Transferability and Endorsement Severability

The CV(MS) whiting endorsement (together with the associated catch history) *may not be* severed from the groundfish LE trawl permit. Catch history associated with the whiting endorsement may not be subdivided. CV(MS) permits may be transferred two times during the fishing year, provided that the second transfer is back to the original catcher vessel (i.e., only one transfer per year to a different catcher vessel).

c. Accumulation Limit

CV(MS) Permit Ownership: No individual or entity may own CV(MS) permits for which the allocation total is greater than 20 percent.
Catcher Vessel Usage Limit: No vessel may catch more than 30 percent of the MS sector's whiting allocation.

[9] February 2010: The word "worst" was removed in line with the Council's April 2009 action specifying that the permit owner would be allowed to select the years dropped from the calculation.

d. Combination

CV(MS) Permit Combination to Achieve a Larger Size Endorsement. When a CV(MS)-endorsed permit is combined with another permit (including unendorsed permits), the resulting permit will be CV(MS) endorsed.[10]

B-2.2.2 Mothership Processor Permit

a. Qualifying Entities

The owners of qualifying motherships will be issued MS permits. In the case of bareboat charters, the charterer of the bareboat will be issued the permit.

b. Qualification Requirements

A qualifying mothership is one which processed at least 1,000 mt of whiting in each of any two years from 1997 through 2003.

c. Transferability

1. MS permits will be transferable.
2. MS permits may be transferred to a vessel of any size (there will be no size endorsements associated with the permit). MS permits **may not** be transferred to a vessel engaged in the *harvest* of whiting in the year of the transfer.
3. Limit on the Frequency of Transfers: MS permits may be transferred two times during the fishing year provided that the second transfer is back to the original mothership (i.e., only one transfer per year to a different mothership).

d. Usage Limit

No individual or entity owning a MS permit(s) may process more than 45 percent of the total MS sector whiting allocation.

B-2.3 Co-op Formation and Operation Rules.

B-2.3.1 Who and Number of Co-ops

Co-ops are not required but may be voluntarily formed among CV(MS) permit owners. The number of co-ops will be indirectly limited by the limit on the minimum number of vessels able to form a co-op (see Section 2.3.3-b).

[10] Specifically, a CV(MS)-endorsed permit that is combined with a LE trawl permit that is not CV(MS) endorsed or one that is CV(Shoreside) [CV(SS)] endorsed will be reissued with the CV(MS) endorsement. If the other permit is CV(SS) endorsed, the CV(SS) endorsement will also be maintained on the resulting permit. However, CV(MS) and CV(SS) catch histories will be maintained separately on the resulting permit and be specific to participation in the sectors for which the catch histories were originally determined. If a CV(MS) permit is combined with a CP permit, the CV(MS) endorsement and history will not be reissued on the combined permit. The size endorsement resulting from permit combinations will be determined based on the existing permit combination formula.

B-2.3.2 When

Each year at a date certain prior to the start of the fishery, MS and CV(MS) permit holders planning to participate in the MS sector must register with NMFS. At that time CV(MS), permit holders must identify which co-op they will participate in or if they plan to participate in the non-co-op fishery.

B-2.3.3 Co-op Agreement Standards

a. Submissions to NMFS and the Council

Co-op permit and agreement. Federal co-op permits will be issued for co-op agreements approved by NMFS. Signed copies of the cooperative contracts must be filed with the Council and NMFS and available for public review before the co-op is authorized to engage in fishing activities.[11] Any material changes or amendments to the contract must be filed annually with the Council and NMFS by a date certain.

Letter to Department of Justice. Co-ops must also file with the Council and NMFS a copy of a letter from the co-op requesting a business review letter on the fishery cooperative from the Department of Justice and any response to such request.

b. Number of Participants in Each Co-op (Including Inter-co-ops)

CV permits may join together in separate harvester co-ops. A minimum of 20 percent of the CV(MS) permit holders are required to form a co-op.[12] Co-ops may form co-ops with other co-ops. Within one of the whiting sectors, these co-ops may be formed to manage directed catch and/or bycatch. Whiting and bycatch allocations may be transferred among co-ops through inter-co-op agreements.

c. Catch History Distributions among Permits

Co-op agreements must stipulate that catch allocations to members of the co-op be based on their catch history calculation by NMFS used for distribution to the co-op.

d. Participation by Non-CV (MS) Endorsed Permits

Through temporary arrangements a co-op allocation may be harvested by any catcher vessel holding a valid LE trawl permit which has joined the co-op (including one that does not have a CV(MS) endorsement).[13]

e. Other Required Co-op Agreement Provisions

The Council's intent is to have MS sector participants work with NMFS to develop and describe a process and co-op agreement requirements to include in implementing regulations for this action.

[11] During council discussion, this was flagged by NOAA GC as a potential legal problem.

[12] The minimum threshold number of participants required to form a co-op balances the potential advantages for multiple co-ops while limiting implementation and management costs and administrative requirements for managing this sector.

[13] As a member of the co-op, such a vessel would be subject to Section B-2.4 and the indicated processor obligations.

A co-op agreement must include:

1. A list of all vessels, and which must match the amount distributed to individual permit holders by NMFS.
2. Signature of all permit holders participating in the co-op.
3. A plan to adequately monitor catch and bycatch.
4. Adequate enforcement and penalty provisions to ensure that catch and bycatch overages do not occur.
5. Measures designed to reduce bycatch of overfished species.
6. An obligation to manage inseason transfers of catch history.
7. A requirement that agreement by at least a majority of the members is required to dissolve a co-op (**During council discussion this was flagged by NOAA GC as a potential legal problem**).
8. An obligation to produce an annual report to the Council and NMFS by a date certain documenting the co-op's catch and bycatch data and inseason transfers (the report is to be available for review by the public).
9. Identification of a co-op manager who will:
    a. serve as the contact person with NMFS, the Council and other co-ops,
    b. be responsible for the annual distribution of catch and bycatch,
    c. oversee transfers,
    d. prepare annual reports, and
    e. be authorized to receive or respond to any legal process against the co-op.
10. Provisions that prohibit co-op membership by permit holders that have incurred legal sanctions that prevent them from fishing groundfish in the Council region.
11. A provision that requires new owners to comply with membership restrictions in the co-op agreements.

f. Additional Provisions for Inter-co-op Agreements

1. In the case of two or more cooperatives entering into an inter-cooperative agreement, the inter-co-op agreement must incorporate and honor the provisions of the individual co-op agreements unless all such agreements (or modifications thereof) are resubmitted for approval.
2. The requirements of Sections 2.3.3.a-2.3.3.e apply to the inter-co-op agreement, except that for the purpose of Section 2.3.3.e., subparagraph 7, the members of the inter-co-ops are the co-ops and not the participants in each co-op.

B-2.3.4 Annual Allocation Transferability

a. The annual allocations received by a co-op based on catch history of the whiting endorsements held by its members may be transferred among co-op members and from one co-op to another so long as obligations to processors are met (as per Section B-2.4). Additionally, in order to transfer annual allocation from one co-op to another there must be a NMFS approved inter-co-op agreement.
b. Allocations may not be transferred from the MS sector to another sector.

B-2.4 Obligations to Processors (Processor Ties)

Each year, a permit will obligate to a processor all of its catch for a coming year.

B-2.4.1 Formation and Modification of Processor Tie Obligations

There will not be a processor tie that carries from one year to the next. CV(MS) permits will be obligated to a single MS permit for an entire year but may change to a different MS permit through a preseason declaration of intent.

Between September 1 and December 31 of the year prior to implementation and every year thereafter, each CV(MS) permit is required to contact NMFS and indicate whether CV(MS) permit will be participating in the co-op or non-co-op fishery in the following year. If participating in the co-op fishery, then CV(MS) permit must also provide the name of the MS permit that CV(MS) permit will be linked to in the following year (i.e., annual catcher vessel, mothership linkage that may be changed each year without requirement to go into the "non-co-op" fishery). Once established, the catcher vessel, mothership linkage shall remain in place until changed by CV(MS) permit. By September 1 of the year prior to implementation and every year thereafter, if CV permit would be participating in the co-op fishery in the following year, then CV permit must notify the MS permit that the CV permit QP will be linked to in the following year.[14]

Mothership Permit Transfer. If a mothership transfers its MS permit to a different mothership or different owner, the CV(MS) permit obligation for that year remains in place and transfers with the MS permit to the replacement mothership unless the obligation is changed by mutual agreement. The obligation does not extend beyond the fishing year.

B-2.4.2 Flexibility in Meeting Obligations to Processors

a. Temporary Transfer of the Annual Allocation Within the Co-op or from One Co-op to Another

When CV(MS) permit owners transfer co-op allocations from one co-op member to another within the co-op or from one co-op to another within an inter-co-op such allocations must be delivered to the mothership to which the allocation is obligated through the preseason declaration, unless released by mutual agreement.

b. Mutual Agreement Exception

By mutual agreement of the CV(MS) permit owner and mothership to which the permit is obligated, a permit may deliver to a licensed mothership other than that to which it is obligated.

B-2.4.3 Mothership Processor Withdrawal

If a mothership withdraws subsequent to quota assignment, then the CV(MS) permit that it is obligated to it is free to participate in the co-op or non-co-op fishery. The MS permit shall notify NMFS and linked CV(MS) permits of its withdrawal, and CV(MS) permits shall notify NMFS of their intent to participate in the co-op or non-co-op fishery thereafter. If continuing in co-op fishery, then CV(MS) permit shall provide NMFS with the name of the new MS permit to which it will be obligated for that season.

[14] February 2010: The last sentence of this paragraph was part of the November 2008 Council motion and was inadvertently omitted from previous drafts of the Council's final preferred alternative. At its June 2010 meeting, the provision was modified to specify September 1 as the notification date. Previously the date was July 1.

B-2.5 NMFS Role

B-2.5.1 Permit and Endorsement Issuance

NMFS will issue all necessary permits and endorsements under the rules specified under this program. Appeals processes will be provided as appropriate and necessary.

B-2.5.2 Fishery Registration and Co-op Approval

NMFS will announce a deadline before which all co-op agreements must be received for the coming year. NMFS will review and approve or reject co-op agreements based on standards provided here and other standards that it deems necessary to achieve the policy intent of the Council's actions.

B-2.5.3 Annual Allocation to Co-ops and the Non-co-op Fishery

a. Co-op Allocation

Each year NMFS will determine the percent of the mothership sector's harvest allocation to be given to each co-op based on the catch history calculation of CV(MS) permits registered to participate in the co-op that year. NMFS does not allocate to the individual permit holder; rather, NMFS allocates an aggregate amount of harvest tonnage annually to the co-op based on the catch histories associated with the members of the co-ops.

b. Non-co-op Allocation

Each year NMFS will determine the distribution to be given to the non-co-op fishery based on the catch history calculation of permit holders registered to participate in that fishery.

B-2.5.4 Fishery Management and Co-op Monitoring

1. NMFS will track all permit transfers and the invocation of mutual agreement exceptions. Permit transfers will not be valid until registered and acknowledged by NMFS.

2. NMFS will monitor catch and close segments of the fishery as necessary to ensure catch limits are not exceeded for:
   a. the whiting mothership co-op fishery
   b. the whiting mothership non-co-op fishery
   c. the mothership whiting sector as a whole
3. NMFS will not necessarily monitor, but will investigate and enforce as it deems necessary, the permit and co-op obligations to motherships.
4. NMFS will not necessarily monitor or enforce (except as it deems necessary):
   a. an individual permit's progress towards its catch allocations (permit level catch control will be at the co-op level and enforced through execution of the private contract)
   b. a co-op's progress toward its catch allocation[15]

[15] This assumes that there is an inter-co-op agreement in place that covers the entire co-op fishery. If such an agreement is not in place covering both catch and bycatch, NMFS may have to monitor catch by each individual

c. actual performance of the co-op agreement (the parties to the contract will resolve through private contract and remedies any deviation from provisions such as that requiring that a vessel have the opportunity to harvest the catch allocated to the co-op based on that vessel's permit, Section B-2.3.3.c)

5. NMFS will monitor other program provisions as needed. In some situations, there may need to be a declaration procedure to determine where a permit is delivering its obligated catch, for example, if a mothership withdraws without transferring its permit or reaching a mutual agreement for the transfer of obligated deliveries to a different mothership.

B-3 Whiting Shoreside Sector Co-Op Program (placeholder, not recommended)

The shoreside whiting sector will be managed with an IFQ program. This section header is being maintained so that section numbering here will correspond to section numbering in the alternatives and analysis in the EIS.

B-4 Catcher-Processors Co-op Program

Catch by the CP sector will be controlled primarily by closing the fishery when a constraining allocation is reached.[16] As under status quo, vessels may form co-ops to achieve benefits that result from a slower-paced, more controlled harvest. The main recommendations are the creation of a limited number of CP endorsements, the requirement that a CP co-op qualify for a Federal co-op permit, and the specification in regulation of the amounts that will be available for harvest by the voluntary co-op. A new entrant will have to acquire a permit with a CP endorsement in order to enter the fishery. If the co-op system fails, it will be replaced by an IFQ program and the initial issuance of IFQ will be allocated equally among the permits (equally divided among all CP endorsed permits).

B-4.1 Participation in the Catcher-Processor Sector , Endorsement Qualification and Permit Transferability.

Catcher-processor (CP) Endorsement. The class of CP endorsed permits (CP permits) will be limited by an endorsement placed on a LE permit. LE permits registered to qualified CP vessels will be endorsed as CP permits. A qualified permit is one that harvested and processed in the CP sector of the Pacific whiting fishery at any time from 1997 through 2003. Only CP vessels with a CP endorsed LE permit will be allowed to process whiting at-sea as part of the CP sector. LE permits with CP endorsements will continue to be transferable.

Participation as Mothership. A CP cannot operate as a mothership during the same year it participates in the CP fishery.

CP Permit Combination to Achieve a Larger Size Endorsement. A CP permit that is combined with a LE trawl permit that is not CP endorsed will result in a single CP permit with a larger size endorsement. (A CV(MS) endorsement on one of the permits being combined will not be reissued on the resulting

co-op (but not by the individual vessels in the co-op).

[16] All references to catcher-processors in this section references to vessels operating in the catcher-processor sector. Vessels under 75' which catch and process at-sea as part of the shoreside sector are not covered here.

permit.) The resulting size endorsement will be determined based on the existing permit combination formula.

CP Permit Transfers to Smaller Vessels. Length endorsement restrictions on LE permits endorsed for groundfish gear will be retained, however, the provision that requires that the size endorsements on trawl permits transferred to smaller vessels be reduced to the size of that smaller vessel will be eliminated (i.e., length endorsements will not change when a trawl endorsed permit is transferred to a smaller vessel).

Number of Transfers Per Year. CP permits may be transferred two times during the fishing year, provided that the second transfer was back to the original CP (i.e., only one transfer per year to a different CP).

B-4.2 Co-op Formation and Operation Rules

Annual registration. As under status quo, co-op(s) will be formed among holders of permits for CP. Participation in the co-op will be at the discretion of those permit holders. If eligible participants choose to form a co-op, the CP sector will be managed as a private voluntary cooperative and governed by a private contract that specifies, among other things, allocation of whiting among CP permits, catch/bycatch management, and enforcement and compliance provisions. The co-op will submit an application to NMFS for a Federal co-op permit. NMFS will not establish an allocation of catch or catch history among permits unless the sector fails to organize itself under a single co-op agreement that qualifies for a Federal co-op permit. If the co-op system fails, it will be replaced by an IFQ program and the initial issuance of IFQ will be divided equally among all CP endorsed permits.

Annual Reporting Requirements. The CP cooperative will submit an annual report to the Council at their November meeting. The report will contain information about the current year's CP fishery, including the CP sector's annual allocation of Pacific whiting; the CP cooperative's actual retained and discarded catch of Pacific whiting, salmon, rockfish, groundfish, and other species on a vessel-by-vessel basis; a description of the method used by the CP cooperative to monitor performance of cooperative vessels that participated in the CP sector of the fishery; and a description of any actions taken by the CP cooperative in response to any vessels that exceed their allowed catch and bycatch. The report will also identify plans for the next year's CP fishery, including the companies participating in the cooperative, the harvest agreement, and catch monitoring and reporting requirements.

B-4.3 NMFS Role

B-4.3.1 Permit and Endorsement Issuance

NMFS will issue all necessary permits and endorsements under the rules specified under this program. Appeals processes will be provided as appropriate and necessary.

B-4.3.2 Annual Allocation

Harvest amounts for the co-op will be specified in regulation. If the co-op breaks up, IFQ will be issued and divided equally among the 10 permits.

The CP sector allocation may be divided among eligible CP vessels (i.e., those CP vessels for which a CP permit is held) according to an agreed CP cooperative harvest schedule as specified by private contract.

B-4.3.3 Fishery and Co-op Monitoring

1. NMFS will track all permit transfers. Permit transfers will not be valid until registered and acknowledged by NMFS.
2. NMFS will monitor catch and close the CP sector fishery as necessary to ensure catch limits are not exceeded.

ANALYSIS OF THE IMPACT OF THE INITIAL QUOTA SHARE ALLOCATION ON LONG-TERM QUOTA SHARE DISTRIBUTION

Appendix E

TO THE
RATIONALIZATION OF THE PACIFIC COAST
GROUNDFISH LIMITED ENTRY TRAWL FISHERY
FINAL ENVIRONMENTAL IMPACT STATEMENT

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JUNE 2010

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Acronyms and Abbreviations

Acronym	Definition
IFQ	individual fishing quota
OY	optimum yield
QP	quota pound
QS	quota share

E.1 Introduction

This appendix contains a detailed analysis of the impact of the initial quota share (QS) allocation on long-term QS distribution. We start with some conceptual groundwork in Section E.2 ("Raw Fish Markets and Resource Rent Dissipation or Capture under Status Quo") and Section E.3 (" QP Markets and Interaction with Raw Fish Markets"). The discussion within these sections is presented in the following order:

1. Identify general economic principles.
2. Identify how those principles play out when the fishing industry is highly competitive (i.e., composed of many entities acting independently).
3. Identify what happens if one sector or the other is not highly competitive and define market power.

After that groundwork, we will get into the specific factors affecting QS flow in Section E.4 ("QS Flow among Groups (Independent of the Initial Allocation)"). Each subsection contains the following:

1. A description of the factors of interest and their conditions under status quo
2. A description of how those factors may change under an individual fishing quota (IFQ) program and influence the flow of QS (under fully competitive and less competitive conditions)

Finally, we will summarize the factors affecting flow of QS and consider the effect of the initial QS, allocation on these factors, and the long-term distribution of QS, assuming fully competitive and less than competitive conditions (Section E.5).

This provides the background for the section of Appendix A on the initial allocation among groups (Section A-2.1.1), the impacts of that allocation, how the impacts vary depending on who is given the QS, and differences between the short-term and long-term effects.

As we go through this discussion, it will be important to keep in mind that the markets of focus will be the raw fish market, the exchange between harvesters and processors, and the QS/quota pound (QP) market. Any discussion of the wholesale fish market (market into which the processors sell) will be noted when relevant. Some parts of the discussion will be simplified by focusing primarily on IFQ held as QP. QP are issued annually to those holding QS. Where it is necessary to consider the long-term stream of harvest opportunity, we will focus on IFQ held as QS.

Note: When this analysis was developed, the Council control limit options would have applied such limits to both the ownership of QS and QP. Under such circumstances, the QS control limits would have limited the amount of fish any owner of harvesting operations could take. With the decision to apply the control limit only to QS, entities would be restricted in the amount of QS they could own, but there would be no limit on the total amount of QP they could harvest on their vessels, so long as no individual vessel violates the vessel QP limit. Therefore, an entity could own as many vessels and harvest as much fish as it wanted (subject to antitrust considerations), but it would have to acquire all the QP it needs each year from those entities holding the QS. This change in policy will alter the conclusions in this appendix regarding the limitations of the QS system on processor ability to vertically integrate and harvester ability to horizontally integrate through ownership of additional vessels.

E.2 Raw Fish Markets and Resource Rent Dissipation or Capture under Status Quo

The price of QP will interact with the reported market price for fish. To understand these interactions and how breakdowns in the assumptions about perfect competition affect the expected outcome for QP, it is useful to first address status quo raw fish markets and the dissipation of resource rents.

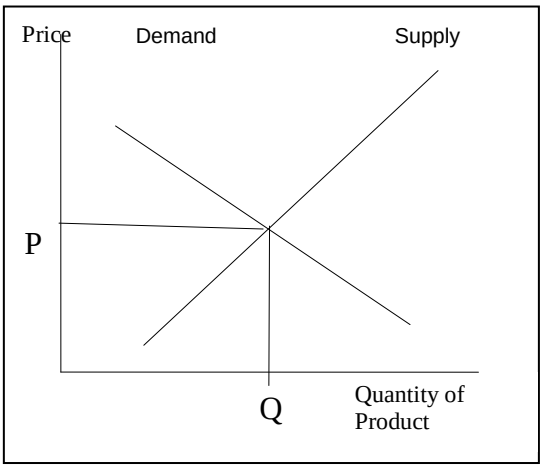


Figure E-1. Market price (P) and quantity (Q) at equilibrium (quantity supplied matches quantity demanded).

In a competitive market situation, the quantity of an item produced or demanded (the horizontal axis in Figure E-1) is related to its price (the vertical axis in Figure E-1). This is true for consumer goods and for factors of production (the inputs businesses need to support production and manufacturing). In input markets, the price a firm is willing to pay for an additional unit of an input (for example, raw fish) is related to the additional revenue that the firm will be able to generate as a result. The amount of an input supplied is determined by its marginal cost, the cost of supplying each additional unit of the input (the supply line ("curve") in Figure E-1). In general, as total production increases, the cost of producing each additional unit increases, resulting in an upward slope for the supply line. With respect to the demand line, or "curve," as in the market for consumer goods, as price increases, purchasers buy less. However, at higher prices, suppliers are willing to supply more. Conceptually, when the amounts supplied and demanded are identical, an equilibrium price is reached (price "P" and quantity "Q" in Figure 1). In practice, a stable equilibrium is seldom reached. However, this conceptual construct is still useful as an entry point for understanding the dynamics and interactions of the raw fish and QP markets under fully competitive conditions and conditions that are less than fully competitive.

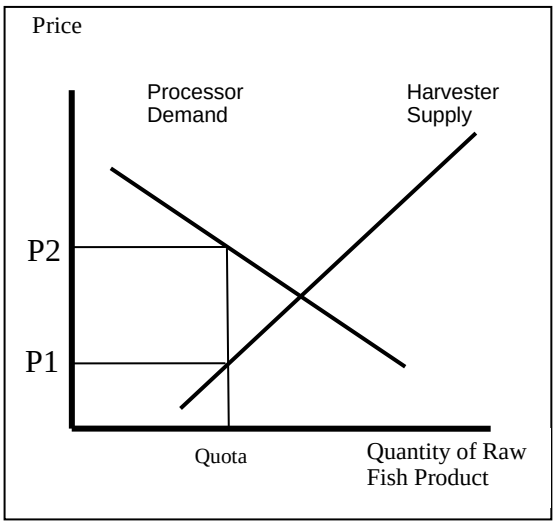


Figure E-2. Harvester cost (P1) and raw fish market price (P2) when harvest is constrained by a quota and rents are not dissipated through harvester capital investment.

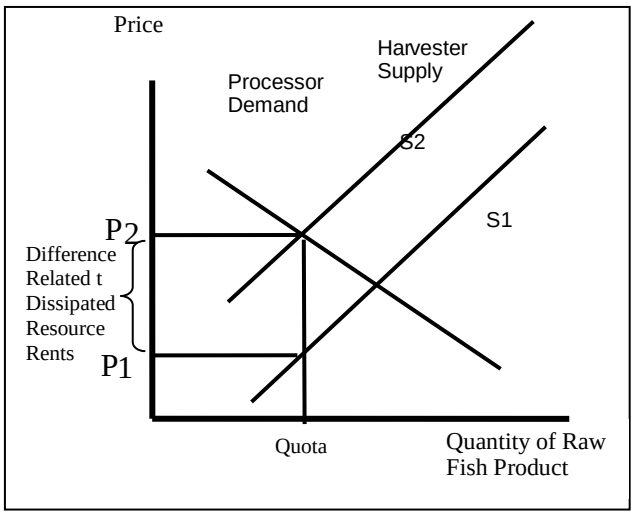


Figure E-3. In this example, it is assumed that harvesting and processing sectors are fully competitive and that harvester costs increase from S1 to S2, dissipating potential resource rents (see text for discussion of processor competition on the position o the processor demand curve and the resulting price).

Fisheries managers impose constraints to protect a resource. These constraints are generally below the amounts that fishermen would produce in the absence of a regulatory restriction ("Quota" in Figure E-2). In Figure E-3, the quota could be produced by harvesters at a cost of P1 and processors would be willing to pay price of P2. The difference between P1 and P2 reflects the rents that could be charged for the resource. However, these rents are not extracted. Therefore, processors and harvesters will struggle during price negotiations to exert bargaining power and capture a portion of the potential rents. However, to the degree that they are successful in capturing some of the difference between P1 and P2, their above-normal profits will cause them to expand their operations, and new entrants may be attracted, expanding industry capacity.

Under fully competitive conditions, new harvester entry and increasing competition raises harvest costs and dissipates rents, as illustrated by the shift from supply curve S1 to S2 in Figure E-3. The resulting price in this example is P2. The competition for harvest may also require processors to increase their investment in capital to levels above that necessary to process the fish. For example, if the fishery becomes season limited (e.g., becomes an Olympic fishery like the current shoreside and mothership sector whiting fisheries) processors with insufficient capacity to handle the product available during the season would invest in additional capacity to allow them to process in a time frame that matches the vessels' harvesting time frame.

The use of additional capital and variable inputs to increase their production capacity increases their costs and may reduce the price they are willing and able to pay for the product. In Figure E-3 this would be reflected by a downward shift of the processor demand curve. If the supply curve shifts up and the demand curve shifts down, the result would be that the lines would intercept above quota at some point between P1 and P2 for fully competitive harvesting and processing sectors, and all resource rents would be fully dissipated. In the shoreside nonwhiting fishery, cumulative trip limits have been implemented specifically to constrain the pace of the fishery. Therefore, there is not currently a race for fish, and the need for processors to invest in additional capacity is limited. Nevertheless, there may be some overcapitalization in the fishery due to the dramatic declines in optimum yields (OYs) for certain species

since the late 1990s. While there is not a race for fish in this fishery harvest sector, overcapitalization in this fishery has resulted from the investments occurring prior to the cumulative limit management regime imposed in the early 1990s, declining OYs, continuation of Olympic fishing conditions in other fisheries in which trawl vessels also participate, and government programs encouraging investment in domestic fishing capacity.

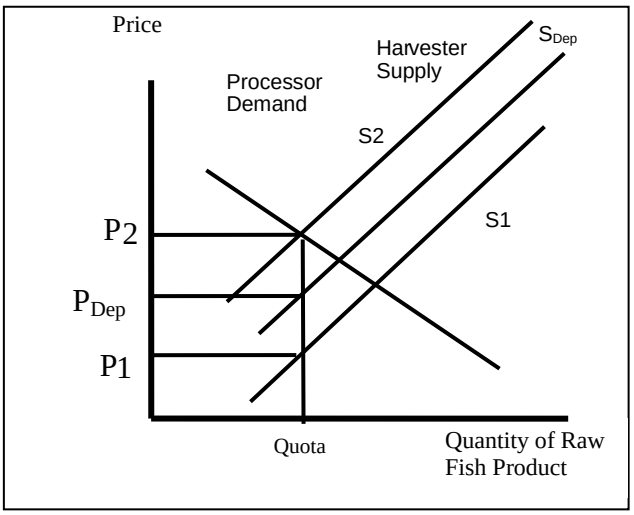


Figure E-4. Capture of a portion of the available rents (difference between P2 and PDep) through the example of a possible buyer (processor) exercise of market power.

In the case that either sector has market power, resource rents might not be fully dissipated. Market power means that members of at least one of the sectors can influence price to move away from the competitive equilibrium and use that power to capture a portion of the resource rent. Factors that make it likely that a sector will be able to exert market power are discussed in more detail in the section on QS flow among groups (page E-8). For harvesters, the effective exercise of market power to capture rents would also require some additional self-restraint or constraints such as barriers to entry.[1] Otherwise, we would expect harvesters to use the resource rents they capture as profits to support their competition for harvest, thereby raising their cost curve and, over time, dissipating the rents.

Suppose a quota constraint creates an opportunity to capture rents and the rents are not dissipated. If processors were able to exercise market power and capture all the rents, the price for raw fish would be P1 (Figure E-4). If processors are able to use market power to capture only a portion of the rent, they might be able move the raw fish price to an intermediate position. For example at an intermediate equilibrium, denoted P_{Dep}, processors would capture the difference between P2 and $P_{Dep.}$ If vessels were able to exert market power, they would capture the difference between P1 and $P_{Dep.}$ Unless the coordination that allowed them to exert the market power also enabled them to constrain their competition with one another, the difference between P1 and P_{Dep} would be dissipated as the industry increases capital investment and costs, thereby shifting the supply curve from S1 to S_{Dep} in Figure E-4. Along the same lines, returning to Figure E-3, if the harvesters are able to capture all of the available rent and not dissipate it with increased capital investment (the supply line remains at S1), the price for raw fish would be P2, and the rents captured by harvesters would be an amount associated with the difference between P2 and P1. If harvesters were to dissipate all of the rent in the race for fish, the harvester supply line would rise to S2.

E.3 QP Markets and Interaction with Raw Fish Markets

The IFQ program would create a new input that a vessel would have to acquire to bring raw fish to shore for sale: the QP. On one hand, harvesters will experience a cost associated with this new input; on the other hand, rationalization of the fishery is expected to drive down other costs of production. Figure E-5 picks up where Figure E-3 left off and assumes an equilibrium price has been established at P2 (for now

[1] The license limitation program provides some constraint on expansion of harvesting capacity and possibly supports increased cooperation among harvesters in that regard. However, there are still some permits that are unused or relatively unused. In addition, for the whiting fishery, where the race for fish continues, there continues to be an opportunity for capital stuffing (i.e., increasing the amount of capacity used with permits within the constraints of that permit).

ignore lines S3 and D2 and price P3), holding the product mix and quality constant. The net effect of an IFQ program is that the harvest supply curve depicted in Figure E-5 would stay at S2 with a price of P2, and the costs for all inputs except the QP would decline, perhaps back to S1.[2] The difference between P1 and P2 would reflect the value of the QP.[3] For those who must buy QP to participate in the fishery, the QP cost is a direct price that they would pay (their cost curve would be S2), and their profits would not vary much from competitive market equilibrium. For those who receive an initial allocation, the cost of the QP would be the opportunity cost (by holding on to the QP they lose the opportunity to gain revenue by selling the QP). They will collect the difference between P1 and P2 as rent as long as they remain in the fishery and continue to hold their initial allocations.

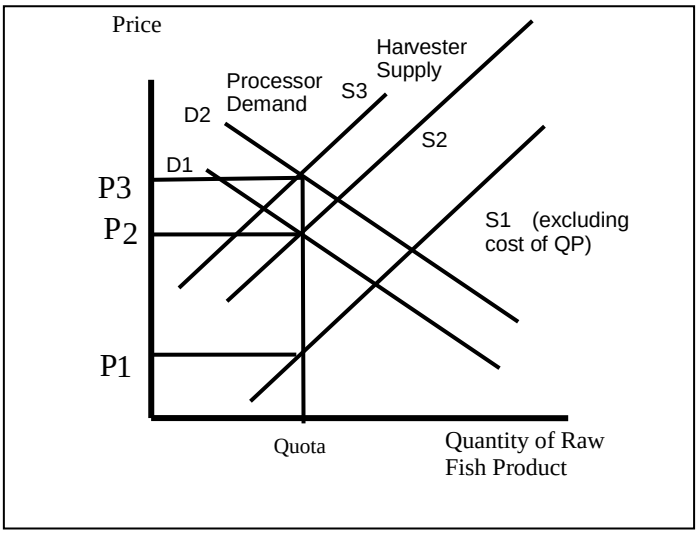


Figure E-5. Effect of a price increase through change in quality (movement of demand from D1 to D2) on value of the QP (difference between P1 and P3). (Line S1 would be the supply line of an efficient fleet if it did not have to pay for QP).

Often, the imposition of an IFQ program also creates an opportunity to increase revenues through increasing the product quality, selling when prices are higher, etc. In such a case, under competitive conditions, processor demand for the higher value products would be expected to be higher, for example, at D2 as compared to D1 in Figure E-5. This would result in an increase in the raw fish price from P2 to P3. In this example, it is assumed that the harvester costs exclusive of the QP would be expected to remain relatively unchanged (line S1 in Figure E-5), and the price of the QP would be expected to increase by the difference between P2 and P3 (increasing the harvester supply curve from S2 to S3). Thus for those who must buy QP, as the exvessel price goes up, their profit margins do not increase substantially. Those who already hold QS/QP experience an increase in financial profits. However, the firms with QS/QP still incur an opportunity cost by holding and not selling their shares. Therefore, from a theoretical perspective, in terms of assessing net economic performance, they, too, would not experience a substantial increase in real profits, though they would experience financial profits (because they do not have to buy the QP) and an increase in wealth in the form of the value of the QS asset that they hold.

[2] For purposes of simplicity, here it will be assumed that prices decline to S1. However, there will be other costs associated with harvester participation in the IFQ program. One major cost will be that of carrying observers.

[3] Assuming that industry bears the cost of observers, the cost curve would be higher, diminishing the difference between raw fish price and operating costs (excluding cost of buying QP). As this difference diminishes, the amount fishermen would be willing to pay for QP would decline, decreasing the market price of the QP.

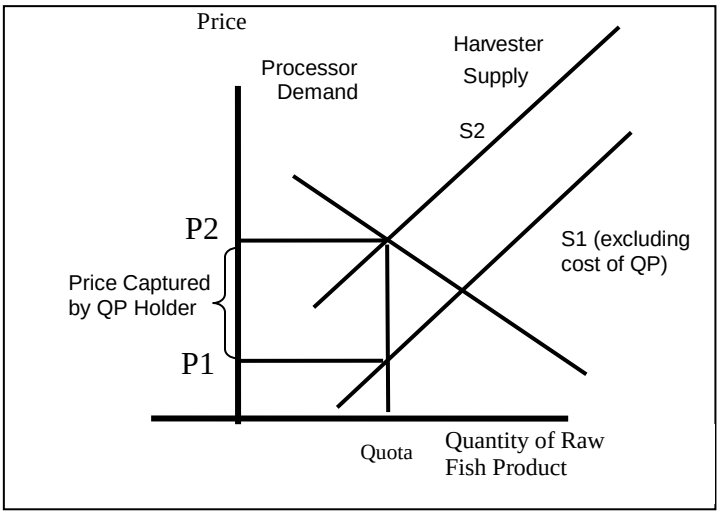


Figure E-6. Price captured by QP holder.

The actual market transaction prices reported for raw fish will be affected by who provides the QP for a transaction and the terms and conditions under which the QP is provided. In a competitive market (a large numbers of sellers and buyers acting independently), vessels not having to pay for QP will be willing to fish if they receive at least P1 for their deliveries of fish (their marginal costs excluding the cost of the QP), and processor will be willing to pay P2 for the raw fish (Figure E-6). If markets are functioning effectively, the person holding the QP should be able to sell QP to the harvester or the processor for the difference between P1 and P2 and capture the resource rent.[4] The QP holder could be the permit owner, vessel owner, crew, processors, communities, or others. The following examples show how reported raw fish price outcomes may vary depending on who provides the QP, assuming that both the harvesting and processing sectors are competitive.

- If a vessel holds its own QP, the price for the fish would likely be reported as P2, and it would include the value of the QP supplied for the transaction (in Figure E-6). P2 is composed of the vessel marginal cost (the minimum the vessel would fish for, P1 in Figure E-6) plus the price of the QP supplied by the vessel (the difference between P2 and P1).[5]

- If a processor holds the QP and buys from an independent vessel, the transaction price would vary depending on the arrangements made to transfer the QP to the vessel account (i.e., whether the QP price was wrapped together with the fish price). For example, if a processor provides the QP at no charge, then the exvessel price would be expected to be the vessel marginal cost (P1 in Figure E-6). If a processor sells the QP to the vessel, it would be expected that the price of the QP would be recovered in the exvessel price, which we would expect to be P2 if both sectors are fully competitive (Figure E-6).

Under a fully competitive situation, if both parties hold some of the QP that will be used in a particular landing, actual prices may be between the two extremes (P1 and P2). However, we would expect the amount of resource rent collected by each side to be the same as if the two parties had entered into separate sales agreements (i.e., both parties are expected to enter into the agreement only if they can earn as much revenue as they would working with a party who brought no QP to the transaction). Table E-1 contains **hypothetical** information used to illustrate the negotiating dynamic when both sides are competitive. In this table expected ex-vessel prices are shown based on the amounts of QS held by vessels and processors assuming the following:

1. Processor marginal revenue $0.40 per pound
2. Vessel marginal cost $0.30 per pound

[4] If the fishery is overcapitalized, the QP holder may not only capture a portion of the resource rent, but also a portion of the profits expected to otherwise accrue to harvesting capital, and possibly processing capital. This issue will be addressed in the section on impacts and the equity of the initial QS allocation.

[5] The difference between P2 and P1 represents the vessels opportunity cost for the QP (a profit it could have made by not fishing and selling the QP to someone else).

- In Scenario 1, all the QP is held by the vessel, and the expected price would be the processor marginal revenue ($0.40/lb) (i.e., the price would include the vessels marginal cost and the value of the QP, P2 in Figure E-6).
- In Scenario 2, all the QP is held by the processor, and the expected price would be the vessel marginal cost ($0.30/lb) (P1 in Figure E-6).
- In Scenario 3, the total transaction and the QP held are the sum of scenarios 1 and 2. The expected exvessel price would be an amount that brings both the processor and the vessel an amount of rent at least equal to what they would have earned if they entered into separate transactions with other partners; otherwise, they would not enter into the transaction. Only one price satisfies this condition, $0.366/lb.

Table E-1. Hypothetical example of price negotiations between harvesters and processors where both sectors are fully competitive.

	QP Owned by		Total Landing	Exvessel Price	Exvessel Value	Vessel Marginal Cost ($.30/lb)	Processor Marginal Rev ($.40/lb)	Rents for QP Collected by	
	Vessel	Processor						Vessel	Processor
Scenario 1	2,000 lbs	0	2,000 lbs	0.40	$800	$600	$800	$200	$0
Scenario 2	0	1,000 lbs	1,000 lbs	0.30	$300	$300	$400	$0	$100
Scenario 3	2,000 lbs	1,000 lbs	3,000 lbs	0.366	$1,100	$900	$1,200	$200 ($.066/lb)	$100 ($.033/lb)

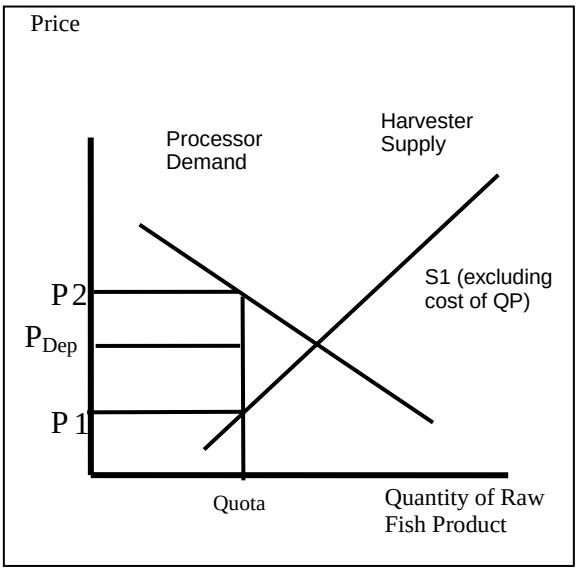


Figure E-7. Capture of a portion of the available rents (difference between P2 and P_{Dep}) through the exercise of market power by a buyer (processor). QP holders capture difference between P_{Dep}. and P1.

If the raw fish market is not fully competitive, there are two situations to consider. First, consider the situation of the entity that comes to the negotiating table with QP and desires to use his/her market power to increase profits. For this example, assume that entity is a harvester, and he/she is facing a fully competitive processing sector.[6] That entity can do no better than the price P2 in Figure E-7[7] At price P2, the entity receives its full marginal cost of harvesting (excluding the value of the QP, P1) plus the value of the QP (difference between P2 and P1). Similar logic shows the same result for a processor bringing QP to the table. If the processor tries to depress the price below P2, it will cut into the amount that is paid to the QP holder. In either situation, if the source of the price leverage is the QPs held, then the party attempting to excerpt market power could only cut into what it would reimburse itself for its own QP. This, then, implies that in an IFQ program where one side is fully competitive, the only way for the other side to gain from the exertion of market power is through the influence of the prices of transactions for which it does not

[6] For now, we will also assume the processing sector is fully rationalized, so there is no excess capacity.

[7] Unless it is able to achieve price discrimination (i.e., to charge firms for whom the delivery is more valuable more than other firms). Price discrimination is difficult to achieve and usually only arises in certain monopoly-type situations. Unless price discrimination can be achieved, the harvester can do no better than P2 with respect to a delivery for which it has QP.

hold the QP. For example, if a processor without QP was able to get a harvester to settle for a price of P_{Dep}, in Figure E-5, that processor would capture the QP related value reflected by the difference between P2 and P_{Dep}, the harvester would get P_{Dep} (before paying for the QP), and the QP holder would get the difference between P_{Dep} and P1. Of course, if the QP holder is not the harvester, the QP holder may decide to not take part in the transaction and seek an alternative buyer. Similarly, if a harvester without QP faced a processor and were able to get the processor to pay a price of P_{Dep} for raw fish, the harvester would earn his/her normal return of P1 plus additional profits reflected by the difference between P_{Dep} and P1, the processor would pay the price of P_{Dep}, and the QP holder would get the difference between P_{Dep} and P2. In both these situations, the entity exerting the market power is not the QP holder, and the QP holder loses the value unless the QP holder refused to participate in the transaction and accepts a better offer, which would be likely if the QP market is competitive.

Finally consider a possible case where both parties are in a position to exert market power (perhaps one sector is highly concentrated, and the other has many entities but is organized and working together cooperatively. Any exertion of market power by one side will come out of the value of the QP held by the other side or a third party. If the source of one side's power is that it holds a large amount of QP relative to the other side, the amount of additional rents it can extract is limited by the amount of QP held by the other side. If the QP holder is a third party (harvester or the processor), the QP holder's own ability to preserve his/her return on his/her QP holdings will depend on the competitiveness of the QP market and the QP holder's ability to exert power in price negotiations.

E.4 QS Flow among Groups (Independent of the Initial Allocation)

After the initial allocation, QS will be traded between members of the groups initially receiving the QS and any other entity eligible to own a U.S. documented fishing vessel (whether or not they actually own one). Traditional economic thinking holds that in the absence of transaction costs (the cost of buying and selling something) the QS will end up in the hands of those able to derive the greatest benefit from it independent of the initial allocation (Coase 1-44). However, transaction costs do exist. Recently, it has been demonstrated that other factors are at work such that the initial allocation may affect the long-term distribution of a resource (Hurwicz 49-74). In this section, we seek to put the question of initial allocation in the context of the expected flow of QS among groups no matter who receives the initial allocation. Once we cover the dynamics affecting this flow, we will be in a position to look at how the initial allocation might alter those dynamics.

In our previous discussion, we focused on the QP, which are issued each year to those holding QS. Our focus now turns to QS. The value of the QS is directly related to the value of the QP that will be issued for those QS in the future. We will consider the following factors from the perspective of their influence on the flow of QS among groups, independent of the initial allocation (also see the hexagons in Figure E-8).

1. Relative efficiency and intramarginal rents (page E-11)
2. Vertical integration, quasi-rents, and economic rents (page E-13)
3. Market power, horizontal integration and market share consolidation (page E-17)
4. Access to capital (demand) (page E-35)
    a. Time preference
    b. Risk
    c. Planning horizon
5. Access to capital (supply) – risk (page E-38)

Above, we identified that resource rents in the form of profits will be captured by the owner of the QS under an IFQ program, regardless of the nature of that entity (vessel, processor, crew, etc.). This result

changes only if a party not holding QP is able to exert market power, causing the price to deviate from the equilibrium for raw fish. In the following discussion, it will be important to consider other sources of profit and how they vary within and between sectors. This includes discussion of normal profits and intramarginal rent (see relative efficiency), as well as quasi-rents and economic rents (see vertical and horizontal integration). The following table provides a brief overview of these economic concepts and the technical terms we use for them.

Table E-2. Explanation of Terminology: return on investment, profits, and rents.

General Term and Description of the Concept	Economic Term
Normal Return on Investment: The level of profit required to compensate for capital investment (compensate the owners of capital). For industries that involve greater risk, greater return is required to compensate or attract capital investment. If the industry profit level is not sufficient to compensate capital, there will not be new investment.	Quasi-rents
Efficiency Profits: Profits earned by firms that are more efficient than others.	Intramarginal Rents
"Reasonable" Profit Level: Income necessary to pay for all labor, supplies, capital, and entrepreneurial expertise used by a firm at going market prices. This includes normal return on investment (quasi-rents).	Normal Profits (Zero Economic Rent or Zero Economic Profit)
Extra Profits (Abnormal Profits): Any earnings above normal profits are considered "economic profits" or "economic rents." Economic profits or rents attract new entrants.	Economic Rents (Above Normal Profits)
Cost of the Resource: Amount paid for the use of a raw resource. In open access fisheries management, no one collects resource rents; therefore, resource rents show up as economic rents, which attract new entrants until efficiency decreases to the point that only normal or less than normal profits are earned.	Resource Rents

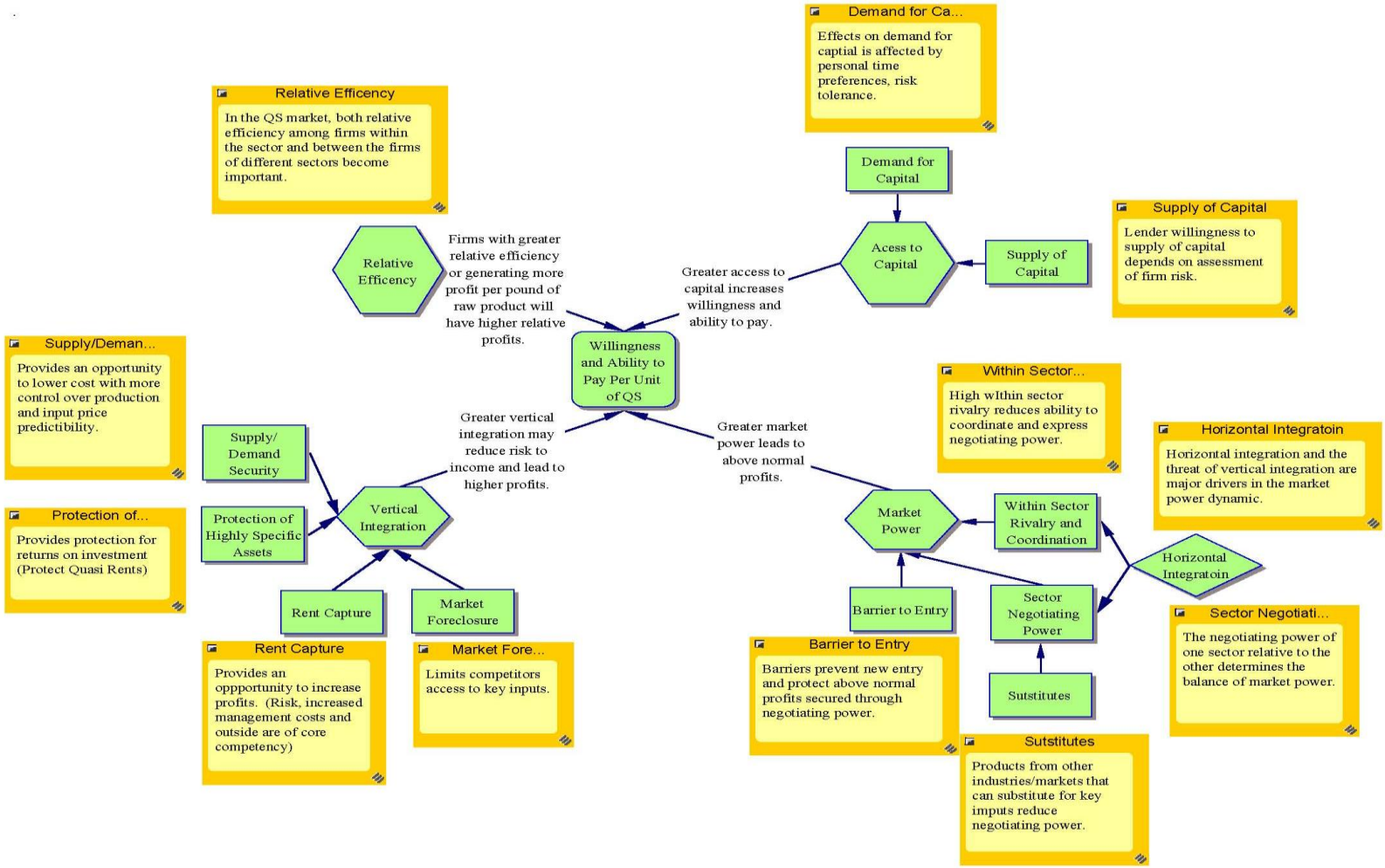


Figure E-8. Factors influencing QS flow among groups.

E.4.1 Relative Efficiency (Intramarginal Rents) and Profit Per Unit of Physical Input

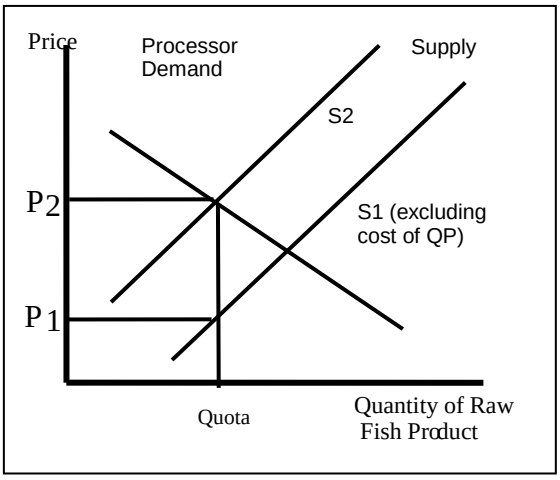


Figure E-9. Sector supply and demand curves and a point that represents a sale by a firm capturing intramarginal rents (difference between P1 and Pi).

If the harvesting and processing sectors are competitive, and the market and sectors achieve a long-run equilibrium, we would expect all participants in both sectors to be equally efficient. For both processors and harvesters, "economic" profits would be zero (all entities would have "normal" profit levels). In reality, however, even if an equilibrium market price is reached due to constant change, it is likely that some firms will be more efficient than others.[8] Additionally, it is possible for the business models of two firms to be equally efficient but produce different levels of total revenue per unit of input of a key raw produce. Those firms that are relatively more efficient and those firms that produce more value per unit of a key input (raw fish) are more likely to accumulate QS over the long run.

Firms that are more efficient than others in a sector earn extra profits, sometimes identified as intramarginal rents. Intramarginal rents are represented as the area between the price and the supply curve in Figure E-9 (the area between the horizontal line running out from P2 and the supply line S2, or the horizontal line running out from P1 and the supply line S1).[9]

Implementation of the QS program itself may affect both the harvester supply and processor demand curves. The harvester supply curve (excluding the cost of the QP) should go down as vessel efficiency improves, scale of operations increase, and less efficient capital leaves the fishery. The cost of complying with the program will limit cost savings and downward shift. If processors are overcapitalized or involved in the race for fish, the height of the processor demand curve under IFQs may increase as the amount of capital and other costs decline (as processor costs decline, the they would be expected to be willing to pay for acquisition of raw fish product increases). The IFQ program may have a differential effect on the profits of one sector as compared to that of another. The IFQ program appears to provide more direct mechanisms for the harvesting sector to improve operational efficiency as compared to processors (Table E-3). A harvester without QP would be forced to leave the fishery, while there is no mechanism that directly forces some processors to leave their sector.

[8] The long-term equilibrium in which all firms are equally efficient is rarely, if ever, reached.

[9] This explanation is a simplification to illustrate the main point. For a complete and technically accurate explanation of intramarginal rents and their relation to resource rents, see Coglan and Pascoe (Coglan and Pascoe 219-28).

Table E-3. Conditions leading to overcapitalization and opportunities for efficiency improvements for harvesters and processors in the nonwhiting and whiting sectors.

	Nonwhiting		Whiting	
	Status Quo	**IFQS**	**Status Quo**	**IFQs**
Harvesters	The race for fish occurred primarily in the 1980s and early 1990s. Imposition of 2-month cumulative limits and license limitation strongly muted capitalization. Overcapitalized state compounded by harvest contraction. Operational inefficiencies from constraints of 2-month cumulative limit management.	The IFQ program directly provides an opportunity for increased efficiency through consolidation of QS, transfer of operations to more efficient producers, flexibility in determining harvest strategies (timing and species mixes), regulatory stability and more direct control over planning.	Overcapitalized in race for fish. Operational inefficiencies from race for fish.	Same as for the non-whiting fishery with the addition of the opportunity to improve efficiency through more control over the pace of fishing and improved product quality with better handling.
Processors	Overcapitalized through harvest contraction. Operational inefficiencies from constraints of 2-month cumulative limit management.	Processors will have less certainty about the expected flow of product except to the degree they can influence product flow through the prices they offer or by acquiring QS. Over time, excess capital will diminish but the IFQ does not provide a direct mechanism for consolidation of processing opportunity (processors without QS can continue to compete for deliveries by vessels with QS).	Overcapitalized in race for fish. Operational inefficiencies from race for fish.	Processors will be gain efficiency with the slower pace of harvest and may be able to increase the value of their product with better handling or the development of higher value product forms. Over time, excess capital will diminish but the IFQ does not provide a direct mechanism for consolidation of processing opportunity (processors without QS can continue to compete for deliveries by vessels with QS).

See Sections 4.9 and 4.10 for discussions of the efficiency effects of the IFQ program on the trawl and processing sectors, respectively. Note that the existence of differences in relative efficiency within a sector depends on the industry not reaching a complete equilibrium and is independent of whether a sector has been able to exert market power and influence price away from the market equilibrium.

One of the factors determining the flow of QS will be the amount of profit a firm is able to generate with that QS on a per unit of raw product basis. Profit per unit of raw product and overall efficiency may vary from one another. By way of providing a conceptual example, consider grain farming and the production of bread. Assume that both the grain growing and grocery industries are competitive, both with normal returns on investment, and that grain is the key input without which there would not be a loaf of bread to sell (there are no substitutes for grain). We know that there are only a few cents worth of grain in a loaf of bread that may cost several dollars. Moreover, we know that on a per unit basis the farmer's profit is a fraction of those few cents, while the grocer's profit is a larger amount, some fraction of the several dollars that the loaf of bread costs. Thus, in a competitive market, the financial profit both earn may be similar, but the amount of profit per unit of the raw product may be substantially different. If each are now offered the opportunity to insure their profit based on a rate per unit of grain, the grocer will be willing to pay more because he has a greater dollar profit at risk per unit of grain. From this viewpoint, it is possible to demonstrate the potential for two companies operating at different points in the production

chain with equal relative efficiency on a dollar basis to generate different levels of profit on the basis of units of raw fish. The point of this discussion is not to identify a particular direction that QS is likely to move, but to establish conceptually relative profitability per unit of a key raw product could operate to drive the distribution of QS in a direction away from the firms with greatest relative efficiency when all inputs are taken into account. If processors have greater profit per unit of raw product, they may be willing to pay more for QS to secure access to the resource. On the other hand, to maximize profits, it is likely that they will hire the most efficient vessels to use the QP they are issued each year.

A number of other factors that affect efficiency will be influenced by the creation of an IFQ program. Some of these are discussed below in sections on integration and access to capital.

E.4.2 Vertical Integration, Return on Investment (Quasi-rents), and Above-normal Profits (Economic Rents)

Vertical integration or control occurs when a firm owns or exerts control over its suppliers or customers.[10] Businesses may vertically integrate to increase technical efficiency,[11] increase economic efficiency by internalizing transaction costs, and/or seek to exert market power (Perry 183-255). A processor that also owns a harvesting operation is a vertically integrated company. In commercial fisheries, some factors that may encourage vertical integration are as follows:

- Supply/demand market security
  - Price
  - Quantity
  - Quality
  - Timing
- Protection of profits from assets that are not easily employed in some other use ("highly specific" or "nonmalleable" assets)
- The capture of profits from another level of the production chain (rent capture)
- Preventing competitors from acquiring a key input – for increasing market share (market foreclosure)

(adapted from Dawson 1-125)

Increased management costs and the risks entailed in expansion beyond areas of core competence may be a downside of vertical integration.

QS ownership does not provide harvesters with a direct opportunity to vertically integrate in that QS are required for harvesting and provide no opportunity to direct or control processing operations.[12] Therefore, discussion of the opportunities that an IFQ program may create for harvesters to vertically integrate is taken up in the context of the IFQ program's effect on market power (see section, "Market Power, Horizontal Integration, and Consolidation" in the following).

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[10] Vertical integration or vertical control: Ownership or control of (1) suppliers (backward integration, e.g., a buyer owning a vessel), (2) buyers (forward integration, e.g., a vessel owning a buyer). Some companies engage in both forward and backward integration (balanced integration). Horizontal integration is the term used for one firm owning another that is producing the same outputs (e.g., one harvesting company owning another harvesting company).

[11] An example of technical efficiency is the integration of the steel production process such that already heated material does not have to be reheated for the next phase of the production process. At this point, technical efficiencies have not been identified with respect to the harvester processor interface.

[12] Once the IFQ program is created, the ownership of QS itself might be considered a type of vertical integration (i.e. ownership of the QS gives the harvester direct control of an essential factor of production, the QP). Elsewhere in this document, ownership of QS is sometimes referred to as a form of vertical integration.

There are a number of reasons to expect that processor vertical integration might increase under IFQs:

- The opportunity to own QS may provide a less expensive way for processors to respond to existing pressures for vertical integration (pressures to ensure market security or protecting assets that may not be easily transferred to other uses, nonmalleable assets).
- If there are above normal profits in the harvesting sector because of existing market power, or an increase in harvester market power as a result of the IFQ program (see following section, page E-17), the opportunity to capture these profits (rent capture) would create additional incentive for vertical integration through direct ownership of a harvesting operation. Acquisition of additional QS would be expected to accompany this integration.
- The exclusivity of QS provides a new opportunity for processors to increase their market share by acquiring QS and, thereby, foreclosing the opportunity of competing processors.

Processors that are already vertically integrated through ownership of vessels might have more incentive to acquire QS to protect their profits than firms that are not vertically integrated. For entities that own vessels, the acquisition of QS will protect both the profits from their harvesting operations and processing operations.

While there are reasons to expect that an IFQ program might lead processors to acquire QS in response to changing incentives and opportunity for vertical integration, control limits applied to QP would substantially limit a given processor's ability to use IFQ ownership to vertically integrate. For some processors, control limits could even reduce existing levels of vertical integration (immediately, if there is no grandfather clause, or over time as the grandfather clauses expire). Vertical integration through direct ownership of vessels would be constrained by control limits applied to QP. For example, assume a processor owns vessels that operate using amounts of QP that put the processor at a QP control limit. The processor would not be able to expand its vertical integration by acquiring additional vessels because it would not be able to acquire additional QP for additional vessels, since any such acquisition would put the processor over its QP control limit. Therefore, a control limit applied to QP would limit some processors' ability to acquire both QP and additional vessels. In its final preferred alternative, the Council applied control limits only to QS, not to QP. Therefore, a processor desiring to expand its harvesting operation will be able to do so but will not be able to support those operations with QS (each year it will have to acquire QP from other QS holders).

Vertical integration entails a firm taking on management costs related to merging the newly acquired means of production. If a firm is already vertically integrated and is just expanding the amount of that integration, there may be little additional risk. However, if the firm were extending beyond its area of core competency for the first time, it would be taking risks that could lead to higher production costs until full competency is developed. Managing a skilled crew and operation of a fishing vessel requires knowledge substantially different from the operation of a processing facility. The implementation of an IFQ program would provide processors of raw fish some opportunity to extend their control over supply production without necessarily having to incur the management costs and risks associated with control over a fishing vessel. By holding QS, a processor would be able to offer QP to the available fleet and have more leverage to control the timing of the delivery of those QP. However, while holding the QP provides the processor with an additional degree of vertical control, it is not enough to entirely free the processor from uncertainty about the price it would have to pay to get the raw fish delivered in the fashion it desires. The vessel would still be an independent operation. For example, even if the processor holds the QP, if the vessel also has its own QP, or there are competing processors in the area, it may still have to offer a higher price for the raw fish to get the desired delivery terms (time and quantity). Ownership of the underlying QS would secure QP price certainty for the processor and provide substantial leverage, but not complete certainty with respect to the raw fish price.

E.4.2.1 Supply/Demand Market Security

In general, price, quantity, quality, and timing are market security issues that can be addressed through vertical integration. With respect to quantity in a delivery, quality, and timing, processors can influence the delivery of an independent harvester through price negotiations or general market offerings. However, doing so involves transaction costs, which can be avoided with vertical integration. Vertical integration allows the producer to plan and control production and, most important, to know price (Arrow 173-83). For example, with respect to timing and quantity, the producer can more efficiently allocate labor and assets that are fixed for the period. It is also easier for a processor to control production quality when the employees work for the processor rather than the harvester. In situations where investment to support production for an upcoming period must be made with only partial or uncertain information about market price for key inputs, there will be a tendency for firms to vertically integrate. Moreover, in such a situation, this tendency for vertical integration will also encourage horizontal integration and the exertion of market power (Arrow 173-83). Under an IFQ program, the opportunity to own QS would provide processors a lower cost means for vertically integrating for market security.

E.4.2.2 Asset Specificity (Malleability) and Quasi-rents

Highly specific (unmalleable) assets are those that cannot be easily transferred to other uses if access to a key input is lost. The value of the asset that is not recoverable through transfer to another use is considered a sunk cost or sunk portion of the asset. Consideration of asset specificity has to take into account not only the alternative use of the asset but also the cost of moving the asset into the alternative use. The difference between the value of the asset in its current use and its value in the next best use is the *quasi-rent*.[13] Quasi-rents are considered a part of "normal rents" or "normal profits." They represent the return on investment that is necessary to attract and maintain capital in an industry.

The profit a buyer needs to pay a return on capital investment (quasi-rents) may be subject to capture when the number of suppliers is limited. For example, if one of a very limited number of suppliers selling an input knows a customer has equipment that must have that input (that there are few substitute inputs) and that the customer's equipment is not easily transferred to a different use, that supplier may be able to negotiate a higher price and capture some of the buyer's profit otherwise needed for a return on investment. Alternatively, a customer who is buying from a supplier that has a very unmalleable asset might be able to capture some of the suppliers return on capital investment. Such a circumstance might arise if there are a limited number of customers and a product that is highly specific in its use and its availability. An example would be a vessel with a hold full of fish and no pre-agreed-upon buyer. In this case, the fish are the unmalleable asset. Thus, specific assets earn a return that is subject to capture when there are market imperfections. The capture of these profits can only be sustained over the short term; otherwise, the firm losing the profit will not earn enough to replace its capital and will eventually be forced to leave the industry.

In the section above on the interaction of QS and raw fish markets (page E-4), we noted that when the raw fish market is fully competitive the QP owner would be expected to capture resource rents. With fully competitive markets and overcapitalization, the QP owner may capture both the resource rents and some of the quasi-rents. In an overcapitalized situation, firms seeking to ensure they have sufficient product for optimal production levels will bid away some of the profits (quasi-rents) that would otherwise go to returns to capital. However, this would be a short-term phenomenon. As assets age, deteriorate and are not replaced—all else being equal—QP prices would be expected to decline. The decline in QP prices would yield back the profits for return on investment to induce new investment. [This dynamic is

[13] The terms "economic profits" or "economic rents" occur when profits are above normal. See the following section for additional discussion of economic rent.

discussed in more detail in A-2.1.1.a, in the sections on "Investment, Dependence, and Disruption," and impacts on "Buyer/Processors."]

E.4.2.3 Rent Capture and Economic Profit (Economic Rent)

Vertical integration is also a way for one sector to capture another sector's economic profit (economic rent). Economic rent is any profit that is earned above that necessary to pay all costs, including the cost of recouping the original capital investments. Economic rents are termed "above normal" profits.[14] Vertical integration may be through forward integration (a harvester buying a processor) or backward integration (processor buying a harvester). In determining whether vertical integration will increase its profits, a firm would have to consider increased management costs and risk associated with expansion of the business beyond its area of core competence.

When both sides of a market are competitive and at equilibrium, there would be no above-normal rents to capture through vertical integration. However, if one or both sides are exerting market power under status quo, or become able to exert power as an outcome of the IFQ system, then there is an increased incentive to vertically integrate to capture rent (see the following section on market foreclosure and the section discussing horizontal integration, starting on page E-17). Firms able to capture economic rent will place more value on QS and have more incentive to buy QS to secure access to their key input.

E.4.2.4 Market Foreclosure

Firms may vertically integrate to limit their competitor's supply. While vertical integration occurs under status quo, use of that integration to foreclose a competitor's market is difficult. Any additional harvesting capacity acquired by a processor competes with existing harvesting operations, effectively reducing the two-month cumulative limits (or the season length, in the case of catcher vessels participating in the whiting fishery). It might be argued that the license limitation program makes it difficult to add capacity. However, latent permits and permits that are not used to full capacity offer opportunity to expand capacity. Further, even if a processor acquires a fully utilized permit and vessel, capacity could be expanded if the competitor losing deliveries from that permit and the vessel compensate by bringing one of the latent or underutilized operations on line. Whether or not IFQ would become a key production input for which there is no substitute, the creation of an IFQ system would provide a new opportunity for entities to foreclose a competitor's access to another key input (raw fish) and expand market share through vertical integration by the purchase of QS. Alternatively, if prevented from acquisition of QS through accumulation limits, a processor might secure a contract for delivery by a vessel with QS. Since no one else could purchase the fish associated with the QS assigned to that vessel, this would be a form of vertical control and market foreclosure. However, use of such contracts by processors could be counted toward a processor's QS/QP accumulation limit. Whether accumulation control limits would apply to marketing commitments secured by this type of a contract would have to be determined.[15] Foreclosing a competitor's access to an essential input (raw fish) will become more feasible under an IFQ program. This could lead to further consolidation in the processing sector, as discussed in the following section on market power.

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[14] Economic rent does not include quasi-rent since quasi-rents are necessary to maintain an asset in the industry over the long run (i.e., to provide incentive for future investment). The intramarginal rents earned by firms that are more efficient than others may be economic rents (discussed in the section on relative efficiency, page E-11). In addition, above-normal profits earned by firms exerting market power would be considered economic rent.

[15] While under a control limit, fishery managers would not directly monitor these contracts. If suspicion arises that an entity is exceeding a control cap via the use of private contracts, that circumstance could be investigated, and at that time, contracts would be evaluated as potential violations of the control cap.

E.4.3 Market Power, Horizontal Integration, and Consolidation

"Market power is viewed as the ability to maintain ***long-term abnormal profit…***" (Poole and Van de Ven -429). Market power enables firms to move price away from the competitive, market-determined equilibrium. In a fully competitive market, no firm or sector has market power because none can influence price away from the equilibrium. If a firm is able to achieve above normal profits through the expression of market power, they will be willing and able to place a higher value on the QS because the QS represents a larger stream of profit to them than to other firms. Thus if a firm or sector has market power under status quo and it is maintained under the IFQ program, or if the firm or sector establishes market power under the IFQ program, QS will flow in the direction of the entities with market power.

Market power is influenced by the following:

- Rivalry and coordination within a sector (page E-17). Effective exertion of market power requires coordinated action and coordinated action is affected by the degree of rivalry within a sector.
- Relative bargaining (negotiating) power between sectors (page E-21). The bargaining power of the sector vís-a-vís another sector is affected by current conditions and threats of longer-term recourse. This topic will be addressed in three parts:
  - Threat of substitutes
  - Harvester bargaining power
  - Buyer/processor bargaining power
- Barriers to entry (page E-23). Unless barriers to entry can be maintained, higher profit will attract new entry that will then disrupt market power.
  (adapted based on (Porter))

One of the major themes that shows up in the consideration of rivalry, coordination, and bargaining power is sector concentration (the number of firms and whether market share is relatively evenly spread among the firms, or is spread among just a few). As concentration in a sector increases, ability to exert market power increases. Two processes affect concentration:

- Horizontal integration—occurs when one firm in a sector acquires another or when firms within a sector merge.
- Market consolidation—occurs when existing firms expand market share (with other firms losing market share and potentially exiting the business).

In the following sections, we will address each of the factors influencing market power and then turn to the question of how implementation of an IFQ program may change these factors and thereby influence market power. These sections help to set the stage for addressing the question of how the initial allocation of QS affects the longer-term distribution of QS.

E.4.3.1 Rivalry and Coordination

Market power requires some form of coordinated action within the sector to move the price away from the market equilibrium (away from the price that results when there are many independent participants on both sides of the market transaction). In some situations, there may be legal issues if that coordination is jointly planned. On the other hand, sometimes a single firm acts as a price setter with other members of the sector following that firm's lead. Such coordination through smaller firms following the lead of larger firms is occasionally seen in the airline industry and some other industries with a structure similar to that of west coast groundfish processors. Coordination also may occur among many entities, as was attempted with mixed success during the mid-coast groundfish trawl vessel tie-up during price negotiations in

March-April 2007. Ability to coordinate within a sector depends on rivalry. For example, rivalry among harvesters increases the threat that a harvester might lose its market to a competitor during difficult price negotiations with a particular processor. A number of factors affect degree of rivalry. These factors are described in the following text box (Porter).

Within-sector Rivalry (Porter) (this summary adapted from http://www.quickmba.com/strategy/porter.shtml)
The intensity of rivalry is influenced by the following industry characteristics:

1. **A larger number of firms** increases rivalry because more firms must compete for the same customers and resources. The rivalry intensifies if the firms have similar market share, leading to a struggle for market leadership.
2. **Slow market growth** increases rivalry as firms fight for market share in order to continue growing. A firm's growth does not rely on market share competition in a growing market.
3. **High fixed costs** result in an economy of scale effect that increases rivalry. When total costs are mostly fixed costs, the firm must produce and sell at near capacity to attain the lowest unit costs. Rivalry intensifies as firms fight for customers for their production.
4. **High storage costs or highly perishable products** cause a producer to sell goods as soon as possible. If other producers are attempting to unload inventory at the same time, competition for customers increases rivalry.
5. **Low switching costs** increases rivalry. When a customer can freely switch from one product to another, there is a greater struggle to capture and retain customers.
6. **Low levels of product differentiation** are associated with higher levels of rivalry. Brand identification, on the other hand, differentiates production and tends to constrain rivalry.
7. **Strategic stakes are high** when a firm is losing market position or has potential for great losses or gains. This intensifies rivalry.
8. **High exit barriers** exist when there is a high cost for abandoning production. This intensifies the rivalry to remain in the sector. High exit barriers cause a firm to remain in an industry, even when the venture is not profitable. A common exit barrier is asset specificity. When the plant and equipment required for manufacturing a product are highly specialized, they are difficult to liquidated when demand within the sector is weak and the assets cannot easily be used in other industries.
9. **A diversity of rivals** with different cultures, histories, and philosophies make an industry unstable. There is greater possibility for mavericks and for misjudging rival's moves. Rivalry is volatile and can be intense.
10. **Industry shakeout** periods intensify rivalry. When an industry becomes crowded with competitors, and there are insufficient key inputs or insufficient product demand to support all participants a shakeout ensues, with intense competition, price wars, and company failures.

The factors affecting rivalry are listed in Table E-4 with a qualitative evaluation for the harvesting and processing sectors. This evaluation indicates that conditions for high rivalry would be expected in both sectors. High rivalry leads to shake out, which can lead to concentration of the type that is seen in the processing sector (greater concentration reduces rivalry because of the interdependence it creates among the firms as they deal with suppliers and customers).

Table E-4. Assessment of factors influencing within sector rivalry for harvesters and processors.

Factor Causing Greater Rivalry	Harvesters	Processors
1. A larger number of firms with similar market shares	+ More harvesters than processors. + Entities with similar market shares. *Note: Potential sector participants include latent permit holders.*	- Fewer processors than harvesters, Small number of firms. Very restricted in some localities. - Market shares highly concentrated, going mainly to a few companies.
2. Slow market growth	+ Yes	+ Yes
3. High fixed costs relative to variable costs	? Possibly	+ Yes
4. High storage costs or highly perishable products	+ Yes	+ Yes
5. Low cost for customers to switch suppliers	+ Yes	+ Yes
6. Low levels of product differentiation	+ Yes	N/A
7. Strategic stakes are high	+ Moderate for nonwhiting, high for whiting	+ Yes
8. High exit barriers	+ Yes	+ Yes
9. A diversity of rivals	o Uncertain	o Uncertain
10. Industry shakeout.	- Constrained by current management system	o Uncertain. Shakeout may have already occurred.
Summary	Many reasons to expect high rivalry. However, license limitation constrains threat of new entrants; and for nonwhiting, 2-month limits minimize opportunity to compete for market share	Many reasons to expect high rivalry. However, high concentration indicates shakeout may have already occurred; and threat of intense competition may discourage strong moves to expand market shares.

Harvester Rivalry. In the shoreside nonwhiting sector, the number of harvesters is small but is large relative to processors (about 100 to 120 vessels compared to 5 to 10 processing companies of significant size). Fixed costs for harvesters may be high relative to variable costs, leading to a strong incentive to maximize the use of capital. However, for the nonwhiting fishery the two-month cumulative limits prevent this from serving as an incentive for rivalry.

Strategically, license limitation and trip limit management provide limited opportunity for direct market share competition or much industry shakeout in the nonwhiting harvester sector. Assuming that the market is capable of fully absorbing the harvest (i.e., there are no market limits), within a two-month period, no vessel can preempt the harvest opportunity of another. However, if the market is limited (e.g., a limited ability to absorb Dover sole) and if processors use limited markets as leverage by making the delivery of other products (e.g., crab) dependent on negotiations over groundfish deliveries, there may be a strategic stake in maintaining a relationship with a processor.

Competition is more intense in the whiting derby. Specialized capital with a limited market creates an exit barrier (high cost of leaving the fishery). Total capital invested in a harvesting operation is likely to be lower for harvesters than processors. However, the relative exit cost per dollar of capital (i.e., non-recoverable investment) could be higher than for processors, depending on the alternative activities available for the vessel and other assets of the fishing firm as compared to processors. Lack of unified action among harvesters during the 2007 mid-coast trawler tie-up, which occurred during the price negotiations with processors, indicates that rivalry may be strong enough to prevent coordinated action. The tie-up lasted for 43 days (70 percent of the bimonthly period), but 44 vessels were active during the tie-up, and 35 vessels were active only after the tie-up. About 55 percent of the landings were made during the last 18 days off the tie-up (Table E-5). Participation varied geographically (
Table E-6).

Table E-5. Landings and deliveries for vessels during and after the mid-coast vessel price negotiation tie-up (3/1/07 to 4/12/07).

Period	MT		Exvessel Value		Days		MT/Day	Vessels
3/1/2007 – 4/12/2007	1,194	45%	1,428,863	46%	43	70%	28	44
4/13/2007 – 4/30/2007	1,474	55%	1,699,901	54%	18	30%	82	79
Total	**2,668**		**3,128,764**		**61**		**44**	**94**

Table E-6. Number of vessels delivering and not delivering during the tie-up by port area.

Port Area	Did Not Deliver During Tie-up (3/1/2007-4/12/2007)	Delivered During Tie-up (4/13/2007-4/30/2007)
Northern Puget Sound	4	2
Coastal Washington	1	2
Columbia River	17	5
Newport	7	6
Coos Bay	6	8
Brookings	3	4
Crescent City	5	1
Eureka	5	7
Fort Bragg	2	2
Bodega Bay		1
San Francisco	1	9
Monterey		2

Processor Rivalry. The processing sector also appears to have many characteristics that would lead one to expect intense rivalry within that sector. However, one characteristic in particular indicates that rivalry would *not* be expected: a few processors handle a large share of the raw fish market. It may be that previous shakeouts in the industry have reduced rivalry. If rivalry tends to be low, price setting for raw product may still be competitive or it may be that prices are set as smaller firms follow the prices set by larger firms. While processors do not publish information on offering prices for raw product, the fishing community within a port tends to be small, and it is likely that information on offering prices is readily available by word of mouth. Additionally, the processing sector is structured in such a way that it is unlikely firms can set prices independently, even if they wanted to. For example, if one of the larger processors were to increase the price it offers for fish in order to expand its market share, other processors may also increase their prices in order to preserve their shares. If this happens, the firm that started the price increase will not have gained production but would have higher costs and lower profits. Similarly, if that processor were to cut its price, it would have to guess about what it expects its competitors would do. If it believes its competitors would not also cut the prices they offer for raw fish, then by dropping its price, it may increase profits per unit of production but lose total production. On the other hand, if other processors also drop their price, then all processors may gain. The situation in which a firm is not a monopoly but also cannot change its own price without the possibility of affecting the market prices is typically characterized as an "oligopsony." In situations like this, rivalry may be lower because the major firm must consider the responses of others to any price changes. In a fully competitive situation, other firms do not usually respond directly to one firm's price changes.

E.4.3.2 Bargaining or Negotiating Power

In the previous section, we focused on the within-sector coordination required to establish market power. Here we discuss factors affecting bargaining power between sectors. These include the following:

- Threat of substitutes
- Supplier (harvester) power
- Buyer (processor) power

Substitutes. The threat of substitutes refers to substitutes from outside the industry. An oft-used example is the substitutability of glass, metal, and plastic containers for one another. When there is a substitute available from outside the sector, the negotiating stance of the suppliers is weakened. In the raw fish market on the west coast, substitutes appear relatively limited. Processors that are vertically integrated into the wholesale chain may be able to substitute production from other geographic areas to meet customer needs and may utilize some portion of their processing capacity if they have access to "imported" raw product. However, there are not a lot of substitute activities for the profit centers represented by coastal processing facilities. It is likely that locally available resources are fully exploited and that supply facilities would be idle more of the time without trawl-caught groundfish. If processors raise prices, they also face the possibility that their customers will find substitute fish products from other geographic areas or in the form other protein products. Substitute fisheries for vessels are also limited. While vessels may move into other fisheries, they will likely have to continue to deal with the same processors if they do so in fisheries on the west coast, particularly if they stay within a restricted geographic range. If they are negotiating with a processor that is a major buyer for several west coast fisheries, substitutes that would credibly allow them to threaten to sever relations with a local processor may be limited. This situation could also pertain if a processor faced a harvesting company that is dominant in a number of fisheries.

Table E-7. Indicators of harvester bargaining power.

Indicators of Higher Supplier Bargaining power (Based on Porter)	Evaluation
Suppliers can credibly threaten forward integration (ability to buy or control processing facilities).	No (Yes, at-sea whiting)
Suppliers are reasonably safe from threat of backward integration (a processor purchasing a vessel).	No
Production is concentrated among a few suppliers.	No
Sales are spread among many processors.	No
There is a significant cost for processors to switch to a different supplier.	No
The processor's customers are powerful and willing to boycott in support of the suppliers.	No
Suppliers' products are highly differentiated from one another.	No

Supplier (Harvester) and Buyer (Processor) Power. The focus here is on relative power between the sectors.

Table E-7 provides indicators of supplier (harvester) power. Several of the factors related to rivalry within the sector have corollaries in the consideration of supplier and buyer power. For each indicator of supplier power, an inverse statement describes buyer power.[16] One of the indicators of power is the ability of each group to take on the functions of the other (forward and backward integration). Some processors have successfully integrated harvesting operations, but, while there have been attempts, there are not many examples of harvesters successfully developing processing operations at a significant level. When activity in one sector is aggregated, that sector will be more powerful, and its relative power is greater if the sector on the other side of the market is disaggregated. Buying power is higher when suppliers sell products that are not highly differentiated from those of other suppliers and when the cost to a processor of switching from one supplier firm to another is low. This statement characterizes the situation of harvesters versus processors in the west coast groundfish fishery.

The 2007 mid-coast trawler tie-up may provide another indicator of sector bargaining power. Some vessels, both processor-owned and others, did not participate in the tie-up. The tie-up ended when vessels returned to fishing to avoid losing the catch opportunity represented by an entire two-month cumulative limit period. It was anecdotally reported that there was some disruption in the local wholesale markets, with other products filling in for west coast groundfish and that, when supply returned, those markets had to be regained and the alternative supply displaced.

E.4.3.3 Barriers to Entry

If a sector is able to establish above-normal profits by overcoming rivalry, coordinating action, and exerting power in negotiations, then maintenance of that profit over the long term requires barriers to entry. Barriers to entry can be classified as follows:

1. Government created
2. Patents and proprietary knowledge
3. Asset specificity (capital malleability)
4. Economies of scale

Conclusions on barriers to entry with respect to the harvesting and processing sectors are provided in Table E-8.

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Indicators of Higher Buyer Power	Evaluation
Buyers are safe from a credible threat of forward integration by suppliers (harvesters are unlikely to acquire processing facilities).	Yes (no for at-sea)
Buyers can credibly threaten backward integration.	Yes
Supply is spread among many suppliers.	Yes
There are a few buyers with significant market share.	Yes
There is not a significant cost to switch suppliers.	Yes
Buyers purchase a significant portion of the suppliers output.	Yes
The product is standardized.	Yes

Table E-8. Summary of barriers to entry.

Barriers to Entry	Harvesters	Processors
Government Regulation	Limited number of permits but some "latent." Heavily regulated.	Fishery management related regulations less heavy than for harvesters, but also face environmental regulations (waste discharge).
Special Proprietary Knowledge	Fishing locations.	None identified.
Asset Specificity (Malleability)	Very specific (geographic relocation possible).	Very specific. Shoreside--not mobile; some utility in other sectors. At-sea—mobile.
Economies of Scale (fixed costs of attaining efficient production)	Smaller than for processors.	Larger than for harvesters.

Government Created. Government action may affect barriers to entry by directly restricting participation or indirectly imposing regulations that increase capital or operating costs. The primary direct barrier for the west coast trawl fishery is the limited entry permit requirement. This permit limits the number of harvesting vessels in the fishery and, with Amendment 15 to the groundfish FMP, restricts the movement of vessels among the shoreside nonwhiting, shoreside whiting, mothership whiting, and catcher-processor sectors. A buyback program in 2003 dramatically reduced the number of trawl permits, but, even with that reduction, some permits remain relatively inactive and presumably available for purchase or lease by someone who might want to bring a new vessel into the fishery. Both harvesters and processors operate in a highly regulated environment and face compliance costs.

Patents and Proprietary Knowledge. Control of technology and proprietary knowledge provides competitive advantage where it is not readily available to others. Knowledge of fishing grounds is an example of specialized proprietary knowledge that fishermen often seek to protect. We have not determined whether some processing firms have unique knowledge that would create a barrier for new entrants.

Asset Specificity (Capital Malleability). Both harvesters and processors utilize some highly specific assets (vessels and processing facilities, respectively). Alternative uses for a vessel generally involve switching to a different fishery. If the firm retains ownership of the vessel, switching fisheries may mean geographic relocation and the need to acquire new expertise about fishing grounds, fish behavior, and gear operation. When the alternative fisheries are under a license limitation program, permits must be purchased from other vessels. If the vessel only needs a part-time opportunity, but the prices for permits in a particular fishery are driven by their value when used full time, the permit cost may be a barrier that prevents the vessel from to switching to the alternative fishery.[17] In Chapter 3, information is provided on the degree to which trawl vessels participate in multiple fisheries. Processors also have some assets that may be specific to certain species (e.g., skinning machines) and other assets that may be more versatile (e.g., cold storage facilities) and may be used for a variety of fish species within the region, as well as for agricultural and nonagricultural products. Some processors may receive product from other geographic areas, and processors that have vertically integrated into the wholesale sector may meet their customers' needs with products from other sources.

Economies of Scale. Critical here is "minimum efficient scale." The barrier will be greater if achieving the minimum size required for cost-efficient production requires a large investment in capital, personnel, and development of organizational structure. Under circumstances where there is a very high initial cost, it may be more likely that a competitor will enter from another geographic area, related industry, or

[17] On the other hand, if the alternative fishery is under an IFQ program, the costs of the harvest rights necessary to switch into that fishery will likely be more proportional to the vessel's needs.

through vertical integration as opposed to building from the ground up. Another vehicle for initial entry would be to use a different business model, for example, relying on a higher degree of product differentiation, i.e., a company might start up by selling into a small specialty niche market and then increase scale, expanding into less differentiated fish products. Shoreside processing businesses tend to involve larger commitments of capital than harvesting operations, indicating a greater challenge for new entrants.

E.4.3.4 IFQ Program Effects on Market Power and QS Flow

The following three tables and subsequent text describe how implementation of an IFQ Program may influence the determinants of market power (rivalry, bargaining power, and barriers to entry). For each of these determinants, the tables review the same indicators covered in previous sections, evaluating how these indicators would change with the implementation of an IFQ program.

Rivalry	(Section E.4.3.1)	Table E-9
Bargaining Power	(Section E.4.3.2)	Table E-10
Barriers to Entry	(Section E.4.3.3)	Table E-11

Firms in a sector with more market power are more likely to accumulate QS up to the maximum limits; such firms will be willing and able to pay more for QS, thereby influencing the flow of QS in their direction. Horizontal integration, vertical integration, and consolidation have a primary influence on market power, and barriers to entry are necessary to maintain that power. The text following the tables explains some of the results summarized in the tables. In section E.5 we will see how these results are influenced by the initial allocation of QS.

Table E-9. Effects of IFQ program on the degree of competition and co-operation within a sector (within sector rivalry) ("-" = indicator or less rivalry "+" = indicator of more rivalry, "o" = no change).

Factor Causing Greater Rivalry	Harvesters	Processors
1. A larger number of firms with similar market shares	- A decrease in the number of active harvesting vessels and harvesting companies (subject to accumulation limits). Much of the rivalry for market share will be focused on the QS/QP market. However, for harvesters who do not own their own QS this competition may also involve rivalry in the raw fish market. - Limited opportunity for latent capacity in the sector to become more active, except through direct voluntary reductions by active vessels through QS/QP transfers.	+ Decreased geographic isolation of markets, increasing number of participants within a market. + Some pressure for consolidation in response to existing overcapitalization and threat of harvester market power. - However, if there are effective accumulation limits growth of market share for larger firms will have to occur without the advantage offered by QS ownership.
2. Slow market growth	o	o
3. High fixed costs	+ Increased fixed costs (e.g. camera systems), but for harvesters the increase influences rivalry in the QS/QP market more than the raw fish market (though if a harvester is negotiating to access QP held by a processor, the two markets could be linked). - Incentive to exert market power in the raw fish market to increase profits and recover fixed costs.	o Minor increase relative to vessels*.
4. High storage costs or highly perishable products	o	o
5. Low cost for customers to switch suppliers	o	o
6. Low levels of product differentiation	o	N/A
7. Strategic stakes are high	o	+ Increased strategic stakes, expansion requires direct displacement of competitors, more limited vertical integration opportunities.
8. High exit barriers	o	o
9. A diversity of rivals	o	o
10. Industry Shakeout.	± Expected (more stable over the long term)	± Possible (not certain)
Summary	After an initial shakeout, rivalry will decrease because of fewer harvesters and accumulation limits constraints. The need to cover fixed costs (including cameras and observers) may stimulate rivalry in the QP market and cooperation in the raw fish market. Rivalry in the raw fish market will occur to the degree that processors provide QP linked with raw fish exvessel price negotiations.	Rivalry will increase as a decrease in the geographic isolation of raw fish markets expands the number of effective participants, processors position themselves to defend against the possible exercise of harvester market power, competition for market share requires direct displacement of other processors, and accumulation limits constrain existing and potential vertical and horizontal integration.

*The IFQ program is likely to increase some processor fixed costs related to compliance with regulations, but those costs are not expected to be nearly as substantial as for vessels. To the degree that fixed costs increase, there will be an incentive for processors to increase production, thereby increasing rivalry and posing a higher barrier to new entrants.

Table E-10. Effects of IFQ program on the bargaining power of one business sector in relation to the other (bargaining power) ("-" = indicator or less power, "+" = indicator of more power, "o" = no change).

Indicators of Sector Power	Harvester (Supplier) Evaluation	Processor (Buyer) Evaluation
Threat of vertically integrating with other sector (See section on vertical integration for more detail)	+ Harvesters may vertically integrate by retaining ownership of fish while they are being processed (demanding custom processing services). + Harvesters may exert vertical influence by using QS to encourage new entry by processing concerns.	+ Increased incentive. - Threat limited by accumulation limits. - Possible reduced vertical integration for firms with strong vertical integration.
Business sector concentration (See #1 of table on "rivalry" for more detail)	+ Increased concentration. + Reduction of potential for competition through activation of latent permits.	- Decreased geographic isolation of markets (QP liquidity). + Pressure for consolidation/integration. - Consolidation/integration constrained by accumulation limits.
Switching Costs (processor to a different supplier or supplier to a different processor)	o	O
Processor customer power	O	N/A
Harvester products are highly differentiated from one another	O	O

Table E-11. Effects of IFQ program on the ability of a sector to protect any advantage it gains in bargaining power (barriers to entry) ("-" = indicator or less rivalry "+" = indicator of more rivalry, "o" = no change).

Changes to Barriers to Entry	Harvesters	Processors
Government Regulation	+ Increased fixed costs. + Absolute barrier to entry and expansion	+ Increased fixed costs. Relatively minor compared to harvesters.
Special Proprietary Knowledge	O	O
Asset Specificity (Malleability)	O	O
Economies of Scale (fixed costs of attaining efficient production)	+ The cost of achieving any given level of scale will be increased by the need to acquire QS.	+ If processors in the industry acquire QS, the cost to new entrants to reach a similar level of scale, efficiency, and risk control will be increased by the need to purchase QS. Accumulation limits create absolute barrier in ability to protect higher production levels through ownership of IFQ.

Harvesters. Regardless of who is given the QS, implementation of an IFQ program will result in a shakeout in the harvester sector, leading to consolidation of harvest among vessels in the long term. If most of the harvest were also concentrated among a few of the remaining harvesters, rivalry would be further reduced; however, accumulation limits would be expected to limit concentration. While rivalry may be reduced, the IFQ system is not, itself, one in which intense rivalry among harvesters who acquire QS would be expected. To expand their market share, harvesters would have to compete in two markets: (1) the QS/QP market, to gain the needed access rights; and (2) the raw fish market.[18] Once a harvester secures QS/QP, the need to compete with other harvesters for a share of the raw fish market may be minimal (i.e., it is expected that, in general, the trawl groundfish allocation will be fully utilized—that markets will exist or be developed for all of the reasonably marketable catch).[19] Moreover, since harvesters' ability to expand revenue through increased harvest will be limited by their QS/QP holdings, there is a strong incentive for them to cooperate in raw fish price negotiations with processors as a main means of increasing their revenue for the catch for which they have QS/QP. However, the degree of direct competition and rivalry among harvesters for shares of the raw fish market will depend on the long-

[18] The need to gain access rights in the form of QS/QP and the effects on the market are closely related to the creation of a barrier to entry, discussed in the following paragraph.

[19] For some species, such as Dover sole, supply may exceed demand at prices that harvesters are willing to make a delivery.

term distribution of QS among harvesters and processors. Some harvesters may not acquire all the QS they need for their optimal production levels. If some QP are available from processors (e.g., those processors not using the QP holdings from their own vessels), the negotiations over QP and raw fish prices may be linked.

Under the IFQ program, there is not likely to be latent license capacity for a processor to threaten to draw on if negotiations fail. This affects rivalry among harvesters, bargaining power, and entry barriers. Under status quo, by using a latent permit, a new harvester might come online without directly taking fish deliveries away from another harvester.[20] The need to hold QS/QP forms an absolute barrier to entry, and new entry can only occur to the degree that the production of an existing participant is first removed through the acquisition of QS/QP. While the barrier to activation of latent capacity may increase the opportunity for a harvester with its own QS to exert power, harvesters may still have to be concerned about linkages between their harvest of groundfish and deliveries from other fisheries (e.g., Dungeness crab).

Fixed costs affect both rivalry and barriers to entry; here we will discuss harvester rivalry. Categorization of fixed costs depends on the time frame of reference. For example, costs may be fixed for a year, a trip, or a day of a trip. An increase in fixed costs, particularly those related to compliance and costs that are fixed per day of fishing, such as observer costs, would be expected to increase rivalry in the QS/QP market but increase cooperation in the raw fish market. [21,22] Increased fixed costs will likely lead vessels to seek to expand their production per trip, requiring more QS/QP. However, if there is a willing buyer for any QS/QP acquired (i.e., vessels need not compete for a market for their raw fish), the increased fixed costs would give vessels a greater incentive to coordinate marketing in the raw fish market in the hopes of generating higher profits to recover increased fixed costs.

Harvester market power may also increase with an increased opportunity to exert vertical control through (1) retaining ownership of fish and hiring custom processors, and (2) acquiring QS and using those QS to encourage new processors to enter the west coast market by guaranteeing raw fish deliveries. Custom processing has been seen in the IFQ system in British Columbia. [23] This initial increase in vertical control through custom processing could allow vessels to develop some of the marketing expertise, which might then put them in a better position to more completely step into vertical integration by taking on direct ownership of processing facilities. If harvesters encourage entry of a new processor, that processor would still have to compete with existing processors in the wholesale market, but their risk could be substantially reduced if harvesters with QS are willing to make long-term commitments.

With respect to entry barriers, there will likely be certain government required compliance costs, e.g., camera systems, that will raise the cost of entry. Harvesters wishing to achieve efficiencies related to any particular scale of production will also have to purchase an amount of QS commensurate with that scale of production (the effect of the initial allocation in this regard will be discussed in Section E.5).

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[20] While the two-month landing limits mutes some rivalry, under status quo, if a licensed vessel holds out during negotiations, a buyer may be able to find another licensed vessel to make that delivery, activating a latent permit if necessary (there are a number of permits available that are not used or not used to their full capacity).

[21] The cost of the QS/QP itself does not represent a fixed cost because they can be sold (the QP in particular) during the season.

[22] With consolidation of production among fewer vessels, it is likely that some of the existing permits will go unused and may be available for purchase by new entrants (reducing the cost of entry with respect to permit price). However, the higher the fixed compliance costs for participating in the program, the more QS/QP a new entrant will need to buy to achieve the level of efficiency necessary to pay the cost of the QS/QP. The fixed costs and need to purchase QS/QP will result in a net increase in the cost of entry (barrier to entry).

[23] Under a custom processing arrangement, vessels retain ownership of the fish, which is processed for them under contract. The harvesters then sell the fish into the wholesale or retail market. In this way, harvesters begin vertical integration and the capture of some rents from other parts of the production chain.

Processors. With an IFQ program, rivalry would be expected to increase among processors for a number of reasons (note: this portion of the analysis does consider the effect of the initial allocation).

First, processor rivalry may be increased by a decrease in the geographic isolation of markets that effectively raises the number of participants. In the discussion box below, a hypothetical construct is provided to explain how the liquidity of QP may link markets that had been previously geographically isolated, thereby expanding the number of participants. Table E-13 through Table E-16 provide information on processors that operate in multiple ports and the size of processors in each port as measured by their average metric tons for 2004 to 2006 for the whiting and nonwhiting fisheries.

Second, the potential for increase in harvester market power will encourage processing firms to integrate horizontally and vertically. With respect to vertical integration, acquisition of QS could provide a lower-cost means for processors to (1) compete with one another for market share (foreclosing competitors' access to supply and consolidating processors' market shares), (2) vertically integrate to secure supply,[24] and (3) hold out during negotiations. However, while there may be more incentive for horizontal integration and consolidation, actual integration may be limited by accumulation limits.[25]

Finally, rivalry may also increase due to direct strategic conflict. Direct strategic conflict would be associated with the foreclosure effect caused by any firm that tries to expand operations, the effects of accumulation limits on current industry structure, and a firm's ability to integrate horizontally and vertically. With respect to the foreclosure effect, under status quo, a processor can expand its operations by acquiring access to an unused or underutilized limited entry permit and vessel. Other processors are displaced indirectly as managers reduce vessel two-month cumulative limits in response to the increased effort, and processors compete with one another to sell their products in the wholesale market. Under IFQs, competition will be direct. A processor can secure more product only if the raw product going to a competitor is directly and immediately reduced (i.e., acquisition of QP or harvester delivery commitments directly reduce a competitor's market share by foreclosing its access to supply of a key input). Accumulation limits will alter the existing and potential horizontal and vertical integration, possibly shifting power balances within the sector and leading to strategic repositioning. Fish buyers at their QS accumulation limits who are vying to maintain or increase production will have to compete with one another for the production of existing vessels with less latitude in the means available for securing harvest commitments. They would not be able to offer their own QS/QP to cover additional harvester (see paragraph below on the limits to vertical integration).[26]

[24] Facilitating planning for more efficient production.

[25] In its final preferred alternative, the Council applied accumulation limits on control limits only to QS; this substantially reduced the constraint that the control limits would have imposed on vertical integration by processors and horizontal integration by harvesters. Under the final preferred alternative, such integration can occur limited only by antitrust laws and the ability of the firm to acquire QP each year from other QS owners.

[26] The situation under IFQs and status quo would be similar for vessels that max out their two-month limits with deliveries to a particular buyer. One buyer can bid production away from those vessels only at the cost of a direct reduction in raw product delivered to another buyer.

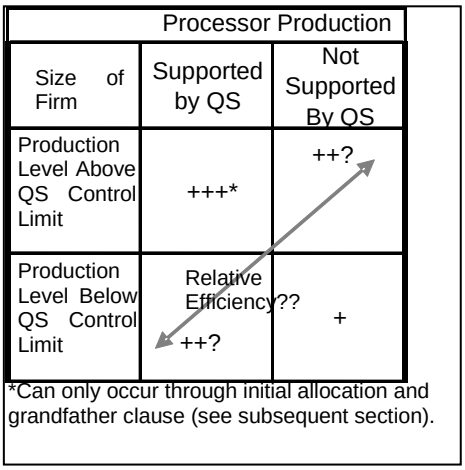


Figure E-10. Relative efficiency (including risk factors) based on size of firm and whether production is supported by QS.

For processors that are at their control accumulation limits, horizontal integration could occur only through the acquisition of firms that do not control QS, and expansion (consolidation) can occur only through increasing the proportion of production unsupported by processor-owned QS. When at the control limit, a processor that expands production decreases the portion of its production supported by QS controlled by the processor (such a processor would be increasing the amount of its QS in the upper right hand cell of Figure E-10). At the same time, processors that are not at their limits may acquire additional firms that own QS or support expanded production by securing additional QS (expand activity in the lower left hand cell of Figure E-10). Therefore, unless firms at their QS accumulation limits have other advantages (e.g., are already more efficient than firms that are below their accumulation limits, gain enough efficiency through expansion to compensate for the costs and risks of production unsupported by QS, or have better access to capital), firms that are below their accumulation limits may gain more advantage through consolidation (growth). However, with respect to consolidation, firms with no QS may be less expensive to acquire than those with QS, making them more likely candidates for acquisition by firms at their accumulation limits that wish to extend their horizontal integration. Processors at accumulation limits will be more likely to expand if, for them, the relative efficiency of an additional increment of production not supported by QS is greater than the same increment of additional production by a firm operating at a lower level of overall production, but with support of its own QS (the upper right-hand cell of Figure E-10 is *greater* than the lower left-hand cell). On the other hand, if the relative profitability is the opposite, it will be more likely that smaller firms will acquire QS and expand up to accumulation limits (the upper right-hand cell of Figure E-10 is *less* than the lower left-hand cell). Section A-2.2.3-e provides data on the number of fish-buying firms that would be expected to be above and below accumulation limits under various allocation formulas.

Processors at their accumulation limits may not be able to further integrate vertically through acquisition of harvesting vessels. If control limits apply to both QS and QP, a processor at its control limit that decided to vertically integrate by purchasing a groundfish trawl vessel would not be able to acquire additional QP to place on the vessel.[25] The definition of control will also be important in determining the nature of harvester-processor relations. For example, if exclusive contracts for delivery are considered "control," then processors at their limits may not be able to enter into this type of contract with a harvester. At the same time, it would be less expensive for processors not at the control caps to vertically integrate though acquisition of QS (as compared to integration by acquisition of a vessel), increasing the viability of a threat by the processors to integrate vertically. However, it is more likely to be the smaller processors that will not be at their accumulation limits, and they may not control enough of the processing capacity to exert much market power.

While processor rivalry may increase for the reasons described above, some of the same factors will decrease bargaining power, specifically the decrease in the threat for backward integration due to the effect of accumulation limits and the expanded geographic scope of the market due to the liquidity of QP and interaction between the QP and raw fish markets. At the same time, the threat of the potential for harvesters to exert market power will provide incentive for increased cohesion among processors. However, processors' ability to act together is very limited because of antitrust law constraints. Harvesters, on the other hand, are able to coordinate their marketing under provisions of the Fishermen's Collective Marketing Act.

Those processors that own QS may be more competitive than those that do not (depending on acquisition costs); therefore, the possible need for new entrants to acquire some QS to be competitive may add to the cost of entry, creating a barrier to entry. Differences in processor profit opportunities before and after implementation of the IFQ program may also create a short-term barrier. If existing processors have some market power before implementation of IFQs, and that market power still exists, but at a diminished level after IFQ implementation, new entrants will be at a disadvantage in their ability to recover their investment compared with those who may have recovered their investments at a time of relatively greater profit.

The above paragraphs deal with conditions that would encourage or discourage the exertion of market power among processors. In this context, if the raw fish market is competitive before and after implementation of IFQs, and the processing sector is overcapitalized because of recent declines in OY or the race for fish in the whiting sector, that sector may bid away some of the profits associated with capital investment to secure access to harvest and QS. Also, if processors currently have market power in the raw fish market, but do not after IFQs are implemented, they will also be likely to bid away some of their profits. In both cases, a new entrant will face the situation of attempting to recover capital investment in an environment in which existing firms are not making enough profit to cover their capital costs. While this situation may present a temporary barrier to entry during a period of processor rationalization, it is not relevant to the market power evaluation, since there would be no market power for an entry barrier to preserve.

Box: Decreasing the Geographic Isolation of Local Raw Fish Markets

Consideration of the factors influencing market power requires careful definition of the scope of the market and assessment of whether that scope changes with the implementation of an IFQ program. In the market for raw fish, part of a processor's ability to exert market power may be based on transaction costs that imply less than perfect mobility in harvesting operations. The cost of moving harvesting and raw fish marketing activities between geographic areas or from one owner to another reduces mobility, or in some sense, creates "stickiness" in the system. This stickiness determines the scope of the individual markets. There may be numerous processors coast wide, but if there is only one or a very limited number of processors in a particular port, under status quo, the processors in that port may have more bargaining power than if they compete on a coast wide basis. While they have some latitude to offer lower prices within a port, that latitude may be limited if there is a processor in another port willing to offer a higher price. In such a case, if the processor in the vessel's preferred port offers a price that is lower than the price available in an alternative port by an amount greater than the cost of delivering to the alternative port, the preferred port processor might lose that delivery.* In aggregate, if one processor operates in many ports coast wide, coordinating prices between its plants, and if that sector operates similar to other sectors with a single dominant player (with smaller processors following the prices of the larger processors), then the opportunity for a vessel to find a higher price elsewhere along the coast may be limited.

The introduction of QP changes the situation by reducing the cost of moving production between ports, thereby reducing stickiness. QP may move from one port to another at relatively low cost. Consider a hypothetical status quo situation In which there are five ports (yellow, red, blue, white, and orange [in north to south order]), and there are processors in each port. Within each port, there are only a few processors, and the costs of moving fish between ports isolates the local market and provides the processors in each port with some latitude to follow price setting by the dominant processor in that port. If the dominant processor in each port is processor A, then prices may be coordinated among the somewhat separated markets. Now consider a QP market. Since QP can move easily between ports, there may be really a single market for QP along a major section of the coast. Now if Processor A wants to offer a lower price for vessels delivering fish in say, Port Orange, vessels can consider transferring QP to a willing buyer in any one of the other ports without catching the fish themselves. With respect to relations with a particular vessel in Port Orange, Processor A has to contend not only with Processor F and possibly D, but also with Processors C, B, and E. If one of those processors is willing to offer a higher exvessel price for the fish, the QP can easily be transferred to the alternative port, with the vessel in Port Orange receiving the higher profits associated with the QP.

Table E-12. Hypothetical markets for raw fish and quota pounds.

Raw Fish				Quota Pounds	
Market	**Processors**			**Market**	**Processors**
Port Yellow	A B C			Coast wide or Regional (e.g., north of 40 10)	A B C D E F
Port Red	A				
Port Blue	A B E				
Port White	A D				
Port Orange	A F				

Whether the price-setting situation hypothesized here exists and whether the additional mobility provided by QP is enough to break down such price setting are open for discussion. If processors are able to exert market power, they will be in a stronger position to buy QS up to accumulation limits or negotiate strong contracts for delivery of QS fish.

There are some limits to QP mobility that influence the result and have to be considered:

(1) There will be some transaction costs associated with the QP transfers (even if much lower than for the movement of the vessels or fish).

(2) There may be non-pecuniary benefits to fishing (lifestyle benefits associated with the fishing activity that are not financially rewarded) such that a fisherman will have some additional tolerance to fishing at a profit lower than what he might receive by not fishing and selling the QP in an alternative market (i.e., a fishermen might be willing to give up some of his quasi-rents).

(3) If this transfer of QP went on for a period, and if the vessel owner were not able to cover its fixed costs through other fishing activities, over time, the vessel owner would reduce the size of its capital investment (the vessel owner would likely sell the vessel).

Table E-13 through Table E-16 provide information on processors that operate in multiple ports and the size of processors in each port as measured by their average metric tons for 2004 to 2006 for the whiting and nonwhiting fisheries.

*Other factors would also come into play such as negotiations over the suite of raw product a vessel might want to deliver to its preferred port on a year-round basis.

Table E-13. Trawl non-whiting groundfish buyers active in multiple ports (A = active buyer in the port) and single ports (count of single port buyers in each port), and distribution their buying activities among ports (based on 2004 to 2006 fish tickets).

	Non-whiting Buyer Category*																
	Buyers Active in Multiple Ports and Ports In Which They Were Active													Number of Buyers Active in a Single Port		SubTotal	Total Buyers
Port	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11	B12	B13	>10,0000 lbs	<10,0000 lbs	>10,0000 lbs	
Neah Bay						A								2		3	3
Blaine									A					1		2	2
Bellingham						A			A					1		3	3
West Port	A														2	1	3
Ilwaco														1		1	1
Astoria	A					A									3	2	5
Tillamook	A														2	1	3
Newport	A				A										4	2	6
Florence														1		1	1
Coos Bay	A	A			A									1	4	4	8
Brookings	A	A			A										1	3	4
Crescent City	A						A								2	2	4
Eureka	A		A													2	2
Fort Bragg	A	A	A												1	3	4
Bodega Bay	A	A	A		A											4	4
San Francisco	A		A	A			A				A	A			2	6	8
Oakland		A														1	1
Princeton		A	A											3	5	5	10
Santa Cruz															3	0	3
Monterey												A	A	1	1	3	4
Moss Landing		A		A				A			A		A	1	4	6	10
Morro Bay				A			A	A		A				1	6	5	11
Avila				A												1	1
Santa Barbara										A						1	1
Total	**11**	**7**	**5**	**4**	**4**	**3**	**3**	**2**	**2**	**2**	**2**	**2**	**2**	**13 Buyers**	**40 Buyers**	**62**	**102**

* The 10,000-pound threshold is an average per year.

Table E-14. Number of non-whiting buyers by average level of landings received during 2004 to 2006.

Port	<10,000 lbs	10,0000 - 20,000 lbs	20,000 - 100,000 lbs	100,000 lbs - 100 mt	100 mt - 500 mt	500 - 1,000 mt	>1,000 mt	Subtotal >100,000 pounds	TOTAL
Neah Bay		1	1		1			1	**3**
Blaine			1			1		1	**2**
Bellingham			2				1	1	**3**
West Port	2				1			1	**3**
Astoria/Ilwaco	3		1				2	2	**6**
Tillamook	2		1					0	**3**
Newport	4				1		1	2	**6**
Florence/ Coos Bay	5	1		1			2	3	**9**
Brookings	1	1		1		1		2	**4**
Crescent City	2			1	1			2	**4**
Eureka					1		1	2	**2**
Fort Bragg	1		1		1	1		2	**4**
Bodega Bay	3		1					0	**4**
San Francisco Bay & Princeton	10	1	4	1	3			4	**19**
Santa Cruz	3							0	**3**
Monterey	2		1		1			1	**4**
Moss Landing	4	1	1	3	1			4	**10**
Morro Bay/Avila & Santa Barbara	8	2		1	2			3	**13**
TOTAL	**50**	**7**	**14**	**8**	**13**	**3**	**7**	**31**	**102**

Table E-15. Trawl shorebased whiting buyers active in multiple ports (A = active buyer in the port) and single ports (count of single port buyers in each port), and distribution of their buying activities among ports (2004 to 2006).

Port	Whiting Buyer Category*			
	Buyers Active in Multiple Ports and Ports In Which They Were Active		Buyers Active in a Single Port	Total Buyers
	B1	B2		
West Port			1	**1**
Ilwaco			1	**1**
Astoria	A	A	2	**4**
Newport	A		2	**3**
Coos Bay	A		2	**3**
Crescent City			2	**2**
Eureka	A		1	**2**
Moss Landing		A		**1**
Totals	**4**	**2**	**9 Buyers**	**17**

Table E-16. Number of whiting buyers by average level of landings received during 2004 to 2006.

Port	<100,000 lbs	100,000 lbs – 1,000 mt	>1,000 - mt	**TOTAL**
West Port			1	**1**
Ilwaco			1	**1**
Astoria		3	1	**4**
Newport			3	**3**
Coos Bay	1	1	1	**3**
Crescent City		2		**2**
Eureka	1		1	**2**
Moss Landing	1			**1**
Totals	**3**	**6**	**8**	**17**

E.4.4 Access to Capital (Demand) - Discount Rates

The purchase of QS requires access to financial capital. Such purchases may occur by using wealth that a firm or individual already holds or through commitment of future earnings in return for access to capital held by someone else (e.g., commitment of future payments in return for a loan from the bank). The focus of this section is on factors that affect how much individuals and businesses are willing to pay for access to capital (demand) and how that affects their access to QS. The focus of the following section is on factors that affect how much lenders are willing to supply capital and how that affects the ability of individuals and businesses to get loans for the purchase of QS.

All else being equal, QS will flow toward people or businesses that have a low personal discount rate (Francis et al. 217-33). [Note: personal discount rates are related but different from market interest rates that must be paid to borrow. Interest rates will be discussed in a following section.] Discount rates play a major role in determining how much an individual is willing to pay for QS. The value of QS to the individual represents the expected stream of income from QP issued for that QS, discounted based on preferences between future and present income. People or businesses that have a strong preference for earnings in the current year as opposed to future years are said to have high discount rates.

Here we will first discuss discount rates in general and then discuss factors affecting discount rates, including the following:

- Time preference
- Risk

To illustrate the effect of differential discount rates of QS values, consider a person who places a relatively high value on current consumption as compared to next year's consumption, say a 25 percent discount rate. That person would prefer to receive $80 this year rather than waiting and receiving something less than $100 next year ($80 + (25 percent x $80)) but would give up $80 this year in order to gain something more than $100 next year. To illustrate the effect of differences in discount rates, consider an amount of QS that is expected to generate $100 of net revenue each year. To simplify this illustration, we will limit the duration of time considered to five years. Now assume there are individuals with discount rates of 5, 10, and 20 percent. Table E-17 shows how much these individuals would be willing to pay for the QP in each subsequent year and in total, assuming that they had to buy QP for all five years up front. As can be seen, a person with a discount rate of 5 percent would be willing to pay $452 now for the QS compared to $269 that a person with a 20 percent discount rate would be willing to pay for that same QS (i.e., the person with the lower discount is willing to pay 68 percent more).

Table E-17. Example of the effect of personal discount rate on willingness to pay for a five-year stream of revenue.

		Year					Present Value
	Personal Discount Rate	**1**	**2**	**3**	**4**	**5**	**(5 years summed)**
		Values by Year($)					
	Nominal Values	**100**	**100**	**100**	**100**	**100**	**500**
Person A	Values Discounted at 5%	100	95	90	86	81	452
Person B	10%	100	86	73	63	53	375
Person C	20%	100	68	47	32	22	269

People with lower discount rates are likely to pay more for QS even if they expect to derive similar revenue. The following sections discuss factors affecting personal discount rates.

Literature based on IFQ trading shows fishermen have fairly high discount rates (Asche 403-10). Table E-18 displays the relationship between the ratio of QS value and QP value and the implied discount rate.

Table E-18. Discount rate associated with different relationships between quota value and QP value (adapted from Asche, 2001).

QS/QP Value	**3/1**	**4/1**	**5/1**	**6/1**	**10/1**	**11/1**	**15/1**
Discount Rate	0.50	0.33	0.25	0.20	0.11	0.10	0.07

In the mid 1990s, ratios reported for the Iceland IFQ system varied from 3.5/1 to 9.2/1 depending on the species. This would place discount rates between 11 and 50 percent. These rates would be determined by those able to participate in the market. In Iceland, the system is designed to discourage absentee ownership of ITQ (ownership by those who do not participate as harvesters). Therefore, the rates may better reflect time preferences of fishermen. If members of other sectors of the fishing industry or the broader economy also participated in the market, the ratios might be different. We will now look at some factors that influence the general discount rate.

E.4.4.1 Personal Time Preferences

We are using the term "time preference" here to reference personal time preferences unrelated to risk and other factors that influence discount rates. Factors affecting time preference include income, wealth, innate patience, and education (Becker and Mulligan 729-58).[27] Individuals with low income will often have higher time preferences (value current consumption over future consumption) due to a greater desire to meet immediate needs. Research on fishermen time preferences is available but limited. When asked to respond to hypothetical profit decreases and increases for a series of years, fishermen in the north Irish Sea answered in ways that indicated a range of time preferences that were fairly high (Curtis 775-78). Thirty-seven percent of all fishermen had discount rates of greater than 50 percent, and 40 percent had discount rates of between 30 percent and 50 percent. It seems likely that crewmembers will be less wealthy than business owners and, therefore, more likely to discount future earnings and less likely to acquire QS. Level of expected future income also affects time preference (if one expects income to rise in the future, one may have a higher preference for current consumption). Similar to an individual, managers of a business under financial stress may place a higher value on current income that is needed to survive, compared to the value that a healthier business might place on current relative to future income. Simple patience is another personal characteristic affecting time preference. While QS is more likely to flow in the direction of those with lower time preferences, the IFQ system itself, independent of the initial allocation, is not expected to directly affect personal time preferences.

E.4.4.2 Risk

The aspect of risk of concern here is a person's assessment of future risk. Considerations include ability to enjoy/utilize future income and personal assessment of the likelihood that future earnings will be realized. Those who face greater risk in their activities or otherwise believe the future is riskier will discount QS and be less likely to buy than those who see more certainty, unless the acquisition of QS overcomes that risk. The IFQ program will create an opportunity for individuals (e.g., crew), businesses, or other entities (e.g., communities) to increase the security of their income by acquiring QS to ensure access to harvest. A QS owner may earn income from the sale or direct use of the QP associated with the QS, or use it as leverage to ensure access to employment or other economic activity (e.g., a community ensuring the continuation of fishing activity in its port). This is closely related to risk reduction through vertical integration, discussed in a previous section (page E-13). Assessments of the degree to which ownership of QS might increase security will also involve consideration of the likelihood that there will be changes to the program or changes in the fishery resource. Other factors affecting risk under IFQs are discussed in Chapter 4. These include a harvesting firm's assessment of the risk that it will encounter a disaster tow for limiting overfished species or that another vessel will encounter such a tow and cause portions of the trawl IFQ fishery to be closed, even though some QP have not been harvested.[28]

E.4.5 Access to Capital (Demand) – Planning Horizon and Investment Recovery

Another factor determining the value a person will place on QS is the length of time over which the person will value the asset. A person with a shorter planning horizon may tend to place a lower value on QS; however, future resource rents can be captured by the firm at any time through the sale of the QS (assuming competitive sectors). Therefore, in order for the planning time horizons to make a difference,

[27] Note: Individuals who expect to have higher incomes in the future or have less utility for income in the future (e.g., the anticipation of a more limited ability to enjoy the income) will also have higher discount rates than those without such expectations.

[28] Another aspect of risk is simply the risk a person attributes to the possibility that they will not be around or will have less ability to enjoy the income in the future than they do in the present.

the firm must be earning some rents that are not reflected in the QS value (representing resource rents) or place some additional value on the QS that will not be captured in sale of the QS.

To illustrate, assume that the following:

- There are two individuals who each have a discount rate of 5 percent (person A in the previous example).
- They both own QS and earn resource rents (the difference between P1 and P2 in Table E-19**Error! Reference source not found.**).
- They are equally efficient and earning intramarginal rents (see Section E.4.3).
- The $100 value that they anticipate earning each year is derived from owning the QS (rents) *and* participating in the fishery (intramarginal rents).

When they leave the fishery, they will be able to sell their QS and capture future resource rents. However, they will no longer capture the intramarginal rent. If we assume the intramarginal rents are $20, that the general market price for the QP is $80, and that a person plans on leaving the business after three years,[29] that person would value the QS at only $419 as compared to $452 for someone who plans to remain in the fishery for all five years (the actual time horizons over which QS is valued are likely longer; the five-year horizon is being used to illustrate the concept).

Table E-19. Example of the effect of planning horizon on willingness to pay for a f-year stream of revenue (both cases assume that QS are sold at the end of the five-year period, but that Person A-2's intramarginal rents are based on exceptional fishing skill and will not be captured upon sale of the business).

		Year					Present Value
	Personal Discount Rate	1	2	3	4	5	(5 years summed)
		Values by Year($)					
Person A-1	Nominal Value	100	100	100	100	100	500
	Discounted Values at 5%	100	95	90	86	81	452
Person A-2	Nominal Value	100	100	100	80	80	$460
	Discounted Values at 5%	100	86	73	69	65	419

In this example, we have considered a planned exit. Other factors may also affect planning horizons, for example, the amount of time required to recover the cost of a capital investment. If one of the reasons a firm holds QS is to increase its security in recovering on a capital investment, the longer it takes to recover on that capital investment, the longer the stream of benefits the firm will necessarily take into account and the more it may be willing to pay for the revenue security the QS provides, as compared to other firms with a shorter time horizon.

E.4.6 Access to Capital (Supply)

The main concern here is what it costs to borrow money (access to capital) for the purchase of QS. These costs are generally reflected in the interest rates charged by lending institutions. Risk, at the industry and borrower level, is major determinant of willingness to lend. At the industry level, an IFQ program is expected to reduce risk by stabilizing the industry economically, allowing for better long-term planning, and improving stock conservation through improved information and more precise control over total

[29] Also assumed here is that the source of the person's intramarginal profits is such that he/she will not be able to capitalize on those profits through sale of the business (receive a price for the firm that takes into account the firm's greater efficiency relative to other firms). An example of this would be if the individual leaving the industry is also the vessel operator and the source of his/her rents is superior skill.

removals. The IFQ program may also increase the potential for harvesters to exert market power (or decrease the effectiveness of processor market power), thereby increasing the risk that processor profits may decline. Therefore, all else being equal, the cost of capital for processors could increase.

At the individual firm level, some of the factors that affect willingness to lend are the borrower's equity (including the liquidity of that equity), size, diversification, and viability of the business plan. The nature of a firm's equity determines the firm's ability to offer up collateral as security for a loan. When a loan is sought for the purchase of an asset, the asset itself sometimes serves as security for the loan (e.g., borrowing for a real estate purchase). Our primary concern here is a firm's access to capital under an IFQ program and how that affects QS flow. Access to capital is necessary for the purchase of QS. If a firm does not already have the capital, it will have to borrow money if it wants to purchase QS. To secure a loan to purchase QS, the QS itself may be of limited use as collateral because the value of the QS may fluctuate with changing stock conditions, prices, and regulations (including increases in costs caused by regulations and possible changes to the QS system). In deciding whether to lend for the purchase of QS, , a lender is more likely to evaluate the loan applicant's overall financial condition, including total equity and its liquidity, because the value of the QS may be somewhat tenuous. A firm without QS or with insufficient QS to support its business plan will be viewed as a higher risk.[30] Thus, QS may be of limited value as security for the loan itself, but ownership of QS may reduce the firm's risk profile, giving it cheaper access to capital secured by other assets.[31]

Table E-20. Influences of the IFQ program on QS flow through effect on demand and supply of capital.

	Harvesters	**Processors**	**Crew**	**Communities**
Demand for Capital				
Time Preference	Those with high time preference will not be willing to pay as much for QS.			
	Indication of high time preferences.	Uncertain	Low income may lead to high time preference.	Uncertain
Risk	Those who believe that the future holds greater risk than others will have a lower willingness to borrow, unless ownership of QS overcomes the risk. The fishery managed with IFQs will have inherently less risk. There is no basis to distinguish among groups.			
Planning Horizon and Investment Recovery	Those who have a longer planning horizon for the use of an asset may be willing to pay more to acquire it (as compared to someone acquiring the same asset with a shorter horizon). (This outcome depends on there being a limited ability to recover future earnings through sale of the asset at the end of the planning horizon.) There is no basis to distinguish among groups.			
Supply of Capital	The overall financial position of a firm will be evaluated in determining loan worthiness. Firms are likely to receive more favorable terms for a loan if they are larger, diversified, and have assets that may be used as security and are of value outside the industry. In general, the IFQ program will likely decrease risk in the industry. QS are of tenuous value as collateral, but are important to the viability of a firms business plan. Firms with cheaper access to capital will be more likely to accumulate QS.			
	Harvesters less likely to have capital useful in other industries. Of generally smaller total size than processors. Risk and cost of accessing capital may decrease with greater stability and possible increase in market power.	Firms more likely to have capital that may be useful in other industries Firms often of larger size than harvesting firms. Processors may experience a risk increase associated with harvester market power, increasing the cost of accessing capital.	Not likely to have fishing business related assets for use as collateral. This may mean higher costs of borrowing.	May have cheaper access if the governing body is viewed as lower risk.

[30] Not receiving a sufficient allocation in itself would raise a question in the lender's mind as to the status of the firm in the industry and viability of its business plan.

[31] Anonymous interviews with bank lenders and industry analysts. March 2008.

In evaluating the liquidity of a firm's assets, one of the factors that banks consider for the fishing industry is whether an asset can be used outside the industry (is malleable to other uses). In general, harvesting firms tend to have fewer assets usable outside the fishing business, relative to processing firms. Harvesting firms generally have a vessel and vessel-related assets (gear) and may have some shorebased equipment (e.g., a truck). Processing companies may own a number of assets that are not industry specific, potentially including land, buildings, cold storage, heavy equipment (e.g., lift trucks), trucks, and cars. [Note: Some companies may lease some of these assets (e.g., land and buildings in a port).]

Size and diversification of the firm are other factors considered in evaluating risk. Processing companies tend to require greater capital investment than harvesting companies. Their business operations may also be more diversified in that some assets may be used temporarily in non-fish industry employment (e.g., cold storage), and they may satisfy customer needs and to some extent utilize processing capacity with product from outside the geographic region. On the other hand, vessels are more mobile and so have some opportunity for diversification through geographic relocation.

E.5 Summary of Influences on the Flow of IFQ among Groups and Effect of Initial Allocation of QS

The following is a summary of the general way in which the flow of QS is influenced by the initial allocation for each of the above topics.

- **Relative efficiency**. Initial allocation will provide an infusion of capital. Those receiving an initial allocation will have an opportunity to make investments to increase their efficiency over competitors. Greater profits will then enhance their ability to accumulate more QS up to accumulation limits.
- **Vertical Integration**. Under IFQs, there will be an increased incentive for vertical integration. Those receiving an initial allocation will experience an increase in resources to support vertical integration (for processors, vertical integration includes the acquisition of QS). If there is a grandfather clause, initial allocations may lock in certain efficiency advantages among firms, until the grandfather clause expires. However, to the degree that control accumulation limits are effective, this differential will not allow the firms at their accumulation limit to acquire more QS; moreover, processing firms with higher levels of vertical integration may have to divest themselves of some harvesting opportunities.
- **Market Power**. An increase in market power among those receiving an initial allocation will increase their profits and ability to acquire additional QS. The initial allocation will affect within-sector rivalry, bargaining power, and barriers to entry.
- **Access to Capital**. Those receiving an initial allocation will have enhanced access to capital, which, in turn, will allow them to accumulate QS more rapidly. An initial allocation may increase the recipients' demand for capital, and it may be less expensive for them to acquire capital (lower borrowing costs) and thereby QS. Harvesters not receiving enough initial allocation may be viewed as high risk if they go to borrow.

The following text and tables (Tables E-21 and E-22) review these results in more detail, discussing some of the differences between sectors. Where there are a number of contingencies that will determine the expected outcome, key questions are provided to help the reader develop their own assessment of expected outcomes. A final summary table provides an overview of differences in the outcomes for harvesters and processors.

E.5.1 Relative Efficiency

For initial recipients, the initial QS allocation will give them an ongoing advantage over those who did not receive an initial allocation. The initial allocation constitutes a "free" infusion of capital and all else being equal, the firm receiving that infusion will experience greater opportunity to increase efficiency compared to firms not receiving an initial allocation. For example, assume there are two firms with similar relative costs and revenues, but the first receives an initial allocation of QS, and the second does not. If industry profitability allows the second firm to purchase QS with the expectation of being able to recover its investment in the QS, then it is implied that the firm receiving the initial allocation of QS will have a similar opportunity to make a capital investment and either expand its operations through the acquisition of yet more QS, or make other acquisitions to enhance its business activities. If this investment further advances that firm's efficiency, it will then have a competitive advantage in the acquisition of even more QS or in other areas of competition. In this way, the initial allocation may create a self-perpetuating and potentially expanding difference between firms receiving and not receiving the allocation.

Table E-21. Influences of status quo, IFQ program, and initial allocation relative to efficiency on profit distribution and QS flow (shaded cells repeats information in previous sections).

	Harvesters	Processors
Status Quo	At a competitive equilibrium, both sectors would be expected to have comparable profit levels. Because a full competitive equilibrium is never reached, in every sector, some firms are more profitable than others, and one sector as a whole may have greater profits than the other. Changes in the fishery may affect profits for firms in each sector differently. For example, the effect of the contraction of the fishery in the last decade may have affected harvesting and processing firms to different degrees.	
IFQ Program	IFQs are another change that is expected to affect the sectors differently. If one sector gains more efficiency than the other, all else being equal, we would expect that QS would initially flow toward the sector that has a greater efficiency gain. In the short term, the IFQ Program will probably provide more direct opportunity for vessels to increase their efficiency than for processors.	
Initial QS Allocation	***A self-perpetuating "leg up."*** *The initial allocation constitutes a "free" infusion of capital, and, all else being equal, the firm receiving that infusion will experience greater opportunity to increase efficiency compared to firms not receiving an initial allocation.*	

Note: An initial allocation to crewmembers or communities might also give them a leg up in an effort to accumulate wealth.

Key questions to assess the direction of future QS flow are as follows:

- At present, do we believe that one sector tends to be more efficient than the other?
- Do we think that one will gain more efficiency under IFQs than the other?
- If there is a difference between the sectors, and the less efficient sector is gaining efficiency, do we think the gain will be enough to overcome the initial deficit?

E.5.2 Vertical Integration, Quasi-rents, and Economic Rents

The initial allocation of QS will be an asset that processors may use to increase their vertical integration, placing them in a stronger financial position and strengthening their competitive stance.

Under the accumulation limit grandfather clause, processors (buyers) receiving an initial allocation of QS (based on permits they hold or direct allocation for processing history) that exceeds the accumulation limits will have a unique advantage over later entrants who will not be able to achieve the same level of vertical integration. However, while that advantage will allow them to horizontally integrate (although with the support of QS for the expanded operation) or otherwise increase their competitiveness, because of control accumulation limits, they will not be able to acquire more QS beyond the grandfather clause ceiling. Once the business ownership changes, the grandfather clause expires, and the amount in excess of the accumulation limit will flow back onto the market. When 25 percent of the QS is allocated to

processors, a greater proportion of the QS received by processors will exceed the accumulation limits than that of firms that harvest only (see Sections A-2.1.1 and A.2.2.3.e). With the grandfather clause, the more allocated directly to processors, the more of the total QS will be held by firms in excess of accumulation limits. Because any QS that a firm at its accumulation limit divests itself of cannot be repurchased, the QS held by those over accumulation limits is more likely to remain off the market than QS held by those below the accumulation limits.

If there is no grandfather clause, an already strongly vertically integrated company may be weakened by the need to divest itself of harvesting assets. One aspect of the competitive position among processors would be evened out; all processors (existing and new entrants) would be restricted to the same amount of vertical integration. This change in the within sector strength of competitors would affect the future distribution of QS within the processing sector.

Table E-22. Influences of status quo, IFQ program, and QS initial allocation on vertical integration and QS flow (shaded cells repeats information in previous sections).

	Harvesters	Processors
Status Quo	Reasons for vertical integration are market security, protecting profits associated with specialized assets, rent (profit) capture, and market foreclosure (preempting a competitor's access to a market). Under status quo, firms can acquire assets to engage on either side of the raw fish market (harvesters can acquire processing assets and processors can acquire harvesting assets). Expansion into the other sector also requires management time and expertise. In practice, there appears to be more acquisition of harvesting assets and little significant entry into processing by harvesting firms.	
IFQ Program	Harvester vertical integration will not be constrained by accumulation limits. Vertical integration for harvester is covered more completely under market power.	Under IFQs vertical integration and QS access motivated by vertical integration may increase as follows: • The opportunity to own QS may provide a less expensive way for processors to respond to existing pressures for vertical integration (ensuring market security or protecting unmalleable assets). • As harvester profits increase, harvesters may become more of a target for vertical integration. • The exclusivity of QS provides a new opportunity for processors to increase their market share by acquiring QS and thereby foreclosing the opportunity of competing processors. At the same time, accumulation limits may substantially limit processor ability to vertically integrate and could even reduce existing levels of vertical integration. Accumulation limits would prevent processors from supporting as great a proportion of their production as harvesters, because processors handle larger volumes than harvesters do on a per operation basis. Vertical integration through direct ownership of vessels would also be constrained by accumulation limits because any QP put on the vessel would count against a processor's accumulation limits. Any processor with vessel capacity that substantially exceeds the accumulation limits may divest themselves of some of those vessels.
Initial QS Allocation	*Firms receiving an initial allocation will be in a stronger financial position to vertically integrate, thereby strengthening their financial position and competitive stance.*	
		Under the grandfather clause, processors (buyer) receiving an initial allocation of QS that exceeds the accumulation limits will have a unique advantage over later entrants. However, accumulation limits will prevent those grandfathered in from using that advantage to acquire QS. Once the grandfather clause for those QS expires, there will be a new flow of QS onto the market. *The more allocated directly to processors the more of it that will be held by firms in excess or at accumulation limits (if there is no grandfather clause). Because any QS divested cannot be repurchased, the QS held by those at accumulation limits is more likely to remain off the market than QS held by those below the accumulation limits.* *If there is not a grandfather clause, an already strongly vertically integrated company may be weakened by the need to divest itself of harvesting assets and affect the future distribution of QS within the processing sector.*

Key Question:

1. If there is no grandfather clause, to what degree will smaller processing companies be strengthened? If larger companies receive fewer QS and is a relative strengthening of smaller companies, would those companies use that strengthening to buy QS up to the accumulation limits?

E.5.3 Market Power, Horizontal Integration, and Consolidation

To simplify the discussion in this section we will address the initial allocation issue from the perspective of its effect on QS flow in the long term as the amount of QS allocated to processors increases. Our concern in that regard is how the initial allocation affects market power. The more market power a sector has, the more likely it is that QP will flow toward that sector.

This discussion provides additional detail on the effects of the initial allocation on market power, as displayed in tables each on the factors that determine market power, as follows.

Rivalry	(Section E.4.3.1)	Table E-23
Bargaining Power	(Section E.4.3.2)	Table E-25
Barriers to Entry	(Section E.4.3.3)	Table E-26

Readers are encouraged to review the tables, then look to the discussion to provide additional information on the findings displayed in the tables.

Discussion of Results in Tables

For harvesters, competition in the raw fish market will increase as the amount of the initial QS allocation to harvesters declines and that to processors increases. If processors cannot reach agreements with existing harvesters, latent permits may be activated to meet processor needs, increasing the number of active harvesters. As the allocation to processors increases, the financial health of the largest producing vessels and financially weakest firms may be diminished. The largest producing harvesters may not achieve the level of production they would have if there had been a 100 percent allocation to harvesters and a grandfather clause.[32] The largest harvesters need the benefit of the grandfather clause if they are to attain close to their historic production levels. The only way they can benefit from the grandfather clause is through what they receive in the initial allocation. If the amount of QS they receive as part of the initial allocation diminishes as a result of the allocation to processors, the level at which they are grandfathered in will be lower. If harvesters are grandfathered in at lower levels, the level of concentration in the sector will be closer to what would be expected over the long term as the grandfather clause expires.

To achieve previous production levels, some harvesters may have to borrow money to acquire QS or enter into raw fish delivery price negotiations with processors. This will have a more significant adverse effect on the weaker firms than on the stronger firms and will move the harvesting sector through its shakeout and adjustment period more quickly. At the same time, any QS received will reduce the barrier to exiting; thus, as the amount harvesters receive goes down, the incentive to stay in the fishery will increase. A more rapid adjustment period with more stress on financially weak firms and higher exit barriers will increase strategic stakes, and rivalry will be more intense during initial phases of the program. Negotiations with processor for access to processor-held QP may be an important factor in determining which harvesting firms survive. With less of an initial allocation, harvesters will be in a somewhat

[32] Processors do not need QP to produce and so can achieve their historic production levels even if they do not receive an initial allocation.

weaker position with respect to the assets they have available to threaten more vertical integration as part of their price negotiations. The initial allocation will also provide harvesters with a competitive advantage vís a vís new entrants. On one hand, that advantage diminishes as the amount of QS going to processors increases; on the other hand, the importance of the initial allocation as an advantage in competition in the raw fish market for access to processor-held shares increases.

The grandfather clause has less significance for competition within the harvester sector than it does within the processing sector. Within the harvesting sector, harvesters able to take advantage of the grandfather clause will have a cost advantage but will not be able to use that cost advantage to compete for QS or in the raw fish market because they will not be able to add QS or QP to their existing holdings. Processors will not experience the same limitations in using their advantage to expand market share.

With respect to rivalry within the processing sector, rivalry generally decreases as the concentration of market shares increase. Market share concentration will likely be influenced by the concentration of the initial allocation of QS. Some processors own permits and will, therefore, receive an initial allocation regardless of whether there is an explicit allocation to processors. If there is no direct allocation to processors, there will be greater differences in the allocations among processors (five processors that also own permits would receive an initial allocation). QS will be most evenly distributed among processors if there is an allocation to processors, but no grandfather clause, thus increasing rivalry. Under such circumstances, smaller processors (processors that would not receive enough initial allocation to put them above the accumulation limits) will receive a greater initial allocation, increasing the security of their access to raw product and putting them in a better position to acquire additional QS and compete with larger processors. Rivalry will likely decrease if there is an allocation to processors and a grandfather clause. More of the QS will be concentrated among larger processors than without a grandfather clause.

The initial allocation will also lower the exit barrier, providing compensation for leaving the fishery and reducing the intensity of the competition to remain in the fishery. Those choosing to leave the fishery will provide remaining participants with an opportunity to consolidate and expand operations. At the same time, the additional endowment will also give all existing processors receiving an initial allocation an advantage over any new entrant (raising the entry barrier). For larger processors, in particular, the initial allocation (with a grandfather clause) will provide an opportunity to produce at a larger scale with a lower risk profile, increasing the competition barrier for new entrants. Over time, a decreased exit barrier and increased entry barrier would be expected to increase consolidation.

With respect to processor bargaining power, as the amount of QS allocated to processors increases, their position in negotiating raw fish prices with harvesters will improve because of their option to use their own QP on their own vessel or to activate a latent permit. If all QS goes to harvesters, for as long as the QS remains in harvester hands, at least initially, direct harvester competition for market share in the raw fish market should be minimal.

The initial allocation also provides an asset to support increased vertical and horizontal integration by smaller companies. Those receiving large amounts of QS would be limited in their ability to use it to acquire QS because of their accumulation limits. However, even for those larger initial recipients, the capital infusion could provide an advantage in the acquisition of processors that do not hold QS. Whether this occurs would likely depend on the relative efficiency gain when a large processor acquires a new facility without additional QS to support production at that facility as compared to a smaller company acquiring the same facility, but with the benefit of QS to support the production. If the efficiency gains for a large company expanding without QS are sufficient, then the capital infusion represented by QS may allow them to aggregate additional processing operations (or expand existing operations).

Table E-23. Influences on rivalry of status quo, IFQ program and QS initial allocation (as more QS goes to processors) (shaded text repeats previous tables) ("-" = indicator or less rivalry "+" = indicator of more rivalry, "o" = no change.

Factor Causing Greater Rivalry		Harvesters	Processors
1. A larger number of firms with similar market shares	Status Quo	+ Under status quo: larger than number of processors. + Entities with similar market shares. Potential sector participants include latent permit holders.	- Small number of firms. Very restricted in some localities. Market shares highly concentrated, going mainly to a few companies.
	IFQS	- A decrease in the number of active harvesting vessels and harvesting companies (subject to accumulation limits). Much of the rivalry for market share will be focused on the QS/QP market. However, for harvesters who do not own their own QS, this competition may also involve rivalry in the raw fish market. - Limited opportunity for latent capacity in the sector to become more active, except through direct reductions by active vessels through QS/QP transfers.	+ Decreased geographic isolation of markets, increasing number of participants. + Some pressure for consolidation in response to existing overcapitalization and threat of harvester market power. - However, if there are effective accumulation limits growth of market share for larger firms will have to occur without the advantage offered by QS ownership.
	Initial QS Allocation	*+ Latent permits may be activated to handle processor owned QP, increasing the number of participants.* *As more QS goes to processors, and those processors receive more allocation than can be serviced with processor owned vessels, then there will be more competition among harvesters for the opportunity to utilize latent capacity to deliver raw fish on processor owned QP.* *The long-term distribution may be achieved more quickly in that there will not be as many permits receiving QS as high above the accumulation limits.*	*? Concentration of market shares will be influenced by the QS allocation. If there is a grandfather clause, there will be greater concentration of the QS allocation among processors regardless of whether there is an initial allocation to processors (because of processor-held LE permits). If there is no grandfather clause, an allocation to processors will result in a more even distribution of QS until the grandfather clause expires.* *The initial allocation will be an asset to support growth for smaller firms. For larger firms (at accumulation limits), use of the initial allocation as an asset to support further horizontal consolidation will depend on the relative incremental efficiency of a large firm expanding without QS compared to a small firm expanding with QS.*
2. Slow market growth	Status Quo	+Yes	+Yes
	IFQs	O	o
	Initial QS Allocation	O	*o*
3. High fixed costs	Status Quo	+Yes	+Yes
	IFQs	+ Increased fixed costs (e.g., camera systems), but for harvesters with QS, the increase influences rivalry in the QS/QP market more than the raw fish market. - Incentive to exert market power in the raw fish market to increase profits and recover fixed costs.	o Minor increase relative to vessels.
	Initial QS Allocation	*o*	*o*
4. High storage costs or highly perishable products	Status Quo	+Yes	+Yes
	IFQs	O	o
	Initial QS Allocation	O	*o*

Table E-24. Influences on rivalry of status quo, IFQ program and QS initial allocation (as more QS goes to processors) (shaded text repeats previous tables) ("-" = indicator or less rivalry "+" = indicator of more rivalry, "o" = no change. (continued)

Factor Causing Greater Rivalry		Harvesters	Processors
5. Low cost for customers to switch suppliers	Status Quo	+Yes	+Yes
	IFQs	O	O
	Initial QS Allocation	O	*o*
6. Low levels of product differentiation	Status Quo	+Yes	N/A
	IFQs	O	o
	Initial QS Allocation	O	*o*
7. Strategic stakes are high	Status Quo	+Moderate for nonwhiting, high for whiting	+Yes
	IFQs	O	+ Increased strategic stakes, expansion requires direct displacement of competitors, more limited vertical integration opportunities.
	Initial QS Allocation	*+ Increase as more goes to processors. More rapid shakeout. Those able to partner with processors to acquire QP and increase scale of their operations are more likely to survive over the long term.*	*Change and uncertainty may increase action based on perceived strategic stakes.*
8. High exit barriers	Status Quo	+Yes	+Yes
	IFQs	o	o
	Initial QS Allocation	*+As more of the initial allocation goes to processors, exit barriers will be higher.*	*-Reduced exit barriers. Selling the QS may be a way to clear off debts/accumulate savings and leave the industry.*
9. A diversity of rivals	Status Quo	o Uncertain	o Uncertain
	IFQs	O	o
	Initial QS Allocation	O	*o*
10. Industry Shakeout.	Status Quo	- Constrained by management system	o Uncertain
	IFQs	+ Expected	o Possible
	Initial QS Allocation	*+As more goes to processors, the intensity of the initial adjustment and speed of the shakeout will increase. There will not be as many firms as high above the accumulation limits (assuming a grandfather clause); financially weaker firms will drop out more quickly.*	*The initial distribution will alter the balance of competitive advantages among existing processors and may lead to new entry, a shakeout, or stabilize existing participants.*
Summary	Status Quo	Many reasons to expect high rivalry. However, license limitation constrains threat of new entrants; for nonwhiting, two-month limits minimize opportunity to compete for market share.	Many reasons to expect high rivalry. However, high concentration indicates shakeout may have already occurred; and threat of intense competition may discourage strong moves to expand market shares.
	IFQs	After an initial shakeout, rivalry will decrease because of fewer harvesters and accumulation limits constraints. The need to cover fixed costs may stimulate rivalry in the QP market and cooperation in the raw fish market. Rivalry in the raw fish market will occur to the degree that processors provide QP linked with raw fish exvessel price negotiations.	Rivalry will increase as a decrease in the geographic isolation of raw fish markets expands the number of effective participants, processors position themselves to defend against the possible exercise of harvester market power, competition for market share requires direct displacement of other processors, and accumulation limits constrain existing and potential vertical and horizontal integration.
	Initial QS Allocation	*+As more QS goes to processors, rivalry in the raw fish markets will increase as harvesters vie for processor held QP needed to achieve the larger scale of operations and efficiency needed survive the initial shakeout. Exit barriers will be higher increasing the intensity of the competition to remain in the fishery.*	*Quite a bit of uncertainty about effect, some of it related to the decision on a grandfather clause for processors. Some shift in the balance of power within the sector could lead to a shakeout (particularly if larger firms are disadvantaged by accumulation limits and no grandfather clause).*

Key Questions:

Which will be more profitable, taking into account variation in risk?

- A processing facility purchased by a small company that can also acquire QS for a significant amount of the facility's raw product needs?
- The same processing facility purchased by a larger processing company that cannot acquire additional QS to cover the facility's raw product needs?

If the former is more profitable, the IFQ program may inhibit further consolidation in the processing sector. If the latter is more profitable, consolidation may continue and may accelerate with the infusion of capital represented by IFQs (depending on balance with other factors such as changes in harvester market power and ability to vertically integrate).

Will there be a grandfather clause for processors? If not, an initial allocation to processors may advantage small processors relative to larger processors.

Table E-25. Influences of status quo, IFQ program and QS initial allocation (as more QS goes to processors) on bargaining power status and QS flow (shaded text repeats previous tables; "-" = indicator or less power, "+" = indicator of more power, "o" = no change).

Indicators of Sector Power		**Harvester (Supplier) Evaluation**	**Processor (Buyer) Evaluation**
Threat of vertical integration is addressed in more detail the section above on vertical integration. Sector Concentration is addressed in more detail in the above table on rivalry.			
Threat of vertically integrating with other sector	Status Quo	- Not much threat	+ Threat
	IFQ Program	+ Harvesters may vertically integrate by retaining ownership of fish while they are being processed (demanding custom processing services). + Harvesters may exert vertical influence by using QS to encourage new entry by processing concerns.	+ Increased incentive. - Threat limited by accumulation limits - Possible reduced vertical integration for firms with strong vertical integration due to accumulation limits.
	Initial QS Allocation	Financial resources for threatening vertical integration diminish.	Increased viability of vertical integration for firms not at QS accumulation limits.
Sector concentration	Status Quo	- More firms than processors. - Even distribution of market share	+ Relatively few. + High market share concentration
	IFQ Program	+ Increased concentration. + Reduction of potential for competition through activation of latent permits.	- Decreased geographic isolation of local markets. + Pressure for consolidation/integration - Consolidation/integration constrained by accumulation limits.
	Initial QS Allocation	*- Potential for activation of latent permits or capacity to service processor held QS increases number of possible participants*	*+ Processor held QP can be used to activate latent permits, decreasing harvester sector concentration.* *? Effect on processor concentration is uncertain. More concentration if larger firms expanding without the support of QS gain more profits than smaller firms expanding the same amount but with the support of QS, and a grandfather clause applies to the accumulation limits. The initial allocation will be an asset that may support consolidation.*

Table E-24. Influences of status quo, IFQ program and QS initial allocation (as more QS goes to processors) on bargaining power status and QS flow (shaded text repeats previous tables; "-" = indicator or less power, "+" = indicator of more power, "o" = no change). (continued)

Indicators of Sector Power		Harvester (Supplier) Evaluation	Processor (Buyer) Evaluation
Switching Costs (buyer to a different supplier or supplier to a different buyer)	Status Quo	- No significant costs.	+ No significant costs.
	IFQ Program	O	O
	Initial QS Allocation	*O*	*O*
Buyer customer power (customer willingness to boycott in support of supplier)	Status Quo	- No	N/A
	IFQ Program	O	N/A
	Initial QS Allocation	O	*N/A*
Harvesters' products are highly differentiated from one another	Status Quo	- No	+ No
	IFQ Program	o	O
	Initial QS Allocation	*o*	*O*

Table E-26. Influences of status quo, IFQ program and QS initial allocation (as more QS goes to processors) on the ability of a sector to protect any advantage it gains in bargaining power (barriers to entry) and QS flow.

Changes to Barriers to Entry		Harvesters	Processors
Government Regulation	Status Quo	Limited number of permits but some "latent." Heavily regulated.	Fishery management related regulations less heavy than for harvesters but also face environmental regulations (waste discharge).
	IFQ Program	+Increased fixed costs. +Absolute barrier to entry and expansion.	Minor increased fixed costs.
	Initial QS Allocation	The QS needed for participation will not be affected by who receives an initial allocation. Relative advantage for initial recipients is addressed under economies of scale.	Relative advantage for initial recipients is addressed under economies of scale.
Special Proprietary Knowledge	Status Quo	Fishing locations.	None identified.
	IFQ Program	o	o.
	Initial QS Allocation	o	O
Asset Specificity (Maleability)	Status Quo	Very specific (geographic relocation possible)	Very specific Shoreside—not mobile some utility in other sectors. At-sea—mobile
	IFQ Program	o	O
	Initial QS Allocation	o	O

Table E-25. Influences of status quo, IFQ program, and QS initial allocation (as more QS goes to processors) on the ability of a sector to protect any advantage it gains in bargaining power (barriers to entry) and QS flow. (continued)

Changes to Barriers to Entry		Harvesters	Processors
Economies of Scale	Status Quo	-	
	IFQ Program	+ The cost of achieving any given level of scale will be increased by the need to acquire QS.	+ If processors in the industry acquire QS, the cost to new entrants to reach a similar level of scale, efficiency, and risk control will be increased by the need to purchase QS. Accumulation limits create an absolute barrier in ability to protect higher production levels through ownership of IFQ.
	Initial QS Allocation	*The effect of the initial allocation on the barrier to entry for harvesters will not be as great as for processors.* *+Harvesters receiving an initial grant will have some short-term financial advantage over new entrants in competition to acquire additional QS and achieve greater economies of scale. This advantage will be diminished as more of the initial allocation goes to processors, but will also become more important as competition in the raw fish market increases with an increasing allocation to processors.* *o Those harvesters grandfathered in at greater levels of production may have greater profit opportunity than others; however, they will not be able to use those profits for the expansion of their harvesting operations. Therefore, it will not cause a competition barrier for new entrants.*	*+ If processors receive an initial allocation, over the short term, the barrier to new entrants may increase because of the relative financial advantage provided by the grant of the asset.* *+ If some processors receive an initial allocation of QS, grandfathered in above the accumulation limits, those processors may have efficiencies of scale that provide them with greater profits than would be available to new entrants or those who could only achieve a similar level of production without the benefit of support of their own QS.*

E.5.4 Access to Capital

Demand.

- **Time Preference.** The initial allocation will raise individuals' wealth level. If their income was relatively low, this may decrease their time preference, leading them to be willing to pay more for QS.
- **Risk.** Those receiving an initial allocation of QS will have more secure access to their expected fishery related income. This may increase their willingness to incur additional debt in order to purchase more QS (giving them an advantage over those who do not receive QS).
- **Planning Horizon and Investment Recovery.** The initial allocation is not expected to have an effect on planning horizons or amount of investment a firm needs to recover.

Supply. Those receiving an initial allocation will experience an increase in wealth. They will be viewed as lower risk borrowers than they were before they received the initial allocation. A lower risk profile will give them cheaper access to capital and enable them to more easily accumulate additional QS, up to accumulation limits. It will also put them in a better position to acquire capital for other improvements, which may lead to further business growth and additional QS purchases. Harvesters need access to QS/QP in order to produce. A harvester under economic stress that does not receive enough of an initial allocation for its business plan may find it difficult to acquire financing to purchase more QS and would, therefore, have to cease production or rely on QP provided by others to stay in business. Processors do not need direct access to QS for processing activities; therefore, QS/QP is not a key input. At the same time, processors with an initial allocation may be viewed as less risky, particularly if it appears that after IFQ program implementation harvesters may be in a position to exert market power. An initial allocation

to crew would likely represent a substantial boost in their capital, increasing their ability to accrue additional capital, including QS. The funding base for communities is large enough that an initial allocation of QS is not likely to affect their access to capital. See Table E-26.

Table E-27. Influences of status quo, IFQ program and QS initial allocation on access to capital and QS flow.

		Harvesters	Processors	Crew	Communities
Demand for Capital					
Time Preference	SQ	Those with high time preference will not be willing to pay as much for QS.			
		Indication of high time preferences.	Uncertain	Low income may lead to high time preference.	Uncertain
	IFQ Program	No change.			
	Initial QS Allocation	*Increased wealth of initial recipients may increase their willingness to pay for QS.*			
Risk	Status Quo	Those who believe that the future holds greater risk than others believe will have a lower willingness to borrow.			
	IFQ Program	The fishery managed with IFQs will have inherently less risk. Personal assessment of future risk may change for those who acquire QS.			
	Initial QS Allocation	*Increased income security of those receiving an initial allocation of QS may increase their willingness to incur additional debt in order to purchase more QS.*			
Planning Horizon and Investment Recovery	Status Quo	Those who have a longer planning horizon for the use of an asset may be willing to pay more to acquire it (as compared to someone acquiring the same asset with a shorter horizon). [This outcome depends on there being a limited ability to recover investment through sale of the asset at the end of the planning horizon.]			
	IFQ Program	Those who have a longer planning horizon or need a longer time to recover a capital investment or have a larger capital investment (for which QS can help secure their return) will be willing to pay more for QS. There is no basis to distinguish among groups.			
	Initial QS Allocation	*The initial allocation is expected to have no effect.*			
Supply of Capital					
	Status Quo	The overall financial position of a firm will be evaluated in determining loan worthiness. Firms are likely to receive more favorable terms for a loan if they are larger, diversified, and have assets that may be used as security and are of value outside the industry.			
		Harvesters less likely to have capital useful in other industries. Of generally smaller total size than processors.	Firms more likely to have capital that may be useful in other industries. Firms often of larger size than harvesting firms.	Not likely to have fishing business related assets for use as collateral. This may mean higher costs of borrowing.	May have cheaper access if the governing body is viewed as lower risk.
	IFQ Program	In general, the IFQ program will likely decrease risk in the industry, reducing the cost of access to capital. QS are of tenuous value as collateral but important to the viability of a firms business plan. Firms with cheaper access to capital will be more likely to accumulate QS.			
		Risk may decrease with greater stability & possible increase in market power.	Processors may experience a risk increase associated with harvester market power, increasing capital costs.		
	Initial QS Allocation	*Initial recipients will experience increased wealth and be viewed as lower risk borrowers. Cheaper access to capital will likely spur their growth and lead to future QS purchases up to limits.*			
		QS/QP is needed for production. Firms under financial stress will be viewed as high risk and may find it difficult to acquire financing to purchase QS/QP they do not receive as part of the initial allocation.	*Direct access to QS/QP is not needed for processing activities.* *An allocation of QS may increase security of access to raw product, reducing risk and cost of capital.*	*An initial allocation would likely represent a substantial boost in the capital owned by crewmembers and increase their ability to accrue additional capital, including QS.*	*An initial allocation appears unlikely to change the communities standing the capital market.*

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ECONOMIC AND POLICY ANALYSIS OF A FIXED TERM AUCTION-BASED INDIVIDUAL FISHING QUOTAS PROPOSAL FOR THE WEST COAST LIMITED ENTRY GROUNDFISH TRAWL FISHERY

Appendix F

TO THE
RATIONALIZATION OF THE PACIFIC COAST GROUNDFISH LIMITED ENTRY TRAWL FISHERY
FINAL ENVIRONMENTAL IMPACT STATEMENT

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F.0 Fixed Term and Auction Analysis and Contractor Report

This appendix contains an analysis of an option considered by the Council which would place a 15- or 16-year limit on the duration of quota share (QS) and introduce biennial auctions of 20 percent of the QS starting in year 15 or 16. The option is more fully described in Appendix A, Section A-6. The analysis was developed for the Council by a contractor (Syldon Inc) and is provided in full in this appendix. The Council's Scientific and Statistical Committee reviewed the contractor's analysis and provided the Council with the following evaluation at its November 2008 meeting.

> The SSC . . . received a presentation . . . from Drs. Gil Sylvia and Michael Harte (Oregon State University) concerning an analysis they conducted of the option for a fixed-term auction of quota shares.
>
> The SSC discussed the issue of fixed-term auctions and reviewed the associated analysis contained in Appendix F. Drs. Silvia and Harte presented their analysis to the SSC. The SSC notes that the rationale and goals of a fixed-term auction are not fully developed in the Preliminary DEIS; thus, it is difficult for the SSC to discuss the degree to which its goals would be met. Generally speaking, fixed-term auctions would capture for the public a portion of the rents generated by rationalization. Fixed-term auctions also affect the distribution of the economic benefits and may, to some degree, decrease the overall size of those benefits. Both of these latter effects would vary with the percentage of QS that reverts to an auction. There are many different ways that fixed-term auctions could be implemented; the outcomes will depend on the details of the implementation.
>
> Appendix F analyzes the potential effects of a fixed-term auction. A fixed-term auction increases the amount of uncertainty and risk associated with holding QS. This will tend to decrease the amount of investment QS holders are willing to make in the fishery and, in turn, reduce the economic benefits of rationalization. However, the conclusions in the appendix are stated too strongly and fail to acknowledge the uncertainty involved in predicting the outcomes.
>
> There are several factors that may mitigate reductions in investment and economic benefits. First, the length of the initial allocation of QS is 15 or 16 years. This is a rather long time horizon, and much of the fleet consolidation will likely take place well in advance of the 15 or 16 years. Thus, the remaining QS holders will tend to have larger QS holdings due to consolidation, and they will be the most efficient, profitable, and innovative operators. Second, most businesses operate in risky and uncertain environments regarding costs of inputs, and they tend to take actions to mitigate those risks. QS holders, for instance, could engage in contracts or purchase quota in the private market in anticipation of the auction. Third, investment time horizons may be shorter than those suggested in the appendix because returns on business investments usually have to be realized more rapidly. Generally, the effects of an auction on investment and economic benefits will depend on the percentage that is auctioned. If it is 1 to 5 percent, there may be very small effects. If it is closer to 20 percent, the effects would be larger.
>
> The SSC also discussed the effect of fixed-term auctions on stewardship. The appendix asserts that fixed-term auctions would have a negative effect on stewardship because the returns to stewardship would be partially dissipated by any loss of QS that is not replaced. However, it is unclear to the SSC how large the stewardship incentive associated with QS ownership would be, even if held in perpetuity. The expected number of vessels that will operate in the rationalized fishery may be so large and the percent of the quota owned by a single operator so small (due to accumulation limits) that the private gains to stewardship may not be significant enough to change operations in a meaningful way.

> The SSC notes that the analysis in Appendix F is qualitative. As such, the analysis does not support the firm conclusions regarding the magnitudes of the effects, as stated in the report and described in Table 5.1 and Figure F-1.

The SSC is the Council's primary authority on scientific matters and determination of the best available information. The following is one of the primary charges of the SSC:

> Provide the Council advice in the development, collection, evaluation, and peer review of such statistical, biological, economic, social, and other scientific information as is relevant to the Council's development and amendment of any Fishery Management Plan in accordance with the Magnuson Stevens Fishery Conservation and Management Act (MSA) and the National Standards as amended through January 12, 2007 (Council Operating Procedure #4).

After reviewing the contractor analysis and the SSC report cautioning the Council on the strength of some of the conclusions of the report, the Council chose to include the following provision as part of its final preferred alternative (Section A-2.3.4).

> The Council shall begin a review of the TIQ program no later than 5 years after implementation of the program. The review will evaluate the progress the TIQ program has made in achieving the goal and objectives of Amendment 20. The result of this evaluation could include dissolution of the program, revocation of all or part of quota shares, or other fundamental changes to the program. Holders of quota shares should remain cognizant of this fact when making decisions regarding their quota shares, including buying selling, and leasing of these shares.
>
> The Council shall consider the use of an auction or other non-history based methods when distributing quota share that may become available after initial allocation, such as quota that results after a stock transitions from overfished to non-overfished, when Quota share from an AMP is no longer needed, when "use it or lose it" quota shares are forfeited, and if any quota is available after the initial or subsequent reviews of the program are completed.
>
> The specific form of the auction or other method of distribution shall be designed to achieve the goals of Amendment 20, specifically including minimizing the adverse effects from an IFQ program on fishing communities to the extent practical.

The following rationale was provided in support of including this provision:

> This [provision] promotes the idea that the fisheries resources are the property of the citizens of the United States and not perpetual grants to the QS holders. This also recognizes that we are not developing the perfect system. It puts the QS holders on notice that there may be changes to the program that could involve their QS and affect them. There will be a review in four or five years. At that point in time, the Council could consider what is going on in the fishery, including whether there are adverse effects on communities, new entrants are effectively prohibited due to costs of entry, or there are other adverse affects. If the adaptive management program is not adequate, the Council could consider an auction of some of the QS to correct these things or to deal with other results of the review. There are concerns that under the auction those with the deepest pockets will get it all. The last paragraph addresses ways to limit the auction so as to not disrupt communities, e.g., limiting the auction to small vessels. The motion does not require the Council to have an auction; it is a specific item that the Council would consider after the initial review. . . . The earliest the auction that might be implemented would likely be six to eight years after implementation. There would be no additional action or analysis at this time.

Acknowledgements

Syldon Inc would like to thank the staff of the Pacific Fishery Management Council for their assistance in understanding Council needs, clarifying EIS requirements, and formatting the report. We would also like to thank George Khalis for pointing us toward the non-fishery management literature highlighting the importance of asset values for addressing asymmetrical information and collateralizing small firm financing.

Executive Summary

This report analyzes the Pacific Fishery Management Council's preferred option for the West Coast Limited Entry Groundfish Trawl Fishery rationalization plan against a nonpreferred alternative that combines a fixed term privilege (15 or 16 years) with post-term biennial auctions for up to 20 percent of quota shares. Our analysis looks at 5 percent or 20 percent auctions of quota shares for comparative purposes. The report includes a 1) description of the fishery, processors, and communities; 2) a review of literature on fixed term systems and auctions for fisheries and other natural resources; 3) an analysis of the preferred option relative to the fixed term/auction options on fishery rents, resource stewardship, and communities; 4) an analysis of the preferred option relative to the fixed term/auction options on key groundfish management objectives; and 5) a summary of the impacts of the alternative options on 37 related groundfish management goals, objectives, and standards.

The literature review demonstrates that fixed term tenure systems and auctions can be successfully used in allocating and managing natural resources depending on management objectives, resource characteristics, and design of the tenure and auction systems. Fixed term privileges can provide management flexibility and perception of public ownership but can reduce incentives for long term investment and resource stewardship. Auctions can be an efficient mechanism for allocating homogeneous resources and collection of royalties, but may be more difficult to employ when equity and social objectives are important objectives. Fixed term privileges combined with auctions, however, are not commonly used in fisheries management. Auctions are rarely used in allocating fishery assets due ostensibly to the heterogeneity and complexity of fishery resources, uncertain status of fishery stocks, number of management goals, and unpopularity of auctions by resource users. The review suggests that combining fixed privileges with post tenure auctions may reinforce the weaknesses of each approach, particularly for multispecies fisheries.

Analysis of the Council's preferred option relative to the combined fixed term/auction options reveals that the preferred option generates greater benefits across almost the entire range of management objectives. These results are influenced by key characteristics of the West Coast Limited Entry Groundfish Trawl Fishery including: 1) the large number and complexity of assemblages and species; 2) stock rebuilding and bycatch constraints; 3) management focus on protecting small firms; 4) effects of the self-financed buyout program; and 5) number and diversity of dependent/engaged communities. The Council's preferred option results in higher rents and economic efficiency through incentives for entrepreneurial innovation and reduction in risk. In contrast, the fixed term/auction alternatives generate less profit and rent and lead to greater risk due to "wasting effects" and disincentives for rent creation. These effects are magnified over time due to the inherent challenges in managing asset portfolios in a complex multispecies fishery. In addition, the reduction in asset values undermines the ability of family-owned firms to finance operations and manage risk. The fixed term/auction alternatives reduce incentives for stewardship, and negatively impacts communities by increasing risk and inhibiting long term contracting. The auction system may provide for moderate gains in new entrants and price discovery but this is a benefit only if secondary quota markets are failing to function efficiently. The review of the summary results for 37 groundfish management goals, objectives, and standards reveals that the fixed term/auction alternatives have a moderate to significant negative effect on 22 objectives, a slight negative or zero effect on 14 objectives, and a positive effect on only one potential objective (royalty payments).

F.1 Introduction & Scope of Work

The Pacific Fishery Management Council (here after "the Council") is evaluating management alternatives in preparation for rationalizing the West Coast Limited Entry Groundfish Trawl Fishery. The Council chose a preliminary preferred alternative at their June 6–13, 2008, meeting in Foster City, California. They adopted Individual Fishing Quotas (IFQ) for the non Pacific whiting shoreside sector, either IFQs or co-ops for the shoreside whiting sectors, and cooperatives for the at-sea whiting sectors. One proposed alternative to the preferred option is allocating individual fishing quotas (IFQs) for a fixed term (15 or 16 years) and then auctioning off a portion of the quota (up to 20 percent) on a biennial basis.

F.1.1 The Council's Preferred Option and Fixed Term and Auctions Option

The IFQ alternative preferred by the Council provides an amount of catch (IFQ) that would be available for use on each trawl limited entry vessel (PFMC 2008a). The IFQ would be transferable and divisible. The timing of harvest and amounts taken would be restricted primarily by each vessel's individual quota. Each vessel would have both flexibility and individual accountability. IFQ transfers would be tracked by NMFS and checked against vessel catch. An initial allocation may be given to processors. The Council may decide to use an adaptive management provision to provide processor compensation, mitigate against adverse impacts to communities, assist new entrants, or to achieve bycatch reduction and habitat protection goals, among others.

One proposed alternative is allocating individual fishing quotas (IFQs) for a fixed term and then auctioning off a portion of the quota. The alternative is described as:

> *"The IFQ program could optionally include a 15 or 16 year limit on all the QS that has been issued. Starting with Term-2 of the program, every 2 years up to 20 percent of all QS will be returned to NMFS for reissuance via an auction. The specific form of the auction would be decided by the Council in the period between trawl rationalization implementation and the first auction. It would be designed to achieve the goals of the trawl rationalization program, including reducing bycatch; increasing operation flexibility; and producing measurable economic and employment benefits through the seafood catching, processing, distribution elements, and support sectors of the industry."* (PFMC 2008a, page 11).

As with all options it must be evaluated according to goals, objectives and standards found in the Pacific Coast Groundfish Management Plan (2008c), the Trawl Rationalization Plan (2000a), the MSA (NOAA Fisheries 2006), and other standards relevant in conducting Environmental Impact Statements (EIS).

F.1.2 Scope of this Report

This report compares and analyzes the Council's preferred option relative to the fixed term/auctions option. The report includes:

- A review of auctions for renewable and non renewable resources with reference to using fixed term/proportional auction strategies relative to the goals of economic efficiency, resource conservation, and minimizing environmental and community impacts.
- Discussion of literature and key concepts associated with fixed terms and quota auctions relative to economic, social, and environmental objectives of the West Coast Limited Entry Groundfish Trawl Fishery.
- A comparative qualitative analysis of the fixed term/auction alternative for the West Coast Limited Entry Groundfish Trawl Fishery including evaluation of the costs and benefits

advantages/disadvantages of this option relative to relevant management goals, objectives, and standards. Analysis includes the potential impacts of this alternative on 1) the creation, size, and capture of fishery rents; 2) effects on voluntary resource stewardship and fishery investment; 3) flexibility of private and public management; and new entry into the fishery. The evaluation also includes impacts to various stakeholders including, but not limited to, trawl harvesters, non-trawl harvesters, processors, communities, groundfish resources, and management agencies.

F.1.3 Caveats and Assumptions

Because of the range and complexity of the options, including differences between the Pacific whiting and non-whiting sectors, and the uncertainty regarding how the fixed term/auction would be applied, the following caveats/assumptions have been made:

- For purposes of the comparative analysis, it is assumed that the only options being analyzed are the fixed term/auction options versus the Council's preferred option(s). Where options are not preferred or equally preferred, and the option may impact the comparative analysis, the analysis includes the specific alternative options. The analysis is not intended to analyze alternative rationalization plans or option design in order to achieve higher goals, objectives, or benefits.

- The fixed term/auction option does not specify an amount to be auctioned beyond "up to twenty percent." For the purpose of comparative analysis we assume either 5 percent or 20 percent of the quota is surrendered and auctioned.

- The Pacific whiting sector includes cooperative and non-cooperative options. Given uncertainty about whether the fixed term/auction option would apply to cooperatives, the analysis is conducted assuming that all sectors of the Pacific whiting fishery are managed under the IFQ preferred option.

- While this report discusses basic types and design features of auctions, it is beyond the scope of this work to analyze or recommend design elements for an auction mechanism for the West Coast Limited Entry Groundfish Trawl Fishery.

F.1.4 Structure of the Report

The Report is structured in six major sections. The next section briefly describes key characteristics of the West Coast Limited Entry Groundfish Trawl Fishery, the processing sector, and coastal communities. Based on a review of the literature, Section 3 summarizes comparative advantages and disadvantages of fixed term privileges and auctions for natural resources including fisheries. Section 4 analyzes the predicted impacts of the fixed term/auction option relative to the Council's preferred option on resource rents, environmental stewardship, and coastal communities. Section 5 summarizes specific impacts on key federal and west coast fisheries management objectives. Attachment A provides a literature review of fixed term privileges and auctions for managing natural resource industries including fisheries. Attachment B is a brief discussion of resource rent creation, an issue central to much of Sections 3, 4, and 5. Chapter 1 in the main document lists the Council's objectives for groundfish management and groundfish rationalization that provides the basis for the comparison of the Council's preferred IFQ option against the fixed term/auction alternative.

F.2 Characteristics of the West Coast Limited Entry Groundfish Trawl Fishery

F.2.1 Introduction to the Limited Entry Groundfish Trawl Fishery

From almost any perspective, the West Coast Limited Entry Groundfish Trawl Fishery is a complex fishery that has undergone major and sometimes wrenching change over the last thirty years. It is part

of a broader network of west coast fisheries that stretch over four states (including the distant water fishery primarily fishing in Alaska) involving thousands of fishing firms, hundreds of seafood processors and support industries; and scores of "engaged" "dependent", and "at-risk" communities. The trawl fishery harvests from major fish assemblages representing widely varying habitats and life histories that include over 80 species, of which more than half are commercially harvested and sold.

The fishery has transitioned through five major periods during the last 30 years:

- Pre-MSA (before late 1970s): characterized by open access management and domination by foreign fleets;

- Post MSA (1980s - early 1990s): development of a groundfish management plan, domestication of the fleet, foreign-domestic joint ventures, regulated open access management, priority for year-round landings and processing;

- Limited Access (mid 1990s): development of a limited access permit fishery, domestication and allocation of the Pacific whiting fishery, creation of the Pacific Whiting Cooperative;

- Overcapitalization (late 1990s): disaster declaration, biological limits and overfished status for some stocks, overcapitalized fleet, self financed permit buyback program;

- Conservation and Rationalization (present): implementing rebuilding plans for overfished stocks, establishing rockfish conservation zones (RCA) and essential fish habitats, rationalizing the fishery using Limited Access Privileges.

After the establishment of the Exclusive Economic Zone (200-mile limit) and passage of the MSA, the groundfish trawl fleet grew to more than a thousand vessels that were ultimately permitted into the limited entry groundfish trawl fishery. But with the exception of Pacific whiting, harvest and total revenue dropped 30-50 percent from the 1980s to the present. For example, shoreside landings by nonwhiting nontribal commercial sectors totaled only 25,000 mt, in 2004 compared to landings of 60,000 mt in 1995 and 1996, respectively. Groundfish trawl permits for the shoreside sector which totaled nearly 400 when the Limited Entry plan was initially developed decreased to 183 by 2003 due to the purchase and aggregation of permits by the at-sea whiting catcher processing vessels and the self financed buyout program which retired more than 40 percent of the permits active in the fishery at the time.

The growth and decline in non-Pacific whiting groundfish trawl harvests paralleled the growth and reduction of the groundfish seafood processing sector (http://www.pcouncil.org/groundfish/gfspex/07-08/ch7.pdf.) The number of firms engaged in processing trawl-caught groundfish in the three west coast states totaled approximately 140-150 in the mid eighties but declined by 60 percent to 55 companies by 2005. Besides fewer processors, the processing industry also significantly consolidate with the top three companies processing 77 percent of the product and the top six companies processing some 90 percent. To some extent, however, these numbers are skewed due to the large proportion by weight of Pacific whiting, which is a large industrial processing operation dominated by a few companies.

F.2.2 Harvesting, Processing, and Communities

The west coast has an active commercial and recreational groundfish fishery made up of thousands of shore based trawl, at sea trawl, fixed gear, tribal and recreational charter and recreational private vessels. Trawl and fixed gear vessels make most of their landings in Oregon. Newport, Astoria, and Charleston (Coos Bay), Oregon were three of the largest four ports for landed weight and exvessel revenue during the 2000–2003 period.

Port Districts have invested significantly in infrastructure to support the trawl fishery and processing sectors in these ports. Nevertheless this investment is always at risk from environmental and market factors and also from changes in the regulatory regime for trawl fisheries. For example, because of the trawl buyback program, some port communities, mainly smaller ports, appear to have lost relatively more groundfish trawl vessels than other ports.

Vessels participating in shore-based groundfish fisheries deliver to shore-based processors along the entire west coast. However, processing capacity has been both consolidating and declining in recent years. Many small ports have lost both processors and on-site buyers, and trucking groundfish from these ports to larger communities for processing has become common place. Nevertheless, processing remains an important source of employment and regional income. From 2000 to 2004 seafood processing on the west coast generated approximately 380 to 420 million dollars in wages and employed over 10,000 workers.

The capital and associated infrastructure invested by industry and port districts is not easily transported to other sectors or locations should changes occur in the groundfish fishery due to new harvest or market conditions or new management plans. Significant port capital is fixed in location and designed to handle fishing vessels and fish products. When landing volumes fall below the economic capacity of a plant, operators have little choice but to consolidate operations, often leaving plant and infrastructure to rapidly deteriorate in prime waterfront communities. Maintaining working waterfronts that efficiently use valuable real estate to support fewer vessels and consolidation in processing capacity is an ongoing challenge for port districts and the seafood industry

This dependence on the seafood industry and limited resilience to change means that many coastal communities are potentially vulnerable to changes in the management of the groundfish fishery. The Council identifies some 38 cities and 18 counties as vulnerable commercial and/or recreational fishing communities. Four cities and six counties are identified as the most vulnerable. The cities are: Garibaldi, Ilwaco, Moss Landing, and Neah Bay. The counties are: Coos, Grays Harbor, Humboldt, Lincoln, Mendocino, and Pacific (Pacific Fishery Management Council 2006). Focusing just on dependency on the commercial groundfish fishery, Neah Bay is identified as a most vulnerable area. Other vulnerable areas include Astoria, Bellingham, Coos Bay, Crescent City, Eureka, Fort Bragg, Moss Landing, Pacific City, and Port Orford.

F.2.3 Key Characteristics of the Groundfish Fishery

The history and description of the groundfish fishery, processing, and community sectors reveals some of the complex characteristics relevant for this analysis. These include:

- Large number of assemblages and species: The fishery targets a variety of assemblages and species (e.g., flatfish, rockfish, deep water, and mid water (primarily Pacific whiting) across different habitats found along more than a 1,200 mile coastline. Individual species and assemblages may be either complements or substitutes, and targets or nontargets depending on the fishing strategy, quotas, market demand, geography, habitat, and captain's skill.

- Complex quota: Each of the assessed species have associated quotas. Even within assemblages, these quotas may be substantially different across species, given biologically intrinsic differences for each species/stocks and different stock status. This heterogeneity creates significant costs to develop fishing strategies consistent with harvesting the "optimal" proportion of each stock given regulations, market demand, and environmental conditions.

- Heterogeneity in species productivity: One distinguishing characteristics of some of the groundfish stocks is their relatively slow growth. This is particularly true of some of the rockfishes which may grow to be over 100 years old. In contrast, other stocks may be relatively

fast growing (e.g., ling cod). Still other stocks may have moderate to fast growth but show significant variability in recruitment (e.g., Pacific whiting).

- Rebuilding stocks and bycatch: Seven groundfish stocks are presently listed as "overfished" and have been placed on rebuilding plans. Quota for some of these stocks is less than 100 metric tons for the entire west coast. These severe limits have required harvesters to dramatically alter fishing behavior in order to keep below individual and aggregate bycatch quotas. In some case the bycatch is the most significant binding constraint on the fishery and has resulted in early closures of the fisheries.

- Family owned firms: Most of the vessels landing product are relatively small family firms. Average vessels range from 60-80 feet with rights to harvest less than 1-2 percent of the total available quotas given existing regulations. Some permits are owned by seafood processors who hire vessels to land the permitted catch. Very large vessels sometimes greater than 200 feet in length characterize the at-sea whiting catcher processing industry, which is dominated by large seafood firms.

- Complex interactions of west coast fisheries: Many west coast trawl groundfish vessels also own permits and licenses in other fisheries in order to maximize profits and manage risk. Recent history has demonstrated that major changes in the west coast limited entry trawl fishery can create rippling or "cascading" effects in other fisheries.

- Self financed buyout program: In 2003, almost half of the West Coast Limited Entry Groundfish Trawl Fishery permits were retired as part of a voluntary government-backed loan and auction buyback scheme. Remaining permit holders must repay the loan based on a tax on landings.

- Cooperation in science and management: Members of the West Coast Limited Entry Groundfish Trawl Fishery have invested time and money over the last 30 years in cooperative science and management through the Council process and formation of harvester and processor organizations. West coast trawl vessels are now used in conducting groundfish surveys for assessment purposes by NMFS. The Pacific Whiting Cooperative conducts collaborative science including monitoring of Pacific whiting pre-recruitment.

This brief snapshot of the history and key features of the groundfish fishery provides a limited sense of the complex and interdependent biological, economic, and social issues that impact this industry. These features will prove important in influencing the impact of the rationalization options which are analyzed in the remaining portions of this report.

F.3 An Overview of Fixed Term Rights and Auctions as Resource Management Policy Options

This section provides a general background to the evaluation of the costs and benefits of the limited term/auction alternative for the West Coast Limited Entry Groundfish Trawl Fishery described in Section I. Drawing on relevant literature (documented more extensively in Attachment A) it explores the use of fixed term rights and auctions of natural resources to promote the goals of economic efficiency, resource conservation, and minimizing negative environmental and community impacts. The evaluation of auctions and fixed term privileges are each conducted separately. It should be noted that there are few instances where the literature addresses the combination of these policy options. Our analysis in Sections 4 and 5, however, are based on the combined effects of fixed term privileges and auctions in the context of the specific biological, economic and social context of the West Coast Limited Entry Groundfish Trawl Fishery.

F.3.1 Fixed Term Fishing Rights versus "Permanent" Rights

Privileges to extract a public resource may either be of permanent duration or be time-limited. Although permanent privileges, or more accurately "conditional" permanent privileges, are the tool of choice in fisheries around the world, fixed term privileges are common in other public resource industries.

The choice of duration of the privilege can have implications for:

- The flexibility that managers have in addressing policy goals.
- The level of transaction costs for the managed sector.
- The incentives that resource users face for investment in, and conservation of, public resources.

F.3.1.1 *Permanent privileges may reduce transaction costs*

Transaction costs are the resources dedicated to establish, operate, and enforce a market system (Lee and Jouravlev 1998). Permanent privileges are homogenous in duration so their value is determined solely by the factors underlying supply and demand. Privileges subject to a fixed-term, however, are a "wasting asset" i.e. their value diminishes with time (Hodgson 2006) . Higher information and renewal costs may be associated with renewing or replacing fixed term assets. These costs will be higher the greater the degree of uncertainty associated with the status and/or management of the resource. Permanent privileges can help avoid potentially contentious, time-consuming, and costly future re-allocations (Libecap 2006; Morgan 1995) .

F.3.1.2 *Permanent privileges can encourage efficient investment*

Secure rights to a resource reduce risk, thereby promoting long term investment and technological improvements(White 2006). Investment and innovation by firms collectively improve the economic efficiency and competitiveness of a sector (Bess 2006; Harte, *et al.* 2008; Harte and Barton 2007).

For example, if a fishing entity does not know if they will have the right to fish in five years time it is less likely to make new capital investments in equipment and durable assets. In sectors where markets take a long time to establish, permanent or long term access to the resource is more conducive to the formation of more-efficient business arrangements (Bess 2006).

F.3.1.3 *Permanent privileges can promote resource and environmental stewardship*

Secure privileges to harvest natural resources may encourage stewardship for the resource and the environment it is found in (Morgan 1995). The longer the duration of the privilege, the larger the stake the user has in the industry and the greater the user's desire to engage in long term stewardship behavior (Beddington, *et al.* 2007; Costello, *et al.* 2008; Grafton, *et al.* 2006; Griffith 2008; Townsend and Shotton 2008).

In contrast, Macinko and Bromley (2001) argue that the degree of long term stewardship that a user will exercise is determined not by the duration of the privilege but by the user's rate-of-time preference -- that is, how an individual evaluates present income versus future income. Individuals with a higher discount rate are less likely to care for the long term health of a resource. If enough fishery participants have a high discount rate, the economic incentive to ensure the long term sustainability of a resource will be much reduced because the sector believes short term gains are better employed in other uses (Clark 1990). Page (1977) calls this the "iron law of the discount rate." The effects of this iron law may mean that time limited privileges have the same implications for resource and environmental stewardship behavior as do permanent privileges, provided they are of sufficient length.

F.3.1.4 *Fixed terms can provide opportunities for change*

Problems can arise from the initial allocation of privileges. For example, allocations made by administrative decision are almost never economically efficient (Morgan 1995). There may also be concern over excessive market share situations developing. Both of these concerns may be mitigated by a system of time-limited privileges, since there is a defined future opportunity for managers to adjust the structure of the regulated sector (Lee and Jouravlev 1998).

Although administrative allocations may not be efficient in the short-term, secondary markets can be designed or allowed to develop that result in more efficient resource allocations over time. Excessive market share concerns can be addressed through caps on ownership or other methods. Changes in conditions attached to permanent privileges after they have been allocated can generate significant uncertainty and may undermine secondary markets for privileges (Lee and Jouravlev 1998). The conditions attached to any system of privileges need to be clear from the beginning.

Fixed-term rights also offer potential flexibility to resource managers. Necessary changes in policy may be implemented more easily, and with less resistance under a system of time-limited rights (Macinko and Bromley 2001). Fixed terms provide managers with predictable regular intervals at which to make changes to the management program in light of new developments. Privilege holders also have a high degree of certainty about when changes to the system will be made and can plan accordingly. There may also be less resistance to changes in management procedures if the privilege holders do not hold a permanent, vested share in the industry.

In the context of the rapidly changing understanding of the oceans and the shift towards ecosystem-based science and management (Upton, *et al.* 2007), this flexibility may make it easier for adaptive management to occur. For example, The United States Commission on Ocean Policy (2004) recommended assigning:

> *...quota shares for a limited period of time to reduce confusion concerning public ownership of living marine resources, allow managers flexibility to manage fisheries adaptively, and provide stability to fishermen for investment decisions.*

Fixed term privileges may also provide industry with increased flexibility, especially when there is uncertainty about the status or management of a resource. For example, the lower cost and protected nature of fixed term contracts for water use reduces the farmer's exposure to risk in the event of a long term drought where farming is unviable. Flexibility in this case comes at the expense of long

term security. But in an industry where seasonal flows are often highly variable, the amount of long term security from having permanent access to water may be negligible. Sometimes the duration of the right may depend on the level of uncertainty regarding the right. For example, in Iowa, the legislature restricts the term of water use rights to 10 years if the aquifer capacity is uncertain (Hodgson 2006).

The durability of the privilege depends not just on the length of time it is issued for, but also on the privilege holder's perceptions of a program's management and whether or not long term expectations for the resource will be met. For example, a fixed-term privilege granted for a short period but with a strong presumption of renewal may be just as durable and will confer the same or greater economic benefits than a privilege granted for 20 years but carries with it an expectation that the government will fundamentally change aspects of the management program within that period.

F.3.1.5 *Equity considerations*

A concern about permanent privileges is that they capitalize the value of the fishery and therefore, when traded, confer benefits to the initial recipients in the form of windfall gains (if the initial allocation is free or cheap). These may be viewed as inequitable from society's standpoint.

The Redstone Group (2007) modeled the economic gains of implementing a Limited Access Privilege Program in the snapper-grouper fishery under the jurisdiction of the South Atlantic Fishery Management Council (SAFMC). They found that implementing the LAPP would provide $15-20 million in benefits, much of which would come from consolidation and de-capitalization in the fishery. However, they also found that most of these gains could be taken out of the fishery in the form of quota purchased from exiting privilege holders.

Macinko (2008) states that the effect of the LAPP would be: *"...transferring the entire future (enhanced) value of the fishery into the hands of those chosen by the particular qualification scheme..."* This is known as the transitional gains trap, when the initial recipients of privileges are able to capitalize a portion of the stream of future benefits and extract these from future participants in the fishery, thereby depriving them of these same benefits. Fixed term privileges may help avoid this transitional gains trap.

However, this rather simplistic view of the transitional gains trap argument reflects a misunderstanding of the concept of resource rents and confuses several important issues. First it may be equating the creation of desirable resource rent with undesirable monopoly rents. Monopoly rents arise when a sole supplier or buyer can charge a higher price to buyers or pay a lower price to suppliers due to their market position. This situation leads to inefficient resource allocations and concerns about equity. However, monopolies rarely exist in fisheries and even if there is a concentration of ownership in one region or sector, the availability of the same or similar fish from other countries and regions mean a commercial seafood company is generally a price taker and unable to generate monopoly rents.

Second, and more importantly, it views rents as somehow unearned and a windfall to those who receive them. However, a significant portion of the asset value of a resource arises from rents generated by the innovation and enterprise of the resource extracting sector (see Attachment B for a more detailed discussion of the concept of Resource Rent). These resource rents are very different from unearned monopoly rents or windfall gains and arise because natural resources, like any other economic good, are scarce and can be sold for a price which is higher than the costs of extraction. Without investment and innovation the resource would remain underutilized with little or no rent generated. Neither are resource rents independent of the prevailing regulatory regime. Regulation affects the amount of resource rent generated because it either creates incentives or disincentives for investments and innovation.

Unlike monopoly rents and windfall gains, resource rents can represent efficiency and sustainability and therefore are a benefit to society. Creating a Limited Access Privilege System with either fixed duration or a relatively unlimited or "rolling" duration does two things:

- It allows those who have created an asset value for the resource through investment, innovation and entrepreneurship to capture a portion of that value through the sale or leasing of privileges.
- It encourages new entrants to enter a sector because they now have the potential to extract a proportional share of the future benefits created from rents generated by their ongoing investment, innovation and entrepreneurship.

From this perspective, individuals arguing against the unfairness of the "transitional gains trap" may be overstating the inequality aspects of the issue. In fact, rather than creating an inequality, a Limited Access Privileges Program may address an existing inequality where participants in a fishery have previously been unable to capitalize the benefits generated by their investment, entrepreneurship and innovation (Harte and Barton 2007). By establishing a tradable privilege with an asset value, participants can now obtain some of the benefits they have created.

Another equity issue regarding permanent privileges is that of the perceived private ownership of a public resource. Even though marine organisms in U.S. waters are the property of the people of the U.S. until they are captured, and will remain so under a Limited Access Privilege Program, fixed term privileges may have a moderating effect on public concerns regarding this issue (Macinko 2008).

F.3.1.6 *Interplay of duration, economic, ecological and institutional variables*

Recent modeling work by Costello and Kaffine (2008) shows that the value, growth characteristics and duration of the harvest privilege all impact incentives for resource stewardship and economic efficiency. Modeling the abalone and spiny lobster fisheries in Baja California, Mexico the authors demonstrate how limited duration privileges could induce resource stewardship. However for slower growing stocks, either a long tenure period or high certainty of renewal is required to induce stewardship. This finding is consistent with work by Larkin et al. (2006) who showed that stock growth rates fundamentally impact the economically efficient management strategy for overfished stocks required to meet a mandated rebuilding target. Importantly, Costello and Kaffine show that a tenure system will encourage stewardship depending on the tenure length, the probability of renewal (as a function of the probability of achieving a predetermined "escapement" level), and the economic and biological characteristics of the fishery. Although modeled for relatively high value single species fisheries, this work demonstrates the context specific nature of the complex relationship between stock characteristics, duration of fishing privileges and the certainty of privilege renewal.

F.3.1.7 *International treatment of the duration of fishing privileges*

Globally there is no consistent pattern to the duration of fisheries privileges. They range from annual to perpetual. For example, in New Zealand privileges are held in perpetuity (Harte, *et al.* 2008) while in the Falkland Islands privileges are held for 25 years (Harte and Barton 2007). In Canada, privileges are granted "annually" while in Australia they vary from fishery to fishery depending on the duration of the management plan (Arnason 2001).

With few exceptions (notably several fisheries in Chile) privileges have what Anderson and Holliday (2007) call *rolling conditional permanence.* For example, in both the Canadian and Australian situation the continual renewal of short-term privileges has resulted in the expectations by holders and management agencies that the privileges are a form of rolling conditional privileges. Holders of such privileges have a legal or procedural expectation based on precedence that their basic privilege to access a fishery will be renewed before or when it expires. As noted earlier it is the certainty associated with the management of the fishery that matters as much as the statutory duration of the privilege when it comes to the perception of its value by the asset owner and the broader marketplace.

F.3.2 Auctions for Privileges to Extract Public Resources

Most initial allocations of public resources have been undertaken using historical participation rules. Such first possession rules are politically popular but are complicated and often involve perceptions of wrangling and back-room dealings. They do have desirable characteristics, in that they benefit socially desirable industry pioneers, and optimal share sizes might have been determined through years of use (Libecap 2006). The allocating authority may also have tighter control over who actually ends up with the privileges (Morgan 1995). However, there are drawbacks to this method of allocation. First, they may discriminate against new entrants, initial allocations are often economically inefficient, and undesirable market situations often exist as a result of them. Auctions may not produce these effects to the same degree.

Auctions are market institutions with explicit sets of rules determining resource allocation and prices on the basis of bids from market participants (McAfee.R.P. and McMillan 1987). In the United States they have been used to sell treasury notes, landing slots at busy airports, parts of the electromagnetic spectrum for use by cellular phone companies, electricity transmission time slots, pollution licenses, mineral leases such as oil and gas, timber plots for harvest, leases on grazing lands, and surface water rights. There were auction "experiments" in Estonia and Russia for allocating fishery privileges, and they are currently in use in Chile for one fishery.

Auctions have several desirable attributes. They can:

- Promote economic efficiency in the allocation of privileges.
- Generate revenue for public expenditure.
- Provide price information to market participants.
- Be designed to promote social and political goals.

F.3.2.1 *Auctions can promote economic efficiency in the allocation of scarce resources.*

Auctions can be economically desirable because those bidders with the highest and best use for the resource (i.e. those with the lowest production costs or the ability to gain a price advantage) will be willing to pay the most for the privilege of utilizing the resource therefore promoting economic efficiency (Libecap 2006; McMillan 1994; Morgan 1995). However, efficiency in the auction process itself may not guarantee an efficient industry (Longo 2003). An economically efficient sector depends as much on the operating rules that are made by the management authority as the initial allocation of privileges.

F.3.2.2 *Auctions may be a suitable royalty recovery mechanism.*

Many argue that the public should be compensated by private companies via royalties for the right to use a public resource (Anderson and Holliday 2007). Auctions may be an effective mechanism for collecting royalties as the resource users themselves establish the level of rent they think is present in the bids they submit (Morgan 1995). Auctions were used to great effect in collecting resource rent from the sale of radio spectrum licenses in 1994, when over $10 billion in revenue was collected (McMillan 1994).

It can be difficult to establish the amount that society should be compensated for a right to access a resource. As owners of the resource the public is clearly due a portion of the rents generated in a fishery (see Attachment B for a more detailed discussion of resource rents). But resource rent is a dynamic concept rather than a simple fixed amount. Industry may generate new rents through innovation, lower production costs, market development, and improved science and resource management. Leaving a proportion with the industry provides an incentive to invest in the fishery and improve economic performance. Total rents accruing to both the public (through general taxation and reinvestment in the economy) and private sectors will increase. If an auction extracts all forms of

rents then this incentive is removed. Allowing industry to retain a portion of rents may actually optimize the total rents that could be accrued by government (a concept analogous to an "optimal" tax rate and backward bending supply of tax revenue). Allowing industry to retain rents can be especially important when access to capital is limited and/or external investors view the sector as risky.

A second and related issue is that it is difficult to identify the rent that is due to the public ownership of the fishery. Rents are the residual that remain after subtracting costs of production from gross revenue. They include the "highliner rents" ("inframarginal" rents) earned by participants who have unique skills or knowledge that enables them to produce at lower costs than other companies operating under the same conditions. It would be a mistake if rent recovery policies sought these rents.

Anderson (2001, p.36) sums up this debate:

> *The rent from a fishery is determined by the size and reproductive capacity of the fish stock and the types and amounts of fixed and variable inputs that are used to catch, process, and market the fish. It is difficult if not impossible, to state how much is due to the fish stock and how much is due to the choice of inputs. The creation of rights-based fishing if done correctly provides the incentives for owners to select the appropriate inputs. Care must be taken to insure that incentives to seek out and implement new ways of production are not unduly weakened.*

F.3.2.3 *Auctions are particularly useful when asymmetries of information exist*

When one party has more information than another, the auction provides a mechanism to communicate that information in a simple way. All the available information underlying supply and demand is incorporated into the price of that item so all that a buyer or seller needs to know to make a rational decision is that price. They may also be desirable when the government has little idea about the value of the privileges for sale.

F.3.2.4 *Auctions may be designed to take social and political goals into account*

As compared to administrative allocations that often occur behind closed doors, auctions are a transparent method of allocating public resources. The auction process is generally an open one, with the rules set in advance, and can avoid claims of favoritism, influence by politically powerful movers, and corruption. This may be extremely important in gaining public acceptance for the process of allocating a public resource. Auctions were used in Russia partly as a way of bringing the allocation process into the public eye and allegations of corruption were reduced (Anferova, *et al.* 2005).

Favoring certain bidders may be justified if willingness-to-pay does not reflect social value (McMillan 1994). For instance, the preservation of disadvantaged small-scale communities may be desirable. Similarly minority groups, small companies, or other previously disadvantaged groups may not be able to compete at auction. There are several ways that they can be taken into account:

- Entry restrictions help ensure that only certain targeted participants can take part in an auction
- A price preference can be granted to certain classes of bidders, such as small scale operators, minorities, or firms that exhibit better than normal environmental stewardship.
- Set-asides for some or all of the resource can be created. A certain amount of privileges may be withheld from the general auction for side-auctions (or perhaps allocation by another method) to designated bidders.

It can be the case that existing participants in an industry will cooperate with each other to create favorable market distortions. In these cases, it may be desirable to introduce new entrants. Auctions can be a fair and transparent way of re-allocating privileges (Anferova et al. 2005).

Although auctions are generally held to be an economically efficient method of allocating resources, they may also be designed to provide political flexibility. The simple auction design of "highest bidder wins" does not have to follow, and governments can manipulate auction design to address policy goals in a variety of ways. Social objectives can be incorporated into auction design, but any such alteration of the unrestricted auction structure to incorporate these considerations will likely entail a loss of economic efficiency. There is, therefore, a tradeoff between the efficiency benefits of auctions and their ability to achieve social objectives.

Having many benefits, auctions also have limitations:

- Auctions may be subject to collusion or gaming by potential bidders and may not reflect actual rents generated.
- Auctions for annual or short term privileges give no or limited security of access to holders and may lead them to focus on exploitation rather than value added activities, and in poorly enforced fisheries, may lead to over-fishing.
- Small fishing companies may not have access to the finance or subsidies that larger entities have access to, handicapping them in auctions. Arrangements that favor smaller companies distort the auction market and may lead to lower rents being generated or a smaller proportion of the rents being collected.
- Auctions for long term rights will result in one-off payments to the government that then requires the government to invest wisely if a long term income stream is desired.
- Bid prices for long term rights may be highly discounted by the commercial industry given the financial risk involved in many fisheries.

F.3.2.5 *Examples of auctions for fishery privileges*

Fishery privileges were auctioned in the Russia Far East from 2001-2003 (Anferova et al. 2005), in Estonia from 2001-2003(Vetemaa, *et al.* 2001; Vetemaa, *et al.* 2005), and in Chile for the Patagonian toothfish fishery (Gonzales, *et al.* 2001).

In 1991 Chile introduced an auction system for privileges in a new, large-scale industrial fishery targeting Patagonian toothfish (Gonzalez et al. 2001). The auction system was designed to provide equal opportunities for bidders, provide revenue for the state budget, and to avoid monopolies in the market for fishing rights. It was also seen as a way of minimizing complaints and conflicts among fishing interests. As the fishery was fairly new, no change in the structure or distribution of the fishery was needed. Fishing companies in the fishery at the time the auction system was implemented were granted prior-use rights. Initially they were allowed to continue their fishing activities for a period of three years, and after this period were granted permits totaling 10 percent of the allowable catch. These permits had a term of 10 years. The fraction of the allowable catch allocated to firms decreased by 10 percent each year and the 10 percent was then re-auctioned

Auctions for fishery quota in Estonia were first implemented in 2001 (Vetemaa et al. 2001; Vetemaa et al. 2005). Prior to 2000, fishing privileges were of indefinite duration. However, with the new system privileges depreciated by 10 percent annually and the 10 percent reclaimed was to be sold at annual auction. This was intended to promote new entry and provide revenue to the government. The other 90 percent was allocated according to historical participation criteria. Despite its apparent success in meeting its objectives for revenue generation and transparency, the auction system was abolished for political reasons in 2003.

Auctions for fishing quota were employed in Russia from 2001-2003 (Anferova et al. 2005). The main purposes of the Russian auctions were to allocate fishery quota in a fair, transparent manner, and to increase the share of resource rents accruing to government. A maximum of 20 percent of the quota would be allocated by auction on a yearly basis. There was a considerable increase in state

revenues as a result of the auctions, and it was felt that the auction system was transparent. However, although the auction system proved successful in increasing state revenues, it was abolished due to ongoing implementation issues and its perceived negative impact on the economic performance of the fishing fleet.

F.3.3 Discussion

A review of the literature suggests that both permanent privileges and limited term privileges have advantages and disadvantages. Permanent privileges have two potential benefits:

- The homogenous nature of the privileges may reduce the level of transaction costs at which the industry operates.
- Permanent privileges are more secure privileges, and may increase incentives for long term investment in the industry, and for resource stewardship.

Fixed terms privileges have the benefit of potentially providing:

- Flexibility for managers to adjust the regulatory environment.
- A balance between the benefit of clear, appropriate and enforceable private privileges and the public ownership of many natural resources.

Limited access privilege type systems operate around the world with a high degree of variability in their statutory duration. Most, if not all, are considered successful in promoting resource stewardship and economic viability of the fishery. This suggests that it is the overall "quality" of the privilege that matters. A high quality title is certain and secure. Certainty and security are increased proportionately with the predictability of the privilege. The more certain and secure the privilege the more likely are fishers to invest in capital and the fisheries to enhance the quality of their catch. Furthermore, the more certain and secure the privileges, the more likely that financial institutions will accept title as collateral against loans.

Limited duration privileges are often promoted on the grounds that they increase management flexibility because the system can be changed on the expiry of rights. In practice, the management system is always under review. This occurs in two ways:

- Through the monitoring of individual companies' compliance behavior and performance.
- Through going oversight of the management system by management agencies, the industry and other stakeholders.

This means any issues arising from the limited access privilege system will be identified and regulations and policies changed in response. Adaptive management provisions are common in fisheries legislation and fisheries management plans around the world.

Many amendments can be introduced into the auction system that may serve social or community goals well but some of the economic efficiency benefits might be lost. For example, set-asides or price preferences for minority groups or small fishing communities may introduce distortions that may be politically desirable, but the economic benefits of auctions could be significantly reduced. In these cases where social and community objectives are more important than economic efficiency and government revenue generation, alternative allocation methods may be more suitable.

Efficient re-allocations may also be made through a functional secondary market, such as that for North Pacific halibut and sablefish IFQs. In Iceland, electronic auctions are held which has the effect of broadening the participation in the auction and increasing competition. Increased competition decreases the chance of collusion occurring and also increases the prices that privileges sell for (Arnason 2001).

Auctions can be efficient revenue raisers for management agencies, transferring a portion of the rents generated in a fishery to the government. A one-off auction of initial rights will see a one-off collection of royalties. Rolling auctions through the take back of privileges from existing holders produce a steady revenue flow but can have considerable distributional and equity consequences for fishery participants.

Auctions are commonly used to allocate natural resources, but rarely in fisheries. Trondheim (2004) suggests fishery privileges have heterogeneous product attributes that have various values. Knowledge about the current status of the fishery resource and its future status is very limited compared to other natural resources such as forests, minerals, water and oil and gas. And while auctions may occur on a stock by stock basis, these stocks are also economically and ecologically interdependent. Auction design may be many times more complicated for fisheries resources than for other natural resources and the potential for unintended consequences far greater.

Auctions appear most effective in new fisheries with few participants or a significant history of industry participation, such as the Chilean Patagonian toothfish fishery, and where catch history allocations have not been made in the past. They can be designed to take a range of policy goals into account.

The allocative efficiency properties of auctions are highly desirable in situations where economic efficiency and fleet capacity reduction are important policy goals. In situations where auctions for fishing privileges have been used, initial allocative efficiency appears to have been achieved. Their limited use in fisheries appears due to concerns about distributional impacts, perceived complexity of design and administration and a lack of popularity with fishery participants and administrators vis-à-vis non-auction alternatives.

F.4 Analysis of Fixed Term/Auction Option versus Council's Preferred Option: Cross Cutting Issues

F.4.1 Introduction

The previous sections of this report described the characteristics of the West Coast Limited Entry Groundfish Trawl Fishery and reviewed the advantages and disadvantages of fixed term tenure and auction systems for achieving alternative objectives in managing fisheries and other natural resources.

This section and section 5 evaluate the advantages/disadvantages and costs/benefits of the fixed term/auction alternative relative to the Council's preferred auction given the specific characteristics of the trawl fishery. Particular emphasis is given to the potential dynamic effects on the fishery from combining fixed term quota shares with an auction of up to 20 percent of the quota shares previously held by participants in the fishery. Previous sections, in contrast, focused on the benefits and costs of auctions and limited duration privileges as independent policy options.

The analysis is based on two assumptions regarding intent of the Council:

- The Council is attempting to strike a balance between pure economic efficiency, environmental protection, and support for social needs and communities in order to increase net regional and national benefits. This assumption is consistent with the first goal in the Trawl Rationalization Plan (see Chapter 1 in the main document). It is also consistent with the combination of preferred alternatives that are not solely focused on efficiency (e.g., relatively small ownership caps on individual IFQs), and concern about communities (e.g., holdback of 10 percent of quota to be distributed to selected communities).

- The Council will continue to use adaptive techniques to improve management of the limited entry trawl fishery including tools and incentives in addition to those incorporated in the preferred option of the West Coast Limited Entry Groundfish Trawl Rationalization Plan.

F.4.2 Wealth Creation (Rents) and Economic Efficiency

The comparative analysis on the limited term/auction option versus the Council's preferred option with respect to rents and economic efficiency rests on the following assumptions:

- Rents and economic efficiency are dynamic concepts. Rents in the trawl groundfish fishery are created over time due to the entrepreneurial activity of industry and supporting sectors given prevailing institutions, incentives, and regulations. Rents can result from investment in all key aspects of the fishery including production, management, and science.

- The amount and time stream of rents are influenced by many factors including the design of the management system and fishing privileges. These design features include all the tools which the Council uses to manage groundfish including tools that influence harvest, allocation, and rationalization.

A more detailed discussion of resource rents and their creation can be found in Attachment B.

The remaining part of this analysis is based on the comparative advantages and disadvantages of the two options based on Section 3 and Attachment A. For each of the major issues, we provide a comparative discussion and analysis given the fundamental features of the west coast limited entry groundfish trawl fishery.

F.4.2.1 *Impact of a Wasting Asset*

As described in Section 2, the west coast limited entry trawl fishery is a complex fishery characterized by multiple assemblages and species, multiple sectors, severely binding quotas (rebuilding rockfish), multiple biological habitats, and coastal communities with supporting infrastructure spread over a 1,200 mile of coastline. Under the preferred alternative, the "rolling conditional permanence" LAPP (Anderson and Holliday 2007) would allow quota holders over time to build a complex portfolio of species to meet their specific business needs and the unique characteristics of their operations (geography, markets, personal expertise, and capital configuration (e.g., vessel size and design)). Quota holders would be expected to alter the quota configurations (both leases and assets) in response to changing resource conditions and changing environments, markets, and regulations. Quota holders would also be expected to invest in new markets and technologies -- and as their past history demonstrates -- engage in co-management, science and cooperative ventures with industry, agency, and community partners. Given the complexity of the challenges and the slow growth of some stocks, returns on investment could take 10, 20, and 30 years or more. Given the assurance of "rolling conditional permanence" quota holders would be willing to invest in projects that increase profits and create entrepreneurial rents over relatively long periods of time.

In contrast to the Council's preferred alternative, the fixed term/auction alternative causes the IFQ quota to become a "wasting asset" as describe in Section 3. This implies that its asset and rental value will decline over time as the end point approaches (in this case end points given that 20 percent of the quota must be given up every two years). Flexibility would be reduced and economic theory suggests that quota holders would be less likely to invest in their operations, research, or management as the end point approaches given diminishing opportunities to realize a return on investment. An individual wishing to acquire additional catch shares, or enter the fishery, could decide to wait until future allocations take place, leaving potential sellers at a disadvantage.

Asset values would significantly drop and approach the annual lease price value. Although many fishermen might plan to stay in the fishery and bid for quota, asset values and total rents would remain lower than the Council's preferred option. True entrepreneurial rents, that is those rents created due to the investment and innovation of the industry would be reduced. Given the absence of empirical data on this option, it is impossible to determine the relative degree of loss rents; but based on the complexity and heterogeneity of the fishery it could be significant, particularly if 20 percent of the operator's IFQ was auctioned.

F.4.2.2 *Limiting and extracting entrepreneurial rents*

Unless carefully designed, one of the challenges of fixed tenure or auctions is that they can reduce the amount of rents created in the fishery due to disincentives. Anderson and Holliday (2007), in their discussion of LAPPS and rent recovery schemes, cautioned against weakening incentives for rent creation and "destroying the goose that lays the golden egg." Possibly a more apt analogy would be "destroying the goose with potential to lay two, three, or more golden eggs." Wilen (2005) estimated that worldwide, fisheries managed under rights-based schemes could generate $80 billion in rents, an amount $30 billion higher than comparable studies. He bases his estimate on the rent-creating potential of fisheries due to entrepreneurial innovation.

The fixed term/auction option can limit entrepreneurial creation of rents in two ways: 1) through disincentives associated with the fixed term that would discourage investment and innovation; and, 2) an auction design that after years 15 or 16 would take 20 percent of the quota and associated resource rent and return it to the government every two years. The rents associated with potential entrepreneurial innovation in the trawl fishery, whether it is in production, marketing, science, or management, would be lost in forced auctions to those who did not create them (government). This would discourage the very creation of the rents and wealth in the first place (which is why patent laws protect intellectual property for a reasonable period of time, e.g., 30 years). A fundamental question is whether an average quota term of five to six years (portfolios would include a mix of termed assets ranging from 10 to 2 years or less) is a long enough period to induce innovation and return on investment?

There may be configurations of auctions and/or tenure that could potentially optimize rents and rent creation while sharing rents with the public. The type of auction and tenure system embodied in this alternative, however, appears to create disincentives to entrepreneurial rent creation.

F.4.2.3 *Increasing risk and uncertainty*

Fishing is a risky business and high risks have the potential to reduce rents. Given fishing's inherent risk, a primary objective of fishery management should be to reduce risks, or at a minimum, not exacerbate risks through poorly conceived management strategies, (dis)incentives, and institutions.

Given ownership caps, most quota will be owned by family-owned firms with (presumably) less access to financial tools to manage risks relative to larger companies (the exception being larger processors and the catcher-processing sector of the at-sea Pacific whiting fleet). Due to information asymmetries and relatively higher proportional transaction costs, small firms must also rely, to a greater degree than large firms, on the value of their assets to collateralize loans (Brewer 2007; Hutchinson 1999). The complex and high risk nature of the west coast trawl fishery suggest that fishermen in an IFQ fishery will attempt to address risks through the types of quota portfolios they inherit and purchase over time. Some of these risks may be substantial given the complex substitute/complement nature of the assets and the constraints associated with bycatch and overfished stocks. Having an extra 100 pounds of canary or yelloweye rockfish may be critical to both asset value and risk management strategies. One would expect that each fishermen holding quota would build an "optimal" quota portfolio that matched their business and risk management strategies.

The fixed term/auction alternative may increase risks in potentially three ways. First, as the fifteen year term unfolds, asset values will be influenced, not only by changes in the normal activities of the quota markets, but through the influence of the "wasting" characteristics of the asset. This will become more pronounced as the term expires and quota holders relinquish twenty percent of their portfolios. Given the potentially "balanced" nature of the quota holdings, this could increase the risks associated with holding and trading quota given changing market conditions. Secondly, the quota holders will face risk given their uncertain financial situation when the expected first auction takes place. Quota holders will be forced to relinquish and then buy back quota regardless of their financial situation—this will also create risk. And third, prices at the auction may be uncertain given the large amount of quota available at the auction and the limited 10 year tenure associated with 20 percent of the quota. Risk/uncertainty may also be increased due to high and possibly speculative prices for bycatch constraining stocks.

Given the impacts on risks/uncertainty, the fixed term/auction alternative will reduce rents relative to the Council's preferred option. This may even be true for the 5 percent auction given the critical importance (and presumably high price) of the constraining bycatch stocks.

F.4.2.4 *Summary*

The comparative qualitative analysis indicates that on balance, the Council's preferred option relative to the fixed term/auction results in significantly higher rents and economic efficiency through incentives for entrepreneurial innovation, rent creation, and reduction in risk and uncertainty. In contrast the fixed term/auction alternatives generate less rent due to the disincentives for rent creation and greater risk and uncertainty. The auction system may provide for moderate gains in new entrants and price discovery but this depends on whether secondary market will function efficiently. The analysis suggests that developing LAPP systems perceived as "fair" while also producing significant entrepreneurial rents is an important challenge.

The qualitative results of the analysis can also be represented if Figure 4.1. Over time rents will increase for the Council's preferred option due to creation of entrepreneurial rents and reduction in risk and uncertainty. The fixed term/auction alternatives generate less initial rents and rents decrease over time due to the "wasting effects" of the fixed term, decrease in entrepreneurial rents, and greater risk and uncertainty due to the timing and structure of the auction system. As shown by the 5 percent and 20 percent auction curves, the loss of economic rents increases as the auction approaches.

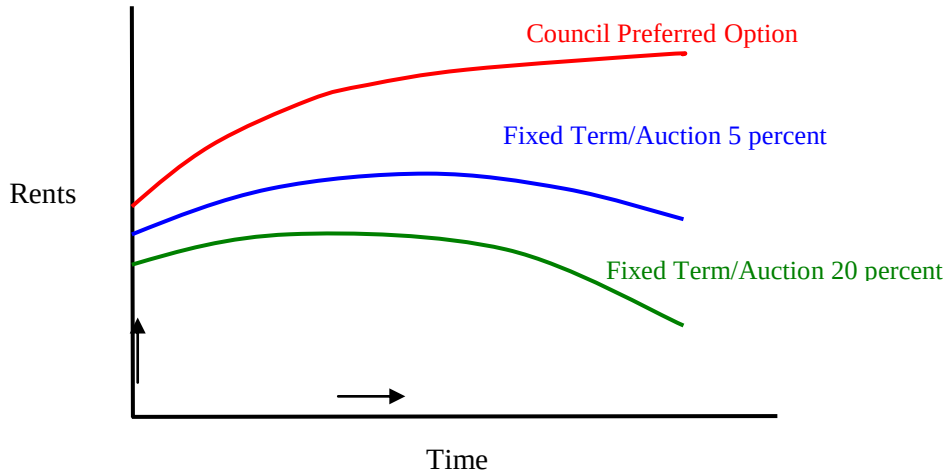


Figure F-1. The level of rents across time as a function of the Council's preferred option, fixed term/5 percent auction, and fixed term/20 percent auction.

F.4.3 Incentives for Resource Stewardship

The history of the west coast groundfish trawl fishery demonstrates the difficult and sometimes contentious issues associated with conserving stocks and managing anthropogenic effects on marine ecosystems. The Council has made major efforts in managing these effects including mandating MSY stock levels, eliminating trawl roller gear, creating rockfish conservation zones, establishing trawl closure areas, reducing effort through vessel and permit buybacks, and rebuilding overfished stocks. Many of these decisions were difficult and at times wrenching given their economic and social impacts. Some of these efforts were required under the MSA, while others were developed by the Council as the best approach to conserve groundfish stocks and ecosystems.

As discussed in Section 3 and Attachment A, the creation of rights and privileges is expected to generally have a "stewardship effect" if the assets are relatively well defined, have long duration, and are reasonably secure. These features induce asset holders to conserve the stock over time in order to enhance overall profits, increase entrepreneurial rents, and maximize quota (asset) value. Reviews of rights based fisheries in New Zealand, the United States, Canada, and other nations generally provide supporting evidence for conservation and stewardship of the targeted resource and habitats.

Conversely, inadequate stock conservation and protection of supporting habitats and ecosystems could potentially reduce long term profits, rents, and asset values. As Section 3 points out, some analysis believe that even a well designed rights based system may not lead to long term conservation of stocks and ecosystems if fishermen have high rates-of-time-preference (high discount rates) and/or stocks are relatively slow growing and unproductive.

Whether the Council's preferred option would have stronger stewardship effects relative to the fixed term/auction is partially determined by the types of impacts that the groundfish industry could produce. Most of these effects would not be generated by a single fisherman but would be produced in aggregate by all groundfish trawlers owning assets or annual leases. These impacts would fall into three classes:

- Class I: Adverse resource impacts caused by a user group's collective "club" good (e.g., groundfish quota holders) which reduces the productivity of the groundfish resource and lowers the asset value of their user privilege. This might take the form of excessively targeting units of the resource important for reproduction and recruitment (e.g., "big fat old females") or destroying habitats important for spawning and feeding (rocky reefs).

- Class II: Adverse impacts are caused by a second party's activities (e.g., a second group of fishermen) that reduce the productivity of the resource and lower the asset value of the first group's property right. This might include fishermen targeting important prey species or damaging the environment through inappropriate use of gear.

- Class III: Adverse impacts are caused by a user group's activities but do not influence the productivity of the asset-related resource, nor directly lower the asset value of their user right. For example, quota owning trawl fishermen may fish using methods that do not significantly impact the productivity of the commercially targeted groundfish but may adversely impact other aspects of the resource (e.g., excessive bycatch of non quota species).

For class I and II impacts, the groundfish quota holders will have incentives to collectively "internalize" the externalities -- even without direct intervention by the Council -- including voluntary management and enforcement. For Class II impacts, groundfish quota holders would be expected to lobby the Council or use LAPP systems and quota markets (if broadly developed) to alter the behavior of the second party. Class III impacts may require the active leadership, participation, and "coercion" of the Council and regulatory/enforcement bodies in order to alter fishermen behavior.

The remaining part of this analysis is based on the comparative advantages and disadvantages discussed in Section 3 and Attachment A. For the two "stewardship" related issues discussed below we provide a comparative analysis given the fundamental features of the west coast limited entry groundfish trawl fishery.

F.4.3.1 *Stewardship effects of a wasting asset*

Similar to the discussion on rents, the fixed term/auction alternative would have a "wasting asset" effect on quota values due to potentially inadequate investment in stewardship. Assuming that the long term health of the stock and supporting environment has an important positive affect on groundfish asset values, under the preferred option one would expect LAPP groundfish quota holders to invest in voluntary resource conservation, habitat protection, and scientific research leading to improved resources, environments, and asset values. This would be especially true for Type I and Type II impacts. Given the difficult problems associated with bycatch of rebuilding stocks, one would also expect strong investment in conserving and avoiding quota-based "bycatch" stocks. The expected high quota value of bycatch rebuilding stocks, coupled with the high costs of exceeding bycatch quota, would reinforce active stewardship behavior.

In contrast, the fixed term/auction options would induce a "wasting asset" effect, reduce rents and entrepreneurial innovation, and inhibit efforts to reduce Type I and Type II resource and environmental impacts. As time progressed toward the 15th year, incentives for stewardship would decrease, and given the inhibitory effects of the biennial auctions on entrepreneurial rent creation, would decrease conservation investment. The degree of effects could be similar to those illustrated in Figure 4.1.

Two additional points should be noted. The first is that for Type III impacts, neither option would necessarily induce a stewardship effect. Second, is that other tools used by the Council to incentivize or regulate stewardship behavior, combined with market influences to reward stewardship, could somewhat mitigate stewardship differences between the two options. In general, however, relatively secure rights with higher rent creative potentials should induce a stronger stewardship effect than options without these virtues.

F.4.3.2 *Stewardship effect of impacts on discount rates*

As discussed in Section 3 and Attachment A, some analysts argue that the "iron law of the discount rate" favors fixed tenure systems. This "law" suggests that fishermen with high discount rates would under-invest in stewardship regardless of tenure length, particularly for slower growing stocks. Given this problem, they argue that tenure systems coupled with auctions would provide an opportunity for resource managers to adjust the system to better encourage stewardship through improved regulation and incentives for conservation-based participants.

There is, however, little empirical evidence supporting the argument that fishing industries have higher intrinsic discount rates than other sectors of society, particularly with respect to financial activities and investment. It is true that fishermen can be observed engaging in risky and destructive behaviors that put fishery resources at risk. However, these behaviors usually reflect poorly crafted institutions that create open access conditions and race-for-the-resource business strategies. Fishermen reflect their institutions, and apparent destructive behaviors are as much a function of the management system than any inherent high discount rate. In general, poorly regulated or open access fisheries will tend to attract individuals with high discount rates who "prosper" in such systems (at least in the short run). Conversely, well managed fisheries with incentives and rights that motivate entrepreneurship and innovative will tend to attract risk averse fishermen and quota asset holders with lower discount rates. Studies of New Zealand's rights based fisheries including groundfish (Harte, *et al.* 2008) suggests that implicit discount rates based on the observed ratio of nominal lease and asset

prices are quite reasonable, (8 to 22 percent), particularly given the inherent risk in using and managing marine natural resources.

Given these arguments there is no prior reason to expect that the fixed tenure/auction option will increase stewardship and conservation relative to the Council's preferred option; in fact the converse is probably true. In addition, as a backstop measure, any behavior by fishermen leading to violation of MSA conservation standards would result in the revocation of the privilege or additional regulation constraining harvest activities.

F.4.4 Impacts on Communities

Pacific Management Council staff identify some 38 cities and 18 counties as vulnerable commercial/and or recreational fishing communities. Four cities and six counties are identified as most vulnerable. The cities are: Garibaldi, Ilwaco, Moss Landing, and Neah Bay. The counties are: Coos, Grays Harbor, Humboldt, Lincoln, Mendocino, and Pacific counties (Pacific Fisheries Management Council 2006).

The rationalization of the Groundfish limited entry trawl fishery is anticipated to have the following impacts on communities (Pacific Fisheries Management Council 2008):

- More economically efficient vessels are expected to remain in the fishery, while less efficient vessels leave the fishery. Communities with inefficient vessels or operators may see greater levels of exit behavior.

- Ports that have a higher degree of fishing support business (agglomeration) make it easier and more efficient for operators to conduct day-to-day activities and may favor some communities over other communities.

- All things being equal, communities with vessels that have a longer travel time to fishing ground will be at a disadvantage when compared to other regions.

- Ports that are adjacent to fishing grounds with a high abundance of over-fished stocks subject to rebuilding mandates would also be at a disadvantage encouraging operators to move to areas with lower abundance.

Fixed term privileges and the auctioning of up to 20 percent of Quota Shares every two years will likely have three effects:

- It will exacerbate the disadvantages already faced by communities and ports with vessels that have a long travel time to fishing grounds, have less successful operators, more costly vessels, and fewer few support businesses.

- The negative impacts of the fixed term/auction alternative will be felt earlier in the most vulnerable communities compared to less vulnerable communities.

- It will create disincentives for collaborative community initiatives such as the creation of statutory Fishing Communities and Regional Fisheries Associations. These disincentives will be felt more strongly in disadvantaged communities.

These expectations are due to the increased uncertainty associated with both the loss of harvest privileges and the need to have access to sufficient capital to participate in the auction to regain or increase quota share holdings. Operators with marginally profitable businesses are more likely to form a higher proportion of operators in disadvantaged communities. They are more likely to sell their Quota Shares and exit the fishery long before the fixed term duration of the privilege turns it into

a wasting asset. Purchasers of these privileges are more likely to be based in more prosperous fishing communities and have access to the capital necessary to take full advantage of the auction system.

Moreover, fishing communities and ports make infrastructure investments with a 30-plus year time horizon. This is well beyond the proposed 15 year fixed term for quota shares. Disadvantaged communities face a higher degree of uncertainty about future level of participation in the groundfish fishery than other fishing communities and may therefore be more risk adverse when deciding about infrastructure investment. This may result in a declining infrastructure base in disadvantaged communities that is increasingly less attractive compared to other communities. Operators will then be more likely to move to ports and communities with better infrastructure to support their operation.

It can be argued that the fixed term/auction alternative potentially allows operators or port-owned entities in disadvantaged communities to form a cooperative-type entity to bid for quota shares and thus retain fishery participants. The MSA provides for both the creation of formal Fishing Communities and Regional Fishery Associations. However, as long as there are efficient secondary markets in privileges these entities will be able to do this in the absence of fixed term privileges and auctions. Cooperative entities will also still face competition in auctions from operators and entities based in more prosperous communities. Irrespective of an efficient secondary market for privileges and the opportunity to acquire quota shares through auction, the loss of up to 20 percent of quota shares every two years may also create major disincentives for any operator, community or port to enter into a cooperative arrangement, This is because of the need for ongoing funds required to sustain the cooperatives' overall holding of privileges. These disincentives become larger the greater the size of the quota takeback.

The Management Council's preferred option contains an Adaptive Management provision. This creates a potential mechanism to assist disadvantaged fishing communities by setting aside 10 percent of the Quota Poundage each year to create incentives for community development, among other purposes. If used to assist communities to remain viable competitive ports, the imposition of fixed term/auction alternative in 15 years could undermine the adaptive management program. This is because the increased uncertainty created by the fixed term/auction alternative disproportionately impacts disadvantaged communities undermining potential gains from the adaptive management program.

F.5 Analysis of Fixed Term/Auction Option versus Council's Preferred Option: Management Goals and Objectives

This section first evaluates the Council's preferred option against the fixed term/auction option with respect to key management goals and objectives for the West Coast Groundfish Trawl Fishery. This evaluation is informed by discussion and analysis in Sections 3 and 4. The goals and objectives for Groundfish Management and Groundfish Rationalization are listed in Chapter 1 of the main document. Second, the section qualitatively scores the relative strengths and weaknesses of the fixed term/auction against the preferred option in Table 4.1. It concludes with a brief discussion of key findings.

F.5.1 Conservation (also see Section 4)

The Council's preferred option provides greater incentives to conserve resources, habitats, and ecosystems than the fixed term/auction alternative. Due to wasting effects, reduction in entrepreneurial rents, and greater risks and uncertainty, the fixed term/auction alternatives significantly reduces resource and habitat conservation efforts over time. Although auctions could be designed to reward conservation efforts, this would be at potentially high costs in lost economic efficiency. There is no evidence that fishermen or quota holders have intrinsically high discount rates that would inhibit them from investing in habitat and resource conservation efforts having moderate or long pay back periods. Class III type environmental impacts may not result in environmental or conservation efforts for either option but would require Council regulatory action and enforcement

including revocation of LAPP privileges. The negative impacts are greater with the 20 percent relative to the 5 percent auction.

F.5.2 Net Economic Benefits (also see Section 4)

The Council's preferred option relative to the fixed term/auction results in significantly higher rents and net economic benefits through incentives for entrepreneurial innovation, rent creation, and reduction in risk and uncertainty. In contrast the fixed term/auction alternatives generate less rent due to the disincentives for rent creation and greater risk and uncertainty. Net economic benefits are lower with the 20 percent auction option relative to the 5 percent.

The auction system may provide for moderate gains due to price discovery and rebalancing price asymmetries but this depends on whether secondary market will function efficiently. The analysis suggests that developing LAPPS systems perceived as "fair" while also producing significant entrepreneurial rents is an important challenge.

F.5.3 Disruption

Compared to the Council's preferred option, the fixed term/auction option will cause significant disruption to the fishing, marketing procedures, and the environment. This is because of the uncertainty that the loss of up to 20 percent of privileges introduces to harvest plans, processing volumes and marketing agreements. It also undermines the operators' potential commitment to the long term sustainability of the fishery and industry. The disruption could take three forms compared to the preferred option:

- Barriers to long term beneficial investments and partnerships because of the uncertainty created by the pending auction.
- Non-productive rent seeking behavior by sector participants in advance of the fixed term expiration and auction to 1) prevent its implementation 2) to gain strategic advantage to minimize losses from the auction processes and/or) maximize individual gains at the expense of the sector as a whole.
- Disruption to existing harvesting, processing and marketing plans following the auction as some operators fail to replace quota, others gain it and new entrants learn about the fishery and sector.

Though it is possible to predict the severity of this disruption, there is no possibility of these disruptions under the preferred option unless they come about from economic or environmental factors exogenous to the Limited Access Privilege Program.

F.5.4 Excessive shares

With respect to excessive shares there is unlikely to be a net difference between the Council's preferred option and the fixed term/auction alternative. This is because the accumulation limits (vessel and control) apply under both options. Operation of secondary markets in Quota Shares will create the same conditions affecting consolidation and quota concentration as an auction. The proposed accumulation limits should prevent any tendency for excessive geographic or consolidation occurring in either the harvesting or processing sector.

F.5.5 Fairness and Equity

A fixed term/auction system could promote fairness and equity through:

- The operation of a transparent and competitive allocation mechanism.
- Returning a share of the rents generated from the exclusive use of a public resource.

Nevertheless, exiting inequities with respect to fishing community wellbeing, market position and access to capital could be exacerbated with an auction system leading to a bigger gap between the best performing operators and communities and the poorer performer operators and their communities. On balance the larger the takeback of quota shares the larger the potential for negative impacts on fairness and equity in the groundfish fishery.

F.5.6 Sector Health

The Council's preferred option would promote greater sector health than the fixed term/auction alternatives. The preferred option would promote significantly greater efficiency, resource and habitat conservation, and reduced risk and uncertainty to the harvesting and processing sectors and the service sectors that support them. Quota holders would be expected to develop "optimal" portfolios of quota that met specific business needs. Harvesters and processors would be encouraged to develop long term relationships based on dependable quotas to address market needs and opportunities. Communities and ports could engage with harvesters, processors, and other quota holders to develop long term arrangements and contracts that "underwrite" community investment in critical fishing and seafood industry infrastructure.

F.5.7 Community (also see Section 4)

Overall, communities and disadvantaged communities will be no better off under the fixed term/auction duration compared to the Council's preferred alternative, and disadvantaged communities could be significantly worse off vis-à-vis more prosperous fishing communities.

- It will exacerbate the disadvantages already faced by communities and ports with vessels that have a long travel time to fishing grounds, have less successful operators, more costly vessels, and fewer few support businesses.
- The negative impacts of the fixed term/auction alternative will be felt earlier in the most vulnerable communities compared to less vulnerable communities.
- It will create disincentives for collaborative community initiatives such as the creation of statutory Fishing Communities and Regional Fisheries Associations. These disincentives will be felt more strongly in disadvantaged communities.

F.5.8 Labor: Captains, Crew and Processing Plant Workers

The Council's preferred option contains provisions for an adaptive management program and secondary markets in Quota Shares and Quota Poundage will also operate giving labor opportunities for greater ownership of privileges in the fishery. The limited term/auction option although potentially increasing the availability of quota to captains and crew will also result in the loss of quota shares to operators and captains and crew already holding shares. This could negatively impact captains and crew both directly through the loss of quota they have already acquired and indirectly if the vessels they captain or crew lose access to quota.

Processing staff workers may see lower wages and less secure jobs because of the uncertainty generated by the fixed term/auction system. Because no processing company can predict the outcome of the auction process with up to 20 percent of quota shares changing hands, winners and losers from the auction process will be equally impacted by the uncertainty created by the auction process.

Impacts of a fixed term/auction system on vessel safety are difficult to anticipate relative to the Council's preferred option. A Limited Access Privilege Program generally has positive impacts on vessel safety because it ends the race to fish. A fixed term/auction system may reduce these anticipated benefits because:

- Increased uncertainty may delay or stop investment in new vessels and gear which may be safer to operate.
- Prior to an auction, operators may fish harder to make sure there they have no uncaught quota poundage if there is the possibility of losing access to the poundage the following season.

All of the potential impacts to labor are sensitive to the size of the auction and associate loss of quota from existing portfolios. The closer the auction to the proposed 20 percent quota share maximum, the greater the impact will be.

F.5.9 Small Entities and New Entrants

Due to the more limited access to capital and the smaller quota holdings, smaller entities are in a more disadvantaged position compared to larger entities under the fixed term/auction option. In particular small entities are potentially more vulnerable to the consequences of being outbid in the auction process and therefore losing up to 20 percent of their harvest privileges. This disruption of their quota portfolio could lead to an unviable business, causing them to exit the fishery and cash in their remaining quota shares. Small entities will be especially impacted by high prices for constraining stocks. Constraining stocks may have a low exvessel price but a high quota value because the availability of quota poundage or quota shares is limited because they are a constraint on the harvest of stocks with a higher exvessel price.

An auction does provide opportunities for new entrants but small-owner operators are likely to be a small minority of new entrants. Moreover, the functioning of an efficient secondary market for quota shares should provide an ongoing opportunity for new entrants to the fishery and only in the case of thin markets would an auction greatly assist new entrants.

The larger the take-back and the amount of quota auctioned each year the greater the impact on small entities and new entrants. For nonconstraining stocks the larger the auction of quota the potential for new entrants increases. At the same time a larger takeback may severely impact small entities that could end up with quota share holdings too small to fish themselves, forcing them to lease quota or exit the fishery. For constraining stocks the effects on small entities could be significant at even relatively low auction percentages.

Although auctions could provide for more efficient entrants, this may not be the case for the trawl fishery for two reasons: 1) the west coast groundfish fishery undertook a self financed buy out program that eliminated 40 percent of the fishing vessels -- theoretically this should have eliminated less efficient fishing firms; and 2) the auction occurs after 15 or 16 years of trading on the secondary market which, if operating reasonably successfully, should also function to eliminate inefficient firms.

F.5.10 Auctions and Cost recovery

The Council's preferred option provides for cost recovery of up to 3 percent of ex-vessel costs for program costs but does not provide for a system to collect royalties. This raises the question of whether or not the collection of royalties is a high priority for the Council. If it is, then the fixed/term auction option is superior to the Council's preferred option. However, there are many royalty collection mechanisms that could be built into the preferred option without the need to resort to an auction. As discussed previously, setting the level of rent extraction through a royalty mechanism is fraught with difficulty. Set too high and the mechanism may reduce rents in a fishery as it acts as disincentive to innovation, investment and entrepreneurship.

Given that any royalties collected go into the Limited Access Administrative Fund and are then made available by appropriation, there is no guarantee that this revenue will be available to promote fisheries management in the Council's management area. Royalties are a transfer payment and therefore provide no net gain to the nation but are a potential loss to the region. Moreover by

removing beneficial resource rents from the industry it reduces the capital available for reinvestment in the seafood or other wealth creating economic sectors in the region.

F.5.11 Program Performance and Management

Compared to the Council's preferred option, the fixed term/auction alternative potentially imposes significant additional administrative costs on the Management Council. Not only will an effective auction system need to be designed, set up, and operated but an administrative system must be established for taking back up to 20 percent of quota across multiple stocks and multiple owners. Outsourcing this task to the private sector could reduce administrative complexity but will still require significant regulatory oversight.

Fixed duration privileges can create the appearance of increased management flexibility because the system can be changed on the expiry of rights. However in practice, groundfish management is always under review. This means any issues arising from the Limited Access Privilege Program based system will be identified and regulations and policies changed in response.

F.5.12 Summary

Results of the qualitative comparative analysis are shown in Table 5.1. The Table highlights the relative impacts with respect to key groundfish management goals, objectives, and standards (GOS). Results demonstrate that:

- For major conservation objectives the Council's preferred option outperforms the fixed term/auctions. The lower conservation performance of the alternative option is due to the fixed term "wasting effects" and disincentives stemming from the auction's effects inhibiting conservation investment. Information effects and impacts on nongroundfish mortality are considered similar due to Type III environmental impacts.

- Net benefits and efficiency are all considered to be significantly lower for the fixed term/auction option. This is a result of the wasting effects of the fixed term, the rent creation inhibiting effects of the auction, and greater risk and uncertainty. The 20 percent auction impacts are significantly greater than the 5 percent effects.

- The fixed term/auction option will cause significant disruption to fishing and marketing strategies, and the broader business environment. This is because of the uncertainty that the loss of up to 20 percent of privileges introduces to harvest plans, processing volumes and marketing agreements. It also undermines the operators' potential commitment to the long term sustainability of the fishery and industry.

- With respect to excessive shares there is unlikely to be a net difference between the Council's preferred option and the fixed term/auction alternative. This is because the accumulation limits (vessel and control) apply under both options.

- Fairness and inequities with respect to fishing community wellbeing, market position and access to capital could be exacerbated with an auction system leading to a slightly bigger gap between the best performing operators and communities and the poorer performing operators and their communities. There would be no expected difference between the Council's preferred option and the fixed term 5 percent auction.

- The Council's preferred option would promote greater sector health than the fixed term/auction alternatives. The preferred option would promote greater efficiency, resource and habitat conservation, and reduced risk and uncertainty to the harvesting and processing sectors and the service sectors that support them. Year round marketing would be similar under both options.

Table F-1. Benefits and cost of fixed term/auction option compared to the Council's preferred auction.

Assessment Criteria	Criteria reference	Benefits (+) & Costs (–) of Fixed Term/Auction Option Compared to the Council's Preferred Auction	
		Magnitude of difference 0 No difference – or + Low – – or ++ Moderate – – – or + + + High	
		5% Auction	20% Auction
Conservation			
Allocations calculated to promote conservation	MSA - National Standard 4(b)	–	– –
LAPPs shall assist in rebuilding overfished species	MSA – 303A(c)(1)(A)	–	– –
LAPPs shall promote fishery conservation and management	MSA – 303A(c)(1)(C)(ii)	–	– –
Maintain an information flow on the status of the fishery… as the fishery occurs	GF FMP Objective 1	0	0
Reduce nongroundfish mortality	GF FMP Objective 4	0	0
Minimize adverse impacts on EFH	GF FMP – Objective 5	–	– –
Total catch accounting; Reduce bycatch, discard mortality, and ecological impacts	A-20 Objective 1 & 3	–	– –
Net Benefits and Efficiency			
Consider & provide for a[n] . . . efficient groundfish fishery	MSA - National Standard 5, A-20 Objective 6	– –	– – –
Contribute to reducing capacity	MSA - 303A(c)(1)(B)	–	– –
Attempt to achieve the greatest net economic benefit to the nation	GF FMP Objective 6	– –	– – –
Maximize the value of the groundfish resource as a whole	GF FMP Goal 2	– –	– – –
Promote measurable economic benefits	A-20 Objective 6	– –	– – –

Table F-1 continued

Assessment Criteria	Criteria reference	Benefits (+) & Costs (–) of Fixed Term/Auction Option Compared to the Council's Preferred Auction	
		Magnitude of difference 0 No difference – or + Low – – or ++ Moderate – – – or + + + High	
		5% Auction	20% Auction
Disruption			
Accomplish change with the least disruption of current domestic fishing practices, marketing procedures, and the environment	GF FMP Objective 14	– –	– – –
Excessive Shares			
No particular individual, corporation, or other entity [shall] acquire an excessive share of privileges	MSA - National Standard 4(c)	0	0
Address concerns over excessive geographic or other consolidation in the harvesting or processing sectors of the fishery	MSA – 303A(c)(5)(B)(ii)	0	0
Fairness and Equity			
Allocation shall be fair and equitable to all fishermen	MSA - National Standard 4(a)	0	–
Issue privileges to persons who substantially participate in the fishery (as specified by the Council)	MSA – 303A(c)(5)(E)	0	–
Avoid provisions where the primary intent is a change in marketing power balance between harvesting and processing sectors	A-20 Constraint 5	0	0

Table F-1 continued

Assessment Criteria	Criteria reference	Benefits (+) & Costs (–) of Fixed Term/Auction Option Compared to the Council's Preferred Auction	
		Magnitude of difference 0 No difference – or + Low – – or ++ Moderate – – – or + + + High	
		5% Auction	20% Auction
Sector Health			
Provide for a viable, profitable . . . groundfish fishery	A-20 Objective 2	– –	– – –
Promote measurable economic . . . benefits through the seafood catching, processing, distribution elements, and support sectors of the industry	A-20 Objective 6	– –	– – –
Maximize the value of the groundfish resource as a whole	GF FMP Goal 2	– –	– – –
Promote year-round marketing opportunities and extend those opportunities as long as practicable during the fishing year	GF FMP Objective 7	0	0
Avoid unnecessary adverse impacts on small entities	GF FMP Objective 15	–	– –
Labor: Captains, Crew, & Processing Plant Workers			
Assist… entry-level and small vessel owner operators, captains, crew… through set-asides of allocations… or economic assistance in the purchase of quota	MSA – 303A(c)(5)(C)	–	– – –
Promote measurable… employment benefits through the seafood catching, processing, distribution elements, and support sectors of the industry	A-20 Objective 6	0	–
Promote the safety of human life at sea	MSA - National Standard 10 GF FMP – Objective 17	0	–

Table F-1 continued

Assessment Criteria	Criteria reference	Benefits (+) & Costs (–) of Fixed Term/Auction Option Compared to the Council's Preferred Auction	
		Magnitude of difference 0 No difference – or + Low – – or + + Moderate – – – or + + + High	
		5% Auction	20% Auction
Communities			
Consider importance of fishing to communities in order to provide sustained participation and to minimize adverse impacts	MSA - National Standard 8 GF FMP Objective 16 A-20 Objective 5	–	– –
Consider basic cultural and social framework of the fishery.	MSA – 303A(c)(5)(B)	–	–
Include measures to assist, when necessary and appropriate… fishing communities through set-asides of harvesting allocations… or economic assistance in the purchase of quota	MSA – 303A(c)(5)(C)	–	– –
Small Vessels, Small Entities, and New Entrants			
Promote sustained participation of small owner-operated fishing vessels	MSA – 303A(c)(5)(B)(i)	– –	– – –
Include measures to assist, when necessary and appropriate, entry level and small vessel owner-operators . . . through set-asides of harvesting allocations… or economic assistance in the purchase of quota	MSA – 303A(c)(5)(C)	0	–
Avoid unnecessary adverse impacts on small entities	GF FMP Objective 15	–	– – –
Auctions and Cost Recovery			
Auctions, or other systems to collect royalties, shall be considered for initial or any subsequent allocation	MSA – 303A(d)	+ +	+ + +
Assess and provide a program of fees paid by the quota holders that will cover the costs of management, data collection and analysis, and enforcement activities	MSA – 303A(e)	0	0

Table F-1 continued

Assessment Criteria	Criteria reference	Benefits (+) & Costs (–) of Fixed Term/Auction Option Compared to the Council's Preferred Auction	
		Magnitude of difference 0 No difference – or + Low – – or + + Moderate – – – or + + + High	
		5% Auction	20% Auction
Program Performance Monitoring and Modification			
Take into account the management and administrative costs of implementing and overseeing the IFQ or co-op program and complementary catch monitoring programs, and the limited state and federal resources available.	A-20 Constraint 9	– –	– –
Regular review and monitoring of the program for progress in meeting the goals, 5 year formal review	MSA – 303A(c)(1)(G)	0	0
Privileges may be revoked, limited or modified at anytime. Provide for revocation	MSA – 303A(b)(2), MSA – 303A(c)(1)(K)	0	0

- The limited term/auction, option although potentially increasing the availability of quota to captains and crew, will also result in the loss of quota shares to operators and captains and crew holding shares. The 20 percent auction will have only small negative effects on labor and plant workers' employment benefits and safety.

- Fixed term privileges and the auctioning of up to 20 percent of Quota Shares every two years will likely have negative effects on communities by exacerbating the disadvantages already faced by communities and ports, disproportionally impacting vulnerable communities, and creating disincentives for long term collaborative community initiatives with fishermen, processors, and quota holders.

- Due to the more limited access to capital and the smaller quota holdings, smaller entities are in a more disadvantaged position compared to larger entities under the fixed term/auction option. In particular small entities are potentially more vulnerable to the consequences of being outbid in the auction process and therefore losing up to 20 percent of their harvest privileges.

- Both alternatives collect cost recovery fees to pay for administering the LAPP program. If collection of royalties is a priority or objective for the Council, then the fixed/term auction option is superior to the Council's preferred option.

- Compared to the Council's preferred option, the fixed term/auction alternative potentially imposes significant additional administrative costs and program performance monitoring costs on the Council. Not only will an effective auction system need to be designed, set up, and operated but an administrative system must be established for taking back up to 20 percent of quota across multiple stocks and multiple owners.

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GROUNDFISH FISHERY MANAGEMENT PLAN
AMENDMENT 20 TEXT

APPENDIX G

TO THE
RATIONALIZATION OF THE PACIFIC COAST
GROUNDFISH LIMITED ENTRY TRAWL FISHERY
FINAL ENVIRONMENTAL IMPACT STATEMENT

PREPARED BY
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JUNE 2010

Summary of Proposed Changes to the Content of the Groundfish FMP

As part of implementing the trawl rationalization program, the Groundfish FMP must be amended. This would be Amendment 20 to the FMP. Parts of Chapters 1, 6, and 11 of the FMP have to be modified. In addition, an appendix would be added to the FMP containing a detailed description of the IFQ and co-op programs. The specific changes to FMP text are shown in the next section and summarized below.

A brief description of the amendment is added to Chapter 1, along with a reference to Appendix E to the FMP, containing a detailed description of trawl rationalization program provisions.

Chapter 6 in the FMP describes the range of management measures available to the Council, organized according to major categories. Section 6.9 of the chapter describes measures to control fishing capacity, including permits and licenses.

- Section 6.9.1 describes general provisions for permits. A section is added to cover the new requirement for processor permits for the mothership fishery.

- Section 6.9.3, "Individual Fishing Quota Programs," was incorporated into the FMP by Amendment 18 and authorizes an IFQ program. It has been rewritten to cover trawl rationalization in general (both IFQs and co-ops), and a separate subsection was created to preserve the language referencing IFQs as they would apply to other sectors.

Chapter 11 describes the license limitation program and the division that program created between the limited entry and open access segments.

- Section 11.2.1 identifies the Federal permit requirements and the regulations that apply when vessels with limited entry permits use open access gears. That language is modified to indicate that when a vessel with a trawl permit uses an exempted gear IFQ regulations apply, except with respect to those gears for which the IFQ program provides and exception (see Section A-1.1 of the IFQ program for the gear exceptions).

- Section 11.2.5 identifies the requirements for gear endorsements. Paragraph 6 of this section has been rewritten to clarify the ability of vessels with limited entry permits to use gears for which they do not hold an endorsement and to incorporate language that provides for gear switching.

- A new section was added: "Section 11.2.6, Sector Endorsements." The existing sections on fixed gear sablefish were moved from Section 11.4 to this section, and sections were added on catcher processor (CP) endorsements, and Pacific whiting mothership catcher vessel (CV(MS))endorsements.

- Section 11.2.7 addresses the size endorsement. It has been modified to indicate that a trawl permit's size endorsement will not be reduced if it is transferred to a smaller vessel.

- Section 11.2.11 covers the rules for combining permits. A new paragraph was added to address the treatment of the new endorsements CP and CV(MS) endorsements when permit combination occurs.

- Section 11.5 contained the language implementing Amendment 15. As indicated in the first paragraph of that section, these provisions sunset with the creation of a trawl rationalization program for the Pacific whiting fishery. Therefore, this language has been removed.

Changes to the Groundfish FMP Incorporated by Amendment 20

Relevant FMP text is excerpted below. Insertions are marked by underline and deletions by strikeout. Double underline marks text stricken elsewhere and moved to a new location. Ellipses (…) indicate unchanged text omitted below.

1.0 INTRODUCTION

…

Amendment 20 was approved in [2010] and establishes the groundfish trawl rationalization program. Under this program groundfish limited entry trawl vessels making shoreside deliveries are managed with individual fishing quotas. Motherships and associated catcher-vessels in the at-sea Pacific whiting sector are managed under a system of regulated cooperatives. Pacific whiting catcher processors fish within a voluntary cooperative; the amendment establishes provisions to strengthen this cooperative. As noted above, Amendment 20 supersedes provisions in Amendment 15; corresponding text was replaced.

1.2 How This Document is Organized

…

- Appendix E contains a detailed description of the trawl rationalization program (see Section 6.9.3.1).

[N.B. Appendix D to the Trawl Rationalization EIS would become Appendix E to the Groundfish FMP.]

…

6.0 MANAGEMENT MEASURES

…

6.9 Measures to Control Fishing Capacity, Including Permits and Licenses

…

6.9.1 General Provisions for Permits

6.9.1.1 Commercial Fisheries Permits

All U.S. commercial fishing vessels are required by state laws to be in possession of a current fishing or landing permit from the appropriate state agency in order to land groundfish in the Washington, Oregon, and California area. Federal limited entry permits authorize fishing within limits and restrictions specified for those permits. Vessels without such permits are also subject to the specified limits and restrictions for the open access fishery. ~~Federal permits also may be required for groundfish processors.~~ In the event that a Federal fishing or access permit is required, failure to obtain and possess such a Federal permit will be in violation of this FMP.

6.9.1.2 Recreational Fisheries Permits

All U.S. recreational fishermen are required by state laws to obtain a recreational permit or license in order to fish for groundfish. In the event that a Federal license or permit is required, failure to obtain and possess such Federal permit will be in violation of this FMP.

6.9.1.3 Processor Permits

Federal permits also may be required for groundfish processors. Under the trawl rationalization program (see Section 6.9.3) mothership processors in the Pacific whiting fishery must possess a mothership (MS) permit. Like groundfish limited entry permits (see Chapter 11) Pacific whiting mothership (MS) permits are transferrable once initially distributed to qualifying vessels at the beginning of the trawl rationalization program. To qualify for initial issuance of an MS permit at the beginning of the program, a processing vessel must have processed at least 1,000 mt of Pacific whiting in each of any two years from 1997 through 2003.

6.9.2 Sector Endorsements

The Council may establish sector endorsements, such as with the limited entry fixed gear sablefish fishery (see Section 11.2.6). Sector endorsements would limit participation in a fishery for a particular species or species group to persons, vessels, or permits meeting Council-established qualifying criteria. Participants in a sector-endorsed fishery may be subject to sector total catch limit management. A sector endorsement, whether it is applied to vessels that already hold limited entry permits or to those in the open access or recreational fisheries, is a license limitation program.

6.9.3 Fishery Rationalization~~Individual Fishing Quota~~

6.9.3.1 The Trawl Rationalization Program~~s~~

The trawl rationalization program applies to vessels holding trawl-endorsed groundfish limited entry permits (and mothership processors registered to mothership permits). The program is intended to reduce fishery capacity, minimize bycatch, and meet other goals of the FMP. The program replaces most cumulative landing limits (in both whiting and nonwhiting shoreside limited entry trawl sectors) with individual fishing quotas. Under the Magnuson-Stevens Fishery Conservation and Management Act (MSA), "an 'individual fishing quota' means a Federal permit under a limited access system to harvest a quantity of fish, expressed by a unit or units representing a percentage of the total allowable catch of a fishery that may be received or held for exclusive use by a person." The Council may establish IFQ programs for any commercial fishery sector. ~~IFQ programs would be established for the purposes of reducing fishery capacity, minimizing bycatch, and to meet other goals of the FMP. Participants in an IFQ fishery may be subject to individual total catch limit management (Section 6.7.1).~~The Pacific whiting mothership sector is managed through a system of cooperatives (co-ops) under which catcher vessels choosing to fish in a co-op would be obligated to deliver their catch to an associated mothership processor. Each year motherships and catcher vessels must identify which co-op they plan to participate in. If they do not plan to join a co-op for that year they participate in a non-co-op fishery. The Pacific whiting catcher-processor sector operates as a single, voluntary co-op. If the voluntary catcher-processor co-op dissolves any allocation to the sector will be divided equally among the catcher-processor endorsed permits.

Appendix E describes the details of the trawl rationalization program that will be implemented in Federal regulations.

The trawl rationalization program described in Appendix E may be modified through regulatory amendments proposed by the Council per §303(c) of the MSA and reviewed by the Secretary per §304(b). Appendix E may be revised from time to time to reflect changes to the program, but such changes can be made without submitting such changes for review by the Secretary as described in §304(a) of the MSA. The Council will establish a process for considering recommended changes to the regulations.

6.9.3.2 Rationalization of Other Fishery Sectors

IFQ programs could be established in other fishery sectors for the purposes of reducing fishery capacity, minimizing bycatch, and to meet other goals of the FMP. Participants in an IFQ fishery may be subject to individual total catch limit management (Section 6.7.1).

…

11.0 GROUNDFISH LIMITED ENTRY

11.1 Introduction

…

11.2 Management, Allocation and General Rules on the Issuance and Use of Groundfish LE Permits, Gear Endorsements Size Endorsements, and Fixed Gear Sablefish Endorsements

…

11.2.1 Federal LE Permits Required Only for Gears Fishing on the Limited Access Quota

1. Federal groundfish LE permits will be required and issued only for those vessels catching Council-managed groundfish species[1/] with groundfish limited entry gears (trawl, longline or fishpot gear) under the limited access quota.[2/]

2. Vessels using exempted gears (all gears other than trawl, longline and fishpot) or using longline or fishpot gear[3/] without a permit endorsed for one of those gears may continue to catch groundfish under an open access system. However, catch by vessels with trawl-endorsed LE permits that use such gears may instead be managed with IFQs, as specified in the regulations for the IFQ program (see Appendix E). (Exempted, longline and fishpot gears used by vessels without endorsements for those gears are termed open access gears.)

11.2.2 Allocations between the Limited and Open Access Fisheries and Management of the Open Access Fishery

…

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1 All references to "Council-managed groundfish" refer only to groundfish species specified in the Council groundfish FMP which are caught in the exclusive economic zone or adjacent state waters off Washington, Oregon and California.

2 References to longline, pot and trawl gear are references to legal groundfish gears as defined by the groundfish FMP.

3 Trawl gear may not be used without a permit because the open access fishery for limited entry gears is aimed at accommodating small producers and will likely be managed under restrictive trip limits. The fishing power of trawl gear would result in excessive discards under these trip limits. Additionally, while longline and fishpot vessels catching small quantities of groundfish will be prevented from qualifying by the structure of the minimum landing requirements (MLRs) (a day's landings must be greater than 500 pounds in order for the day to count toward meeting the MLR; Section 11.3.1.3), this structure will provide little barrier for most trawl vessels. Thus, there is no strong reason to provide the open access opportunity to compensate for the 500 pound per landing day threshold.

11.2.3 Initial Issuance of LE Permits

…

11.2.4 Ownership Restriction and Changes in Ownership

…

11.2.5 Gear Endorsements

…

[N.B. In the following, <u>double underline</u> indicates insertions corresponding to the deleted text in paragraph 6.]

6. ~~An LE permit will not allow the use of limited entry gears to catch any Council-managed groundfish unless a valid gear endorsement for the specific gear is affixed to the LE permit. Trawl gear and Council-managed groundfish may not be on board a vessel at the same time, nor may the gear be deployed, without an LE permit registered for the vessel and endorsed for trawl gear. If a vessel has longline or fishpot gear on board, an LE permit registered for the vessel and the permit is endorsed for the gear on board, regulations for the limited access fishery will apply.~~

<u>Gear endorsements are required for LE-permitted vessels to use limited entry gear types (see Section 11.2.1, paragraph 1) to catch groundfish under the regulations governing the limited entry fishery.</u>

<u>a. Longline and Fishpot Usage for Vessels with a Permit Endorsed for the Gear. If a vessel has longline or fishpot gear on board, and the vessel is registered to an LE permit that is endorsed for the longline or fishpot gear on board, regulations for the limited access fishery will apply to the vessel. If the vessel also has a trawl endorsement and has opted to participate for a period in the trawl rationalization program using the fixed gear (longline or fishopt) for which it holds an endorsement then the trawl rationalization portion of the limited entry fishery regulations will apply to the vessel for that period.</u>

<u>b. Exception for Longline and Fishpot Gear Usage for Vessels With a Limited Entry Permit not Endorsed for the Gear Being Used:</u>

<u>i. As specified in Section 11.2.1, paragraph 2, Limited Entry vessels may use longline and pot gear without an endorsement, in which case the use of the gear is governed by the open access fishery regulations unless the vessel's limited entry permit is endorsed for trawl gear.</u>

<u>ii. As specified in Section 11.2.2, if a vessel registered to a LE permit is fishing with longline or fishpot gear, but without an endorsement for that gear, the catch still counts against the limited entry fishery allocation (See Section 11.2.2).</u>

<u>iii. As specified in the trawl rationalization program (Section 6.9.3.1 and Appendix E) vessels registered to a trawl-endorsed LE permit and using longline or fishpot gear without a limited entry endorsement for those gears must cover their landings with trawl IFQ and comply with the provisions of the trawl IFQ program. Open access sector regulations will not apply to vessels participating under the IFQ program.</u>

<u>c. Trawl Gear Usage. Trawl gear and Council-managed groundfish may not be on board a vessel at the same time, nor may the gear be deployed, without an LE permit registered for the vessel and endorsed for trawl gear.</u>

…

11.2.6 Sector Endorsements

11.2.6.1 Fixed Gear Sablefish Endorsements

[N.B. Section 11.4, with the same title, is incorporated into this section as a housekeeping measure.]

1. The permit and gear endorsement requirements of the license limitation program limit the number of vessels which may participate in the groundfish fishery, however, there is still substantial opportunity for vessels to shift between segments of the groundfish fishery. One of the segments of the limited entry fishery subject to an increase in the number of vessels participating is the limited entry fixed gear sablefish fishery. To prevent the movement of vessels from non-sablefish segments of the limited entry fixed gear groundfish fishery to the sablefish segment of the fishery, a fixed gear sablefish endorsement for limited entry permits is required for longline and fishpot gear limited entry vessels to take sablefish against the fixed gear limited entry allocation and as part of the primary fishery, the major limited entry fixed gear sablefish harvest opportunities north of 36°N latitude. Such endorsements are not required to harvest under fixed gear limited entry daily-trip-limit or other regulations intended to allow low level or incidental harvest.

2. The fixed gear sablefish endorsement will be affixed to the permit.

3. The fixed gear sablefish endorsement will remain valid when the permit is transferred.

4. If permits are stacked such that a single permit has multiple sablefish endorsements, sablefish endorsements and associated cumulative limits may be transferred to other sablefish-endorsed permits so long as at least one sablefish endorsement and associated tier limit remains with the permit. Fixed gear sablefish endorsements may not be transferred from permits on which there is only one fixed gear sablefish endorsement.

5. Limitations which apply to the fixed gear sablefish endorsement and fishing thereunder shall not restrict the use of any trawl gear endorsement on the same LE permit, unless these restrictions are specific in their application to trawl gear.

6. Rules on the issuance of fixed gear sablefish endorsements and other characteristics of the endorsements are specified ~~in Section 11.4~~below.

[N.B. The following text is moved from Section 11.4, also entitled Fixed Gear Sablefish Endorsements]

The fixed gear sablefish endorsement is intended for operations participating in the fixed gear sablefish fishery which were significantly active and dependent on the fishery prior to the end of the qualifying period specified in paragraph 3. The following paragraphs describe qualifying criteria that were used for initial issuance of the fixed gear sablefish endorsement.

1. A fixed gear sablefish endorsement will be affixed to any LE permit which meets the fixed gear sablefish endorsement qualifying criteria.

2. The catch history used to determine whether a permit meets the fixed gear sablefish endorsement qualifying criteria is the permit catch history. Permit catch history includes the catch history of

the vessel(s) that initially qualified for the permit and the catch of any other vessels with which the permit rights were associated during the time the rights were associated with the vessel (if the current permit is the result of the combination of multiple permits, then for the combined permit to qualify for an endorsement, at least one of the permits which were combined must have sufficient sablefish history to qualify for an endorsement on its own; or the permit must qualify based on catch occurring after it has combined but within the qualifying period). Permit catch history also includes the catch of any interim permit held by the current owner of the permit during the pendancy of an appeal on a permit denied under the groundfish limited entry program, but only if (1) the appeal on which the interim permit was based was lost and (2) the owner's current permit was used by the owner in the 1995 limited entry sablefish fishery.

3. The fixed gear sablefish endorsement qualifying criteria are at least 16,000 pounds round weight of sablefish caught with longline or fishpot gear in one year from 1984 to 1994

4 All catch must be non-Indian harvest from Council managed areas. Harvest taken in tribal set aside fisheries does not qualify.

5. The NMFS issuing authority will have broad authority to examine information other than codes on landing tickets in determining whether the qualifying criteria is or is not met.

11.2.6.2 Pacific whiting Catcher-processor (CP) Endorsement

The class of CP endorsed permits (CP permits) is limited by an endorsement placed on an LE permit. LE permits registered to qualified catcher-processor vessels are endorsed as CP permits. A qualified permit is one that harvested and processed in the catcher-processor sector of the Pacific whiting fishery at any time from 1997 through 2003. A vessel that is 75 feet or less LOA that harvests whiting and, in addition to heading and gutting, cuts the tail off and freezes the whiting, is not considered to be a catcher/processor nor is it considered to be processing fish. Such a vessel is considered a participant in the shorebased whiting sector, and is subject to regulations and allocations for that sector (50 CFR 660.373(a)(3). Therefore, such vessels do not require a CP endorsement.

11.2.6.3 Pacific whiting Catcher Vessel (CV(MS)) Endorsement

Permits with a qualifying history are designated as CV(MS) permits through the addition of an endorsement to their LE groundfish permit. Only vessels registered to an LE permit with a CV(MS) endorsement may participate in the Pacific whiting mothership-processor fishery. A qualified permit is one that has a total of more than 500 mt of whiting deliveries to motherships from 1994 through 2003.

11.2.7 Size Endorsement Will Specify the Vessel Length

The LE base permit will be endorsed with the length overall (as defined for purposes of U.S. Coast Guard documentation) of the vessel for which the LE permit is initially issued. The length for which the LE permit is endorsed will be changed only when LE permits are combined, as per Section 11.2.11.[4] ~~, or, in the case of LE permits endorsed for trawl gear, when the size of the vessel used with the permit is more than five feet less than the originally endorsed length. In the latter case, the LE permit will be reissued with a size endorsement for the length of the smaller vessel. Regulations may be promulgated to waive this downsizing requirement if the permit was transferred to a smaller vessel for the purposes of stacking~~

[4] The FMP included an exception for when LE permits endorsed for trawl gear were transferred to a smaller vessel such that the LE permit will be reissued with a size endorsement for the length of the smaller vessel (from Amendment 6). This exception was removed by Amendment 20.

~~(see Section 11.2.4, paragraph 3).~~ Vessels which do not have documents stating their length overall will have to be measured by a marine surveyor or the U.S. Coast Guard and certified for that length.[5]

If the Council establishes a permit stacking program, that program may or may not require that permits stacked on top of the base LE permit be endorsed with the length overall of the vessel holding the permits.

11.2.8 An LE Permit and Necessary Gear Endorsements Will Be Held by the Owner of Record of the Vessel

…

11.2.9 Transfer of an LE Permit to Different Owners or Vessels of the Same Owner

…

11.2.10 Loss of a Vessel

….

11.2.11 Combining LE Permits

1. Two or more LE permits with "A" gear endorsements for the same type of limited entry gear (either trawl, longline or fishpot) may be combined (based on specific criteria) to "step-up" to a permit with a larger size endorsement. NMFS, with professional advice of marine architects and other qualified individuals, and after consultation with the Council and review board, will develop and implement a standardized measure of harvest capacity for the purpose of determining the appropriate endorsed length for LE permits created by combining two or more permits possessing smaller length endorsements. The capacity represented by the appropriate length endorsement for the combined permit should not exceed the sum of the capacities of the LE permits being combined.

2. LE permits may not be divided to "step-down" to more than one permit with smaller size endorsements.

3. Survival of Gear Endorsements. When LE permits are combined, "A" endorsements identical on both LE permits will remain valid. Provisional "A", "B" and designated species "B" gear endorsements will generally become invalid because they are not separable from the vessel for which they are initially issued. (See table below for examples.) ~~Fixed gear sablefish endorsements will remain valid only if all the longline or fishpot permits being combined have fixed gear sablefish endorsements.~~

1st Permit Endorsement on 1st LE Permit	+	2nd Permit Endorsements on 2nd LE Permit	=	Combined Permit Endorsements on the Combined LE Permit
"A" - Trawl		"A" - Pot		None
"A" - Longline		"A" - Longline		"A" - Longline
"A" - Trawl		Provisional "A" - Trawl		None
"A" - Pot		"B" - Pot		None
"A" - Trawl		Designated Species "B" - Shortbelly - Trawl		None

[5] While not an immediate cap on vessel capacity, the size endorsement places an upward limit on the amount by which the capacity used with an LE permit may increase.

4. Survival of Fixed Gear Sector Endorsements: Fixed gear sablefish endorsements will remain valid only if all the longline or fishpot permits being combined have fixed gear sablefish endorsements.

5. Survival of Trawl Sector Endorsements. When a CP-endorsed LE permit is combined with an LE trawl permit without a CP-endorsement a single CP-endorsed permit with a larger size endorsement will result. A CV(MS) endorsement on a permit being combined with a CP-endorsed permit will not be reissued on the resulting permit. If a CV(MS) endorsed permit is combined with a permit without a sector endorsement the CV(MS) endorsement is retained on the resulting permit. The resulting size endorsement will be determined based on the permit combination formula authorized in paragraph 1 above.

11.2.12 Permit Renewal

…

11.2.13 Owner-on-board Requirements

…

11.3 Multilevel Gear Endorsement System

…

~~11.4 Fixed Gear Sablefish Endorsement~~

[N.B. Text in this section moved to Section 11.2.6 as shown above.]

~~11.5 Limited Entry Program for the Pacific Coast Whiting Fishery~~

~~Until the implementation of a trawl IQ or cooperative management program in the Pacific whiting fishery, no vessel may participate in the shoreside, mothership, or catcher-processor sector of the Pacific whiting fishery unless that vessel meets the following participation requirements for such vessel in such sector:~~

~~For catcher vessels participating in the shore-based sector, the participation requirements are that the vessel with a limited entry trawl endorsed permit using mid-water trawl gear made at least one whiting delivery to a shoreside whiting processor in at least one primary whiting season for the shore-based sector between January 1, 1994, and January 1, 2007.~~

~~For catcher vessels participating in the mothership sector, participation requirements are that the vessel made at least one delivery to a mothership whiting processor during the at-sea processing season for the mothership sector between January 1, 1997, and January 1, 2007.~~

~~For catcher/processors vessels, participation requirements are having caught and processed whiting during the at-sea processing season for the catcher/processor sector in any one qualifying year from January 1, 1997, through January 1, 2007.~~

~~For mothership vessels, participation requirements are having received at least one delivery of whiting during the at-sea processing season for the mothership sector in any one qualifying year from January 1, 1997, through January 1, 2007.~~

~~A vessel may qualify for participation in each sector for which it meets the above standards.~~

~~Implementing regulations will specify the application procedures. NMFS will maintain a list of vessels or issue a certificate to vessels that qualify for participation in each sector.~~

~~[Added, Amendment 15]~~

11.~~6~~5 LE Permit Issuance Review Board

…

11.~~7~~6 Implementation, Application and Appeals Process

…

11.~~8~~7 Council Review and Monitoring

…

REGULATORY IMPACT REVIEW AND INITIAL REGULATORY FLEXIBILITY ANALYSIS

Apppendix H

TO THE
RATIONALIZATION OF THE PACIFIC COAST GROUNDFISH LIMITED ENTRY TRAWL FISHERY
FINAL ENVIRONMENTAL IMPACT STATEMENT

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Regulatory Impact Review and
Initial Regulatory Flexibility Analysis

Rationalization of the Pacific Coast Groundfish Limited Entry Trawl Fishery AND Allocation of Harvest Opportunity BETWEEN Sectors of the Pacific Coast Groundfish Fishery

National Marine Fisheries Service, Northwest Region
Initial Analysis May 2010

Executive Summary

The Pacific Fishery Management Council (Council) prepared a draft environmental impact statement for Amendment 20 to the Pacific Coast Groundfish Fishery Management Plan (FMP); a notice of availability was published on December 4, 2009 (74 FR 63751). The Council also prepared a draft environmental impact statement for Amendment 21 to the Pacific Coast Groundfish FMP; a notice of availability was published on January 29, 2010 (75 FR 4812). The trawl rationalization program would consist of (1) an IFQ program for the shore-based, limited entry groundfish trawl fleet and (2) cooperative programs (co-ops) for the at-sea whiting limited entry groundfish trawl fleet. The trawl rationalization program is intended to increase net economic benefits, create economic stability, provide full utilization of the trawl sector allocation, consider environmental impacts, and promote conservation through individual accountability for catch and bycatch.

A summary of the proposed action is as follows. The proposed action is to replace the current, primary management tool used to control the West Coast groundfish trawl catch—a system of two-month cumulative landing limits for most species and season closures for whiting—with a system requiring more individual accountability by the assignment of limited access privileges (LAPs). LAPs are a form of output control whereby an individual fisherman, community, or other entity is granted the privilege to catch a specified portion of the total allowable catch (TAC). The alternatives include (1) a catch-based IFQ system where all groundfish catch (landings plus bycatch) by limited entry trawl vessels would count against a vessel's IFQ holdings, which could be applied to the whole groundfish trawl fishery or selected trawl sectors; and (2) a system of co-ops that would be applied to one or more of the fishery sectors that target Pacific whiting. The status quo alternative (no action) could also be considered for application to one or more trawl fishery sectors, even if one or both action alternatives (IFQs or co-ops) are chosen for the other trawl sectors.

The description of purpose and need in section 1.2 of the Amendment 20 DEIS also outlines the objectives of the proposed action. The introductory paragraph in Chapter 1 and section 1.3 of the DEIS, background to the purpose and need provide information on the legal basis for the proposed action (proposed rule). The Council articulated the following goal for the trawl rationalization program: "Create and implement a capacity rationalization plan that increases net economic benefits, creates individual economic stability, provides for full utilization of the trawl sector allocation, considers environmental impacts, and achieves individual accountability of catch and bycatch." The objectives supporting this goal are as follows: provide a mechanism for total catch accounting; provide for a viable, profitable, and efficient groundfish fishery; promote

practices that reduce bycatch and discard mortality, and minimize ecological impacts; increase operational flexibility; minimize adverse effects from an IFQ program on fishing communities and other fisheries to the extent practical; promote measurable economic and employment benefits through the seafood catching, processing, distribution elements, and support sectors of the industry; provide quality product for the consumer; and increase safety in the fishery.

As part of the proposed action, NMFS would place observers and/or cameras on board all catcher vessels in the shore-based sector (which combines the current shore-based whiting and non-whiting trawl sectors). Existing requirements for motherships, catcher vessels in the mothership sector, and catcher-processors would continue. Independently contracted processing plant monitors would track landings. There would also be new reporting requirements related to the tracking of QS and quota pounds (QP) in the shore-based fishery.

This proposed rule has been determined to be significant for purposes of Executive Order 12866.

An initial regulatory flexibility analysis (IRFA) was prepared, as required by section 603 of the Regulatory Flexibility Act (RFA). The IRFA describes the economic impact this proposed rule, if adopted, would have on small entities. A description of the action, why it is being considered, and the legal basis for this action are contained at the beginning of this section in the preamble and in the SUMMARY section of the preamble.

The Council has prepared two EIS documents: Amendment 20—Rationalization of the Pacific Coast Groundfish Limited Entry Trawl Fishery, which would create the structure and management details of the trawl fishery rationalization program, and Amendment 21—Allocation of Harvest Opportunity Between Sectors of the Pacific Coast Groundfish Fishery, which would allocate the groundfish stocks between trawl and non-trawl fisheries. The two draft EISs prepared by the Council provide economic analyses of the Council's preferred alternatives and draft RIR and IRFAs. The draft RIR and IRFAs were updated and combined into a single RIR/IRFA, which comprises this document. Among other things, this single RIR/IRFA contains additional information on characterizing the participants in the fishery and on the tracking and monitoring costs associated with this program.

Due to the complexity of the proposed fishery management measures, the rule associated with this analysis proposes only certain key components that would be needed both to issue permits and endorsements in time for use in the 2011 fishery and to have the 2011 specifications reflect the new allocation scheme. Specifically, this rule would establish the allocations set forth under Amendment 21 and would establish procedures for initial issuance of permits, endorsements, and QS under the IFQ and co-op programs. NMFS plans to propose additional program details in a future proposed rule. Such additional details would include program components applicable to IFQ gear switching, observer programs, retention requirements, equipment requirements, catch monitors, catch weighing requirements, co-op permits/agreements, first receiver site licenses, quota share accounts, vessel QP accounts, further tracking and monitoring components, and economic data collection requirements. To encourage more informed public comment, this proposed rule includes a general description of these additional program requirements. NMFS is also planning a future "cost-recovery" rule, based on a recommended methodology yet to be developed by the Council.

The RIR/IRFA analyzes two alternatives—the No Action Alternative and the Preferred Alternative. The analysis of the no action alternative describes what is likely to occur in the absence of the proposed action. It provides a benchmark against which to compare the incremental effects of the proposed action. Under the no action alternative, the current, primary management tool used to control the Pacific coast groundfish trawl catch includes a system of two-month cumulative landing limits for most species and season closures for Pacific whiting. This management program would continue under the no action alternative. Only long-term, fixed allocations for Pacific whiting and sablefish north of 36° N. lat. would exist. All other groundfish species would not be formally allocated between the trawl and non-trawl sectors. Allocating the available harvest of groundfish species and species complexes would take place during the Council process of deciding biennial harvest specifications and management measures and, as such, would be considered short-term allocations.

The analysis of the preferred alternative describes what is likely to occur as a result of the proposed action. Under the preferred alternative, the existing shore-based whiting and shore-based non-whiting sectors of the Pacific Coast groundfish limited entry trawl fishery would be managed as one sector under a system of IFQs, and the at-sea whiting sectors of the fishery (i.e., catcher-processor sector and mothership sector, which includes motherships and catcher vessels) would be managed under a system of sector-specific harvesting co-ops. The catcher-processor sector would continue to operate under the existing, self-developed co-op program entered into voluntarily by that sector. A distinct set of groundfish species and Pacific halibut would be covered by the rationalization program. Amendment 20 would include a tracking and monitoring program to ensure that all catch (including discards) would be documented and matched against QP. The Council specified that observers would be required on all vessels, and shore-based monitoring (catch monitors) would be required during all off-loading (100 percent coverage). Compared to status quo monitoring, this would be a monitoring and observer coverage level increase for a large portion of the trawl fleet, particularly for nonwhiting, shore-based vessels.

The limited entry trawl fishery is divided into two broad sectors: a multi-species trawl fishery, which most often uses bottom trawl gear (hereafter called the non-whiting fishery), and the Pacific whiting fishery, which uses midwater trawl gear. The non-whiting fishery is principally managed through two-month cumulative landing limits along with closed areas to limit overfished species bycatch. Fishery participants target the range of species described above with the exception of Pacific whiting. By weight, the vast majority of trawl vessel groundfish is caught in the Pacific whiting fishery. In contrast, the non-whiting fishery accounts for the majority of limited entry trawl fishery ex-vessel revenues. On average for the period from 2000 to 2005, Pacific whiting accounted for about 75 percent of the quantity of groundfish landed in the limited entry trawl fishery, but only 21 percent of the value due to their relatively low ex-vessel price.

Non-whiting trawl vessels deliver their catch to shoreside processors and buyers located along the coasts of Washington, Oregon, and California. They tend to have their homeports located in towns within the same general area where they make deliveries, though there are several cases of vessels delivering to multiple ports during a year. Some Pacific whiting trawl vessels are

catcher-processors that, as their name implies, process their catch on-board, while other vessels in this sector deliver their catch to shoreside processors or motherships that receive Pacific whiting for processing but do not directly harvest the fish.

Over time, landings in the limited entry trawl fishery have fluctuated, especially on a species-specific basis. Pacific whiting has grown in importance, especially in recent years. Through the 1990s, the volume of Pacific whiting landed in the fishery increased. In 2002 and 2003, landings of Pacific whiting declined due to information showing the stock was depleted, and the subsequent regulations that restricted harvest in order to rebuild the species. From 2003 through 2007, estimated Pacific whiting ex-vessel revenues averaged about $29 million. In 2008, these participants harvested about 248,000 tons of whiting worth about $63 million in ex-vessel revenues, based on shore-based ex-vessel prices of $254 per ton, the highest ex-vessel revenues and prices on record. In comparison, the 2007 fishery harvested about 224,000 tons worth $36 million at an average ex-vessel price of about $160 per ton.

While the Pacific whiting fishery has grown in importance in recent years, harvests in the non-whiting component of the limited entry trawl fishery have declined steadily since the 1980s. Ex-vessel revenues in the fishery peaked in the mid 1990s at over $60 million. Following the passage of the Sustainable Fisheries Act (1996) and the listing of several species as overfished, harvests became increasingly restricted, and landings and revenues declined steadily until 2002. Since 2002, ex-vessel revenues have stabilized at approximately $23 to $27 million per year. In 2007, the Council estimated that 159 trawlers landed 94,000 metric tons (mt) of groundfish, earning $37 million in ex-vessel revenues, for an average of $234,000 per vessel.

Expected Effects of Amendment 21—Intersector Allocation

The allocation of harvest opportunity between sectors under the proposed regulation does not differ significantly from the allocation made biennially under the no action alternative. The primary economic effect of the long-term allocation under the proposed regulations is to provide more certainty in future trawl harvest opportunities, which would enable better business planning for participants in the rationalized fishery. As described elsewhere, the trawl rationalization program could create an incentive structure and facilitate more comprehensive monitoring to allow bycatch reduction and effective management of the groundfish fisheries. In support of the trawl rationalization program, the main socioeconomic impact of Amendment 21 allocations is longer-term stability for the trawl industry. While the preferred Amendment 21 allocations do not differ significantly from status quo ad hoc allocations made biennially, there is more certainty in future trawl harvest opportunities, which enables better business planning for participants in the rationalized fishery. This is the main purpose for the Amendment 21 actions. The economic effects of Amendment 21 arise from the impacts on current and future harvests. The need to constrain groundfish harvests to address overfishing has had substantial socioeconomic impacts. The groundfish limited entry trawl sector has experienced a large contraction, spurred in part by a partially federally subsidized vessel and permit buyback program implemented in 2005. This $46 million buyback program was financed by a congressional appropriation of $10 million and an industry loan of $36 million. Approximately 240 groundfish, crab, and shrimp permits were retired from state and Federal fisheries, and there was a 35 percent reduction in the groundfish trawl permits. To repay the loan, groundfish,

shrimp and crab fisheries are subject to landings fees. Follow-on effects of the buyback have been felt in coastal communities where groundfish trawlers comprise a large portion of the local fleet. As the fleet size shrinks, and ex-vessel revenues decline, income and employment in these communities are affected. Fishery-related businesses in the community may cease operations because of lost business. This can affect non-groundfish fishery sectors that also depend on the services provided by these businesses, such as providing ice and buying fish. An objective to the trawl rationalization program is to mitigate some of these effects by increasing revenues and profits within the trawl sector.

However, because further fleet consolidation is expected, the resulting benefits are likely to be unevenly distributed among coastal communities. Some communities may see their groundfish trawl fleet shrink further as the remaining vessels concentrate in a few major ports. Species subject to Amendment 21 allocations would be lingcod, Pacific cod, sablefish south of 36° N. lat., Pacific ocean perch, widow rockfish, chilipepper rockfish, splitnose rockfish, yellowtail rockfish north of 40° 10' N. lat., shortspine thornyhead (north and south of 34° 27' N. lat.), longspine thornyhead north of 34° 27' N. lat., darkblotched rockfish, minor slope rockfish (north and south of 40° 10' N. lat.), Dover sole, English sole, petrale sole, arrowtooth flounder, starry flounder, and Other Flatfish. While the preferred Amendment 21 allocations of these species do not differ significantly from status quo ad hoc allocations made biennially, there is more certainty in future trawl harvest opportunities, which enables better business planning for participants in the rationalized fishery. This is the main purpose for the Amendment 21 actions.

Based on ex-vessel revenue projections, Table 4-18 (Amendment 21 Intersector Allocation DEIS) shows the potential 2010 yield to trawl and non-trawl (including recreational) sectors under the Amendment 21 alternatives and the potential 2010 value of alternative trawl allocations. Under the status quo option Alternative 1, the projected ex-vessel value of the trawl allocation is $56 million while the projected ex-vessel value of the Council's preferred alternative is $54 million, indicating a potential increase to the non-trawl sectors and a potential decrease to the trawl sector.

In addition to the species above, halibut would also be specifically allocated to the trawl fishery. The proposed regulations include a halibut trawl bycatch reduction program in phases to provide sufficient time to establish a baseline of trawl halibut bycatch and for harvesters to explore methods (e.g., adjustments to time and/or area fished, gear modifications) to reduce halibut bycatch and bycatch mortality. Pacific halibut currently cannot be retained in any U.S. or Canadian trawl fisheries per the policy of the IPHC. The Council's intent on setting a total catch limit of Pacific halibut in Area 2A trawl fisheries is to limit and progressively reduce the bycatch to provide more benefits to directed halibut fisheries. The program establishes a limit for total Pacific halibut bycatch mortality (legal-sized and sublegal fish) by using an individual bycatch quota in the trawl fishery. The initial amount for the first two years of the trawl rationalization program would be calculated by taking 15 percent of the Area 2A total constant exploitation yield (CEY) as set by the International Pacific Halibut Commission (IPHC) for the previous year, not to exceed 130,000 pounds (lbs) per year for total mortality. For example, if the trawl rationalization program went into effect in 2013, the trawl halibut IBQ would be set at 15 percent of the Area 2A CEY adopted for 2012 or 130,000 lbs per year, whichever is less, for 2013 and 2014 (years 1 and 2 of the program). Beginning with the third year of implementation, the

maximum amount set aside for the trawl rationalization program would be reduced to 100,000 lbs per year for total mortality. This amount may be adjusted downward through the biennial specifications process for future years.

Currently there are no total catch limits of Pacific halibut specified for the west coast trawl fishery. Trawl bycatch of Pacific halibut, therefore, does not limit the trawl fishery. A phased-in halibut bycatch reduction program would provide sufficient time to establish a baseline of trawl halibut bycatch under the new rationalization program and would enable harvesters to explore methods (e.g., adjustments to time and/or area fished, gear modifications) to reduce both halibut bycatch and bycatch mortality. By limiting the bycatch of Pacific halibut in the limited entry trawl fisheries, Amendment 21 would control bycatch and could provide increased benefits to Washington, Oregon, and California fishermen targeting Pacific halibut. Reducing the trawl limit would also provide more halibut to those who participate in the directed tribal, commercial, and recreational halibut fisheries.

Effects of Amendment 20-Trawl Rationalization

Due to the lack of quantitative data, an overall comprehensive model was not feasible. Instead, a set of models designed to focus on specific issues was developed. For example, models were used to analyze the effects of the initial allocation of QS in the trawl IFQ program; project geographic shifts in fishery patterns; and illustrate the potential for reducing bycatch, increasing target catch, and increasing revenues. To illustrate the benefits of the IFQ program, a model projecting the expected amount of fleet consolidation in the shore-based non-whiting fishery was developed. This model illustrates the potential for the fleet to reduce bycatch and potentially increase the amount of target species harvested. This model is primarily based on bycatch reduction experiences in the Pacific whiting fishery and on the arrowtooth flounder fishery as carried out under an exempted fishing permit. The model accounts for the fact that trawlers harvest many species (multiple outputs). The model also uses fish ticket data and the data from the recently completed West Coast Limited Entry Cost Earnings Survey sponsored by the NMFS Northwest Fisheries Science Center. [For the other sectors, similar models could not be developed because the appropriate cost data were unavailable.]

Estimates of potential economic benefits are generated based on the predicted harvesting practices from the first step analysis. Because the west coast nonwhiting groundfish fishery is not a derby fishery, it is expected that economic benefits will come through cost reductions and increased access to target species that arise from modifications in fishing behavior (overfished species avoidance). The key output of this analysis is an estimate of post-rationalization equilibrium harvesting cost.

Changes in harvesting costs can arise from three sources. First, the total fixed costs incurred by the groundfish trawl fleet change as the size of the fleet changes. Since many limited entry trawlers incur annual fixed costs of at least $100,000, reductions in fleet size can result in substantial cost savings. In other words, fewer vessels in the fishery will lead to decreased costs through a decrease in annual fixed costs. Second, costs may change as fishery participation changes, no longer incurring diseconomies of scope (such as the costs of frequently switching gear for participating in multiple fisheries). Third, costs may change as vessels are able to buy

and sell quota to take advantage of economies of scale and operate at the minimum point on their long-run average cost curve (i.e. the strategy that minimizes the cost of harvesting).

The major conclusions of this model suggest that (with landings held at 2004 levels), the current groundfish fleet (non-whiting component), which consisted of 117 vessels in 2004, will be reduced by roughly 50 percent to 66 percent, or 40 to 60 vessels under an IFQ program. The reduction in fleet size implies cost savings of $18 to $22 million for the year 2004 (most recent year of the data). Vessels that remain active will, on average, be more cost efficient and will benefit from economies of scale that are currently unexploited under controlled access regulations in the fishery. The cost savings estimates are significant, amounting to 60 percent of the costs incurred currently, suggesting that IFQ management may be an attractive option for the Pacific Coast Groundfish Fishery. Assuming a 10 percent annual return to the vessel capital investment, estimates indicate that the 2004 groundfish fleet incurred a total cost of $39 million. The PacFIN data indicate fleetwide revenue at roughly $36 million in 2004. Therefore, fleetwide losses of about $3 million occurred in 2004. Based on a lower 5 percent return to vessel capital, the results suggest that the groundfish fleet merely broke even in 2004; i.e., dockside revenues were offset by the fleet wide harvesting costs. The results also suggest that a switch from the current controlled access management program to IFQs could yield a significant increase in resource rents in the Pacific Coast Groundfish fishery. For instance, the analysis finds that the 2004 groundfish catch generated zero resource rent. Instead, it could have yielded a substantial positive rent at about $14 million.

As the model was based on the 2004 fishery, it may be useful to show current trends in the fishery. In 2004, the shorebased non-whiting trawl fishery generated about $30 million in ex-vessel revenues. According to cost estimates discussed above, however, this fishery was at best breaking even or perhaps suffering a loss of up to $2 million. Since 2004, shorebased non-whiting trawl fisheries have increased their revenues to about $40 million. The increases in shorebased revenues have come from increased landings of flatfish and sablefish and significant increase in sablefish ex-vessel prices. Sablefish now accounts for almost half of the trawl fleet's revenues. While revenues were increasing, so were fuel prices. Fuel costs are about 30 to 40 percent of the vessels' revenues. The average 2005 to 2009 revenues were about $28 million, or 22 percent greater than 2004. The average 2005 to 2009 fuel price was about $2.81, 70 percent greater than that of 2004. Therefore, it appears that 2009 fishery may not be that much improved over that of 2004.

Based on the various models, ex-vessel revenues for the non-whiting sector of the limited entry trawl fishery are estimated to be approximately $30 to 50 million per year under the preferred alternative, compared to $22 to 25 million under the no action alternative. This revenue increase is expected to occur in a rationalized fishery, because target species quotas can be more fully utilized. Currently, in the non-whiting sector, cumulative landing limits for target species have to be set lower because the bycatch of overfished species cannot be directly controlled. Introducing accountability at the individual vessel level by means of IFQs provides a strong incentive for bycatch avoidance (because of the actual or implicit cost of quota needed to cover bycatch species) and prevents the bycatch of any one vessel from affecting the harvest opportunity of others. In addition, under the preferred alternative, the non-whiting sector would have control over harvest timing over the whole calendar year. Under the no action alternative,

the non-whiting sector would continue to operate under two-month cumulative landing limits, which reduces flexibility within the period, because any difference between actual limits and the period limit cannot be carried over to the next period. Finally, the ability for vessels managed under IFQs to use other types of legal groundfish gear could allow some increases in revenue by targeting higher-value line- or pot-gear-caught fish. This opportunity would mainly relate to sablefish, which are caught in deeper water, rather than nearshore species where state level regulatory constraints apply.

The preferred alternative may also increase ex-vessel revenues of non-whiting trawl harvesters by changing their bargaining power with processors over ex-vessel prices. Under the preferred alternative, the current two-month cumulative limits structure of the non-whiting trawl fishery would be replaced with QP that is available for a year, thereby extending the time horizon harvesters have to negotiate prices with processors without losing available fishing opportunity. The extended period would give harvesters greater latitude to hold out for better prices compared to the no action alternative. However, these negotiations will also be affected by the availability of target species, as well as the availability of bycatch.

Costs for the non-whiting sector of the limited entry trawl fishery are expected to decrease under the preferred alternative because of productivity gains related to fleet consolidation. Productivity gains would be achieved through lower capital requirements and a move to more efficient vessels. Operating costs for the non-whiting sector are predicted to decrease by as much as 60 percent annually. Based on estimates of current costs, this percentage decrease represents a $13.8 million cost reduction relative to the no action alternative.

The accumulation limits considered under the preferred alternative are not expected to introduce cost inefficiencies in the non-whiting sector, provided that current prices and harvest volumes do not decrease. However, the preferred alternative would impose new costs on the non-whiting sector that would not be incurred under the no action alternative. First, a landings fee of up to 3 percent of the ex-vessel value of fish harvested would be assessed under the preferred alternative to recover management costs, such as maintenance of the system of QS accounts. Second, new at-sea observer requirements would be introduced, and vessels would have to pay the costs of complying with these requirements, estimated at $500 a day if independent contractors are hired. The daily observer cost could place a disproportionate adverse economic burden on small businesses because such costs would comprise a larger portion of small vessels costs than that of larger vessels.

The increase in profits that commercial harvesters are expected to experience under the preferred alternative may render them better able to sustain the costs of complying with the new reporting and monitoring requirements. The improved harvesting cost efficiency under the preferred alternative may allow the non-whiting sector to realize profits of $14 to 23 million compared to $0 or less under the no action alternative. In addition, a provision that allows vessels managed under the IFQ program to use other legal gear (gear switching) would allow sablefish allocated to the trawl sector to be sold at a higher price per pound, possibly contributing to increased profits. The imposition of accumulation limits could reduce the expected increase in the profitability of the non-whiting sector by restricting the amount of expected cost savings, and the costs of at-sea observers may reduce profits by about $2.2 million, depending on the fee

structure. However, the profits earned by the non-whiting sector would still be substantially higher under the preferred alternative than under the no action alternative.

New entrants are likely to face a barrier to entry in the Pacific Coast groundfish limited entry trawl fishery in the form of the cost of acquiring QS (or a co-op share in the case of the at-sea whiting sector). This disadvantages them in comparison to those entities that receive an initial allocation of harvest privileges. Small entities may be particularly disadvantaged to the degree that they may find it more difficult to finance such quota purchases. Among the goals the Council identified for the adaptive management program was to use the reserved non-whiting QS to facilitate new entry into the fishery. In addition, the Council identified, as a trailing action, a framework to allow the establishment and implementation of community fishing associations as part of the adaptive management program. These entities could facilitate entry into the fishery by leasing QS at below market rates, thereby leveling the playing field in terms of costs between initial recipients of QS and new entrants.

The incremental effects of the preferred alternative on buyers and processors of trawl caught groundfish are detailed Sections 4.9 to 4.10 of the Rationalization of the Amendment 20 Pacific Coast Groundfish Limited Entry Trawl Fishery DEIS. Even though processors may have to pay fishermen higher ex-vessel prices, processors may see cost savings under the preferred alternative to the degree that rationalization allows greater control over the timing and location of landings. Processors could use current plant capacity more efficiently, because available information suggests that processing facilities are currently underutilized. Fleet consolidation in the non-whiting sector could also provide cost savings for processors if landings occur in fewer locations, thereby reducing the need for facilities and/or transport. The preferred alternative would also impose new costs on processors that would not be incurred under the no action alternative. Processors would be required to pay some or all of the costs of plant monitors, who would verify landings. Similar to at-sea observers, these monitors would be independent contractors rather than direct employees of the processing firm.

In the non-whiting processing industry, harvest volumes may increase because of a decrease in constraining species bycatch and a subsequent increase in underutilized target species catch. This boost in target species catch may increase utilization of processing capital and processing activity. [It should be noted that if, under the current system, bycatch has been underreported, with 100 percent observer coverage under the new system, the gains in increased target catches may be less than expected.] Consequently, the possibility of capital consolidation in the non-whiting shore-based sector may be lower than in the shore-based whiting sector. However, shifts in the distribution of landings across ports as a result of fleet consolidation, industry agglomeration, and the comparative advantage of ports (a function of bycatch rates in the waters constituting the operational area for the port, differences in infrastructure, and other factors) could lead to consolidation in processing activity at a localized or regional scale, as well as an expansion in processing activity elsewhere. To mitigate harm to adversely impacted non-whiting shoreside processors, the adaptive management program provides a mechanism to distribute non-whiting QS to processors, thereby ensuring that some processors receive greater landings of groundfish than would otherwise be the case.

As noted above, the preferred alternative may reduce the power of non-whiting shoreside processors to negotiate ex-vessel prices with harvesters. The larger harvest volume due to bycatch avoidance may lower processor average costs, which could offset the negative effects on non-whiting shoreside processors of a shift in bargaining power. In addition, processors could purchase QS over the long term, thereby increasing their negotiation power. However, the accumulation limits included in the preferred alternative would limit the ability of processors to purchase substantial quantities of QS. Alternatively, the adaptive management provision could be used to allocate QS to non-whiting shoreside processors, thereby providing them additional leverage when negotiating terms with harvesters.

The allocation of 20 percent of the initial shore-based whiting QS to the shoreside processor portion of the groundfish fishery would give these processors more influence in negotiations over ex-vessel prices and would tend to offset the gains in bargaining power for harvesters. For example, a processor could use QS to induce a harvester that is short of QP for a Pacific whiting trip to make deliveries under specified conditions and prices. Because of a reduction in peak harvest volume, however, fewer processing companies and/or facilities may be necessary to handle harvest volumes of Pacific whiting, meaning some companies may find themselves without enough product to continue justifying processing operations of Pacific whiting.

Revenues from harvesting and processing trawl-caught groundfish are expected to increase. Total revenue from nonwhiting trawl fisheries was $25 million in 2007. Revenue is expected to increase 1.1 to 1.6 times in a rationalized fishery, depending on bycatch rate reductions and stock status. Revenue increases are mainly expected because, under rationalized fisheries, target species quotas can be more fully utilized. Currently, in the nonwhiting sector, cumulative landing limits for target species have to be set lower because the bycatch of overfished species cannot be directly controlled. Introducing accountability at the individual vessel level provides a strong incentive for bycatch avoidance (because of the actual or implicit cost of quota needed to cover bycatch species) and prevents the bycatch of any one vessel from affecting the harvest opportunity of others. Whiting fisheries are more directly managed through quotas and, in recent years, by limits on bycatch. Beginning in 2009, bycatch limits have been established for each of the three whiting sectors. For the shore-based and mothership whiting sectors, the fishery can potentially close before the whiting allocation is fully harvested because a bycatch cap is reached. [The catcher-processor sector currently operates as a voluntary co-op and is, therefore, better able to coordinate harvest strategy to avoid reaching bycatch limits.] However, in general, the whiting sectors have been able to harvest their sector allocations. Whiting vessels could increase revenues due to improved product recovery as a result of the ability to better control harvest timing. As mentioned above, the ability for vessels managed under IFQs to use other types of legal groundfish gear could allow some increases in revenue by targeting higher-value line or pot gear caught fish.

Harvester and possibly processor costs are expected to decrease because of productivity gains related to fleet consolidation. Cost savings would be due to lower capital requirements and a move to more efficient vessels in the nonwhiting sector. Costs are predicted to decrease by as much as 60 percent annually, which, based on estimates of current operating costs, would represent a $13.8 million decrease. Similar levels of consolidation are expected for shorebased and mothership catcher vessels. Proposed mitigation measures could reduce these costs savings.

For example, a 1 percent quota share accumulation limit could reduce cost savings by as much as 20 percent. However, the accumulation limits considered in the alternatives are not expected to introduce higher costs at current prices and harvest volume. The proposed action would introduce some new costs. First, up to 3 percent of the value of landings may be assessed to cover administrative and management costs. Second, new at-sea observer requirements would be introduced and vessels would have to pay the cost, estimated at $350 to $500 a day.

Processors may see cost-savings to the degree that rationalization allows greater control over the timing and location of landings. Processors could use current plant capacity more efficiently, because available information suggests that processing facilities are currently underutilized. Fleet consolidation could also drive some cost savings on the part of processors if landings occur in fewer locations. This would reduce the need for facilities and/or transport. Under the proposed action, processors would be required to pay the costs of plant monitors, who would verify landings. These monitors would not be directly employed by the processing firm but, similar to at-sea observers, would be independent contractors.

Rationalization of the groundfish trawl sector is expected to free up capital and labor because of increases in productivity. [Since the basic input, trawl-caught fish, is subject to an underlying constraint due to biological productivity, increases in labor and capital productivity are expected to reduce the amount of those inputs needed.] However, from a national net benefit perspective, these effects are neutral since capital and labor can be put to some productive use elsewhere in the broader economy. Also, current groundfish fishery participants who receive QS (trawl limited entry trawl permit holders and eligible shoreside processors) are compensated to the degree that the asset value of the QS covers capital losses.

The tracking and monitoring costs of this program will be provided in more detail during the "program components" rulemaking process. However, the RIR/IRFA to this rule contains some preliminary estimates. After a transition period, initial estimates of the annual Federal and state agency costs to run the shore-based fishery (including whiting) are about $5 million. Based on the observer cost of $500 per day, the annual costs of observers is about $4 million. At $350 per day, the compliance monitoring program is just over $1 million annually. These figures add up to just over $10 million. From a cost-benefit viewpoint, if consolidation leads to $14 million savings from reduced harvesting costs, and the new program increases the tracking and monitoring costs of $10 million, there is a projected net gain of about $4 million. This does not take into account expectations that costs will likely be reduced due to consolidation or the increases in expected revenues discussed above.

While the effect of the preferred alternative on revenues and costs in the whiting sector of the limited entry trawl fishery is more difficult to estimate, the lower motivation to "race for fish" due to co-op harvest privileges is expected to result in improved product quality, slower-paced harvest activity, increased yield (which should increase ex-vessel prices), and enhanced flexibility and ability for business planning. The overall effect of these changes would be higher revenues and profits for harvesters in the shoreside and mothership portions of the whiting fishery in comparison to the no action alternative. Under the preferred alternative, some consolidation may occur in the shoreside and mothership sectors of the Pacific whiting fishery, though the magnitude of consolidation is expected to be less than in the non-whiting sector. The

existing catcher-processor co-op would continue under the preferred alternative, with effects on the catcher-processor sector that look similar, or identical, to those of the no action alternative. However, the change from a vessel-restriction under Amendment 15 to the permit-based limit of Amendment 21 will provide additional flexibility that currently does not exist in the whiting fishery.

This proposed rule would regulate businesses that harvest groundfish and processors that want to process limited entry trawl groundfish. Under the RFA, the term "small entities" includes small businesses, small organizations, and small governmental jurisdictions. For small businesses, the Small Business Administration has established size criteria for all major industry sectors in the U.S, including fish harvesting and fish processing businesses. A business involved in fish harvesting is a small business if it is independently owned and operated, is not dominant in its field of operation (including its affiliates), and has combined annual receipts that do not exceed $4.0 million for all its affiliated operations worldwide. A seafood processor is a small business if it is independently owned and operated, is not dominant in its field of operation, and employs 500 or fewer persons on a full-time, part-time, temporary, or other basis, at all its affiliated operations worldwide. A business involved in both the harvesting and processing of seafood products is a small business if it meets the $4.0 million criterion for fish harvesting operations. A wholesale business servicing the fishing industry is a small business if it employs 100 or fewer persons on a full time, part time, temporary, or other basis, at all its affiliated operations worldwide. For marinas and charter/party boats, a small business is one with annual receipts not in excess of $7.0 million. The RFA defines a small organization as any nonprofit enterprise that is independently owned and operated and is not dominant in its field. The RFA defines small governmental jurisdictions as governments of cities, counties, towns, townships, villages, school districts, or special districts with populations of less than 50,000.

NMFS makes the following conclusions based primarily on analyses associated with fish ticket and limited entry permit data, available employment data provided by processors, information on the charterboat and tribal fleets, and available industry responses industry to ongoing survey on ownership. Entities were analyzed as to whether they were only affected by the Amendment 21 allocation processes (non-trawl), or whether they were affected by both Amendments 20 and 21 (trawl).

The non-trawl businesses are associated with the following fleets: limited entry fixed gear (approximately 150 companies), open access groundfish (1,100), charterboats (465), and the tribal fleet (four tribes with 66 vessels). Available information on average revenue per vessel suggests that all the entities in this group can be considered small.

For the trawl sector, there are 177 permit holders. Nine limited entry trawl permits are associated with the catcher-processing vessels that are considered large companies. Of the remaining 168 limited entry permits, 25 limited entry trawl permits are either owned or closely associated with a large shore-based processing company or with a non-profit organization who considers itself a large organization. Nine other permit owners indicated that they were large companies. Almost all of these companies are associated with the shorebased and mothership whiting fisheries. The remaining 134 limited entry trawl permits are projected to be held by small companies. Three of the six mothership processors are large companies. Within the

14 shorebased whiting first receivers/processors, there are four large companies. Including the shorebased whiting first receivers, in 2008, there were 75 first receivers that purchased limited entry trawl groundfish. There were 36 small purchasers (less than $150,000); 26 medium purchasers (purchases greater than $150,000 but less than $1,000,000); and 13 large purchasers (purchases greater than $1.0 million). Because of the costs of obtaining a processor site license, procuring and scheduling a catch monitor, and installing and using the electronic fish ticket software, these small purchasers will likely opt out of buying groundfish, or arrange to purchase fish from another company that has obtained a processing site license.

The major impacts of this rule appear to be on two groups: Shoreside processors, which are a mix of large and small processors; and shore-based trawlers, which are also a mix of large and small companies. The non-whiting shore-based trawlers are currently operating at a loss or, at best, are breaking even. The new rationalization program would lead to profitability, but only with a reduction of about 60 percent of the fleet. This program would lead to major changes in the fishery. To help mitigate against these changes, as discussed above, the agency has announced its intent, subject to available Federal funding, that participants would initially be responsible for 10 percent of the cost of hiring observers and catch monitors. The industry proportion of the costs of hiring observers and catch monitors would be increased every year so that, once the fishery has transitioned to the rationalization program, the industry would be responsible for 100 percent of the cost of hiring the observers and catch monitors by 2014. NMFS believes that an incrementally reduced subsidy to industry funding would enhance the observer and catch monitor program's stability, ensure 100 percent observer and catch monitor coverage, and facilitate the industries' successful transition to the new quota system. In addition, to help mitigate against the negative impacts of this program, the Council has adopted an adaptive management program (CFA) in which, starting in year three of the program, 10 percent of non-whiting QS would be set aside every year to address community impacts and industry transition needs. After reviewing the initial effects of ITQ programs in other parts of the world, the council had placed a short-term QS trading prohibition so that fishermen can learn from their experiences and not make premature sales of their QS. The Council also envisions future regulatory processes that would allow CFAs to be established to help aid communities and fishermen.

Regulatory Impact Review and
Initial Regulatory Flexibility Analysis

Proposed Rationalization of the Pacific Coast Groundfish Limited Entry Trawl Fishery AND Allocation of Harvest Opportunity BETWEEN Sectors of the Pacific Coast Groundfish Fishery
National Marine Fisheries Service, Northwest Region
Initial Analysis May 2010

1. INTRODUCTION

This document is a Regulatory Impact Review (RIR) and Initial Regulatory Flexibility Analysis (IRFA) that describes the expected economic impacts of selected alternatives contained in the following two proposed amendments to the Pacific Coast Groundfish Fishery Management Plan:

- *Amendment 20—Rationalization of the Pacific Coast Groundfish Limited Entry Trawl Fishery*. Amendment 20 would create the structure and management details of the trawl fishery rationalization program.

- Amendment 21—*Allocation of Harvest Opportunity Between Sectors of the Pacific Coast Groundfish Fishery*. Amendment 21 would allocate the groundfish stocks between trawl and non-trawl fisheries.

The Northwest Region of the National Marine Fisheries Service (NMFS-NWR) is developing regulations that will, if approved by the U.S. Secretary of Commerce, implement the plan amendments. The rulemaking process must comply with Executive Order (EO) 12866 and the Regulatory Flexibility Act (RFA). The RFA requires the agency to prepare and make available for public comment an IRFA that describes the impact on small businesses, non-profit enterprises, local governments, and other small entities. The IRFA aids the agency in considering all reasonable regulatory alternatives that would minimize the economic impact on affected small entities. The EO covers a variety of regulatory policy considerations and establishes procedural requirements for RIRs that will contain analyses of the benefits and costs of regulatory actions.

Trawl Rationalization Program Structure

The trawl rationalization program would consist of (1) an individual fishing quota (IFQ) program for the shore-based trawl fleet and (2) cooperative (co-op) programs for the at-sea trawl fleet. The shore-based trawl fleet would include IFQ participants who land groundfish to shore-based processors or first receivers. The at-sea trawl fleet would include fishery participants harvesting whiting with midwater trawl gear (i.e., whiting catcher/processor vessels, whiting motherships, and whiting catcher vessels associated with motherships). The co-op programs for the at-sea trawl fleet are further divided as follows: (1) a single whiting catcher/processor co-op that forms; and (2) one or more whiting mothership co-ops that may form. Vessels may also choose to fish in an open access or non-co-op fishery that would be unaffiliated with a co-op. For the co-op and non-co-op fishery, vessel owners pool their harvest together.

The IFQ program for the shore-based fleet would require NMFS to make an initial allocation of harvest quota share (QS) (expressed as a percentage of the total sector amount) through a new QS permit to current owners of limited entry trawl permits and shore-based whiting first receivers who meet the qualifying criteria. Depending on a person's limited entry trawl permit history in qualifying years, the permit owner will receive an initial allocation for various target species/species groups (approximately 20 species), some with area designations. In addition, NMFS would allocate QS for overfished species based on a proxy of the amount of target species allocated to the quota shareholder. Shore-based whiting first receivers will receive an initial allocation of whiting only, based on their history of being the first receiver reported on state fish tickets (with an opportunity to reassign their history). Each year, based on the optimum yield (OY) amounts for each species and the amount of QS a holder has for a particular species/area, NMFS would allocate quota pounds (QP) to the QS account. The QS owner, in turn, must allocate QP to vessel accounts. Vessels are required to have IFQ or QP in an account to cover all IFQ landings and discards incurred while fishing under this program. In order to comply with the Magnuson-Stevens Fishery Conservation and Management Act (MSA), NMFS would track ownership interest in QS to determine if individuals are within set accumulation limits, both at the initial allocation stage and during the operation of the program. In Amendment 20, the Pacific Fishery Management Council (Council) has adopted limits (by species group and area) on the amount of QS an individual can control (i.e., control limits) and limits on the amount of QP that may be registered to a vessel for use in a given year.

For the at-sea whiting component of the trawl rationalization program, the Council has adopted a program that provides for a catcher-processor co-op and mothership co-ops that differ from how the co-ops have operated in the past. The catcher-processor co-op will not require an initial allocation of catch shares to individual vessels, provided that a co-op is established. However, whiting catch shares for the mothership fleet (called catch history assignments) would initially be allocated to qualifying limited entry trawl permits that were registered to catcher vessels in qualifying years and which were used in the mothership whiting fishery. The catch history assignments would be non-severable from the permit. Holders of qualifying permits that are allocated a whiting catch history assignment may choose to participate in the mothership co-op or non-co-op fishery. Similar to the shore-based IFQ program, NMFS would be required to track permit ownership interests in the mothership sector to determine if individuals comply with accumulation limits. For species subject to trawl rationalization, Amendment 21 would modify the way annual harvest guidelines are distributed. Under the current allocation strategy established in Amendment 6, a commercial harvest guideline (HG) is established. This commercial HG is then divided between limited entry and open access. Under Amendment 21, the limited entry fixed gear fishery would no longer receive a formal allocation. In addition, the commercial HG would be changed to a general HG, which would also apply to recreational fisheries.

Instead of deriving a commercial HG from OY, NMFS would establish a fishery HG applicable to both commercial and recreational fisheries. The HG would be derived by reducing OY in the manner currently described for the commercial HG, except that the recreational catch would not be subtracted; it would be included in the fishery HG. NMFS would then divide the fishery HG into allocations for the trawl and non-trawl fisheries. This differs from the current regime that divides between limited entry and open access. For some species under the proposed program,

the recreational fishery and the limited entry fixed gear fishery would share in the non-trawl allocation with the open access fleet. This proposed rule sets forth the specific percentages of the fishery HG for covered species that would be allocated to the trawl and non-trawl fisheries.

In order to implement the recommended IFQ and Co-op programs, it would be necessary for each of these trawl sectors to have a specific allocation of catch that could be divided among participants. While this could be accomplished through the specification process under the status quo, the council determined that a fixed allocation within the fishery management plan (FMP) would be preferable because it would promote predictability and the type of stability that facilitates successful relationships that make individual-based programs work. Thus, the Council recommended formal allocations in Amendment 21. In addition, Amendment 21 would establish total catch limits for Pacific halibut, as well as set-asides to accommodate the rationalized trawl fleet. The total catch limits would protect the directed fishery for halibut, as well as reducing overall halibut catch limits.

Species not covered by Amendment 21 would continue to be informally allocated through the biennial specifications process.

Introductory Note on the Analysis

Due to the complexity of the proposed fishery management measures, the rule associated with this analysis proposes only certain key components that would be necessary to have permits and endorsements issued in time for use in the 2011 fishery and to have the 2011 specifications reflect the new allocation scheme. Specifically, this rule would establish the formal allocations set forth under Amendment 21 and establish procedures for initial issuance of permits, endorsements, and quota shares under the IFQ and co-op programs. NMFS plans to propose additional program details in a future proposed rule. Such additional details would include program components applicable to IFQ gear switching, observer programs, retention requirements, equipment requirements, catch monitors, catch weighing requirements, co-op permits/agreements, first receiver site licenses, quota share accounts, vessel QP accounts, further tracking and monitoring components, and economic data collection requirements. In order to encourage more informed public comment, this proposed rule includes a general description of these additional program requirements. NMFS is also planning a future cost-recovery rule based on a recommended methodology yet to be developed by the Council.

To support the rulemaking described above, this analysis will be accordingly updated and revised. However, this initial analysis will assess the entire program by drawing heavily upon the Council's November 2010 document "Rationalization of the Pacific Coast Groundfish Limited Entry Trawl Fishery Draft Environmental Impact Statement," including its "Appendix H Preliminary Draft Regulatory Impact Review and Preliminary Initial Regulatory Flexibility Analysis." This analysis also updates the tracking and monitoring cost analysis found in Appendix A, Section A-2.3.3, Analysis of Components, Elements, and Options for the Individual Fishing Quota Alternative Trawl Individual Quota Components Analysis. This updated analysis also includes a discussion of the tracking and monitoring costs of the mothership and catch-processor sectors. This update is Attachment 1 to this document: "Update on Tracking and Monitoring Costs."

The analysis that follows constitutes both the RIR and IRFA as many of their required elements are the same. In terms of meeting the analytical requirements of an RIR and IRFA, the analysis adopts the following approach set forth in the 2007 *Guidelines for Economic Reviews of National Marine Fisheries Service Regulatory Actions*:

> At a minimum, the RIR and the [IRFA] should include a good qualitative discussion of the economic effects of the selected alternatives. Quantification of these effects is desirable, but the analyst needs to weigh such quantification against the significance of the issue and available studies and resources. Generally, a good qualitative discussion of the expected effects would be better than poor quantitative analyses.

The next two sections further describe the considerations and requirements of a RIR and IRFA.

2. REGULATORY IMPACT REVIEW CONSIDERATIONS AND REQUIREMENTS

NMFS requires the preparation of an RIR for all regulatory actions of public interest. The RIR provides a comprehensive review of the changes in net economic benefits to society associated with proposed regulatory actions. The analysis also provides a review of the problems and policy objectives prompting the regulatory proposals and an evaluation of the major alternatives that could be used to solve the problems. The purpose of the analysis is to ensure that the regulatory agency systematically and comprehensively considers all available alternatives, so that public welfare can be enhanced in the most efficient and cost-effective way. The RIR addresses many of the items in the regulatory philosophy and principles of EO 12866.

The RIR is designed to determine whether the proposed action could be considered a significant regulatory action according to EO 12866. EO 12866 requires that an RIR assess whether an action would be a significant regulatory action and mandates that the RIR identify the expected outcomes of the proposed management alternatives. An action may be considered significant if it is expected to 1) have an annual effect on the economy of $100 million or more or adversely affect in a material way the economy, a sector of the economy, productivity, competition, jobs, the environment, public health or safety, or state, local, or tribal governments or communities; 2) create a serious inconsistency or otherwise interfere with action taken or planned by another agency; 3) materially alter the budgetary impact of entitlement, grants, user fees, or loan programs or the rights and obligations of recipients thereof; or 4) raise novel legal or policy issues arising out of legal mandates, the President's priorities, or the principles set forth in the EO.

The RIR analysis includes a description of management objectives, a description of the fishery, statement of the problem, a description of each alternative considered in the analysis, and an economic analysis of the expected effects of each selected alternative relative to the no action alternative.

3. INITIAL REGULATORY FLEXIBILITY ANALYSIS CONSIDERATIONS AND

REQUIREMENTS

The RFA, 5 U.S.C. 603 et seq., requires government agencies to assess the effects that regulatory alternatives would have on small entities, including small businesses, and to determine ways to minimize those effects. When an agency proposes regulations, the RFA requires the agency to prepare an IRFA that describes the impact on small businesses, non-profit enterprises, local governments, and other small entities and make the IRFA available for public comment. The IRFA is designed to aid the agency in considering all reasonable regulatory alternatives that would minimize the economic impact on affected small entities. Under the RFA, an agency does not have to conduct an IRFA and/or final RFA (FRFA) if an agency can certify that the proposed rule will not have a significant economic impact on a substantial number of small entities. To perform this certification, the agency has to state the basis and purpose of the rule, describe and estimate the number of small entities to which the rule applies, estimate economic impacts on small entities (by entity size and industry), and explain the criteria used to evaluate whether the rule would impose "significant economic impacts."

Under the RFA, the term "small entities" includes small businesses, small organizations, and small governmental jurisdictions.

Small businesses. The Small Business Administration has established size criteria for all major industry sectors in the United States, including fish harvesting and fish processing businesses. A business involved in fish harvesting is a small business if it is independently owned and operated and not dominant in its field of operation (including its affiliates) and if it has combined annual receipts that do not exceed $4.0 million for all its affiliated operations worldwide. A seafood processor is a small business if it is independently owned and operated, not dominant in its field of operation, and employs 500 or fewer persons on a full-time, part-time, temporary, or other basis, at all of its affiliated operations worldwide. A business involved in both the harvesting and processing of seafood products is a small business if it meets the $4.0 million criterion for fish harvesting operations. A wholesale business servicing the fishing industry is a small business if it employs 100 or fewer persons on a full-time, part-time, temporary, or other basis, at all its affiliated operations worldwide. For marinas and charter/party boats, a small business is one with annual receipts that do not exceed $7.0 million.

Small organizations. The RFA defines a small organization as any nonprofit enterprise that is independently owned and operated and is not dominant in its field.

Small governmental jurisdictions. The RFA defines small governmental jurisdictions as governments of cities, counties, towns, townships, villages, school districts, or special districts with populations of less than 50,000.

4. REGULATORY IMPACT REVIEW AND INITIAL REGULATORY FLEXIBILITY ANALYSIS

4.1 Statement of the Problem, Including Reasons for Considering the Proposed Actions

This section summarizes the purpose and need for the proposed actions as discussed in Section 1.2 of the *Rationalization of the Pacific Coast Groundfish Limited Entry Trawl Fishery DEIS* and Section 1.3 of the *Allocation of Harvest Opportunity Between Sectors of the Pacific Coast Groundfish Fishery DEIS*.

Despite a program completed in 2003 to buy back groundfish limited entry permits and associated vessels, management of the Pacific coast limited entry groundfish trawl fishery is still marked by serious biological, social, and economic concerns similar to those cited in the U.S. Commission on Ocean Policy's 2004 report, *An Ocean Blueprint for the 21st Century*. The trawl fishery is currently viewed as economically unsustainable due to the number of participating vessels (excess capacity), a regulatory approach that constrains efficiency, and the status of certain groundfish stocks, along with the measures in place to protect those stocks.

One major source of concern stems from the management of bycatch, particularly of overfished species. Over the past several years, the groundfish management efforts of the Council have been involved in drafting rebuilding plans for overfished species, minimizing bycatch, and specific management of overfished species.

As highlighted in the following problem statement that the Council sent out for public review in a June 2004 scoping document, these problems with capacity, economic inefficiency, and bycatch management are interconnected with problems related to the ability to achieve OY; the need for a precautionary management approach; and the need for a flexible system that allows for variations and contingencies, long-term and short-term concerns for communities, and safety. The problem statement is presented below:

> As a result of the legal requirement to minimize bycatch of overfished species, considerable harvest opportunity is being forgone in an economically stressed fishery. The west coast groundfish trawl fishery is a multi-species fishery in which fishermen exert varying and limited control of the mix of species in their catch. The optimum yields (OYs) for many overfished species have been set at low levels, placing a major constraint on the industry's ability to fully harvest the available OYs of the more abundant target species that co-occur with the overfished species, wasting economic opportunity. Average discard rates for the fleet are applied to project bycatch of overfished species. These discard rates determine the degree to which managers must constrain the harvest of target species that co-occur with overfished species. These discard rates are developed over a long period of time and do not rapidly respond to changes in fishing behavior by individual vessels or for the fleet as a whole. Under this system, there is little direct incentive for individual vessels to do everything possible to avoid take of species for which there are conservation concerns, such as overfished species. In an economically stressed environment, uncertainties about average

bycatch rates become highly controversial. As a consequence, members of fishing fleets tend to place pressure on managers to be less conservative in their estimates of bycatch. Given all of these factors, in the current system there are uncertainties about the accuracy of bycatch estimation, few incentives for the individual to reduce personal bycatch rates, and an associated loss of economic opportunity related to the harvest of target species.

The current management regime is not responsive to the wide variety of fishing business strategies and operational concerns. For example, historically the Pacific Council has tried to maintain a year-round groundfish fishery. Such a pattern works well for some business strategies in the industry, but there has been substantial comment from fishermen who would prefer to be able to pursue a more seasonal groundfish fishing strategy. The current management system does not have the flexibility to accommodate these disparate interests. Nor does it have the sophistication, information, and ability to make timely responses necessary to react to changes in market, weather, and harvest conditions that occur during the fishing year. The ability to react to changing conditions is a key factor in conducting an efficient fishery in a manner that is safe for the participants.

Fishery stock depletion and economic deterioration of the fishery are concerns for fishing communities. Communities have a vital interest in the short-term and long-term economic viability of the industry, the income and employment opportunities it provides, and the safety of participants in the fishery.

In summary, management of the fishery is challenged with the competing goals of: minimizing bycatch, taking advantage of the available allowable harvests of more abundant stocks, increasing management efficiency, and responding to community interest. "Taking advantage of the available allowable harvests" includes conducting safe and efficient harvest activities in a manner that optimizes net benefits over both the short and long term.

In addition to problems specified in the problem statement, the two DEISs also deal with issues of foregone opportunities, stress within the management system, discard rates, and overfished species.

With respect to allocation of harvest opportunity between sectors of the Pacific Coast groundfish fishery, only long-term fixed allocations for Pacific whiting and sablefish north of 36° N latitude exist. Currently there are established procedures for any species to be formally allocated between commercial open access and limited entry sectors based on catch history for the license limitation allocation period. However, these are rarely implemented due to constraints imposed by management measures designed to rebuild overfished species. Allocating the available harvest of groundfish species and species complexes occurs in the Council process of deciding biennial harvest specifications and management measures; as such, these are considered short-term allocations. Amendment 21 makes a formal allocation between sectors for the majority of groundfish species, and it would, essentially, supersede these preexisting procedures in a single action.

4.2 Description of the Management Objectives and Legal Basis for the Proposed Actions

This section summarizes the management objectives for the proposed actions as discussed in Section 1.2 of the *Rationalization of the Pacific Coast Groundfish Limited Entry Trawl Fishery DEIS* and Section 1.3 of the *Allocation of Harvest Opportunity Between Sectors of the Pacific Coast Groundfish Fishery DEIS*.

The purpose of the proposed rationalization of the Pacific coast groundfish limited entry trawl fishery is outlined in the following goal and objectives:

Goal: Create and implement a capacity rationalization plan that increases net economic benefits, create individual economic stability, provide for full utilization of the trawl sector allocation, considers environmental impacts, and achieve individual accountability of catch and bycatch.

Objectives: The above goal is supported by the following objectives:

1. Provide a mechanism for total catch accounting.
2. Provide for a viable, profitable, and efficient groundfish fishery.
3. Promote practices that reduce bycatch and discard mortality and minimize ecological impacts.
4. Increase operational flexibility.
5. Minimize adverse effects from an individual fishing quota (IFQ) program on fishing communities and other fisheries to the extent practical.
6. Promote measurable economic and employment benefits through the seafood catching, processing, distribution elements, and support sectors of the industry.
7. Provide quality product for the consumer.
8. Increase safety in the fishery.

In summary, the trawl rationalization program is intended to increase net economic benefits, create individual economic stability, provide full utilization of the trawl sector allocation, consider environmental impacts, and achieve individual accountability for catch and bycatch.

The purposes of the proposed allocation of harvest opportunity between sectors of the Pacific coast groundfish fishery are as follows:

1. To simplify or streamline future decisions by making formal allocations of specified groundfish stocks and stock complexes. If approved, formal allocations would be fixed and do not have to be decided through every biennial process or developed indirectly through the structure of management measures.
2. To support rationalization of the Pacific coast groundfish limited entry trawl fishery. Long-term, formal allocations of Amendment 21 groundfish species to the limited entry trawl sectors would provide more certainty to these sectors by reducing the risk that these sectors would be closed because of other non-trawl sectors exceeding their allocation. Such certainty will be especially important under the proposed IFQ and harvest co-operative systems proposed under the trawl rationalization program, because it would

make it easier for fishermen to make long-range planning decisions based on the allocation of harvest privileges. In addition, supporting rationalization of the limited entry trawl fishery, which would require individual accountability of catch and bycatch, would improve overall total catch accounting of groundfish species by the group with the largest amounts of groundfish catch, the trawl sector. While allocations could be made biennially to support trawl rationalization, this would be a more difficult and controversial process than making those decisions in advance.

3. To limit the bycatch of Pacific halibut in future limited entry trawl fisheries. The proposed action would place a total catch limit on Pacific halibut with the intent of further minimization of Pacific halibut bycatch in Area 2A trawl fisheries. The action would be consistent with the MSA mandate to minimize bycatch and would provide increased benefits to Area 2A fishermen targeting Pacific halibut.

The introductory paragraphs in Section 1.1 of the *Rationalization of the Pacific Coast Groundfish Limited Entry Trawl Fishery DEIS* and Section 1.1 of the *Allocation of Harvest Opportunity Between Sectors of the Pacific Coast Groundfish Fishery DEIS* provide information on the legal basis for the proposed actions. The trawl rationalization program would be a limited access privilege program (LAPP) under the MSA, 16 U.S.C. §§ 1851–1891d, as reauthorized in 2007.

4.3 Description of Each Selected Alternative, Including the No-action Alternative

The term "selected alternatives" refers to the alternatives NMFS determined will be analyzed in the RIR and IRFA. The selected alternatives for this RIR and IRFA are the no action alternative and the Council's preferred alternative. The effects of the other action alternatives that were not selected are analyzed in the *Rationalization of the Pacific Coast Groundfish Limited Entry Trawl Fishery DEIS* and *Allocation of Harvest Opportunity Between Sectors of the Pacific Coast Groundfish Fishery DEIS.*

4.3.1 No Action Alternative

The analysis of the no action alternative describes what is likely to occur in the absence of the proposed action. It provides a benchmark against which the incremental effects of the proposed action can be compared. This section summarizes the description of the no action alternative presented in Section 2.1 of the *Rationalization of the Pacific Coast Groundfish Limited Entry Trawl Fishery DEIS* and Section 2.1.1 of the *Allocation of Harvest Opportunity Between Sectors of the Pacific Coast Groundfish Fishery DEIS.*

Under the no action alternative, the current, primary management tool used to control the Pacific coast groundfish trawl catch—a system of two-month cumulative landing limits for most species and season closures for Pacific whiting—would continue. Only long-term fixed allocations for Pacific whiting and sablefish north of 36° N latitude would exist—all other groundfish species would not be formally allocated between the trawl and non-trawl sectors. Allocating the available harvest of groundfish species and species complexes would occur in the Council process of deciding biennial harvest specifications and management measures and, as such, would be considered short-term allocations.

4.3.2 Preferred Alternative

This section summarizes the description of the preferred alternative presented in Section 2.4 of the *Rationalization of the Pacific Coast Groundfish Limited Entry Trawl Fishery DEIS* and Section 2.1.6 of the *Allocation of Harvest Opportunity Between Sectors of the Pacific Coast Groundfish Fishery DEIS*.

Table 1 provides an overview of the elements of the trawl rationalization program under the preferred alternative. The existing shoreside whiting and shoreside non-whiting sectors of the Pacific Coast groundfish limited entry trawl fishery would be managed as one sector under a system of IFQs, and the at-sea whiting sectors of the fishery (i.e., catcher-processor sector and mothership sector, which includes motherships and catcher vessels) would be managed under a system of sector-specific harvesting co-ops. The catcher-processor sector would continue to operate under the existing, self-developed co-op program entered into voluntarily by that sector. A distinct set of groundfish species and Pacific halibut would be covered by the rationalization program.

Table 1. Summary of elements under the no action alternative and preferred alternative for trawl rationalization program.

Element	No-action Alternative	Preferred Alternative
Catch Control Tool	two-month cumulative trip limits for non-whiting trawl sector	IFQ program for shoreside whiting and non-whiting trawl sectors (trip limits for non-IFQ species)
	Seasonal management for whiting trawl sector	Harvesting co-operatives for at-sea whiting sector
Initial Allocation and Qualification	None	For shoreside fisheries for use 1994 to 2003 catch history Equal sharing of 1994 to 2003 buyback history in non-catcher-processor sectors (except the incidentally caught overfished species other than canary)
		Rebuilding stocks and halibut allocated on a bycatch rate/pro-rata
		Mothership catcher vessel endorsement and allocation based on 1994 to 2003 catch history; Mothership permit: at least 1,000 mt in two years from 1997 to 2003
Accumulation Limits	None	Shoreside non-whiting sector: 2.7% control limit and 3.2% vessel use limit
		Shoreside whiting sector : 10% control limit and 15% per vessel limit
		Mothership sector: Cannot process more than 45%
		Mothership catcher vessel sector: 20% control limit and 30% usage limit
		Catcher-processor sector: none

Table 2 cont. Summary of elements under the no action alternative and preferred alternative for trawl rationalization program.

Element	No-action Alternative	Preferred Alternative
Grandfather clause	None	None, but entities must divest overage QS at the end of year four
Processor Initial Allocation / Co-op Affiliations	None	Annual mothership declaration requirement
		20% shoreside processor allocation of shoreside whiting
		No processor allocation of non-whiting groundfish
Species Covered	All groundfish	Select groundfish species and Pacific halibut in shoreside sector
		Select groundfish species in at-sea sector; At-sea sector bycatch is allocated at co-op level
Number of Trawl Sectors	Four	Three
Adaptive Management	None	10% QS set aside for shoreside non-whiting groundfish species
Area Management	Trip limits vary by area; main split at $40^0$10' N latitude	None
Carry-over	None	Carryover exists; allowance decreases if OY declines
Permits	Limited Entry, Pacific Whiting Vessel License	Limited entry, mothership permit, catcher-processor endorsement, mothership catcher vessel endorsements

At the start of the IFQ program, quota shares (QS) would initially be allocated to fishery participants based on catch/processing history during a catch history qualification period, 1994 to 2003. After the first two years of the program, shareholders will be free to buy and sell the QS thus distributed. QS represent a proportion, or percent, of the total allowable catch (which is called the optimum yield [OY]in groundfish management) of different groundfish stocks. Each year, these shares are converted from a percent to a quantity by issuing QP based on the OYs/annual catch limits established for the year. The amount of groundfish caught by a limited entry trawl vessel, even if it is subsequently discarded, must be matched by an equivalent quantity of QP. The QP is expended in this way, with the matched amount deducted from the vessel's account.

Harvesters in the shoreside sector would receive all the initial allocation of non-whiting QS (minus any amount held back for the adaptive management program in future years) and 80 percent of whiting QS. Processors in the shoreside sector would receive the remaining 20 percent of whiting QS.

Both QS and QP would be perfectly divisible and tradable. However, to prevent a particular individual, corporation, or other entity from acquiring an excessive QS, accumulation limits

would restrict the amount of QS any single entity may hold or control (the control limit) and the amount of QP that can be placed on a vessel during a given year to cover catch (the vessel limit). These limits would vary between whiting and non-whiting groundfish. For mothership catcher vessels, a usage limit would act similar to a vessel limit. The preferred alternative includes a two-year moratorium on QS sales, followed by a two-year period over which entities receiving an initial allocation of QS in excess of the limits can and must divest their excess QS to any willing receiver.

An adaptive management program that would reserve 10 percent of non-whiting QS for the shoreside sector could be used to address a variety of objectives, such as creating incentives for bycatch reduction and use of habitat-friendly gear, mitigating adverse impacts to processors and fishing communities, and helping second generation fishermen/new entrants. During the first two years of implementation of the preferred alternative, the adaptive management QP would be passed through to QS holders in proportion to their holdings. Allocations of other species' QP under the program would begin in the third year, based on further specification of adaptive management program objectives and mechanisms.

These regulations would modify the existing limited entry permit system and would replace the Pacific whiting vessel license system with a series of endorsements. In 2009, NMFS implemented Amendment 15, which required a Pacific whiting vessel license for any vessel participating in either the shorebased or at-sea whiting fisheries. These licenses were issued to limit the number of vessels in the whiting fishery based on participation history in these fisheries. Under the trawl rationalization program, the Pacific whiting vessel licenses will permanently expire and will be replaced by a new mothership permit and new catcher/processor and mothership catcher vessel endorsements for existing Pacific Coast limited entry permits. [Although the Pacific whiting vessel license restricts what vessels can participate in the whiting fishery, these new endorsements convert the at-sea fisheries into a series of limited entry fisheries with tradable permits and endorsements.]

For the mothership catcher vessels, the years 1994 to 2003 would be used for endorsement qualification, and the best 8 out of 10 years from 1994 to 2003 would be used for catch history assignment. Mothership catcher vessels would be required to declare which co-op they will join before the beginning of the fishing year. They would then be obligated to assign their catch to the associated mothership processor for that fishing season. In any subsequent year, they could change their affiliation without first participating in the non co-op fishery through the pre-season declaration. Provision for a non co-op fishery would still be included in the program structure. Any vessel not wishing to affiliate with a co-op could participate in the non co-op fishery and deliver to any willing mothership processor. Since the catcher-processor sector would continue to operate as a single voluntary co-op, catch history assignment is unnecessary; the co-op would have access to the full sector allocation. Should the catcher-processor co-op fail because, for example, the co-op does not manage harvest such that allocations are repeatedly exceeded, the catcher-processor sector would be managed under a system of IFQs, and an equal amount of QS would be issued to each permit with a catcher-processor endorsement.

Amendment 20 would include a tracking and monitoring program to ensure that all catch (including discards) would be documented and matched against QP. The Council specified that

observers would be required on all vessels, and shoreside monitoring (catch monitors) would be required during all off-loading (100 percent coverage). Compared to status quo monitoring, this would be a monitoring and observer coverage level increase for a large portion of the trawl fleet, particularly nonwhiting shoreside vessels. As a result, more accurate estimates of total mortality would be expected to benefit stock conservation goals, as well as other goals discussed herein.

Amendment 20 would require NMFS-certified, at-sea observers on each vessel. These include shoreside catcher vessels, mothership catcher vessels, mothership processors, and catcher-processors. Because this is a new program, ensuring adequate observer coverage would be particularly important for monitoring the complex suite of allocations. Observers aboard vessels would be required to account adequately for catch and bycatch in the fishery. Among his or her duties, the observer would record fishing effort and estimate total, retained, and discarded catch weight by species; determine species composition of retained and discarded catch (non-whiting vessels) and document the reasons for discard; record interactions and sightings of protected species; take biological samples from tagged fish and discards, and estimate viability of Pacific halibut. Observers would be essential to monitor IBQ in the fishery, including IBQ weighing and discarding.

An increase in observer and catch-monitoring coverage requirements would result in increased costs over the status quo observer program costs. There would be a combined status quo, pay-as-you-go industry funding, and an agency-funded observer and catch monitor system, as required for each sector. The agency has announced its intent, subject to available Federal funding, that participants will initially be responsible for 10 percent of the cost of hiring observers and catch monitors. The industry proportion of the costs of hiring observers and catch monitors will be increased every year so that, by 2014, once the fishery has transitioned to the rationalization program, the industry will be responsible for 100 percent of the cost of hiring the observers and catch monitors. NMFS believes that an incrementally reduced subsidy to industry funding will enhance the observer and catch monitor program's stability, ensure 100 percent observer and catch monitor coverage, and facilitate the industries' successful transition to the new quota system.

Amendment 20 would require that first receivers—shoreside processors and other entities that receive groundfish from IFQ harvesters—sort, weigh, and report all landings of IFQ species under a catch monitoring plan. First receivers will be required to hire NMFS-certified catch monitors to verify all shoreside deliveries of IFQ species; ensure that species are sorted according to Federal species of species group; ensure that the fish are weighed on periodically tested, state-certified scales; and record and submit catch data daily.

To ensure that the QP program goals are met and landings are tracked, first receivers will be required to submit electronic fish tickets using software provided by the Pacific States Marine Fisheries Commission. Further, vessels will be required to continue to use vessel monitoring systems for purposes of indicating location of the vessels and to make declarations. In addition, there are plans to develop and require an electronic vessel logbook, but this component will not be immediately implemented.

To ensure that program goals to track transferrable QS and QP are met, NMFS is also developing

an online accounting system for the tracking and trading of QS by owner and for the tracking, trading, and use of the QP that result from these quota shares by vessels.

The preferred alternative for the proposed allocation of harvest opportunity between sectors of the Pacific coast groundfish fishery is as follows:

- Make long-term, formal allocations of the following species between the non-treaty limited entry trawl sectors and non-treaty, non-trawl sectors: lingcod, Pacific cod, sablefish south of 36^0 N latitude, Pacific ocean perch, widow rockfish, chilipepper rockfish, splitnose rockfish, yellowtail rockfish north of $40^0$10' N latitude, shortspine thornyhead (north and south of $34^0$27' N latitude), longspine thornyhead north of $34^0$27' N latitude, darkblotched rockfish, minor slope rockfish (north and south of $40^0$10' N latitude), Dover sole, English sole, petrale sole, arrowtooth flounder, starry flounder, and Other Flatfish.
- Determine a scheme for an initial shoreside trawl sector allocation to the shoreside whiting and shoreside non-whiting sectors of above species other than darkblotched rockfish, Pacific ocean perch, and widow rockfish, as well as sablefish north of 36^0 N latitude.
- Apportion the limited entry trawl allocation of darkblotched rockfish, Pacific ocean perch, and widow rockfish to the four current trawl sectors (shoreside non-whiting, shoreside whiting, at-sea whiting mothership, and at-sea whiting catcher-processor).
- Consider yield set-asides to accommodate the projected bycatch of above species other than darkblotched rockfish, Pacific ocean perch, and widow rockfish by the two at-sea whiting trawl sectors (motherships and catcher-processors).
- Determine a total catch limit of Pacific halibut in Area 2A trawl fisheries to limit the future bycatch of this prohibited trawl species.

4.4 Description of the Fishery and All Affected Entities, Including the Small Entities to Which the Proposed Actions Apply

This section summarizes stakeholder profiles presented in Chapter 3 of the *Rationalization of the Pacific Coast Groundfish Limited Entry Trawl Fishery DEIS* and Section 3.4 of the *Allocation of Harvest Opportunity Between Sectors of the Pacific Coast Groundfish Fishery DEIS*.

4.4.1 Description of the Fishery

The Pacific Coast groundfish fishery as a whole comprises several different major sectors, defined by fishing gear, species targeted, and regulatory context. In addition to the limited entry trawl fleet, there are open access and the fixed gear fleets. Recreational fishermen also harvest groundfish. For the limited entry trawl fleet, the list of current target species includes flatfish, roundfish, thornyheads, and a few species of rockfish. Primary flatfish target species include petrale sole and Dover sole. Roundfish target species include Pacific whiting, Pacific cod, and sablefish. Some rockfish species, especially Pacific ocean perch and widow rockfish, were important trawl targets until the mid 1990s. However, seven rockfish species are currently declared overfished under the MSA. The need to rebuild these stocks to a healthy size has led to various harvest constraints on groundfish fisheries, and rockfish are generally no longer a target

of these fisheries.

The groundfish trawl fishery is subject to a license limitation program (referred to as limited entry) implemented in 1992. Groundfish fixed-gear fisheries—using longline and pot gear—are managed under a complementary limited entry program. Most of the Pacific coast commercial groundfish harvest occurs in the limited entry fisheries. Some retention of groundfish is allowed without a limited entry permit; these vessels comprise the open access sector. The gears used by the open access sector include longline, vertical hook and line, troll, pot, setnet, trammel net, shrimp and prawn trawl, California halibut trawl, and sea cucumber trawl gears.

The limited entry trawl fishery is divided into two broad sectors: a multispecies trawl fishery, which most often uses bottom trawl gear (hereafter called the non-whiting fishery), and the Pacific whiting fishery, which uses midwater trawl gear. The non-whiting fishery is principally managed through two-month cumulative landing limits along with closed areas to limit overfished species bycatch.[1] Fishery participants target the range of species described above with the exception of Pacific whiting. By weight, the vast majority of trawl vessel groundfish is caught in the Pacific whiting fishery. In contrast, the non-whiting fishery accounts for the majority of limited entry trawl fishery ex-vessel revenues. On average from 2000 to 2005, Pacific whiting accounted for about 75 percent of the quantity of groundfish landed in the limited entry trawl fishery but only 21 percent of the value due to their relatively low ex-vessel price.

Non-whiting trawl vessels deliver their catch to shoreside processors and buyers located along the coasts of Washington, Oregon, and California. They tend to have their homeports located in towns within the same general area where they make deliveries, though there are several cases of vessels delivering to multiple ports during a year. Some Pacific whiting trawl vessels are catcher-processors, which, as their name implies, process their catch on board, while other vessels in this sector deliver their catch to shoreside processors or motherships that receive Pacific whiting for processing, but do not directly harvest the fish.

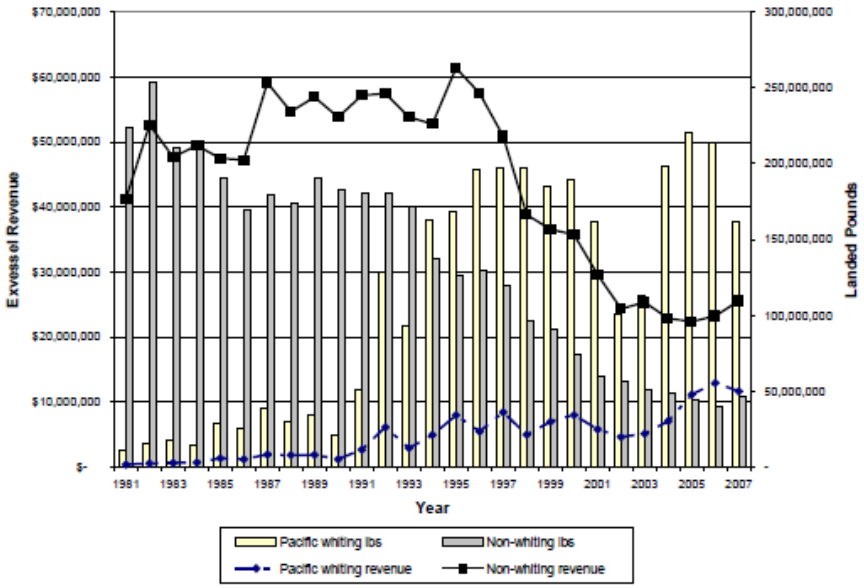
Over time, landings in the limited entry trawl fishery have fluctuated, especially on a species-specific basis. Pacific whiting has grown in importance, especially in recent years. Through the 1990s, the volume of Pacific whiting landed in the fishery increased. In 2002 and 2003, landings of Pacific whiting declined due to information showing the stock was depleted and the subsequent regulations that restricted harvest in order to rebuild the species. From 2003 to 2007, estimated Pacific whiting ex-vessel revenues averaged about $29 million. In 2008, these participants harvested about 248,000 tons of whiting worth about $63 million in ex-vessel revenues based on shoreside ex-vessel prices of $254 per ton—the highest ex-vessel revenues and prices on record. In comparison, the 2007 fishery harvested about 224,000 tons worth $36 million at an average ex-vessel price of about $160 per ton.

While the Pacific whiting fishery has grown in importance in recent years, harvests in the non-whiting component of the limited entry trawl fishery have declined steadily since the 1980s. Ex-

1 The non-whiting fishery currently uses bottom trawl gear exclusively. However, in the past there have been fisheries targeting widow rockfish and other rockfish species with midwater gear. Due to the need to limit catches of overfished species, these fisheries have been closed. However, once overfished species stocks are rebuilt, the fisheries could reopen.

vessel revenues in the fishery peaked in the mid 1990s at over $60 million. Following the passage of the Sustainable Fisheries Act (1996) and the listing of several species as overfished, harvests became increasingly restricted, and landings and revenues declined steadily until 2002. Since 2002, ex-vessel revenues have stabilized at around $23 to $27 million per year (Figure 1). In 2007, the Council estimates that 159 trawlers landed 94,000 mt of groundfish, earning $37 million in ex-vessel revenues, for an average of $234,000 per vessel.

Figure 1. Shoreside landed pounds and ex-vessel revenue from whiting and non-whiting groundfish caught using trawl gear.



Limited entry trawl vessels make most of their landings in Oregon. During the 2004 to 2006 period, the Oregon ports that received the largest amounts of landed weight and revenue were Newport, Astoria, and Charleston/Coos Bay, Oregon. Eureka, Fort Bragg and Crescent City, California; Brookings, Oregon; and Bellingham Bay, Blaine and Neah Bay, Washington comprise the remaining top 10 largest ports for trawl vessel landings. Non-whiting landings and revenues by non-tribal trawlers in Oregon are significantly larger than the other two states. A detailed description of west coast fishing communities and their economic dependence on the groundfish fishery is found in the *Final Environmental Impact Statement for Biennial Harvest Specifications and Management Measures* (PFMC and NMFS 2009).

Non-whiting trawl vessels deliver their catch from targeted trips to 63 shoreside processing companies located in all three Pacific coast states. Thirty-six to forty-six of these companies received non-whiting groundfish in any one year from 2004 to 2006. There are few major non-whiting groundfish processing centers on the Pacific coast. Only seven cities processed more than 1 percent of coast wide landings, and the largest processing center, Astoria, Oregon, accounted for more than two-thirds of processing activity by weight of landed fish. In 2008, Pacific whiting trawl vessels landed their catch at 16 first receivers located in ports in all three states. Between 8 and 16 of these companies received whiting in any one year from 1997 to 2008. Since processing Pacific whiting requires specialized equipment, most whiting processing plants process whiting only.

Limited entry fixed gear vessels use longline and fish pots (traps) to target groundfish. Limited entry fixed gear vessels principally target sablefish. Limited entry fixed gear vessels may also participate in open access fisheries or in the limited entry trawl fishery. Directed open access vessels use various non-trawl gears to target particular groundfish species or species groups. Longline and hook and line gear are the most common open access gear types used by vessels directly targeting groundfish and are generally used to target sablefish, rockfish, and lingcod. Pot gear is used for targeting sablefish, thornyheads and rockfish. Like the limited entry trawl fleet, limited entry fixed gear vessels and directed open access vessels deliver their catch to ports along the Washington, Oregon, and California coast.

In addition to commercial and tribal participants, state-managed recreational fisheries harvest groundfish. These recreational fisheries are managed by a series of seasons, area closures, and bag limits. Recreational groundfish fisheries occurring off the Pacific coast accounted for about 22 percent of all recreational anglers and 12 percent of trips.

Recreational fishing is an important economic contributor to the Pacific coast in general, and to some communities specifically. The recreational fishing fleet is composed of charter and private vessels. The private fleet typically consists of vessels owned by residents living in or near areas where they fish. The charter boat fleet is a for-hire fleet that plays a large role in the tourism sector of many Pacific coast communities. Opportunities to fish on a charter vessel can be a substantial draw for tourists considering a visit to the coast. The distribution of resident and non-resident ocean anglers among the Pacific coast states in 2000, 2001, and 2002 demonstrates the geographic importance of recreational fishing. Southern California has more than twice the number of resident recreational marine anglers than the next most populous region, Washington State. While most of the recreational anglers are residents of those states where they fish, a significant number of anglers are also non-residents. Oregon had the largest percentage of non-resident ocean anglers in all three years.

About 525 charter boats made up the charter boat fleet in 2005. This is a decrease of almost 30 percent from the 753 charter vessels estimated in the Council's 2005/2006 Groundfish Specifications EIS. Estimates of numbers of private boats are unavailable. Recreational fishing in the open ocean generally declined slightly between 1996 and 2003; however, charter effort decreased while private effort increased during that period. Part of this increase likely resulted from longer salmon seasons associated with increased abundance during the period.

The Makah, Quileute, Hoh, and Quinault Tribes off the Washington coast participate in tribal commercial, ceremonial, and subsistence fisheries for groundfish according to their treaty rights. Participants in the tribal commercial fishery use gear similar to non-tribal commercial fisheries operating off Washington. Groundfish caught in the tribal commercial fishery is typically sold through the same markets as non-tribal commercial groundfish catch. The harvest of the four tribes is taken into account when OYs are established. For a few species (sablefish and whiting, for example) a share of the OYs for groundfish species taken in their fisheries is explicitly allocated. For most species, expected tribal harvest levels are taken into account in setting regulations for other sectors, but there is no allocation to the tribes. For those species allocated to the tribes, and for other species for which expected harvest levels are identified, the tribes

oversee the prosecution of their fisheries separate from the management of other groundfish fishery sectors.

4.4.2 Estimate of the Number of Small Entities to Which the Proposed Action will Apply

The following discussion provides information on the number of small and large businesses that participate in the Amendment 20 Trawl Rationalization Programs. Information from the following sources was reviewed, in addition to information found in the Amendment 20 DEIS, other Council documents, and industry publications (these publications are used to assess size as well as affiliations):

- NMFS NWFSC Survey of Limited Entry Trawlers (ex-vessel revenue estimates)
- NMFS Annual Process Product Survey (employment estimates)
- Pacific States Marine Fisheries Commission Pacific Fishery Information Network—Processor/First Receiver purchases of groundfish from limited entry trawlers (ex-vessel revenues)
- NMFS NWR Ownership Survey (respondents classify themselves as large or small)

The NMFS Northwest Fisheries Science Center surveyed limited entry trawlers that delivered to shoreside plants or to motherships in 2004. [The survey did not include catcher processors or motherships.] These sources paint slightly different but consistent pictures of the size of the participants. The discussion provides two perspectives—one that addresses the entities affected by the intersector allocation decisions of Amendment 21 (all major fishing groups that harvest groundfish) and another that address the groups affected by implementation of the trawl rationalization program (shorebased processors, shorebased trawlers, mothership processors and catcher vessels, and catcher-processors).

Amendment 21 Analysis:

Amendment 20 directly regulates the groundfish trawl, mothership, and catcher-processor fleets and shorebased trawl groundfish processors whereas Amendment 21 affects not only those groups, but the other groundfish fleets—fixed gear and open access because of the allocation rules. These businesses are associated with vessels that either target groundfish or harvest groundfish as bycatch (including vessels that participate in the limited entry (trawl and fixed gear), open access, or charter boat portion of the groundfish fishery), or are associated with processors and buyers of groundfish (including shoreside and at-sea processors). These rules also affect companies that own and fish the limited entry trawl permits and the companies that lease these permits.

NMFS NWR issued 399 limited entry permits at the beginning of 2010. These permits include 177 endorsed for trawl (172 trawl only, 4 trawl and longline, and 1 trawl and trap-pot); 199 endorsed for longline (191 longline only, 4 longline and trap-pot, and 4 trawl and longline); 32 endorsed for trap-pot (27 trap-pot only, 4 longline and trap-pot, and 1 trawl and trap-pot). Of the longline and trap-pot permits, 164 are sablefish endorsed. Of these endorsements, 117 are stacked on 45 vessels. Because not all affected groups operate under the Federal limited entry permit, a review of participation in groundfish fisheries based on actual harvests provides a broader perspective.

Chapter 3 of the DEIS provides the following estimates. In 2007, there were six motherships supplied by 20 mothership catcher vessels with many vessels also delivering shoreside. Nine catcher-processors also fished and processed. About 159 trawlers fished in either the limited entry or open access fisheries. The limited entry fixed gear fleet was composed of 130 hook and line vessels and 20 pot vessels. The open access fleet is composed of several gear types—644 hook and line vessels, 57 net vessels, 180 pot vessels, 151 salmon troll vessels, and 32 trawlers. From 2004 to 2006, there were 63 different first receivers of trawl-caught groundfish. During 2007, 14 first receivers purchased whiting from 37 shorebased trawlers.

Although not directly regulated by these rules, tribal fleets participate in this fishery. According to Chapter 7 of the 0910 Groundfish Specifications EIS, the tribal fleet consists of approximately 66 vessels: longline (52), whiting trawl (4), and non-whiting trawl (10). The 2009 Review of Ocean Salmon Fisheries indicates that there were 465 salmon charterboats. These are presumed to be vessels that also will fish for groundfish. In 2007, 142 vessels were issued halibut licenses. Therefore, this rule affects an estimated 2000 business entities—permit holders, vessels, and first receivers that would be directly regulated by the proposed rule. No small organizations or small governmental jurisdictions would be directly regulated by the proposed actions. Although not directly regulated by this proposed rule, approximately 20 fishing communities that range from small towns to major cities are indirectly affected by this rule because of the potential reduction in the number of first receivers/processors and limited entry trawlers, as well as resulting changes in where fish is landed to be processed. In general, these 2,000 entities are presumed to be small with the exceptions noted below based on various analyses.

Non-Trawl Sectors—The following discussion provides small business estimates for groundfish fishery participants that are affected by Amendment 21's allocation policies, but do not qualify

to participate in Amendment 20's trawl rationalization programs. NMFS has very limited information on the companies associated with the following fleets However, it is expected that these companies (unless these vessels are owned or affiliated with large entities), are most likely to be classified as small companies based on average annual ex-vessel revenues that are far below the $4.0 million level. In 2007, the average limited entry fixed gear hook and line vessel earned $88,000 in groundfish revenues; limited entry fixed gear pot vessels earned about $200,000 in groundfish revenues, and the average open access vessel earned about $7,000 in groundfish revenues. Most of the 1,100 open access vessels target other fisheries. In 2007, salmon trollers averaged $11,000 in salmon revenue per vessel, shrimp trawlers $157 million in shrimp revenues, crab pot vessels $157,000 in crab revenues, and purse seiners $269,900 in coastal pelagic species revenues.

Current revenues for charterboats are unavailable. However, the Pacific States Marine Fisheries Commission surveyed approximately 12 percent of the charter and head boats licensed to operate in California, Oregon, and Washington on their 2000 operations. Vessels were categorized according to the region in which they were home ported: southern California (for homeports from the Mexican border to Point Conception), northern California (for homeports north of Point Conception to the Oregon border), Oregon, and Washington. Vessel size class was defined in terms of vessel length: "small" for lengths of 15 to 30 feet, "medium" for lengths of 31 to 49 feet, and "large" for lengths greater than 49 feet. The estimates of average revenues from all types of recreational activities, including fishing and whale watching charterboat estimates, ranged from $7,000 for small Oregon vessels, $131,000 for medium Washington vessels, $184,000 for large Northern California vessels, and $770,000 for large Southern California vessels, the largest in the coastal fleet. These estimates confirm that that those charterboats most likely to fish for groundfish qualify as small entities.

Amendment 20 Analysis:

NWFSC Survey: During 2004, 116 limited entry trawlers fished on the West Coast, but did not participate in the whiting fishery during 2004. Of these 116 limited entry trawlers, 71 responded to the NWFSC's cost-earnings survey. Among the 71 respondents, the average total revenue from all sources (west coast landings, Alaska landings, at sea deliveries, etc) was $368,271. None of the 71 respondents had revenue exceeding $2,000,000 in 2004. Twenty-six limited entry trawlers fished in the shoreside whiting fishery during 2004 (this figure does not include five limited entry trawlers that had positive whiting landings worth less than $2,500). Of these 26 vessels, the NWFSC received 19 responses to the cost earnings survey. Adding all sources of revenue collected by the cost earnings survey (revenue from landings in locations other than the west coast, at-sea deliveries, and other sources of revenue) to west coast landings revenue reported in PacFIN shows that these 19 vessels had average revenue of $971,871from all sources. Of the 19 survey respondents, the three vessels with the greatest total revenue all earned between $1.7 million and $1.8 million during 2004.

Of the seven limited entry trawl vessels that fished as catcher vessels for motherships in the at-sea whiting fishery and did not have any west coast landings, none had revenue exceeding $4,000,000. These seven vessels had average revenue of $1,624,488 million, and one vessel had revenue of $3.6 million. Of the five limited entry vessels that fished as catcher vessels for

motherships in the at sea whiting fishery and made shoreside whiting landings in 2004, none had revenue over $4 million in 2004. The five vessels had average revenue of $1,554,283 and included three vessels with revenue of $1.7 million to $1.8 million (the same three vessels as noted in the response to the previous question).

Annual Processed Products Survey-Employment Estimates for 2009: This voluntary survey was sent to primary processors and secondary processors in Oregon and Washington, 11 companies of which were primary processors of groundfish. Respondents to this survey, among other things, are to provide monthly estimates of employment. Only one of the shorebased processors reported employing more than 500 employees in any one month. Three of these processors are associated with the same parent company, and, collectively, these companies employ more than 500 employees. Therefore, out of nine companies in Oregon and Washington, seven companies are small and two are large. Catcher-processor and mothership companies were also surveyed. These vessels employ from 100 to 140 employees per vessel.

Chapter 3 of the Amendment 20 DEIS: Processing companies are not necessarily first receivers—they may process fish initially delivered to a buyer who then sells the fish to the processor. The Pacific Fishery Management Council staff indicates that from 2004 to 2006 (Table 3-53 DEIS), 63 shoreside companies received non-whiting. In 2008, 6 companies were first receivers of whiting for a total of 69 companies that received groundfish from 2004 to 2008. Three of these companies have multiple state operations (Table 3-42 DEIS). The companies that receive nonwhiting vary widely in terms of the volume received. Nearly 70 percent, or 44 companies, received fewer than 50 mt during the three-year period (Table 3-45 DEIS). A large proportion of these companies receives but does not process nonwhiting; they include restaurants, wholesalers and retailers, or distributors. Of the remaining 19 companies that received more than 50 mt, only 7 received more than 1,000 mt. One received more than 5,000 mt, and one received more than 20,000 mt. The companies that receive whiting also vary widely in terms of the volume received. Five firms received more than 10,000 mt each during the period, including three with more than 30,000 mt. At the other end of the scale, 4 of the 13 firms received less than 1,000 mt during the period (Table 3-38 DEIS).

PSMFC PacFIN—Small Purchaser Analysis: NMFS reviewed the 2008 and 2009 purchases of limited entry trawl groundfish by first receiver. The results for both years are similar, so only the 2008 results are discussed. In 2008, 75 first receivers purchased limited entry trawl groundfish. There were 36 small purchasers (less than $150,000), 26 medium purchasers (purchases greater than $150,000 but less than $1,000,000), and 13 large purchasers (purchases greater than $1.0 million). When the trawl rationalization program is implemented, to continue buying limited entry trawl groundfish, these purchasers will have to obtain a processor site license that includes requirements to submit electronic fish tickets, provide a catch monitoring plan, and schedule a catch monitor. Assuming that a catch monitor costs $350 per day and assuming that the start-up costs of applying for a license, developing a plan, and obtaining the electronic fish ticket software are an additional $350, the total initial start-up cost is about $700. [Note that, in the first few years, the costs of catch monitors will be subsidized in part by NMFS.] Further assuming that undertaking these steps only makes financial sense if the start-up cost is less than 0.5 percent of the groundfish purchased, than a processing site /first receiver would have to

purchase about $140,000 to break even financially based on these assumptions. Therefore, many of the 36 small purchasers are likely to stop purchasing groundfish from limited entry trawlers as a result of this program. Five of these small purchasers bought less than $10,000 worth of limited entry trawl groundfish. The majority of these small purchasers were not major purchasers of other fish (21 of these small purchasers bought less than $150,000 of fish [groundfish and non-groundfish] in total with 14 of these first receivers, purchasing less than $10,000 in limited entry trawl groundfish). This is not to say that all of these purchasers will go out of business as result of these rules. NMFS does not know how dependent these businesses are on groundfish because the agency does not have data on all sources of income (fishery and non-fishery) of these first receivers. In addition, these companies could make arrangements to purchase fish from another company that has obtained a processing site license or groundfish harvested by fixed gear.

NMFS Ownership Survey: The NMFS Northwest Regional Office is in the final stages of completing a voluntary ownership survey. Respondents to this survey were asked if they consider themselves small businesses or non-profit organizations based on the definitions above. In February 2009, this form was sent to the 177 limited entry permit holders and associated vessels (approximately 150 vessels—not all permits have vessels attached to them.) This form was also sent to the six mothership processors who have Pacific whiting vessel licenses and to the 14 first receiver/shorebased processors who hold 2009 first receiver whiting exempted fishery permits. Thirty-three limited-entry permit holders, thirty-six trawlers, 1 mothership processor, and six shorebased whiting first receivers/processors have yet to respond to this survey. Based on this survey, review of available information on those companies who have yet to respond or on those few companies who responded to the survey but did not respond to the small business question, the following characterization of the industry is provided. The nine limited entry trawl permits that are associated with the catcher-processor vessels are considered large companies. [According to the Pacific Whiting Conservation and Whiting Co-operative website, www.pacificwhiting.org, the catcher-processor fleet is made up of three companies that operate ten vessels. Of these companies, two have wholesale sales from whiting, Pollock, and other products that are at least $500 million—see the *Seafood Business Magazine* discussion below. The remaining company is assumed to be a large business because in addition to the two whiting catcher-processors operate off Alaska along with other company vessels.] Of the remaining 168 limited entry permits, 25 limited entry trawl permits are either owned or closely associated with a large, shorebased processing company or with a non-profit organization that considers itself a large organization. Nine other permit owners indicated that they were large companies. Almost all of these companies are associated with the shorebased and mothership whiting fisheries. The remaining 134 limited entry trawl permits are projected to be held by small companies. Three of the six mothership processors are large companies. There are four large companies within the 14 shorebased whiting first receivers/processors.

Seafood Business Magazine (www.seafoodbusiness.com—archives): In the whiting fishery (at-sea and shoreside), many of the processing companies involved are closely affiliated with the 10 ten seafood suppliers with wholesale sales of ranging from about $500 to $1 billion. These companies tend to be involved with Alaska fisheries, and some have major foreign affiliations. [See "In the can: North America's seafood suppliers grow sales despite fears of an economic

downturn," May 5, 2008; and "Bottom Dollar: The Top 25 North American seafood suppliers had a strong 2008, but the future is in question," June 19, 2009]

Amendment 20 and Amendment 21 Summary Conclusion: NMFS makes the following conclusions based primarily on analyses associated with fish ticket and limited entry permit data, available employment data provided by processors, information on charterboat and tribal fleets, and available industry responses to ongoing surveysd on ownership. Entities were analyzed as to whether they were only affected by the Amendment 21 allocation processes—non-trawl—or if they were affected by both Amendments 20 and 21—(trawl). The non-trawl businesses are associated with the following fleets: limited entry fixed gear (approximately 150 companies), open-access groundfish (1,100), charterboats (465), and the tribal fleet (four tribes with 66 vessels).

Available information on average revenue per vessel suggests that all the entities in this group can be considered small. For the trawl sector, there are 177 trawl vessel permit holders. Nine limited entry trawl permits are associated with the catcher-processing vessels, which are considered large companies. Of the remaining 168 limited entry permits, 25 limited entry trawl permits are either owned or closely associated with a large shorebased processing company or with a non-profit organization that considers itself a large organization. Nine other permit owners indicated that they were large "companies." Almost all of these companies are associated with the shorebased and mothership whiting fisheries. The remaining 134 limited entry trawl permits are projected to be held by small companies. Available information suggests that the at-sea and shorebased processing sectors consists of few large firms, a few moderate-size firms, and a considerable number of small firms. Four of the six mothership processors are large companies. Within the 14 shorebased whiting first receivers/processors, there are four large companies, including, the shorebased whiting receivers, in 2008, 75 first receivers purchased limited entry trawl groundfish. There were 36 small purchasers (less than $150,000), 26 medium purchasers (purchases greater than $150,000 but less than $1,000,000), and 13 large purchasers (purchases greater than $1.0 million). Because of the costs of obtaining a processed processor site license, procuring and scheduling a catch monitor, and installing and using the electronic fish ticket software, these small purchasers will likely opt out of buying groundfish or make arrangements to purchase fish from another company that has obtained a processing site license.

4.5 Economic Analysis of the Expected Effects of Each Selected Alternative Relative to the No-action Alternative, Including the Costs of Compliance for Small Entities

The economic impacts of the selected alternatives are detailed in Chapter 4 of the *Rationalization of the Pacific Coast Groundfish Limited Entry Trawl Fishery—Amendment 20 DEIS* (TRAT DEIS) and Chapter 4 of the *Allocation of Harvest Opportunity Between Sectors of the Pacific Coast Groundfish Fishery—Amendment 21 DEIS* (ISADEIS). The allocation of harvest opportunity between sectors under the preferred alternative does not differ significantly from the allocation made biennially under the no action alternative. The primary economic effect of the long-term, formal allocation under the preferred alternative is to provide more certainty in future trawl harvest opportunities, which would enable better business planning for participants in the rationalized fishery.

Expected Effects of Amendment 21—Intersector Allocation

The allocation of harvest opportunity between sectors under the proposed regulation does not differ significantly from the biennial allocation under the no action alternative. The primary economic effect of the long-term, formal allocation under the proposed regulations is to provide more certainty in future trawl harvest opportunities, which would enable better business planning for participants in the rationalized fishery. As described elsewhere, the trawl rationalization program could create an incentive structure and facilitate more comprehensive monitoring to allow bycatch reduction and effective management of the groundfish fisheries. In support of the trawl rationalization program, the main socioeconomic impact of Amendment 21 allocations is longer-term stability for the trawl industry. While the preferred Amendment 21 allocations do not differ significantly from status quo ad hoc allocations made biennially, there is more certainty in future trawl harvest opportunities, which enables better business planning for participants in the rationalized fishery. This is the main purpose for the Amendment 21 actions.

The economic effects of Amendment 21 arise from the impacts on current and future harvests. The need to constrain groundfish harvests to address overfishing has had substantial socioeconomic impacts. The groundfish limited entry trawl sector has experienced a large contraction, spurred in part by a partially federally subsidized vessel and permit buyback program implemented in 2005. This $46 million buyback program was financed by a congressional appropriation of $10 million and an industry loan of $36 million. About 240, groundfish, crab, shrimp permits were retired from state and Federal fisheries—there was a 35 percent reduction in the groundfish trawl permits. To repay the loan, groundfish, shrimp and crab fisheries are subject to landings fees. Follow-on effects of the buyback have been felt in coastal communities where groundfish trawlers comprise a large portion of the local fleet. As the fleet shrinks and ex-vessel revenues decline, income and employment in these communities is affected. Fishery-related businesses in the community may cease operations because of lost business. This can affect non-groundfish fishery sectors that also depend on the services provided by these businesses, such as providing ice and buying fish. An objective to the trawl rationalization program is to mitigate some of these effects by increasing revenues and profits within the trawl sector. However, because further fleet consolidation is expected, the resulting benefits are likely to be unevenly distributed among coastal communities. Some communities may see their groundfish trawler fleet shrink further as the remaining vessels concentrate in a few major ports.

Species subject to Amendment 21's allocations would be lingcod, Pacific cod, sablefish south of 36° N. lat., Pacific ocean perch, widow rockfish, chilipepper rockfish, splitnose rockfish, yellowtail rockfish north of 40° 10' N. lat., shortspine thornyhead (north and south of 34° 27' N. lat.), longspine thornyhead north of 34° 27' N. lat., darkblotched rockfish, minor slope rockfish (north and south of 40° 10' N. lat.), Dover sole, English sole, petrale sole, arrowtooth flounder, starry flounder, and Other Flatfish. While the preferred Amendment 21 allocations of these species do not differ significantly from status quo ad hoc allocations made biennially, there is more certainty in future trawl harvest opportunities, which enables better business planning for participants in the rationalized fishery. This is the main purpose for the Amendment 21 actions.

Amendment 21 would formally allocate a subset of the harvest guideline to the four trawl sectors: SS (whiting and non-whiting), mothership, catcher vessel, and catcher-processor. With to the species subject to Amendment 21's allocations, this would leave the limited entry fixed gear, open access, and recreational fisheries in a pool that would divide the remaining HG (via the biennial specification process). [The open access component of the groundfish fishery consists of fishermen who target groundfish without limited entry permits and fishermen who target non-groundfish fisheries that incidentally catch groundfish.] In general, the allocations are based on catch history from 2003 to 2005 and the recommendations of the Groundfish Allocation Committee. The Council believed that a relatively recent catch period should form the basis for deciding sector allocations since discards during this period were better informed, and current management strategies, such as specification of rockfish conservation areas, are more likely in the near future. However, the Council made modifications for several species. For chilipepper rockfish south of 40º10' N. lat., Amendment 21 contains a higher non-trawl allocation. This is intended to provide greater non-trawl access to this healthy stock off California. Amendment 21 would not allocate longspine thornyhead south of 34° 27' N. lat. to the trawl fishery. Longspine thornyhead are an incidentally caught species south of 34° 27' N. lat., and the available yields are not projected to constrain any of the groundfish fisheries there that incidentally catch these fish. Amendment 21 would allocate a much higher percentage of the available yield of starry flounder to non-trawl sectors (50 percent) than recommended by the Groundfish Allocation Committee. The catch history of starry flounder is highly uncertain, but they are significantly caught in nearshore trawl fisheries and recreational fisheries on the West Coast. The Council thought a 50:50 trawl and non-trawl sharing of the available harvest of starry flounder was the fairest allocation. Amendment 21 includes a higher non-trawl allocation of species in the Other Flatfish complex than recommended by the Groundfish Allocation Committee (10 percent vs. 5 percent). While most of these species are dominant to the trawl fishery, there are some species, such as Pacific sanddabs, that are significantly caught in non-trawl fisheries. The Council believed a higher non-trawl share of the available harvest of Other Flatfish species would better preserve non-trawl fishing opportunities.

Based on ex-vessel revenue projections, Table 4-18 (ISADEIS) shows the potential 2010 yield to trawl and non-trawl (including recreational) sectors under the Amendment 21 alternatives and the potential 2010 value of alternative trawl allocations. Under the no action alternative, the projected ex-vessel value of the trawl allocation is $56 million, while the projected ex-vessel value of the Council's preferred alternative is $54 million—indicating a potential increase to the non-trawl sectors and a potential decrease to the trawl sector.

In addition to the species above, halibut would also be specifically allocated to the trawl fishery. The proposed regulations include a halibut trawl bycatch reduction program in phases to provide sufficient time to establish a baseline of trawl halibut bycatch and to allow harvesters to explore methods (e.g., adjustments to time and/or area fished, gear modifications) to reduce halibut bycatch and bycatch mortality. Pacific halibut cannot currently be retained in any U.S. or Canadian trawl fisheries per the policy of the IPHC. The Council's intent on setting a total catch limit of Pacific halibut in Area 2A trawl fisheries is to limit the bycatch and progressively reduce the bycatch from these limits to provide more benefits to directed halibut fisheries. The program establishes a limit for total Pacific halibut bycatch mortality (legal-size and sublegal fish) by using an IBQ in the trawl fishery. The initial amount for the first two years of the trawl

rationalization program would be calculated by taking 15 percent of the Area 2A total constant exploitation yield (CEY) as set by the International Pacific Halibut Commission (IPHC) for the previous year not to exceed 130,000 lbs per year for total mortality. For example, if the trawl rationalization program went into effect in 2013, the trawl halibut IBQ would be set at 15 percent of the Area 2A CEY adopted for 2012 or 130,000 lbs per year, whichever is less, for 2013 and 2014 (years one and two of the program). Beginning with the third year of implementation, the maximum amount set aside for the trawl rationalization program would be reduced to 100,000 lbs per year for total mortality. This amount may be adjusted downward through the biennial specifications process for future years.

Currently there are no total catch limits of Pacific halibut specified for the west coast trawl fishery. Trawl bycatch of Pacific halibut, therefore, does not limit the trawl fishery. It would apply a halibut bycatch reduction program in phases to provide sufficient time to establish a baseline of trawl halibut bycatch under the new rationalization program and for harvesters to explore methods (e.g., adjustments to time and/or area fished, gear modifications) to reduce both halibut bycatch and bycatch mortality. By limiting the bycatch of Pacific halibut in the limited entry trawl fisheries, Amendment 21 would control bycatch and could provide increased benefits to Washington, Oregon, and California fishermen targeting Pacific halibut. Reducing the trawl limit would also provide more halibut to those who participate in the directed tribal, commercial, and recreational halibut fisheries.

The Council's preferred alternative uses a halibut-abundance-based method for setting the initial trawl allocation by keeping it tied to a percentage of the CEY, but adds a maximum limit on the allocation amount. The initial limit is set at 130,000 lbs, which represents an approximate reduction of 50 percent from the total bycatch estimate provided by the Northwest Fisheries Science Center for the most recent year (2007) If the proposed regulations were applied to the total CEY in 2007 and compared to the actual mortality recorded for 2007, the trawl fishery would find itself about 20,000 lbs short. Similarly, if these regulations were applied in 2008 and 2009, the amount of halibut allocated to the trawl sector would fall short of actual harvests by 204,000 and 161,000 pounds, respectively.

The Council decided to apply the 130,000-pound limit over a four-year period to give the trawl industry more time to learn strategies (and areas) for minimizing their Pacific halibut bycatch. Since this may become the most constraining bycatch species for the rationalized trawl fishery on the northern shelf, this extra adjustment period before the further downward modification of the total catch limit to 100,000 pounds is considered for the fifth year. Additionally, allowing more flexibility for considering a new total catch limit of Pacific halibut in future processes to decide biennial management measures was considered necessary because the limit is lower than the bycatch observed under the WCGOP, and it was unclear how such a stringent limit might affect the fishery. It may turn out that the socioeconomic impacts are too great under these stringent limits, and the Council may ultimately decide to increase the total catch limit. Conversely, the trawl industry may adjust well to these lower limits, and the realized bycatch of Pacific halibut will be lower than the prescribed total limits of 130,000 or 100,000 pounds. In that case, the Council may want to adjust the future total catch limit downward from 100,000 pounds to provide more benefits to Area 2A directed halibut fisheries. In either case, the Council preferred the flexibility of deciding future total catch limits of Pacific halibut in the biennial

specifications and management measures process to avoid a more lengthy and burdensome FMP amendment process for making these decisions. Reducing the maximum limit to 100,000 lbs beginning the third year of the program provides an additional incentive for harvesters to modify their fishing behavior to reduce bycatch and/or bycatch mortality. Information from the Canadian IFQ program indicates that trawl fishermen can voluntarily implement measures to reduce bycatch by avoiding areas known to produce high volumes of halibut, and reduce bycatch mortality by reducing their tow time. Reducing the trawl limit would also provide more halibut to those who participate in the directed tribal, commercial, and recreational halibut fisheries.

If the total CEY from the stock assessment prior to trawl rationalization implementation reflected relatively low abundance (e.g., 640,000 lbs), this would produce an initial trawl allocation of 96,000 lbs. While this is considerably less than what the trawl fishery has caught in previous years, it would also be applied to an exploitation yield lower than what Area 2A has experienced in the past 10 years. This helps ensure that the primary use of halibut is to provide fish for the directed tribal, commercial, and recreational fisheries. If abundance were higher and along the lines of the amounts produced by the 2004 and 2005 assessments (e.g., more than 1 million lbs), the trawl allocation would be capped at 130,000 lbs.

When the Canadian government rationalized its British Columbia groundfish fishery in 1996, an arbitrary cap of 1 million pounds was set for halibut bycatch mortality in that trawl fishery. Halibut bycatch mortality before prior to rationalization was about 1.5 million pounds. The first year of the quota program, halibut bycatch mortality was reduced to about 300,000 pounds. Several factors were the decline of the cod fishery (and a decline in associated halibut bycatch), harvester avoidance behavior, and 100 percent observer coverage, combined with slower fishing practices that allowed the observer to measure every halibut caught and released. Information from the Canadian IFQ program indicates that trawl fishermen can voluntarily implement measures to reduce bycatch by avoiding areas known to produce high volumes of halibut and can reduce bycatch mortality by reducing their tow time (which prevents halibut from being crushed in the trawl cod end).

General Effects of Amendment 21 Trawl Rationalization

The focus of the remaining economic analysis is on the effects of rationalization of the Pacific Coast groundfish limited entry trawl fishery. Below is a summary of the incremental differences (in economic terms) between the proposed action and no action alternative discussed in these draft environmental impact statements. The economic analysis in Chapter 4 of the Amendment 20 FEIS relies predominantly on available fish ticket information (landings and revenues). Section 4.2.1.3 notes the following data limitations:

- Cost and earnings data for individual harvesters are available only for a single year.
- Cost and earnings data for individual processors are unavailable.
- Comprehensive primary data on processed products and product prices are unavailable.
- Final market demand for groundfish products is not well known.
- Data showing the total catch (landings plus discard) of groundfish by individual vessels is unavailable.

Because of the lack of quantitative data, an overall comprehensive model was not feasible. Instead, a set of models designed to focus on specific issues was developed, or are already available. These include the following:

- A model showing the effects of the initial allocation of QS in a trawl IFQ program
- A model assessing the expected amount of fleet consolidation
- A model illustrating the potential for geographic shifts in fishery patterns
- A model illustrating the potential to reduce the catch rate of overfished species and the associated potential for increased target species catch and revenue
- A qualitative comparative advantage model illustrating the potential for regions to be negatively or positively impacted by rationalization
- Available stock assessments showing stock abundance over time under various harvested quantities
- An ecosystem-based model describing the impact on the biological and ecosystem components of the environment resulting from changes in fishing behavior and catch

To illustrate the benefits of the TIQ program, a model projecting the expected amount of fleet consolidation in the shoreside non-whiting fishery was developed. It incorporates the model that illustrates the potential for the fleet to reduce bycatch and potentially increase the amount of target species harvested. This later model is based primarily on bycatch reduction experiences in the Pacific whiting fishery and as carried out in the arrowtooth flounder fishery under an exempted fishing permit. The major conclusions associated with both these models are provided below.

Consolidation under the alternatives will be a key impact mechanism. This model provides projections of consolidation in the fishery and the effects of that consolidation. The model is based on work published by Weninger and Waters (2003).

Ex ante benefit estimates (estimates prior to the action) are obtained by using a two-step methodology. The first step predicts the harvesting practices expected to prevail under an IFQ system. This first step will predict post-QS allocation equilibrium harvesting practices including the folloiwng:

- Groundfish harvest per vessel
- Number of vessels needed to harvest limited entry trawl groundfish catch
- Which vessels remain in the groundfish fishery and which vessels exit
- Nongroundfish harvest per vessel

The model is designed to address the fact that trawlers harvest many species (multiple outputs). It uses fish ticket data and the data from the recently completed West Coast Limited Entry Cost Earnings Survey sponsored by the NMFS Northwest Fisheries Science Center.

Estimates of potential economic benefits are generated based on the predicted harvesting practices from the first step analysis. Because the west coast nonwhiting groundfish fishery is not a derby fishery, it is expected that economic benefits will come through cost reductions and increased access to target species that arise from modifications in fishing behavior (overfished species avoidance). The key output of this analysis is an estimate of post-rationalization equilibrium harvesting cost.

Changes in harvesting costs can arise from three sources. First, the total fixed costs incurred by the groundfish trawl fleet change as the size of the fleet changes. Since many limited entry trawlers incur annual fixed costs of at least $100,000, reductions in fleet size can result in substantial cost savings. In other words, fewer vessels in the fishery will lead to decreased costs through a decrease in annual fixed costs. Second, costs may change as fishery participation changes and participants no longer incur diseconomies of scope (such as the costs of frequently switching gear for participating in multiple fisheries). Third, costs may change as vessels are able to buy and sell quota to take advantage of economies of scale and operate at the minimum point on their long-run average cost curve (i.e., the strategy that minimizes the cost of harvesting).

Using the model developed through this project, it is possible to compare the following:

- Harvesting costs under the current regulatory system
- Harvesting costs under an "unconstrained" IFQ system
- Harvesting costs under an IFQ system where fleet rationalization is constrained through program design features such as quota accumulation caps

The major finding associated with this model and the cost-earnings survey is the following:

> Net revenues for nonwhiting trawl vessels were estimated by Lian, Singh, and Weninger in 2008 (Lian et al. 2008). Estimates of net revenues were generated using a cost earnings survey conducted by the Northwest Fisheries Science Center that collected cost data from trawlers operating in 2004. These cost earnings data were matched with PacFIN fish ticket data to derive estimates of net revenue generated by vessels active in the fishery during 2004.

The major conclusions of Lian, Singh, and Weininger are the following:

> Our results suggest that (with landings held at 2004 levels), the current groundfish fleet (non-whiting component) which consisted of 117 vessels in 2004, will be reduced by roughly 50% to 66% to 40-60 vessels under an IFQ program. The reduction in fleet size implies cost savings of $18- $22 million for the year 2004 (most recent year of the data). Vessels that remain active will, on average, be more cost efficient and will benefit from economies of scale that are currently unexploited under controlled access regulations in the fishery. The cost savings estimates are significant, amounting to 60% of the costs incurred currently, suggesting that IFQ management may be an attractive option for the Pacific Coast

> Groundfish Fishery. We find that mid-sized boats, 60—70 feet in length , are relatively cost efficient and therefore most likely to remain active under the IFQ management of the program; smaller (40-50 feet) and larger vessels (80 feet and above) are likely to leave the fishery. ….(Liann, et al, 2008 page 330)
>
> Our analysis reveals, however, that projected cost savings are sensitive to the design elements of the IFQ program. In particular, we show that restrictions on the total quota that can be harvested by individual vessels, or restrictions on quota trading across vessel length classes, can significantly reduce estimated benefits (cost savings) of switching to IFQs. Our estimates suggest that benefits decline by roughly $3.8 million (18.4%) per year if a 1% cap on quota ownership at the vessel level is imposed, and by as much as $2.14 million (10.4%) per year under restrictions on harvest permit trading across vessel classes. (page 330).
>
> Further calculations provide additional insights on the economic conditions under controlled access regulations. Assuming a 10% annual return to the vessel capital investment, estimates indicate that the 2004 groundfish fleet incurred a total cost of $38.789 million. The PacFIN data indicate fleetwide revenue at roughly $36.275 million in 2004, and, therefore, fleet wide losses of $2.514 million. Based on a lower 5% return to vessel capital, the results suffets that the groundfish fleet merely broke even in 2004; i.e., dockside revenues were offset by the fleet wide harvesting costs….(page 337).
>
> The results suggest a switch from the current controlled access management program to IFQs could yield a significant increase in resource rents in the Pacific Coast Groundfish fishery. For instance, our analysis finds that the 2004 groundfish catch generated zero resource rent. Instead, it could have yielded a substantial positive rent at $13.574 million (page 340).

The Council's analysis draws upon the conclusions of Lian et al., presented below:

> These estimates indicate that the average nonwhiting trawl vessel makes zero economic profit. Simply put, zero economic profit means that there are no profits being generated in the fishery above what would be considered a normal wage plus the costs of operating and maintaining a vessel. While the average vessel makes close to zero economic profit, some vessels do make profits while others may actually lose money and would be better off (financially speaking) leaving the fishery (*Rationalization of the Pacific Coast Groundfish Limited Entry Trawl Fishery FEIS,page 128 FEIS*).
>
> Indeed, research by Lian, et al. (2008), indicates the nonwhiting trawl fleet may be overcapitalized by more than 50 percent (*Rationalization of the Pacific Coast Groundfish Limited Entry Trawl Fishery FEIS*), page 273 FEIS.
>
> Based on results from Lian et al. (2008), harvesters in the nonwhiting sector generate no economic profit from harvest activity. While it is unclear whether

processors generate any economic profit from processing of nonwhiting groundfish, it is clear that if profits exist in the industry, harvesters are not realizing those profits. This suggests that, if profits exist in the harvesting and processing of nonwhiting groundfish, harvesters lack much bargaining power in negotiations over ex-vessel prices with processors (*Rationalization of the Pacific Coast Groundfish Limited Entry Trawl Fishery FEIS, page 276*).

In addition to increased revenue being generated in the fishery, the consolidation likely to occur in the nonwhiting sector is expected to lead to substantial cost savings. Cost savings occur because of less capital, but also because the fleet is expected to consolidate toward the most efficient vessels. The fleet reduction and cost efficiency model shows the consolidation that may occur could diminish the number of vessels by 50 to 66 percent, or to a nonwhiting fleet size that is somewhere on the order of 40 to 60 vessels. This predicted cost savings is fairly sensitive to the design elements of the program and is also dependent on the quantity of species harvested. This consolidation is predicted to decrease costs of harvesting nonwhiting groundfish by as much as 60 percent annually (before incorporating the cost of at-sea monitoring). Using information from recent years, this may mean a cost savings of approximately $13.8 million. Imposing accumulation limits can restrict the amount of expected cost savings substantially. Retaining the vessel length endorsement may restrict cost savings by 10 percent, though this may be lower since harvesters can bundle permits and change the length endorsement. If a 1 percent accumulation limit is placed on vessels, cost reductions may be restricted by approximately 20 percent.[2] At-sea monitoring costs add an additional cost burden to vessels that is not currently incurred. If at-sea monitors cost vessels $350 per day, this may tend to reduce the size of the fleet from the 40 to 60 vessels expected and increase the average size of vessels remaining. This is because additional costs of fishing will mean the optimal fleet size is smaller. The average size of vessels in the fleet is increased with a daily observer cost because such costs comprise a larger portion of small vessels costs than that of larger vessels. At-sea observers will also reduce fleet-wide profits. The fleet reduction and cost efficiency model illustrates that at-sea observers may cost the nonwhiting fleet $2.2 million if all vessels in the fishery operate near capacity (*Rationalization of the Pacific Coast Groundfish Limited Entry Trawl Fishery FEIS, page 290*).

Section 4.6.2.1, *Rationalization of the Pacific Coast Groundfish Limited Entry Trawl Fishery FEIS,* describes the major benefits of the trawl rationalization for shorebased non-whiting fishery, excerpted below:

Trawl harvesters in the nonwhiting sector may be substantially affected by the rationalization of the west coast trawl fishery. The individual accountability measures and harvesting privileges associated with the rationalization alternatives are likely to induce substantial changes in the

2 The lowest accumulation limit in the alternatives of 3 percent is not expected to impose cost inefficiencies on the nonwhiting trawl sector so long as prices and available harvest volumes do not decrease.

way vessels prosecute fishing activities. In the nonwhiting trawl fishery, substantial impacts are likely to occur because of the constraining nature of overfished species and the perceived reward that is associated with avoiding those stocks that may come in the form of increased catch of target species, which are currently underutilized because of weak stock management. The bycatch rate change model is used to show the amount of additional target species that can be leveraged as the nonwhiting trawl fleet reduces encounters with overfished species. The output of this model indicates that the fleet may generate severalmillion dollars in additional ex-vessel revenue under a rationalization program compared to Alternative 1 activity if ex-vessel prices remain constant.

Increased profits and fleet consolidation

Some of the expected increase in ex-vessel revenue is likely to occur almost immediately after the fishery is rationalized. However, the fleetwide estimates are best perceived as a longer-term outcome of rationalization that will occur as the fleet modifies gears and fishing location, the flow of quota through the market occurs in a way so that it reaches the more successful vessels, and processing companies find buyers for the potential increase in product quantity. This is likely to be a gradual effect where ex-vessel revenue increases over time before reaching full potential. The length of time it takes for the increased harvest volume to be absorbed by the processing sector may also depend on the number of processing entities harvesters have the opportunity to sell their catch to. The requirement that the entire catch be off-loaded at a single processor restricts—to some degree—the number of processing companies that harvesters deliver to. By relaxing this requirement, harvesters may be able to sell their catch to more than one buyer at a time, and if these buyers have relatively different access to markets, being able to sell catch to more than one buyer will make it more likely that an increase in catch can be absorbed by the market more quickly.

Figure 4-7 illustrates the potential range of ex-vessel revenues in the nonwhiting trawl fishery generated under a rationalization program compared to Alternative 1 if ex-vessel prices remain unchanged. The range of values presented is meant to bracket the range of uncertainty within the model while still providing realistic estimates. The uncertainty presented in this figure does not capture the risk posed by thin market conditions that may be present in an IFQ program because of species with low trawl allocations.

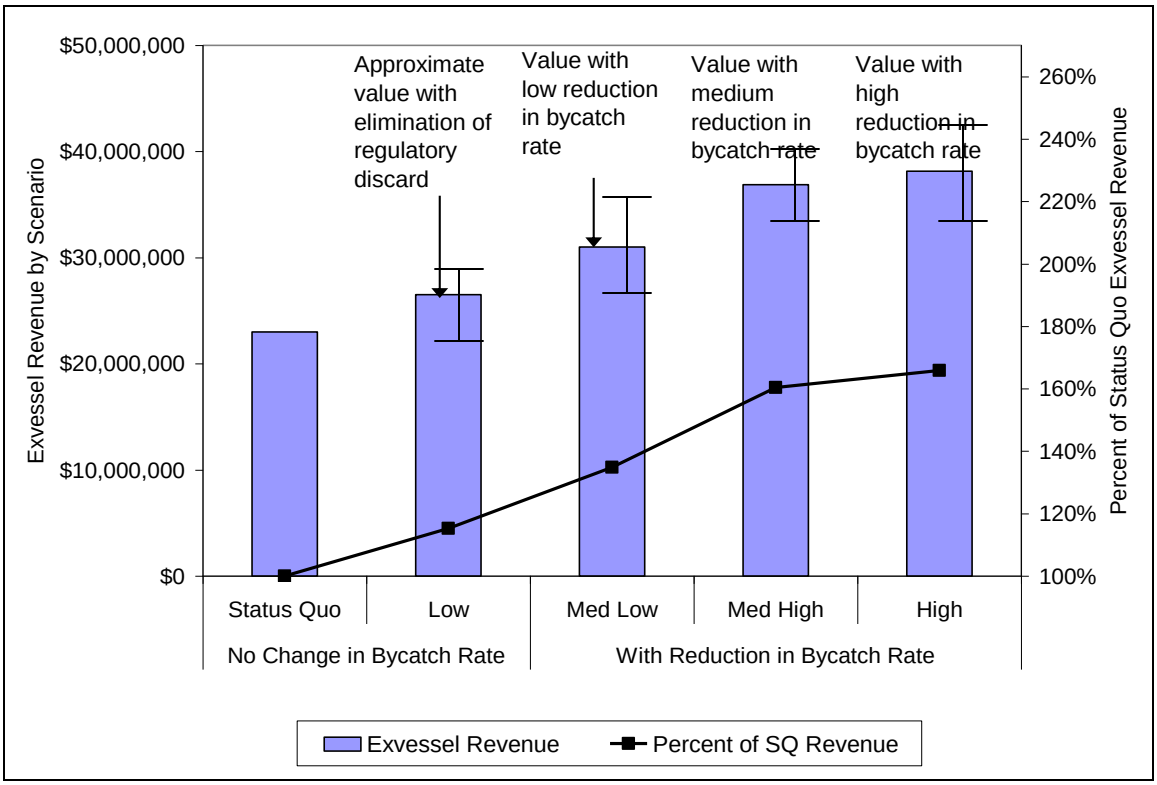


Figure 4.7. Potential ex-vessel revenue in the nonwhiting trawl fishery under rationalization.
Note: Bars are intended to represent uncertainty due to potential variations in ABCs and OYs.

In addition to increased revenue being generated in the fishery, the consolidation likely to occur in the nonwhiting sector is expected to lead to substantial cost savings. Cost savings occur because of less capital, but also because the fleet is expected to consolidate toward the most efficient vessels. The fleet reduction and cost efficiency model shows the consolidation that may occur could diminish the number of vessels by 50 to 66 percent, or to a nonwhiting fleet size that is somewhere on the order of 40 to 60 vessels. This predicted cost savings is fairly sensitive to the design elements of the program and is also dependent on the quantity of species harvested. This consolidation is predicted to decrease costs of harvesting nonwhiting groundfish by as much as 60 percent annually (before incorporating the cost of at-sea monitoring). Using information from recent years, this may mean a cost savings of approximately $13.8 million. Imposing accumulation limits can restrict the amount of expected cost savings substantially. Retaining the vessel length endorsement may restrict cost savings by 10 percent, though this may be lower since harvesters can bundle permits and change the length endorsement. If a 1 percent accumulation limit is placed on vessels, cost reductions may be restricted by approximately 20 percent.3 At-sea monitoring costs add an additional cost burden to vessels that is not currently incurred. If at-sea monitors cost vessels $350 per day, this may tend to reduce the size of the fleet from the 40 to 60 vessels expected and increase the average size of vessels

3 The lowest accumulation limit in the alternatives of three percent is not expected to impose cost inefficiencies on the nonwhiting trawl sector so long as prices and available harvest volumes do not decrease.

remaining. This is because additional costs of fishing will mean the optimal fleet size is smaller. The average size of vessels in the fleet is increased with a daily observer cost because such costs comprise a larger portion of small vessels costs than that of larger vessels. At-sea observers will also reduce fleet-wide profits. The fleet reduction and cost efficiency model illustrates that at-sea observers may cost the nonwhiting fleet $2.2 million if all vessels in the fishery operate near capacity. If some relatively marginal producers remain in the fishery, the cost will be higher. Table 2 illustrates the effect of various factors on profitability.

Table 2. Factors affecting profitability.

Effect of Consolidation	Improves harvesting cost efficiency. May allow the fleet to realize profits of ~$14 to $23 million compared to $0 or less under Alternative 1.
Effect of Accumulation Limits	No effect unless vessel limit is smaller than ~2.5 percent. A 1 percent vessel limit restricts potential cost efficiency by ~20 percent
Effect of Permit Length Endorsement	Restricts cost efficiency by ~10 percent, or imposes costs of ~$1.5 to $3 million[a]
Effect of At-Sea Observers	Increases average vessel size slightly. Decreases fleet size slightly. May reduce profits by ~$2.2 million depending on fee structure.

a) This estimate was modeled based on the idea that QS would be restricted from trading across vessel size classes. That restriction is not part of the options contained in the existing alternatives. Therefore, this estimate does not apply to the existing alternatives for rationalization of the trawl fishery.

Figure 4-8 shows potential fleet-wide profit if all vessels are operating at their most cost effective point. The results in this figure use the fleet-wide revenue estimates shown above in conjunction with the cost-savings and consolidation model. The results show profit under unconstrained cost conditions, profit with a vessel length restriction (i.e., retaining the permit length endorsement), and profit with a vessel length restriction and at-sea observers. Although not shown in the figure, for reference purposes Alternative 1 profits in the fleet are estimated to be between zero and a loss of approximately $2 million annually.

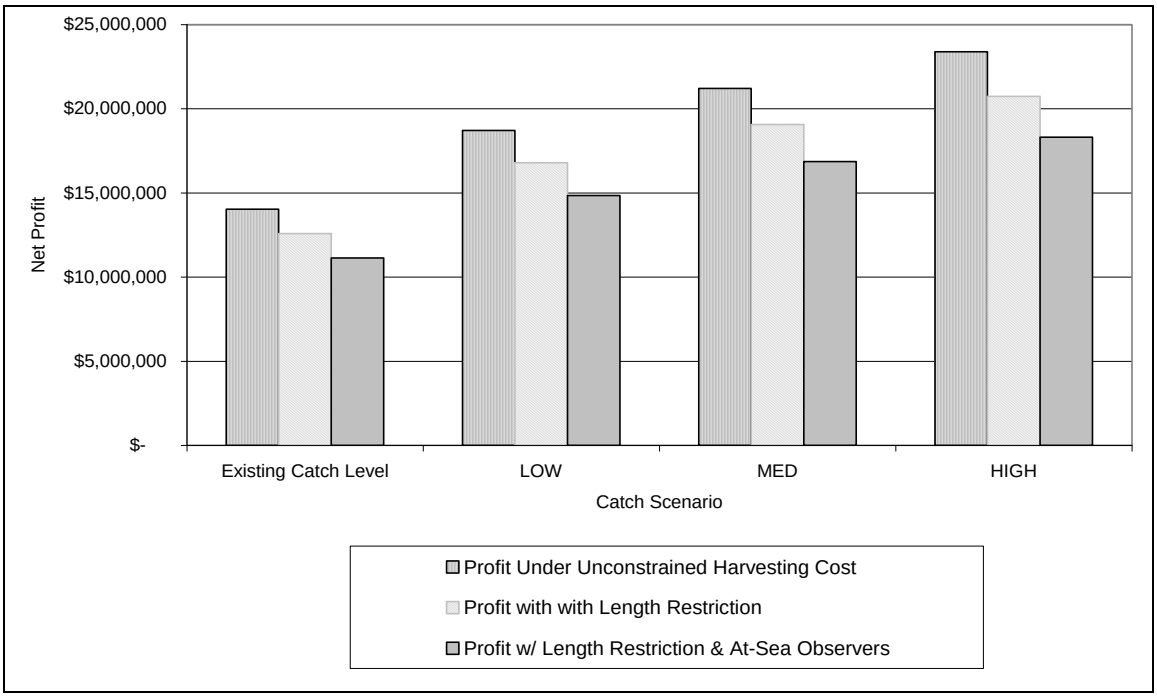


Figure 4-8. Estimated fleetwide profit in a rationalized nonwhiting trawl fishery.

The above information shows that when potential cost savings are combined with the projected increase in gross revenue displayed in Figure 4-7, actual revenues to catcher-vessels and permit holders may increase by several million. Empirical evidence from other programs suggests that consolidation and the associated cost savings could occur quite rapidly after the fishery is rationalized.

The consolidation and cost efficiency model shows that the most efficient vessels for harvesting nonwhiting trawl groundfish are approximately 60 to 70 feet in length. Smaller vessels tend to be limited by the effectiveness of harvest capacity per vessel size while larger vessels tend to operate in an area where costs are increasing more rapidly per scale compared to harvest effectiveness. Vessels that are larger or smaller may find it more profitable to sell QS and leave the fishery rather than remain in the fishery.

Current Status of the Fishery—Changes Since 2004

This discussion is in addition to the information provided in the *Rationalization of the Pacific Coast Groundfish Limited Entry Trawl Fishery FEIS*. As the "Consolidation" model is based on the fishery, it may be useful to provide current trends in the fishery. [The indicators below are landings, ex-vessel prices, and revenues from PacFIN, fuel prices collected by PSMFC, and U.S. export prices for whiting and sablefish shipped from the Seattle Customs District. PacFIN data include tribal harvests and revenues.]

In 2004, the shorebased non-whiting trawl fishery generated about $30 million in ex-vessel revenues. But according to NWFSC cost estimates, this fishery was at best breaking even or perhaps suffering a loss of up to $2 million.

Since 2004, shorebased non-whiting trawl fisheries have increased their revenues to about $40 million

The increases in shorebased revenues have come from increased landings of flatfish and sablefish and significant increase in sablefish ex-vessel prices. Sablefish now accounts for almost half of the trawl fleet's revenues.

While revenues were increasing so were fuel prices. Fuel costs are about 30 to 40% of the vessels revenues (Table 4-43 DEIS). The average 2005-2009 revenues were about $28 million—22 percent greater than of 2004. The average 2005-2009 fuel price was about $2.81—70% greater than that of 2004. Therefore, it appears that 2009 fishery may not be that much improved over that of 2004.

The indicators below also show the growth in whiting revenues due to increased landings and ex-vessel prices stimulated by high export prices. Note that after reaching a peak in 2008 of $0.11 per lb in 2008, the 2009 price for whiting has fallen to $0.05 per lb in 2009.

Recent Indicators of Fishery Trends

Revenues ($1000)

	All Groundfish	All Whiting	At-Sea Whiting
2004	44,526	21,680	14,199
2005	52,640	28,786	16,671
2006	58,673	34,425	18,523
2007	59,401	32,602	18,595
2008	91,517	58,495	43,333
2009	46,146	14,104	7,790

	Shoreside Total	Shoreside Whiting	Shoreside Non-Whiting
2004	30,327	7,481	22,846
2005	35,969	12,115	23,854
2006	40,150	15,902	24,248
2007	40,806	14,007	26,799
2008	48,184	15,162	33,022
2009	38,356	6,314	32,042

Landings (Tons)

	All Groundfish	All Whiting	At-Sea Whiting
2004	237,779	216,557	120,074
2005	281,352	259,499	150,448
2006	284,133	264,728	137,564
2007	238,852	216,583	125,142
2008	274,104	248,221	180,461
2009	149,241	121,465	72,242

	Shoreside Total	Shoreside Whiting	Shoreside Non-Whiting
2004	117705	96,483	21,222
2005	130904	109,051	21,853
2006	146569	127,164	19,405
2007	113710	91,441	22,269
2008	93643	67,760	25,883
2009	76999	49,223	27,776

Shoreside Trawl Revenues ($1000)

Flatfish	Rockfish	Sablefish
12,259	3,358	5,355
13,384	3,045	5,916
12,771	3,006	7,387
14,362	3,322	8,126
15,673	4,625	11,457
14,042	4,430	12,449

Shoreside Trawl Landings (Tons)

	Flatfish	Rockfish	Sablefish
2004	13,329	2,949	2,435
2005	14,012	2,675	2,407
2006	12,606	2,352	2,537
2007	15,417	2,768	2,489
2008	17,250	3,733	2,891
2009	18,655	4,077	3,061

Ex-Vessel Trawl Prices, Fuel Prices and Export Prices ($/gallon, $/lb)

	Dover Sole	Petrale Sole	Whiting	Sablefish
2004	$0.36	$1.03	$0.05	$1.00
2005	$0.37	$0.91	$0.05	$1.12
2006	$0.37	$1.01	$0.06	$1.32
2007	$0.37	$1.00	$0.07	$1.48
2008	$0.37	$1.01	$0.11	$1.80
2009	$0.33	$0.91	$0.05	$1.85

	June Fuel Prices	Export Prices	
	Newport	Seattle Customs District	
	Oregon	H&G Whiting	Sablefish
2004	$1.65	$0.54	$2.82
2005	$2.00	$0.54	$2.55
2006	$2.70	$0.74	$3.61
2007	$2.50	$0.74	$4.12
2008	$2.98	$0.90	$4.38
2009	$2.21	$0.88	$4.59

Non-whiting Trawl Sector: In summary, ex-vessel revenues for the non-whiting sector of the limited entry trawl fishery are estimated to be approximately $30 to 50 million per year under the preferred alternative compared to $22 to 25 million under the no action alternative. This revenue increase is expected to occur in a rationalized fishery because target species quotas can be more fully utilized. Currently, in the non-whiting sector, cumulative landing limits for target species have to be set lower because the bycatch of overfished species cannot be directly controlled. Introducing accountability at the individual vessel level by means of IFQs provides a strong incentive for bycatch avoidance (because of the actual or implicit cost of quota needed to cover bycatch species) and prevents the bycatch of any one vessel from affecting the harvest opportunity of others. In addition, under the preferred alternative, the non-whiting sector would have control over harvest timing for the whole calendar year. Under the no action alternative, the non-whiting sector would continue to operate under two-month cumulative landing limits, which reduce flexibility within a two-month period (because any difference between actual limits and the period limit cannot be carried over to the next period). Finally, the ability for vessels managed under IFQs to use other types of legal groundfish gear could allow some increases in revenue by targeting higher-value line- or pot-gear-caught fish. This opportunity would mainly relate to sablefish, which are caught in deeper water, rather than nearshore species where state level regulatory constraints apply.

The preferred alternative may also increase ex-vessel revenues of non-whiting trawl harvesters by changing their bargaining power with processors over ex-vessel prices. Under the preferred alternative, the current two-month cumulative limits structure of the non-whiting trawl fishery would be replaced with QS that is available for a year, thereby extending the time horizon harvesters have to negotiate prices with processors without losing available fishing opportunity. The extended period would give harvesters greater latitude to hold out for better prices compared to the no action alternative. However, it should also be noted that these negotiations will also be affected by the availability of target species, as well the availability of bycatch.

Costs for the non-whiting sector of the limited entry trawl fishery are expected to decrease under the preferred alternative because of productivity gains related to fleet consolidation. Productivity gains would be achieved through lower capital requirements and a move to more efficient vessels. Operating costs for the non-whiting sector are predicted to decrease by as much as 60 percent annually. Based on estimates of current costs, this percentage decrease represents a $13.8 million cost reduction relative to the no action alternative.

The accumulation limits considered under the preferred alternative are not expected to introduce cost inefficiencies in the non-whiting sector, provided that current prices and harvest volumes do not decrease. However, the preferred alternative would impose new costs on the non-whiting sector that would not be incurred under the no action alternative. First, a landings fee of up to 3 percent of the ex-vessel value of fish harvested would be assessed under the preferred alternative to recover management costs, such as maintenance of the system of QS accounts. Second, new at-sea observer requirements would be introduced, and vessels would have to pay the costs of complying with these requirements, estimated at $500 a day if independent contractors are hired. The daily observer cost could place a disproportionate adverse economic burden on small businesses because such costs would comprise a larger portion of small vessels costs than that of larger vessels.

The increase in profits that commercial harvesters are expected to experience under the preferred alternative may render them better able to sustain the costs of complying with the new reporting and monitoring requirements. The improved harvesting cost efficiency under the preferred alternative may allow the non-whiting sector to realize profits of $14 million to $23 million compared to zero or less under the no action alternative. In addition, a provision that allows vessels managed under the IFQ program to use other legal gear (gear switching) would allow sablefish allocated to the trawl sector to be sold at a higher price per pound, possibly contributing to increased profits. The imposition of accumulation limits could reduce the expected increase in the profitability of the non-whiting sector by restricting the amount of expected cost savings, and the costs of at-sea observers may reduce profits by about $2.2 million depending on the fee structure. However, the profits earned by the non-whiting sector would still be substantially higher under the preferred alternative than under the no action alternative.

New entrants are likely to face a barrier to entry in the Pacific Coast groundfish limited entry trawl fishery in the form of the cost of acquiring QS (or a co-op share in the case of the at-sea whiting sector). This disadvantages them compared to those entities that receive an initial allocation of harvest privileges. Small entities may be particularly disadvantaged to the degree that they may find it more difficult to finance such quota purchases than larger-scale harvesters. Among the goals the Council identified for the adaptive management program was using the reserved non-whiting QS to facilitate new entry into the fishery. In addition, as a trailing action, the Council identified a framework to allow the establishment and implementation of community fishing associations as part of the adaptive management program. These entities could facilitate entry into the fishery by leasing QS at below market rates, thereby leveling the playing field in terms of costs between initial recipients of QS and new entrants.

Whiting Sector. While the effect of the preferred alternative on revenues and costs in the whiting sector of the limited entry trawl fishery is more difficult to estimate, the lower motivation to "race for fish" due to co-op harvest privileges is expected to result in improved product quality, slower-paced harvest activity, increased yield (which should increase ex-vessel prices), and enhanced flexibility and ability for business planning. The overall effect of these changes would be higher revenues and profits for harvesters in the shoreside and mothership portions of the whiting fishery compared to the no action alternative. Under the preferred alternative, some consolidation may occur in the shoreside and mothership sectors of the Pacific whiting fishery, though the magnitude of consolidation is expected to be less than in the non-whiting sector. The existing catcher-processor co-op would continue under the preferred alternative, with effects on the catcher-processor sector that look similar, or identical, to those of the no action alternative. However, the change from a vessel-restriction under Amendment 15 to the permit-based limit of Amendment 21 will provide additional flexibility that currently does not exist in the whiting fishery.

Trawl Groundfish Processors. The incremental effects of the preferred alternative on buyers and processors of trawl-caught groundfish are detailed Sections 4.9 and 4.10 of the *Rationalization of the Pacific Coast Groundfish Limited Entry Trawl Fishery FEIS*. Even though processors may have to pay fishermen higher ex-vessel prices, processors may see cost savings under the preferred alternative to the degree that rationalization allows greater control over the

timing and location of landings. Processors could use current plant capacity more efficiently, because available information suggests that processing facilities are currently underutilized. Fleet consolidation in the non-whiting sector could also provide cost savings for processors if landings occur in fewer locations, thereby reducing the need for facilities and/or transport. The preferred alternative would also impose new costs on processors that would not be incurred under the no action alternative. Processors would be required to pay some or all of the costs of plant monitors, who would verify landings. Similar to at-sea observers, these monitors would be independent contractors rather than direct employees of the processing firm.

In the non-whiting processing industry, harvest volumes may increase because of a decrease in constraining species bycatch and a subsequent increase in underutilized target species catch. This boost in target species catch may increase utilization of processing capital and processing activity. [It should be noted that if bycatch has been underreported under the current system, with 100 percent observer coverage under the new system, the gains in increased target catches may be less than expected.] Consequently, the possibility of capital consolidation in the non-whiting shoreside sector may be lower than in the shoreside whiting sector. However, shifts in the distribution of landings across ports as a result of fleet consolidation, industry agglomeration, and the comparative advantage of ports (a function of bycatch rates in the waters constituting the operational area for the port, differences in infrastructure, and other factors) could lead to consolidation in processing activity at a localized or regional scale and an expansion in processing activity elsewhere. To mitigate harm to adversely impacted shoreside non-whiting processors, the adaptive management provision provides a mechanism to distribute non-whiting QS to processors, thereby ensuring that some processors receive greater landings of groundfish than would otherwise be the case.

As noted above, the preferred alternative may reduce the power of shoreside non-whiting processors to negotiate ex-vessel prices with harvesters. The larger harvest volume due to bycatch avoidance may lower processor average costs, which could offset the negative effects on shoreside non-whiting processors of a shift in bargaining power. In addition, QS could be purchased by processors over the long term, thereby increasing processor's negotiation power. However, the accumulation limits included in the preferred alternative would limit the ability of processors to purchase substantial quantities of QS. Alternatively, the adaptive management provision could be used to allocate QS to shoreside non-whiting processors, thereby providing them additional leverage when negotiating terms with harvesters.

The allocation of 20 percent of the initial shoreside whiting QS to the shoreside processing portion of the whiting fishery would give these processors more influence in negotiations over ex-vessel prices and would tend to offset the gains in bargaining power for harvesters. For example, a processor could use QS to induce a harvester that is short of QP for a Pacific whiting to make deliveries under specified conditions and prices. However, because of a reduction in peak harvest volume, fewer processing companies and/or facilities may be necessary to handle harvest volumes of Pacific whiting, meaning some companies may find themselves without enough product to continue justifying processing operations of Pacific whiting.

The annual co-op declarations under the preferred alternative are expected to give motherships some certainty over delivery volumes from catcher vessels in the upcoming year, but little

leverage in negotiations over prices or profit sharing.

Captains and Crew. The incremental effects of the preferred alternative on the employment and safety of the captains and crew of limited entry trawl vessels are detailed in Section 4.7 of the *Rationalization of the Pacific Coast Groundfish Limited Entry Trawl Fishery FEIS*. The fleet consolidation expected to occur under the preferred alternative would result in a decrease in the number of captain and crew jobs; however, those who retain jobs in the fishery are expected to receive higher wages due to higher vessel profit margins. The increased financial ability of vessel owners to invest in safety equipment and conduct vessel maintenance, together with increased vessel operational flexibility, are anticipated to improve safety conditions on board trawl vessels.

Nontrawl Commercial Harvesters and Processors. The incremental effects of the preferred alternative on nontrawl commercial harvesters and processors are detailed in Section 4.8 of the *Rationalization of the Pacific Coast Groundfish Limited Entry Trawl Fishery FEIS*. Nontrawl harvesters include those targeting groundfish with other gear types and those that do not target groundfish. Since groundfish are an important part of Pacific coast landings, relatively few processors specialize exclusively in nongroundfish species. The preferred alternative may have a number of spillover effects on these harvesters and processors, including the following:

- Fleet consolidation and increased harvest timing flexibility may allow vessels in the non-whiting sector of the limited entry trawl fishery to be made available for use in nontrawl fisheries, increasing participation in those fisheries and adversely affecting the economic performance of nontrawl harvesters.
- Reduction in trawl catch of Pacific halibut (a prohibited species) allows more catch opportunity in target fisheries, thereby increasing ex-vessel revenues in the directed halibut fisheries.
- Gear switching to target sablefish with fixed gear under trawl quotas could increase competition on fishing grounds, a potential cost increase for nontrawl harvesters.
- If the fleet consolidation expected in the non-whiting sector under rationalization concentrates trawl landings in fewer ports, the loss of fishing-related port infrastructure could increase costs for nontrawl harvesters and processors in those ports.

Recreational Harvesters. The incremental effects of the preferred alternative on recreational harvesters are detailed in Section 4.5.3 of the *Rationalization of the Pacific Coast Groundfish Limited Entry Trawl Fishery FEIS*. Fleet consolidation in the non-whiting sector that is expected to occur under the preferred alternative could reduce the availability of fishing-related infrastructure in specific ports. It is, however, unlikely that this reduction would substantially affect the types of services and amenities upon which recreational harvesters depend (e.g., charter operations, boat ramps, bait suppliers, tackle shops) or the quality of the recreational fishing experience.

Fishing Communities. The FEIS describes the status quo of fishing communities as the following :

A summary of major themes presented in public testimony during the 2007-08 groundfish

specification process (PFMC 2006) includes comments on the following:

- The negative cumulative effects of both Federal regulations (such as closed areas, fathom restrictions, season restrictions, and VMS) and nonfederal actions (cable crossings, proposed state restrictions) on fisheries, businesses, and communities
- Crumbling infrastructure (processors, buyers, ice plants, and businesses that support processors closing or consolidating, docks and harbors not being maintained; market infrastructure collapsing);
- Recreational and commercial fishing vessels going out of business or being forced to diversify;
- Fishing-related businesses, such as gear stores, boat repair shops, tackle shops, and fishing equipment manufacturers, and nonfishing-related businesses, such as hotels, restaurants, and car dealerships, feeling the impacts of reduced fishing income, including laying off employees or closing
- Decreasing tax bases due to business closures
- Increasing social tensions in communities, such as psychological impacts, marital tension, divorce and suicide
- Difficulty in making business decisions and planning for the future
- Further dependence on groundfish due to salmon cutbacks

The fleet consolidation that is expected to occur under the preferred alternative, particularly in the non-whiting sector, could have a negative economic effect on some coastal communities where groundfish trawlers are an important component of the local fishing fleet (in terms of local purchases, not necessarily number of vessels). As the fleet size shrinks, the remaining vessels would concentrate in a few major ports. Income and employment in those communities that experience a decline in local fleet size could be adversely affected. Fishery-related businesses in the community may cease operations because of lost business. Smaller, specialized retailers (e.g., ice suppliers, ship chandlers, cold storage facilities, fuel docks) would be especially vulnerable to a decreased demand for fishing-related goods and services inputs. Businesses unrelated to fishing may also feel the impacts of reduced fishing income in the community. Some of these effects would be mitigated by the higher profits expected to be earned by trawl harvesters under the preferred alternative. However, because fleet consolidation is expected, the benefits of increased vessel profitability are likely to be unevenly distributed among coastal communities. Tracking and monitoring costs may affect ports with low landings or intermittent landings, as there may be logistical issues with deploying catch monitors and observers.

The table below summarizes the comparative advantage of non-whiting communities under the preferred alternative. Ports at a disadvantage from consolidation and geographic shift have a relatively inefficient fleet (vessels with a relatively long travel time to fishing grounds, those with relatively unsuccessful operators, costly vessels, and inefficiently sized vessels contribute to the "fleet efficiency" score in the table below), insufficient infrastructure, and are adjacent to fishing grounds with high constraining overfished species abundance ("bycatch dependence" in the table below). The table also includes a positive or negative score for "initial allocation of groundfish," as determined by the initial allocation estimates.

Table 3. Comparative advantage of non-whiting trawl communities under the preferred alternative.

Port	Fleet Efficiency Score	Bycatch Dependent Area Score	Shore-based Infrastructure	Initial Allocation of Groundfish	Score
Bellingham[†]	?	- -	+ +	+	
Neah Bay[*†]	-	- -	- -	-	-
Westport[*†]	-	+	+	-	
Astoria[*†]	+	+	+ +	+ +	+
Newport[*†]	+	-	+ +	+	
Charleston (Coos Bay) [*†]	+	+	+ +	+	+
Brookings[*]	+	+	-	+	
Crescent City[*†]	-	+	+	-	
Eureka[*†]	+	+	+	+	+
Fort Bragg[*†]	-	+	+	+	
San Francisco	-	-	+ +	+	
Moss Landing[* †]	-	- -	+	+	
Princeton/Half Moon Bay[*]	-	- -	+	+	
Morro Bay[*†]	?	+	-	-	

*Small governmental jurisdiction based on Small Business Administration standard. No small governmental jurisdictions would be directly regulated by the proposed actions.
[†]Community that is "vulnerable" due to a high dependence on fishing activity and/or a relatively low resilience to change.

The adaptive management provision could be used to mitigate adverse impacts to communities, particularly ports with non-whiting processors. Directing the adaptive management quota to specific communities that have demonstrated harm, or a likely harm, could maintain fishing activity in a community that may otherwise stand to lose that activity. In addition, the preferred alternative includes other mechanisms that could mitigate adverse impacts to communities, such as a two-year moratorium on QS transfers, a five-year review that includes a community advisory committee, accumulation limits and a two-year review of some of the limits, the opportunity for communities to receive an initial QS allocation by acquiring a trawl permit, and a trailing action to establish community fishing associations.

The allocation of 20 percent of the initial shoreside whiting QS to the shoreside processing portion of the whiting fishery would give these processors more influence over the location of landings by enticing or directing harvests to existing plants even if the harvesters prefer to fish in other areas. However, consolidation in the processing sector is still expected to occur, and this consolidation of shoreside whiting processors will have an effect on communities.

Communities have been evaluated according to whether they are "dependent," "engaged," "resilient," or "vulnerable." Most studies use the term "dependence" to mean a community's use of a particular resource (for example, whiting or flatfish). "Engagement" is used to describe a community's use of a more general resource (for example, fisheries). The term "resilience" is

used to describe a community's ability to adapt to change. "Vulnerable" areas are communities that are either highly engaged or highly dependent and that have relatively low resilience.

This information is useful for considering impacts to communities in cases where changes in fishing activity have different degrees of impact on a community. In such cases, a moderate change in fishing activity occurring in a vulnerable community may be considered a substantial impact, while a moderate change in fishing activity in a less vulnerable community may be considered relatively inconsequential. The projected effects of the trawl rationalization program on the communities is described in Table 4 (Table 4-71 of the FEIS):

Table 4. Summary of the impacts of rationalization on communities.

Community	General Impacts	Vulnerability	Cumulative Impact Notes
Bellingham	Benefits from initial allocation, allocation of IFQ to processors; but close to high bycatch area.	Vulnerable. Medium dependence and medium resilience.	Long-term decline in natural resources employment, but diversified economy. Population has grown 14% since 2000. Increasing gentrification. Young population.
Anacortes	Not strongly affected by rationalization due to nature of fishery (at-sea catcher-processors)	Not vulnerable.	Long-term decline in natural resources employment. Increasing tourism and retiree destination. Population has grown 14% since 2000. Should benefit from whiting amendments (10 & 15).
Seattle	Not strongly affected by rationalization due to nature of fishery (at-sea whiting), diversity and size of community	Not vulnerable.	Diversified economy with strong fishing infrastructure. Population has grown 5% since 2000. Should benefit from whiting amendments (10 & 15). Increasing gentrification.
Neah Bay	At risk of losing trawl fleet. Receives less than average in initial allocation. May experience reduction in landings if processors are allocated quota.	Extremely vulnerable.	Relatively heavy reliance on natural resource jobs. Impacted by 2008 salmon closures. Near marine sanctuary and wave energy site. Older-than-average population.
Westport	Would receive less than average initial allocation. Processor could benefit from processor QS. Consolidation could remove nonwhiting activity from port.	Vulnerable. Fairly dependent on groundfish fishery, but fairly resilient.	Tourism and natural resources both historically important to economy. Impacted by salmon closure. Luxury boatbuilding, important to economy, could be affected be economic downturn.
Ilwaco	Primarily a whiting port. Receives less than average initial allocation of nonwhiting. Processor could benefit from QS.	Vulnerable. Low dependence on groundfish, but low resilience.	Increasing population (5%). Older-than-average population. Impacted by 2008 salmon closure. Should benefit from whiting amendments (10 & 15).

Table 4 cont. Summary of the impacts of rationalization on communities.

Community	General Impacts	Vulnerability	Cumulative Impact Notes
Astoria/Warrenton	Expected to benefit from rationalization, with large initial allocation and possibly increased harvesting and processing activity.	Astoria is vulnerable; Warrenton is not. Medium to high resilience.	General long-term decline in natural resources employment. Astoria population stable; Warrenton population increasing. Slightly older-than-average population. Impacted by 2008 salmon closures. Should benefit from whiting amendments (10 & 15). Increasing tourism (with accompanying low-paying jobs) and increasing gentrification, especially in Astoria. Some population leaving to find higher-paying jobs.
Newport	Expected to benefit from rationalization, with large initial allocation and possibly increased harvesting and processing activity.	Vulnerable. Very dependent on groundfish fisheries, but also fairly resilient.	General long-term decline in natural resources employment. Active tourist industry and increasing gentrification. Older-than-average population. Slightly increasing population. Impacted by salmon closure. Should benefit from whiting amendments (10 & 15). Wave energy projects have been proposed for nearby waters.
Coos Bay/ Charleston	Expected to benefit from rationalization, with large initial allocation and possibly increased harvesting and processing activity.	Somewhat vulnerable. Dependent on groundfish with medium resilience.	Heavily dependent on natural resource economy. Impacted by salmon closure. Should benefit from whiting amendments (10 & 15). Slight population increase since 2000. Older-than-average population. Large wave energy project proposed for nearby waters.
Brookings	Would benefit slightly from initial allocation. Currently no processors of trawl groundfish; processing could be less likely to move to Brookings under rationalization.	Not vulnerable. Dependent on groundfish, but high resilience.	General long-term decline in natural resources employment. Greatly increasing population (23.8% between 1990-2000, 15.9% between 2000-2007), many retirees. Much older-than-average population. Heavily reliant on recreational fishing. Impacted by 2008 salmon closures.
Crescent City	Would receive lower-than-average initial allocation. Relatively inefficient fleet; however, scores well on bycatch dependency, which could mitigate other factors.	Vulnerable; relatively dependent on groundfish, with medium resilience.	General long-term decline in natural resources employment. Many large rent-paying vessels removed by 2003 trawl buyback. Reliant on tourism. Slightly increasing population. Impacted by salmon closure.

Table 4 cont. Summary of the impacts of rationalization on communities.

Community	General Impacts	Vulnerability	Cumulative Impact Notes
Eureka	Would receive higher-than-average initial allocation. Located in low-bycatch area.	Vulnerable; relatively dependent on groundfish, with medium resilience.	General long-term decline in natural resources employment; reliant on tourism, timber, and fishing. Sixteen groundfish vessels retired through trawl buyback. Decreasing population (3%). Impacted by salmon closure. Four wave energy projects are proposed for nearby state and Federal waters.
Fort Bragg	Would receive higher-than-average initial allocation. Located in low-bycatch area. However, a relatively inefficient fleet.	Vulnerable; relatively dependent on groundfish, with medium resilience.	General long-term decline in natural resources employment (large mill closed in 2002). Decreasing population (3%). Older-than-average population. Impacted by 2008 salmon closure. Increasing gentrification. Three wave energy projects are proposed for nearby state and Federal waters. Several marine protected areas located in nearby waters.
San Francisco	Would receive higher-than-average initial allocation. Strong infrastructure. However, located in a high-bycatch area. May lose some of its relatively inefficient fleet.	Not vulnerable.	Decreasing population (2%). Ongoing gentrification of fishing facilities. Wave energy projects proposed for nearby waters (mainly bay). Impacted by 2008 salmon closure.
Princeton/ Half Moon Bay	Initial allocation may be higher or lower than average, depending on allocation formula. Located near high bycatch area. Relatively inefficient fleet (some vessels may be lost), but strong infrastructure may mitigate these factors.	Not vulnerable.	Historically dependent on tourism; active tourist industry. Slightly increasing population; older-than-average population. Increasing gentrification. Near Monterey Bay Sanctuary and newly designated California MPAs.
Moss Landing	Would receive higher-than-average initial allocation. May experience reduction in landings if processors are allocated quota. Inefficient fleet near high bycatch area.	Vulnerable; somewhat dependent on groundfish, with low resilience.	Historically reliant on sardine and other fisheries. Near Monterey Bay Sanctuary and newly designated MPAs. Affected by 2008 salmon closure.

Table 4 cont. Summary of the impacts of rationalization on communities.

Community	General Impacts	Vulnerability	Cumulative Impact Notes
Morro Bay	Currently no trawlers are trawling out of Morro Bay. Permits bought out by Nature Conservancy. Impossible to predict how efficient fleet may be in future. Would receive less than average initial allocation of QS.	Vulnerable. Medium dependence on groundfish, but highly resilient.	Active tourist industry. Slightly decreasing population. Increasing gentrification. Impacted by salmon closure. Five groundfish vessels participated in buyout. New MPAs located in nearby waters. One wave energy project currently proposed for nearby waters.

One of the key indicators of community health is the unemployment rate. Unfortunately, because many of these communities are small, current unemployment rates cannot be found. However, there are current estimates for the counties in which these communities reside. [The data below are taken from the Local Area Unemployment Statistics, U.S. Department of Labor, Bureau of Labor Statistics Databases –see www.bls.gov .]

These trends show that, relative to 2004, unemployment rates were declining but then increased significantly in 2009, mirroring the general trend in the overall U.S. economy. The implication is that vulnerable communities are becoming more vulnerable.

Trends in Unemployment Rates By County of Home Port
(% Unemployed)

Washington					
	Clallam	**Grays Harbor**	**Pacific**	**Whatcom**	
	Neah Bay	**West Port**	**Ilwaco**	**Bellingham**	**State**
2004	7.1	8.3	7.7	5.8	6.2
2005	6.5	7.5	7.1	5.0	5.5
2006	5.8	6.9	6.4	4.5	4.9
2007	5.7	6.9	6.9	4.1	4.6
2008	6.8	7.4	6.6	4.9	5.4
2009	9.6	12.6	12.2	8.0	8.9
Oregon					
	Clatsop	**Lincoln**	**Coos**	**Curry**	
	Astoria	**Newport**	**Coos Bay**	**Brookings**	**State**
2004	6.8	8.1	9.0	7.5	7.3
2005	5.8	8.1	7.6	7.0	6.2
2006	5.0	6.0	6.7	6.8	5.3
2007	4.7	5.5	6.6	6.5	5.1
2008	5.1	6.5	8.1	7.8	6.5
2009	8.9	10.4	12.0	13.1	10.7
California					
	Del Norte	**Humboldt**	**Mendocino**	**Monterey**	
	Cresent City	**Eureka**	**Fort Bragg**	**Moss Landing**	**State**
2004	8.1	6.5	6.4	8.3	6.2
2005	7.5	6.1	5.8	7.3	5.4
2006	6.9	6.5	5.2	6.9	4.9
2007	7.5	5.9	5.5	7.1	5.2
2008	8.7	7.2	6.8	8.4	7.2
2009	12.2	11	10.5	11.9	11.4

Tribal Fisheries. The incremental effects of the preferred alternative on treaty tribe harvesters are detailed in Section 4.15 of the *Rationalization of the Pacific Coast Groundfish Limited Entry Trawl Fishery FEIS*. Under the preferred alternative, tribal groundfish fisheries are expected to generate at least the same level of ex-vessel revenues and personal income as generated under the no action alternative. Loss of port infrastructure due to harvester and processor consolidation could affect tribal fisheries disproportionately. As shown in Table 4-69 of the FEIS, the port of Neah Bay appears to be at a particular disadvantage under the preferred alternative because of its lack of fleet efficiency, lack of shore-based infrastructure, and the high degree of dependence that vessels in this port have on areas defined as "high bycatch."

Seafood Consumers. The incremental effects on seafood consumers are considered in Section 4.5.4 of the *Rationalization of the Pacific Coast Groundfish Limited Entry Trawl Fishery FEIS*. Under the preferred alternative, consumers of groundfish products could benefit from greater availability of target species and new product forms. Given that the current management strategy is focused on a year-round fishery via bimonthly trip limits, there may be little change in the seasonal availability of groundfish products. However, due either to the high bycatches of rockfish species or to high catches of petrale sole preseason, the traditional winter petrale sole fishery has been greatly restricted or closed down as occurred in 2007. These closures affect the availability of petrale sole to the consumer. Under the preferred alternative, closures of major fisheries are unlikely to happen. The major product form for whiting in recent years has been H&G whiting. This product is mainly for the Eastern European markets. The other groundfish products generally have close substitutes available from elsewhere in the global supply chain. For example, seafood processors have testified to the competition from imported tilapia. Therefore, for most consumers of fresh and frozen seafood products, there is probably little difference between the preferred alternative and no action alternative.

Nonconsumptive and Nonuse Values. The incremental effects on nonconsumptive and nonuse values are considered in Section 4.5.5 of the *Rationalization of the Pacific Coast Groundfish Limited Entry Trawl Fishery DEIS*. The preferred alternative may reduce bycatch of overfished stocks, which could enhance the value of wildlife viewing experience for nonconsumptive users. Nonuse values are affected by the impact of harvest on the status of fish stocks. To the degree that the preferred alternative is more effective than the no action alternative in constraining trawl sector harvests to levels expected to improve stock status, nonuse values would be enhanced. It was not practicable to monetize theses changes in nonconsumptive and non-market values; however, they are treated qualitatively in order to provide a complete accounting of costs and benefits attributable to the preferred alternative.

Management Agencies. The incremental effects on management agencies were detailed in Section 4.16 of the *Rationalization of the Pacific Coast Groundfish Limited Entry Trawl Fishery FEIS*. Public expenditures for monitoring and enforcement are expected to increase under the preferred alternative compared to the no action alternative. Some of these costs would be covered by industry directly (at-sea observer and plant monitor costs) or indirectly through a landings fee. At the state and Federal level, the total expenditure is estimated to range from approximately $2.8 million to $5.6 for startup of the program based on fiscal years 2010 and

2011 first quarter expenditures. After a period of transition, annual program costs are expected to be in the neighborhood of about $5.0 million annually.

4.5.2 Summary of Net Benefits to the Nation

Table 5 summarizes the net benefits to the nation under the preferred alternative based on a qualitative and quantitative assessment. Improvements in the economic performance of harvesters in the Pacific Coast groundfish limited entry trawl fishery may be substantial as a result of expected cost efficiencies created by fleet consolidation, increased flexibility in harvest timing, and increase in the harvest of underutilized target species due to incentives to reduce bycatch. Those harvesters who choose to exit the fishery would receive financial compensation from selling their permit or share of the resource. The improvement in the economic performance of processors in the fishery may also be substantial due to increased processing of target species, increased season length and processor consolidation. An initial allocation of QS to shoreside whiting processors is expected to replace the lost capital value potentially occurring among these processors due to a decline in processing demand.

The preferred alternative may also result in a shift in the balance of bargaining strength between harvesters and processors. This shift, in turn, can affect the distribution of efficiency gains. By providing harvesters with a guaranteed harvest opportunity over a longer period compared to the no action alternative, the preferred alternative may change the relative bargaining power between processors and harvesters by giving harvesters greater latitude to hold out for better ex-vessel prices. On the other hand, an initial allocation of whiting QS to whiting processors will tend to enhance their negotiation power with harvesters over prices. In addition, the adaptive management provision provides a mechanism to distribute non-whiting QS to processors, thereby mitigating harm to adversely impacted shoreside non-whiting processors.

Fleet consolidation would result in a decrease in the number of captain and crew jobs; however, those who retain jobs are expected to receive higher wages due to higher vessel profit margins. Increased vessel profits and operational flexibility are anticipated to improve safety conditions onboard trawl vessels. Fleet consolidation may lead to the spillover of excess vessels into nontrawl commercial fisheries that are operationally similar, thereby increasing competition in those fisheries. Fishing communities will be affected differentially, depending on whether fleet and processor consolidation results in a concentration or loss of vessels and commercial infrastructure.

The main socioeconomic impact of the long-term, formal allocations of specified groundfish stocks and stock complexes among sectors of the Pacific Coast groundfish fishery is increased stability for the limited entry trawl fishery. While the allocations under the preferred alternative do not differ significantly from status quo allocations made biennially, there is more certainty in future trawl harvest opportunities, which enables better business planning for participants in the rationalized fishery.

Table 5. Summary of net social benefits of the preferred alternative relative to the no action alternative.

	Qualitative Assessment	Quantitative Assessment
Trawl Harvesters and Processors		
Change in Costs	+/-	~$13.8 million decrease for non-whiting sector due to productivity gains related to fleet consolidation, but at-sea observe requirements will increase costs by ~$2.2 million
Change in Revenues	+	$5-22 million increase in ex-vessel revenues for non-whiting sector
Change in Profitability	+	$14-23 million increase in profits for non-whiting sector, not including at-sea observer costs
Captains and Crew		
Change in Employment and Wages	+/-	
Change in Fishing Vessel Safety	+	
Nontrawl Commercial Harvesters and Processors		
Change in Costs	+	
Change in Revenues	+/-	
Recreational Harvesters		
Change in Value of Recreational Fishing Experience	0	
Tribal Fisheries		
Change in Revenues and Costs	0	
Fishing Communities		
Change in Concentration of Vessels and Commercial Infrastructure	+/-	
Seafood Consumers		
Change in Prices	0	
Change in Quantity/Quality of Seafood Products	+	
Nonconsumptive and Nonuse Values		
Change in Values Associated with Healthy Fish Stocks	+	
Management Agencies		
Monitoring and Enforcement Costs	+	$5.0 million for startup of the program, $6.5 million for the first few years of the program, and perhaps falling to $4.0 to $4.5 million

4.6 Description of the Projected Reporting, Recordkeeping, and Other Compliance Requirements of the Proposed Rules

The preferred alternative has reporting, recordkeeping, and other compliance requirements. A tracking and monitoring program would be necessary to ensure that the total catch (including discards) is accurately documented and matched against QP. All vessels in the shoreside non-whiting and whiting sectors would be required to carry at-sea observers to monitor sorting and discarding of the catch and shoreside landings. There would also have to be an electronic system to report bycatch and landings, which may be integrated with the current state fish ticket

(landings reporting) system. Plant monitors would be required to ensure that the electronic fish tickets are accurate.

A new reporting requirement related to the tracking of quota shares and QP in the shoreside sector. Current requirements for motherships, mothership catcher vessels, and catcher-processors would continue to be in effect. However, a new program for the mandatory submission of economic data by both the shoreside and at-sea whiting sectors would be implemented to facilitate monitoring IFQ and co-op program performance.

In addition to the catch reporting and monitoring requirement, the preferred alternative would impose other compliance requirements. A landings fee of up to 3 percent of the ex-vessel value of fish harvested would be assessed to recover costs of management, data collection and analysis, and enforcement activities. Second, new at-sea observer requirements would be introduced, and vessels would have to pay the costs of complying with these requirements, estimated at $350 to $500 a day.

4.7 Identification of Relevant Federal Rules that may Duplicate, Overlap, or Conflict with the Proposed Rules

There are no relevant Federal rules that may duplicate, overlap, or conflict with this action.

4.8 Description of Significant Alternatives to the Proposed Rules

Each IRFA shall also contain a description of any significant alternatives to the proposed rule that accomplish the stated objectives of applicable statutes and that minimize any significant economic impact of the proposed rule on small entities.

There are no significant alternatives to the proposed rule that accomplish the stated objectives of applicable statutes and that minimize any of the significant economic impact of the proposed rule on small entities.

The proposed action includes provisions that would have a beneficial impact on small entities. It would create a management program under which most recent participants in the Pacific Coast groundfish limited entry trawl fishery (many of which are small entities) would be eligible to continue participating in the fishery and under which the fishery itself would experience an increase in economic profitability. Small entities choosing to exit the fishery should receive financial compensation from selling their permit or share of the resource. To prevent a particular individual, corporation, or other entity from acquiring an excessive share of the total harvest privileges in the program, accumulation limits would restrict the amount of harvest privileges that can be held, acquired, or used by individuals and vessels. In addition, for the shoreside sector of the fishery, an adaptive management program would be allocated an amount of harvest privileges that could be used to mitigate any adverse impacts, including impacts on small entities, that might result from the proposed action.

The following is excerpted from "Analysis of Components, Elements, and Options for the Individual Fishing Quota Alternative Trawl Individual Components Analysis, Appendix A to the Pacific Coast Groundfish Limited entry Trawl Fishery Environmental Impact Statement."

Under the MSA, the Council is required to consider entry-level fishermen, small vessel owners, and crewmembers, and in particular the possible allocation of a portion of the annual harvest to individuals falling in those categories. No special provisions have been identified for analysis given that new entry is addressed indirectly by allowing crew, captains and others to acquire QS in small increments.

Section 303A(c)(5)(C) of the MSA requires that in developing a LAPP, the Council do the following:

> Include measures to assist, when necessary and appropriate, entry level and small vessel owner-operators, captains, crew, and fishing communities through set-asides of harvesting allocations, including providing privileges, which may include set asides or allocations of harvesting privileges, or economic assistance in the purchase of quota.[4]

The MSA requires that the Council consider, and, **if appropriate**, provide additional measures to benefit the named groups. The Council has considered these groups and certain other elements of the program have been designed with impacts on these groups in mind, including the following:

1. Allocating based on the history of the permit, allowing new entrants to receive a greater initial allocation than they would if the allocation were based just on their personal history in the fishery (Section A-2.1.1).
2. Including an equal allocation component as part of the initial allocation formula for permits, this will benefit historically smaller producers (Section A-2.1.3).
3. Not including a minimum holding requirement provision, this might be more difficult for smaller vessels to comply with than larger vessels (A-2.2.1).
4. Specifying a broad class of eligible owners, that includes crews and fishing communities (Section A-2.2.3.a).
5. Specifying that the QS/QP be highly divisible so as to facilitate the acquisition of QS/QP in small increments by crewmembers, those that have just entered the fishery, and operators of small vessels (Section A-2.2.3.d).
6. Including provisions for a set-aside, as needed to support an adaptive management program that may be used at some future time to address community concerns or create other incentives to benefit the groups listed in 303A(c)(5)(C) or for other purposes (Section A-3).

The TIQC also debated and reported to the Council options for a loan program and a provision that would allocate shares forfeited through a use-or-lose provision to new entrants. The TIQC did not recommend that the Council adopt the loan program because the rationalization program already has high costs and the program would act as a subsidy that might drive up QS prices.

4 An **Assisted Purchase Program** may be developed to aid in financing quota purchase by small vessel fishermen and first time purchase by entry-level fishermen (MSA – 303A(g)(1)).

The use-or-lose provision was not included as part of the package because of implementation obstacles. The TIQC also noted that providing a central lien registry would facilitate obtaining financing by increasing security in the collateral, reducing risk and therefore lower interest rates. This would benefit new entrants. Such a registry, while required by the MSA, has not been implemented.

Much of the focus in developing the program is on the impacts of those who are currently in the industry and who will benefit from receiving an initial allocation of QS. Those individuals will be in an economically stronger situation. The value of the QS they receive will be a stream of resource-related rents (additional profits). Because of the infusion of wealth provided by the QS, they will likely be in an economically better position to bear the brunt of increasing fuel prices, program costs, and, if it should occur, declines in the available harvest. As holders of the QS, they will also accrue the benefits that occur from factors that increase the value in the fishery.

However, over the long term, the constituents of the commercial fishery who come before the Council will be those who at one time or another have been new entrants. New entrants who choose to own QS will have paid an amount for their QS based on the best projections of future profits after taking into account expected fuel prices and other production costs, including observer costs, expected ex-vessel prices for raw fish, expected harvest levels, and, significantly, the cost of the QS. If it turns out that costs are greater than expected or revenue is less than expected, they will not have the same revenue buffer initial QS recipients have. Under such circumstances, a new entrant may experience below-normal levels of profit, possibly even similar to those seen in the status quo fishery. At the same time, if costs are lower or revenues higher, they will experience a higher than expected return that will not be dissipated by increased competition. Thus, the IFQ program provides some expectation of more stable profits even for second-generation participants that choose to own QS. However, second-generation participants need not necessarily take on the risk of QS ownership.

The need to acquire quota will add to costs for second-generation owners, as compared to those who came before. In addition to paying for the physical capital (vessel, etc.) they will have to acquire QP each year and may choose to do so by making a capital investment in QS (by acquiring QS). By owning their own QS they would control their risk with respect to changing QP prices. However, by holding their own QS they will bear risk and reward from the changing value of the QS asset (increases, if there is a trend toward higher vessel costs or lower revenue, or decreases if conditions move in the other direction). If there were not an IFQ program, entering the fishery would require less of an investment but revenues would likely be lower. Assuming that all extra profits (resource rents) under status quo are dissipated, the fishery would have similar downside risks but less upside potential as compared to a fishery managed with IFQs. Upside potential would be lower under status quo because higher than expected profits would likely be dissipated by increased competition. If a harvester enters the fishery and chooses not to acquire QS, but rather to lease QP, the capital investment will be lower, they will not risk the potential decline in value of the asset they purchase, they will have a more limited benefit from any long-term improvement in economic conditions in the fishery, and, if they are able to be competitive, will fish at a normal profit level through QP they buy during the season or are provided by processors. [Note: a normal profit implies zero economic profit but sufficient profit to compensate for their investment.]

4.9 RIR Significance Questions

The RIR Guidelines require a review of the following four questions. Responses to those issues are provided.

1) Will the rule have an annual effect on the economy of $100 million or more or adversely affect in a material way the economy, a sector of the economy, productivity, competition, jobs, the environment, public health or safety, or state, local, or tribal governments or communities?

The proposed action is expected to have a positive effect on the national economy, although it is unlikely to exceed $100 million annually. Economic profit from the non-whiting sector of the Pacific Coast groundfish limited entry trawl fishery is estimated at about $14 million to $23 million, although various proposed measures (accumulation limits, at-sea observers) would reduce this profit somewhat. While similar estimates of changes in profits are not available for the whiting sector, the lower motivation to "race for fish" due to co-op harvest privileges is expected to result in improved product quality, slower-paced harvest activity, increased yield (which should increase ex-vessel prices), and enhanced flexibility and ability for business planning. The overall effect of these changes would be higher revenues and profits for harvesters in the shoreside and mothership portions of the whiting fishery.

Improvements in the economic performance of processors in the Pacific Coast groundfish limited entry trawl fishery may also be substantial due to increased processing of target species, increased season length, and processor consolidation. An initial allocation of QS to shoreside whiting processors is expected to replace the lost capital value potentially occurring among these processors due to a decline in processing demand.

Fleet consolidation would result in a decrease in the number of captain and crew jobs; however, those who retain jobs are expected to receive higher wages due to higher vessel profit margins. Increased vessel profits and operational flexibility are anticipated to improve safety conditions on board trawl vessels. Fleet consolidation may lead to spillover of excess vessels into nontrawl commercial fisheries that are operationally similar, thereby increasing competition in those fisheries. Fishing communities will be affected differentially, depending on whether or not fleet and processor consolidation results in a concentration or loss of vessels and commercial infrastructure.

The main socioeconomic impact of the long-term, formal allocations of specified groundfish stocks and stock complexes between sectors of the Pacific Coast groundfish fishery is increased stability for the limited entry trawl fishery. While the allocations under the proposed action do not differ significantly from status quo allocations made biennially, there is more certainty in future trawl harvest opportunities, which enables better business planning for participants in the rationalized fishery.

The proposed action does not present a risk to long-term productivity. As discussed above, productivity is expected to increase through fleet consolidation and other factors. The gains are expected to continue over the long term.

2) Will the rule create a serious inconsistency or otherwise interfere with action taken or planned by another agency?

No inconsistencies or conflicts with the activities of other agencies have been identified.

3) Will the rule materially alter the budgetary impact of entitlement, grants, user fees, or loan programs or the rights and obligations of recipients thereof?

The MSA (§303A(e) and §304(d)(2) provides that up to 3 percent of the ex-vessel value of fish harvested under a limited access privilege program may be assessed to recover costs of management, data collection and analysis, and enforcement activities. The assessment of such a fee is included as part of the proposed action in order to cover management costs, such as maintenance of the system of quota share accounts. In 2006, the Federal government established a loan program to purchase groundfish limited entry trawl permits and associated vessels and retire them from the fishery to reduce capacity. This buyback program is based on both a grant to subsidize the cost and a loan program whereby remaining fishery participants pay a landings-based fee to retire the upfront cost. The proposed action will not alter this obligation and fishery participants will continue to pay the landings fee.

4) Will the rule raise novel legal or policy issues arising out of legal mandates, the President's priorities, or the principles set forth in the EO?

The Council considered various arrangements for obligating catcher vessels participating in co-ops to deliver to certain processors. In particular, the co-op proposal for shoreside whiting vessels included provisions for obligating deliveries that were found to be outside NMFS's legal authority. However, this proposal was not included in the preferred alternative. The co-op program proposed for the mothership sector, which was included in the preferred alternative, was structured in a way to avoid potential legal issues. Otherwise, the proposed action is consistent with the President's priorities as reflected in the NOAA Administrator's emphasis on the use of catch share programs in fishery management.

Attachment 1

Update to the Tracking and Monitoring Costs of the Program

Tracking and Monitoring Program

A key feature of the trawl rationalization program would be a shift from the current catch accounting system for the shoreside sector that uses fleetwide estimates of discards based on an observer sampling system that has 20 percent coverage to an 'individual accountability' system where all catch by shoreside vessels would count against participants' shares, including both retained and discarded catch based on 100 percent observer coverage on vessels and 100 percent compliance monitoring in the plants. Under the current management system, shorebased fishermen fish against bimonthly trip limits and annual fleetwide quotas and have no direct accountability for discards. Under the proposed system, shorebased fishermen would fish against "individual" quotas against which their discards would count. Within the whiting fishery, there will be two major changes. Shoreside whiting vessels will no longer be monitored by cameras as they will be required to have observers. Catcher-vessels that deliver to motherships are currently unmonitored; these vessels, too, will be required to carry observers.

Amendment 20 would include a tracking and monitoring program to ensure that all catch (including discards) would be documented. For shoreside vessels, catch would be matched against QP; for the at-sea co-ops, catch would be matched against sector amounts. The Council specified that observers would be required on all vessels, and shoreside monitoring (catch monitors) would be required during all off-loading (100 percent coverage). Compared to status quo monitoring, this would be a monitoring and observer coverage level increase for a large portion of the trawl fleet, particularly nonwhiting shoreside vessels.

The Council recommended providing NMFS with the flexibility to develop a monitoring program that would achieve the objectives of the QP program. NMFS is working closely with the states and the Council to develop the details of the tracking and monitoring program, as reported by Pacific States Marine Fisheries Commission (PSMFC) at the April 2010 Council meeting. The details of the program will be proposed in the upcoming program components rule. As reported by PSMFC, the following tracking and monitoring components will be addressed.

Amendment 20 would require NMFS-certified, at-sea observers on each vessel. This requirement includes shoreside catcher vessels, mothership catcher vessels, mothership processors, and catcher-processors. Because this is a new program, ensuring adequate observer coverage would be particularly important for monitoring the complex suite of allocations. Observers aboard vessels would be required to adequately account for catch and bycatch in the fishery. Among his or her duties, the observer would record fishing effort and estimate total, retained, and discarded catch weight by species or species group; determine species composition

of retained and discarded catch (non-whiting vessels), and document the reasons for discard; record interactions and sightings of protected species; take biological samples from tagged fish and discards; and estimate viability of Pacific halibut. Observers would be essential to monitor IBQ in the fishery, including IBQ weighing and discarding.

An increase in observer and catch-monitoring coverage requirements would result in increased costs over the status quo observer program costs. There would be a combined status quo, pay-as-you-go industry funding and agency-funded observer and catch monitoring system, as required for each sector. The agency has announced its intent, subject to available Federal funding, that participants initially be responsible for 10 percent of the cost of hiring observers and catch monitors. The industry proportion of the costs of hiring observers and catch monitors will be increased every year so that, by 2014, once the fishery has transitioned to the rationalization program, the industry will be responsible for 100 percent of the cost of hiring the observers and catch monitors. NMFS believes that an incrementally reduced subsidy to industry-funding will enhance the observer and catch monitor program's stability, ensure 100 percent observer and catch monitor coverage, and facilitate the industries' successful transition to the new quota system.

Amendment 20 would require that first receivers—shorebased processors or other entities that receive groundfish from IFQ harvesters sort, weigh, and report all landings of IFQ species under a catch monitoring plan. First receivers will be required to hire NMFS-certified catch monitors to verify all shoreside deliveries of IFQ species, ensure that species are sorted into Federal species groups, ensure that the fish are weighed on state-certified scales that are tested periodically and record and submit catch data daily.

To ensure that the QP program goals are met, and landings are tracked, first receivers will be required to submit electronic fish tickets using software provided by the Pacific States Marine Fisheries Commission. Further, vessels will be required to use VMS to indicate vessel locations and to make declarations. In addition, there are plans to develop and require an electronic vessel logbook, but this component will not be immediately implemented.

To ensure that program goals are met to track transferrable QS and QP, NMFS is also developing an online accounting system for the tracking and trading of QS by owner and for the tracking, trading, and use of the QP that result from these quota shares by vessels.

The agency will collect fees to cover the administrative costs of issuing the quota shares, permit endorsements (one-time fee and annual renewal), and first receiver site licenses (annual). Amendment 20 would allow for assessing cost recovery fees of up to 3 percent of ex-vessel value, consistent with 303A(e) of the MSA. The costs to be recovered would be the agency's costs of management, data collection, analysis, and enforcement activities. The Council will develop the methodology required by 303(A)(e) in a trailing action.

NMFS plans to propose additional program details in a future proposed rule. Such additional details would include program components applicable to IFQ gear switching, observer programs, retention requirements, equipment requirements, catch monitors, catch weighing requirements, coop permits/agreements, first receiver site licenses, quota share accounts, vessel quota pound accounts, further tracking and monitoring components, and economic data collection requirements. In order to encourage more informed public comment, this proposed rule includes a general description of these additional program requirements. NMFS is also planning a future cost-recovery rule based on a recommended methodology yet to be developed by the Pacific Fishery Management Council.

Tracking and Monitoring Costs

The costs of the program can be broken into three categories:

> Agency Implementation Costs (one-time costs to develop the tracking and monitoring programs)
>
> Agency Annual Costs (state and Federal costs associated with running the Program when fully implemented)
>
> Direct Observer and Monitoring Costs (daily costs associated with hiring observers and plant monitors)

These costs are shown in the table below. They are based on converting quarterly estimates developed for the Federal fiscal year budget process. While funds may be received in one quarter, they may not be expended in that quarter. Estimates of agency implementation costs were based on funds received during FY 2010 and first quarter of FY 2011. As programs develop, in some cases using this approach to estimate implementation cost may yield estimates that are too high and in other cases too low. As the fishery progresses and programs adapt, new features will have to be developed, while others will be corrected or phased out. For example, the quota share trading system, while initially developed for 2011, will not be tested until 2013 because the trading in quota shares is prohibited for the first two years. There may also be implementation costs associated with the Adaptive Management Programs or the Community Fshery Association Program. As programs develop, agency costs may increase because of the transition from old programs to new programs where, for a period of time, both programs have to be maintained (see attached figure).

<u>Agency Implementation Costs</u>

These are one-time additional costs to NMFS and the states to implement the program. For managing the program, these include developing the initial issuance processes (historical database development, initial application forms, the appeals processes), permitting processes and development of the shorebased total catch accounts (electronic fish tickets, compliance monitor

reports, and observer discard estimates) and shorebased, vessel accounting systems). Based on review of NMFS Alaska and Northeast Region programs, NMFS estimates that there may be over 100 appeals. States will also incur some implementation costs for upgrading their catch tracking systems to meet the new electronic reporting requirements. The federal enforcement program will have to train new officers and staff and pay their salaries while in training. State enforcement programs will also have to train new officers and staff, but these costs are included in annual costs. Both the NWR and NWFSC will have to expand their monitoring programs and develop the necessary infrastructure (IT, equipment, training, and office space. It may cost more than $12,000 to equip an observer with a laptop, motion-compensated scale, safety gear, and raingear. It costs about $2000 to equip a compliance monitor with gear and a computer. Approximately 100 observers and 60 to 80 plant monitors will have to be equipped and trained for the first year of implementation.

Agency Annual Costs

These are recurring state and federal costs associated with running the program when fully implemented. For the NMFS NWR Management Office, these costs include five positions for managing the permitting processes, quota share accounts, vessel accounts, catch monitoring program, and cost-recovery program. PSMFC and NMFS NWR will continue to expend about $200,000 annually to maintain the IT aspects of electronic fish ticket, total catch databases, quota share, and vessel accounts. States will continue to receive $200,000 each for managing state fish ticket system and for increased port sampling needs. For the Federal enforcement office, these costs fund four positions. For state enforcement, $800,000 is planned to be provided to the three states because of increased enforcement levels. The trawl rationalization program is complex, and there will be a initial need for high enforcement presence. These costs may decline once the program matures, and participants develop better understanding and acceptance of the regulations. These enforcement costs may also decline as a result of the expected consolidation of the fleet. Other costs may change as a better understanding of the roles of compliance monitors, port samplers, and enforcement agents develops, and the roles are revised to avoid duplication or to better complement each other. With respect to the Observer and Economic Data Collection Programs, the Northwest Fisheries Science Center will expend funds associated with about five positions. PSMFC will continue to receive grants for debriefing positions and gear. In addition, contracts for collecting economic data will be developed. The total cost is expected to be approximately $5.0 million by FY 2013. [Note that inflationary effects are taken into consideration.]

Direct Observer and Compliance Monitor Costs—Estimates by Fleet

Observer-Shoreside Non-whiting: In 2008, there were 2,166 actual non-EFP trawl trips. The number of trips has ranged from a high of 3,486 to a low of 2,088 between 2002 and 2008. Therefore, for purposes of analysis, we will assume 2,300 trips. The average trip length has been 3.3 days (trips are usually no longer than five days but range from one to eight days in length).

This yields about 7,600 sea days. The cost of an observer is estimated to be $500 a day based on conversations with the observer providers. Due to the logistical complexities of the west coast groundfish fleet and the high number of unknowns, there is considerable risk for the providers, and they estimate that the cost per sea day at $500 per day. This is higher than in the North Pacific but lower than the $510 estimates associated with the Northeast Region's industry-funded scallop observer program. This estimate leads to a direct annual cost for the shorebased non-whiting fishery of about $3.8 million. Unit costs of observers are a function of the ability to work with the observer providers and make arrangements to lower costs. At the September 2009 Pacific Fishery Management Council meeting, the NWFSC provided information suggesting that if an observer is placed on a monthly stipend under which the observer is expected and guaranteed to work 20 days, the average daily rate of the observer could be lower (Agenda Item E.6.B Supplemental NWFSC Powerpoint September 2009 "Thoughts on Costs").

Observer-Shoreside Hake: In 2008, 590 trips were taken. Using this value and $500 as the daily observer cost, the total cost is $295,000.

Observer-Mothership Catcher Vessel: It is estimated that they will fish for 30 sea days. Using 15 participants and 30 sea days each yields 450 total sea days. At $500 per day, this would yield an observer cost of $225,000. If the season were 60 days with
20 participants, at $500 per day for an observer, the total cost would be $600,000

Mothership Processors and Catcher-Processors: The NWFSC estimates the current at-sea costs of observers for both the Mothership and Catcher-Processor fleets is about $600,000.

Catch monitors: For the non-whiting fishery, if there are 7,600 sea days, and the average trip is 3.3 days, then a projected 2,300 trips that will have to be monitored. This implies that if a catch monitor can monitor one trip per day the direct annual compliance monitor cost would be about $800,000 at $350 per day. For the whiting fishery, if there are 14 processors and a 60-day season, there will be 840 processing days and potential cost of $300,000. If the season is 30 days, then the costs would be about $150,000. For approximation purposes, these estimates were rounded up to a total of $1.3 million.

The total of the direct cost observers and compliance monitors for the shoreside component is $5.4 million (observers, shoreside non-whiting, $3.8 million; observer shoreside hake, $300,000; and catch monitors, $1.3 million). The total costs for the observers in the mothership and catcher-processor fishery is about $1.2 million (observer-mothership catcher vessel, $600,000 and mothership processors and catcher-processors, $600,000). The initial grand total of the direct costs of observing and monitoring this fishery is about $6.6 million.

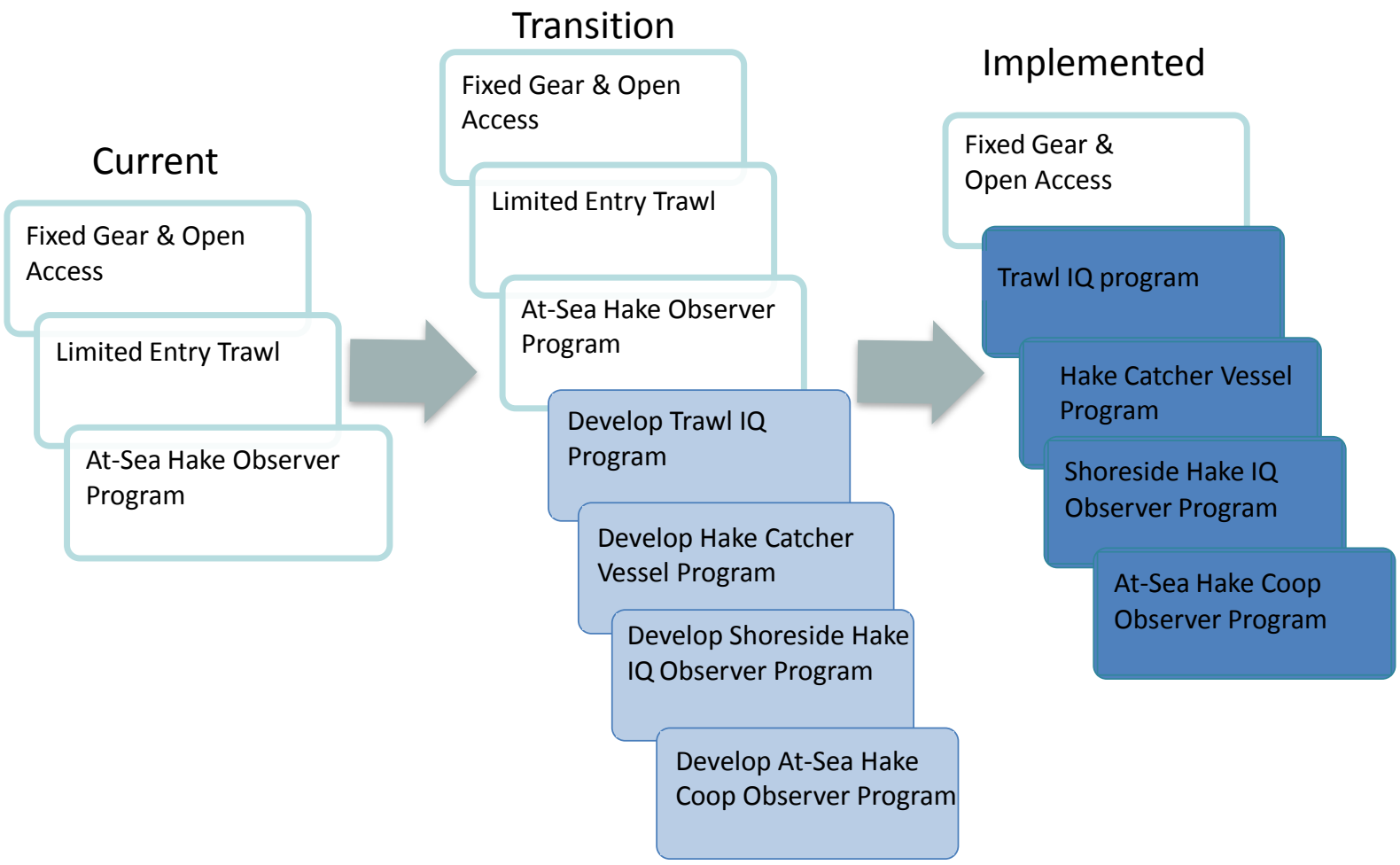
The agency has announced its intent, subject to available Federal funding, that participants would initially be responsible for
10 percent of the cost of hiring observers and catch monitors. The industry proportion of the costs of hiring observers and catch monitors would increase every year so that, by 2014, once the

fishery has transitioned to the rationalization program, the industry would be responsible for 100 percent of the cost of hiring the observers and catch monitors. NMFS believes that an incrementally reduced subsidy to industry funding would enhance the observer and catch monitor program's stability, ensure 100 percent observer and catch monitor coverage, and facilitate the industries' successful transition to the new quota system.

The initial observer and catch monitoring costs projections (shoreside, $5.4 million and at-sea whiting, $1.2 million) do not reflect two cost lowering effects: the effects of consolidation and as the industry increasingly bears the burden of paying for the observer and catch monitors and the ability of the industry to work with observer and compliance monitor providers to reduce costs. It is not unreasonable to expect a 25 percent reduction in costs to a level of $5.0 million annually as a result of these effects.

West Coast Trawl Rationalization program Implementation costs and funding											
Funds Required											
	FY2010 Q2	FY201 Q3	FY2010 Q4	FY2010 Total	FY2011 Q1	FY2011 Q2	FY2011 Q3	FY2011 Q4	FY2011 Total	FY2012 Total	FY2013 Total
Regs Dev./Permitting/ Issuance - NWR salaries	50,000	0	100,000	150,000	225,000	125,000	125,000	125,000	600,000	600,000	600,000
Appeals	0	0	0	0	170,000	20,000	20,000	20,000	80,000	0	0
Total Catch Databases and Quota Share/Vessel Accounts	1,100,000	0	0	1,100,000	200,000	0	500,000	0	700,000	700,000	700,000
State and Federal Enforcement	700,000	0	0	700,000	450,000	0	0	0	450,000	1,182,000	1,150,000
Catch Monitor Program	300,000	0	0	300,000	300,000	0	0	0	300,000	300,000	300,000
Observer and Economic Data Collection Program	519,000	0	0	519,000	1,488,500	720,500	720,500	720,500	3,650,000	3,650,000	2,050,000
Total Agency Costs	2,669,000	0	100,000	2,769,000	2,833,500	865,500	1,365,500	865,500	5,780,000	6,432,000	4,800,000

Observer Program Transition to TRat



RECORD OF DECISION
for the
FINAL ENVIRONMENTAL IMPACT STATEMENT
on
RATIONALIZATION OF THE PACIFIC COAST GROUNDFISH LIMITED ENTRY TRAWL FISHERY

National Marine Fisheries Service
Northwest Region

1 INTRODUCTION

The Final Environmental Impact Statement (FEIS) provides background information and analyzed possible environmental impacts resulting from the proposed action and alternatives. The proposed action is to create a management regime under which the owners of Pacific Coast groundfish fishery limited entry (LE) permits with trawl endorsements are more individually accountable for catch of target and nontarget species harvested by the vessels to which their permits are registered.

The lead agency for this FEIS is the National Marine Fisheries Service, Northwest Region (NMFS Northwest Region). The FEIS was prepared to address regulatory requirements of NMFS, pursuant to National Environmental Policy Act (NEPA), the Magnuson-Stevens Fishery Conservation and Management Act (MSA), the Regulatory Flexibility Act, and Executive Order (EO) 12866. The proposed action requires regulatory approval from NMFS prior to implementation.

The Pacific Fishery Management Council (Council) proposes changes to its *Pacific Coast Groundfish Fishery Management Plan* (FMP) to rationalize Federal management of the Pacific Coast groundfish trawl fishery through Amendment 20. This would be accomplished by implementing a limited access privilege (LAP) program and modifying the approach to controlling bycatch of Pacific halibut in the groundfish trawl fishery. LAPs are a form of output control whereby an individual fisherman, community, or other entity is granted the privilege to catch a specified portion of the total allowable catch (TAC). The proposed action (termed "trawl rationalization") is intended, among other things, to increase economic efficiency within the Pacific coast groundfish trawl fishery and reduce the incidental catch of overfished groundfish and possibly Pacific halibut (often referred to as bycatch and defined as fish that are not kept or sold and are discarded, usually at sea). Implementing the action will involve both changes to the management framework in the FMP and promulgation of implementing regulations.

The two approaches considered for rationalizing the fishery—harvest cooperatives or IFQs—although structurally different, are intended to fulfill the following goal:

> *Create and implement a capacity rationalization plan that increases net economic benefits, creates individual economic stability, provides for full utilization of the trawl sector allocation, considers environmental impacts, and achieves individual accountability of catch and bycatch.*

The above goal is supported by the following objectives:

1. Provide a mechanism for total catch accounting.
2. Provide for a viable, profitable, and efficient groundfish fishery.
3. Promote practices that reduce bycatch, discard mortality, and minimize ecological impacts.
4. Increase operational flexibility.
5. Minimize adverse effects from an IFQ program on fishing communities and other fisheries to the extent practical.
6. Promote measurable economic and employment benefits through the seafood catching, processing, distribution elements, and support sectors of the industry.
7. Provide quality product for the consumer.
8. Increase safety in the fishery.

Amendments 20 to the Pacific Coast Groundfish FMP would establish a trawl rationalization program for a limited entry trawl fishery. The target date for implementation of the trawl rationalization program is January 1, 2011. Due to the complexity and timing of the program NMFS has issued, or is in the process of issuing three separate rulemakings that would implement this program. The final rule that was published in the Federal Register on January 29, 2010, established data reporting and collection requirements that would be used to determine the initial allocations of quota shares for the trawl rationalization program if the program is implemented (75 Federal Register [FR] 4684). The proposed rule was deemed by the Pacific Fishery Management Council (Council) at the April 2010 Council meeting, and contains certain key components that would be necessary to have permits and endorsements issued in time for use in the 2011 fishery and in order to have the 2011 specifications reflect the new allocation scheme. The target date of implementation of these program components is September 2010. The third rule will include additional program details that would, if adopted, complete the trawl rationalization program.

The trawl rationalization program is intended to increase net economic benefits, create individual economic stability, provide full utilization of the trawl sector allocation, consider environmental impacts, and achieve individual accountability of catch and bycatch. The program would consist of: (1) an individual fishing quota (IFQ) program for the shore-based trawl fleet (including whiting and non-whiting sectors); (2) cooperative (coop) programs for the at-sea (whiting only) mothership and catcher-processor trawl fleets; and (3) fixed allocations for limited entry trawl participants.

2 DECISION TO BE MADE

This Record of Decision (ROD) documents the decision made by the NMFS Northwest Region to select the preferred alternatives identified in the *Rationalization of the Pacific Coast Groundfish Limited Entry Trawl Fishery Final Environmental Impact Statement*. This ROD is issued pursuant to the NEPA, the Council on Environmental Quality (CEQ) NEPA regulations at 40 CFR Parts 1500-1508, and NOAA NEPA environmental review procedures in NOAA Administrative Order (NAO) 216-6 Section 6.03 (a) Environmental Review Procedures for Fishery Management Plan actions. This decision is based upon the analyses included within the Final Environmental Impact Statement (FEIS) issued June 25, 2010 (75 FR 36386, June 25, 2010).

3 ALTERNATIVES CONSIDERED

The following is a summary of the alternatives analyzed in the FEIS. The Council and NMFS considered four alternatives for implementing the trawl rationalization program. These are as follows:

- Alternative 1: Status quo management (no action alternative)
- Alternative 2: IFQs for all groundfish trawl sectors
- Alternative 3: IFQs for the nonwhiting sector and cooperatives for all whiting sectors
- Alternative 4: IFQs for a single shore-based sector and co-ops for the whiting at-sea sectors

As part of the impact analysis in the FEIS, which supported Council and NMFS decision making, variations on some alternatives were developed to contrast key program features, which are sub-alternatives denoted by a letter suffix. These are Alternatives 2a, 2b, and 2c and Alternatives 4a and 4b. Alternatives 1 and 3 do not contain sub-alternatives. Alternative 4b is the preferred alternative. With these variations included, six alternatives were evaluated in the EIS. The alternatives are summarized below.

3.1 Alternative 1: Status Quo Management

Under this alternative, most of the elements of the current management regime for the groundfish LE trawl fishery would remain in place.

Every 2 years, the Council establishes harvest limits, called optimum yield (OY), for various species or groups of species. OYs represent an annual quantity of fish that the groundfish fishery as a whole may catch. A few species, such as Pacific whiting and sablefish, have fixed trawl allocations. The FMP defines other allocations between different gears, which, in addition to the whiting and nonwhiting trawl fisheries, include LE fixed-gear, the open access sector, and recreational fisheries in each state. Other allocations are determined through the biennial process to specify harvest limits ([Acceptable biological catch] ABCs, OYs, and harvest guidelines) and management measures. The need to rebuild the seven currently overfished rockfish species means that the OYs for these species are relatively low compared to target species OYs. Due to the multi-species nature of the fishery, these low OYs affect all aspects of groundfish management. The principal management measures for nonwhiting trawl fisheries are as follows:

- Trip limit periods. Two-month cumulative trip limit periods are the primary catch control tool.
- Gear restrictions. Gear restrictions focus on discouraging or prohibiting gear that may be used in rocky habitat, where some overfished species occur. The use of bycatch-reducing trawl nets has also been required in some areas.
- Rockfish conservation areas (RCAs). Closed areas were first implemented in 2003 to keep vessels away from depth ranges where overfished species are more abundant. These closed areas, called RCAs are a coastwide feature of management.
- Essential fish habitat (EFH) conservation areas. These are a set of closed areas to protect bottom habitat from the adverse effects of trawl gear.

Each sector of the Pacific whiting fishery receives an annual allocation, and the fishery is managed under a primary season structure where vessels harvest Pacific whiting until the sector allocation is reached, and the fishery is closed. This is different from the cumulative trip limits used to manage the nonwhiting trawl fisheries. Incidental catch of nonwhiting groundfish species in the Pacific whiting fishery, however,

is managed under the trip limit structure. Season start dates for each whiting sector are set by regulation, and each sector's fishery proceeds until the whiting quota is reached or the fishery is closed.

To allow the Pacific whiting industry to have the opportunity to harvest the full Pacific whiting OY, the nontribal commercial fishery is managed with whiting sector specific bycatch limits for certain overfished species. To date, bycatch limits have been established for darkblotched, canary, and widow rockfish. Regulations provide for the automatic closure of the commercial (nontribal) portion of the Pacific whiting fishery upon attainment of a bycatch limit. This is different from the nonwhiting trawl fishery where harvest availability of target species is often constrained by the projected catch of overfished species.

Incidental take of endangered or threatened salmon runs is another concern for the Pacific whiting fishery. Chinook is the salmon species most likely to be affected because of the spatial/temporal overlap between the Pacific whiting fishery and the distribution of Chinook salmon that could result in incidental take of listed salmon. The season start dates are, in part, meant to prohibit fishing when listed Chinook salmon are most likely to be taken incidentally. NMFS also has the option of closing inshore areas to fishing if too many salmon are caught.

To improve bycatch accounting in the nonwhiting trawl fishery, NMFS implemented the West Coast Groundfish Observer Program (WCGOP) in 2002 for vessels that harvest catch and land the catch on shore. Currently less than 25 percent of nonwhiting trawl fishing trips is monitored by the WCGOP. The primary purpose of the observer coverage is to provide data that can be used to derive catch ratios of nontarget species. Using observer, fish ticket, and logbook data, the fishery is modeled to derive estimates of total catch by species. Due to the delayed availability of fish ticket and logbook data and the time needed to process observer data, the final analysis of estimated total catch by species typically is not finalized until well over 1 year after the fishing year has ended. The At-Sea Hake Observer Program (whiting mothership and catcher-processor sectors) is a seasonal program where the operational costs are shared by NMFS and the vessel owners. Observers are placed on all processing vessels.

3.2 Alternative 2: IFQs for All Groundfish Trawl Sectors

3.2.1 Catch Control Tool

Under this alternative, all groundfish trawl sectors (both whiting and nonwhiting) would be managed with IFQs, which would replace the current two-month cumulative trip limit periods in the nonwhiting fishery and season/quota-based management in the whiting fishery as the primary catch control tool. Three sub-alternatives are evaluated under this alternative (Alternative 2a, 2b, and 2c) to compare and contrast certain key elements of the IFQ program.

3.2.2 Initial Allocation of IFQ and Qualification

At the start of the program quota shares (QSs) must be initially allocated to fishery participants based on catch/processing history during a catch history qualification period, 1994 to 2003. Thereafter, shareholders are free to buy and sell the QSs thus distributed. QSs represent a proportion, or percent, of the Total allowable catch (TAC) (OY) of different groundfish stocks. Each year, these shares are converted from a percent to a quantity by issuing quota pounds (QPs) based on the OYs/annual catch limits (ACL)s established for the year. The amount of groundfish caught by an LE trawl vessel, even if it is subsequently discarded, must be matched by an equivalent quantity of QPs. The QPs are expended in this way, with the matched amount deducted from the vessel's account. Both QSs and QPs are perfectly divisible and tradable.

QSs would be of long duration, so a transfer represents a long-term or permanent divestment. In contrast, QPs must be used within the year for which they are issued (although there is a provision for limited carry-over of unused QPs from one year to the next or QPs issued in the following year to be used in the current year), so QP transfer would not represent a permanent divestment of the harvest privilege, so long as one continues to control the underlying QSs. QS transfers would be prohibited in the first two years of the program so that transfers would only occur once participants fully understand how the program operates, and stable prices have been reached. QPs would still be fully transferable during the first two years.

Eligibility to own QSs/QPs would be defined very broadly; the main requirements are a U.S. citizen must be the owner, and a U.S. documented fishing vessel registered to a groundfish LE trawl permit must be used to harvest groundfish using QPs.

3.2.3 Number of Sectors

Three sectors would be established whereby the two current whiting and nonwhiting shore-based sectors would be combined into a single sector. Participants in this single sector would be free to trade IFQ (QSs or QPs), eliminating any regulatory barrier between targeting whiting and nonwhiting (operational differences among participants may mean that a large degree of specialization in targeting could continue). The whiting mothership and catcher-processor sectors would each be managed separately with their own allocations of catch opportunity and IFQ. IFQ could not be traded among the three sectors.

3.2.4 Accumulation Limits and Grandfather Clause

The maximum number of QSs and QPs an entity may control would be limited, with these limits varying according to the management unit (stock or stock complex). QS limits restrict the amount an individual or entity may control through ownership or other means. QP limits refer to the maximum amount that may be assigned to any one vessel during a given year to cover catch. These vessel limits are twice the control limits to allow several QS holders to work together on a single vessel. These limits are intended to restrict the consolidation of quota holdings by just a few entities. Table 1 summarizes control and vessel limits under the alternatives. This alternative contains a grandfather clause under which initial recipients of QSs who exceed the accumulation limits would be allowed to possess excess QSs up to the amount initially allocated to them.

Table 1. Control limits for QSs, co-op shares, or processing and QP vessel limits under the alternatives.

Alternative	Control Limits: QSs / Co-op Share / Processing					QP Vessel Limit / Co-op Usage Limit				
	NW	SSW	MS	MS(CV)	CP	NW	SSW	MS	MS(CV)	CP
Alternative 1	N/A	N/A		N/A	N/A	N/A	N/A		N/A	N/A
Alternative 2	3%	12%		25%*	60%	6%	25%		50%*	75%
Alternative 3	1.5%	15%†	20%	10%	-	3%	-	-		-
Alternative 4a	2.2%	25%	30%	15%	-	4.4%	12%	-		-
Alternative 4b	2.7%	10%	45%	20%	-	3.2%	15%		30%‡	-

Notes:
NW: Nonwhiting sector; SSW: Shoreside whiting; MS: Whiting Mothership processors; MS(CV): Mothership catcher vessels; CP: catcher-processor whiting.
*Under Alternative 2 the mothership sector would be managed with IFQs, and there would be no distinction as to the type of entity that could hold QSs.
†Under Alternative 3, whiting sectors would be managed with co-ops; shoreside whiting control limit applies to vessels.
‡Catcher vessel usage limit.

3.2.5 Initial Allocation of IFQ to Processors

Under Alternatives 2a and 2b, all of the initial allocation of QSs would go to LE permit holders (harvesters). Under Alternative 2c, shore-based processors would receive 25 percent of the initial allocation of non-groundfish species and 50 percent of the allocation of whiting QSs, and mothership processors would receive 50 percent of the initial allocation of whiting QSs based on their processing history during a qualification period. Catcher-processors both harvest and process fish. For the purposes of initial allocation, they would be considered harvesters.

3.2.6 Species Covered by IFQ

QSs/QPs would be issued for all of the current groundfish management units. Management units are fish stocks, or complexes comprising co-occurring or related stocks, for which an OY (ACL) is established. Table 2 shows the management units for which IFQ would be established. Procedures would be established to reallocate QSs when management units are changed or new ones are added.

Alternative 2 also includes an individual bycatch quota (IBQ) for Pacific halibut. Although functionally equivalent to the IFQ system applied to other species, Pacific halibut are a prohibited species in the groundfish trawl fishery and cannot be retained. Therefore, although accounted for through the IBQ, all halibut must be discarded.

Table 2. Management units considered for IFQ under the alternatives. Overfished species shown in bold.

IFQ Management Units	Flatfish
Roundfish	Dover sole
Lingcod	English sole
Pacific cod	Petrale sole
Pacific whiting	Arrowtooth flounder
Sablefish north of 36° N. latitude	Starry flounder
Sablefish south of 36° N. latitude	Other Flatfish stock complex
Rockfish	**Not Managed With IFQs (Alternative 4b only)**
Pacific ocean perch	Shortbelly rockfish
Widow rockfish	Longspine Thornyhead S. of 34°27'
Canary rockfish	Black Rockfish - coastwide
Chilipepper rockfish	Minor Rockfish North Nearshore complex
Bocaccio	Minor Rockfish South Nearshore complex
Splitnose rockfish	California scorpionfish
Yellowtail rockfish	Cabezon (off CA only)
Shortspine thornyhead north of 34° 27' N. latitude	Kelp Greenling
Shortspine thornyhead south of 34° 27' N. latitude	Other Fish*
Longspine thornyhead north of 34° 27' N. latitude	
Cowcod	
Darkblotched	
Yelloweye	
Minor Rockfish North slope species complex	
Minor Rockfish North shelf species complex	
Minor Rockfish South slope species complex	
Minor Rockfish South shelf species complex	

*Starting in 2009, Longnose skate is managed under its own OY. Because during the time period used to determine initial allocation of QSs, it was managed under the Other Fish complex, however, this species would not be managed with IFQ.

3.2.7 Adaptive Management

Under Alternative 2b each year up to 10 percent of the QSs that would otherwise be distributed to eligible recipients would be set aside for an adaptive management program. This program is meant to address a variety of objectives, ranging from socioeconomic dislocation resulting from implementation of the trawl rationalization program to encouraging innovative fishing methods, for example to reduce bycatch. The Council would decide how much QP would be set aside every two years for adaptive management use as part of the biennial harvest specifications process. The harvest specifications process establishes OYs/ACLs for a two-year period and adjusts management measures so that catches will not exceed these limits.

3.2.8 Area Management

Under Alternative 2, no separate QSs would be created for different latitudinal areas. Area-specific QS is considered under other alternatives because this could prevent substantial geographic redistribution of QS holdings and related impacts to communities. Some stocks are currently managed geographically with separate OYs established for each component; for those stocks, QSs/QPs would be denominated accordingly.

3.2.9 Carryover of Unused QPs between Consecutive Years

Under Alternative 2, unused QPs amounting to 10 percent of the used and unused QPs in the vessel account may be carried over for use in the next year. Similarly, to cover an overage (landings that exceed the amount of QPs held in a vessel account) QPs that may be allocated in the next year may be transferred to the current year, up to 10 percent of the used and unused QPs in the vessel account during the current year.

3.2.10 Tracking and Monitoring

All vessels would be required to carry at-sea observers to monitor sorting and discarding of the catch and shoreside landings. There would also have to be an electronic system to report bycatch and landings, which may be integrated with the current state fish ticket (landings reporting) system. Plant monitors would be employed to ensure that the electronic fish tickets are accurate. NMFS would also administer a system to track QS/QP holdings. Fees would be charged to cover the cost of the tracking system. A comprehensive mandatory monitoring program is expected to require minimal increases in enforcement effort.

3.2.11 Gear Conversion

Once QSs have been distributed, recipients would be free to use them with any legal groundfish gear, which, aside from trawl, principally means bottom longline and fish pots. There is a separate catch opportunity for nontrawl sectors, which would be unaffected by any catches resulting from gear conversion under the IFQ program.

3.3 Alternative 3: IFQs for the Nonwhiting Sector and Cooperatives for all Whiting Sectors

3.3.1 Catch Control Tool

Under this alternative, the nonwhiting sector would be managed with IFQs in a program similar to that described under Alternative 2 (differences are summarized below), while the three whiting sectors would be managed with cooperatives. A separate co-op structure would be used for each of the whiting sectors.

Unlike Alternative 2, there would be four separately managed trawl sectors: shoreside nonwhiting, shoreside whiting, mothership whiting, and catcher-processor whiting.

3.3.2 IFQ Program for the Nonwhiting Sector

Initial Allocation: Under Alternative 3, the initial allocation of QSs would be based on both catch history during the qualification period and an equal allocation of the catch history associated with LE trawl permits that were bought back and retired in 2003 as part of a capacity reduction program. The buyback program is partly funded through a loan to remaining participants, which is being paid back through landing fees. Equal allocation of QSs associated with the buyback permits would result in a more even distribution of QSs among permit holders compared to allocation based on catch history alone.

Allocation of Overfished Species: Unlike Alternative 2 (where all species are allocated based on catch history) under this alternative, a different formula is used for overfished species. These species will still be under rebuilding programs after the projected implementation date of the trawl rationalization program (2011), requiring relatively small OYs. Thus, QSs/QPs for these species could act as a primary constraint on target fisheries to the degree that incidental catch is unavoidable. Furthermore, since regulations prompted a large proportion of overfished species catch to be discarded, landings toward the end of the allocation period (1994 to 2003) do not accurately reflect the actual distribution of historical catch among fishery participants. Therefore, a different formula would be applied to overfished species to allocate QSs. This formula takes into account the amount of target species QSs received by including a proportional component for overfished species QSs. It also factors in areas where fishing occurred, 2003 to 2006, by a vessel associated with an eligible permit in order to account for geographic variation in overfished species bycatch rates. This approach is intended to better balance individual holdings of target and overfished species QSs and take into account the areas where permit holders have fished in the recent past. Provisions may allow QSs to be reallocated once a species is rebuilt, recognizing that the annual OY/ACL could be increased substantially once the rebuilding restrictions are lifted. This formula would be applied to the landings history associated with current permits, which account for 57 percent of the landings history. As with non-overfished species, landings history for overfished species associated with the buyback permits would be divided equally among the current permits.

Accumulation Limits and Grandfather Clause: Under Alternative 3, the nonwhiting sector would be subject to lower accumulation limits in comparison to Alternative 2 (see Table 1). Alternative 3 does not contain a grandfather clause; any potential initial allocation in excess of the accumulation limit would instead be redistributed to those permits below the limits.

Initial Allocation of IFQ to Processors: In Alternative 3, 25 percent of nonwhiting groundfish would be allocated to shoreside processors. This differs from Alternative 2c, because shoreside whiting is not included since that sector would be managed with co-ops. Small amounts of whiting, representing incidental catch by nonwhiting vessels, would be allocated as QSs to the nonwhiting sector permit holders.

Species Covered: Unlike Alternative 2, this alternative does not include a halibut IBQ. Pacific halibut bycatch would be subject to status quo management. Under status quo, the allocation to other fishery sectors in the west coast management area (International Pacific Halibut Commission [IPHC] Area 2A) is determined by reducing the area (TAC) by an amount equal an estimate of the previous year's groundfish trawl sector halibut bycatch. This is an approximate method for accounting for trawl bycatch; if the trawl bycatch in a given year exceeds the amount by which the area TAC was reduced, that is factored into the next stock assessment.

Adaptive Management Program: This alternative would include the adaptive management program described above for Alternative 2b.

Area Management: Under this alternative, QSs/QPs for each management unit would be divided geographically so that area-specific QPs would be needed to cover catches in each area. Two zones would be established, one north and the other south of 40°10' N. latitude.

Carryover of Unused QP: This alternative would not contain the carry-over provision included under Alternative 2.

3.3.3 Cooperatives for the Shore-based and Mothership Pacific Whiting Sectors

Under Alternative 3, the shore-based and mothership whiting sectors would be managed separately but with a co-op structure that is very similar. For that reason, the co-op structure for both sectors is described here, but differences in the co-op rules for the two sectors are pointed out. The catcher-processor sector currently operates under a voluntary co-op. Under Alternative 3, this voluntary structure would continue with modest changes to the management system. The catcher-processor co-op included in this alternative is described in a separate, subsequent section.

The existing allocation of whiting between the shoreside whiting, mothership, and catcher-processor sectors would not change (42, 24, and 34 percent, respectively). No portion of one sector's whiting allocation could be transferred to another sector.

Although Pacific whiting comprises the dominant portion of the catch in this sector, some overfished rockfish do get caught. As discussed above, bycatch caps have been imposed on the whiting fishery. These sector caps would continue to be used under trawl rationalization. Under this alternative, there would be a single cap to cover catch in all three whiting sectors for each overfished species managed this way. These bycatch caps would be established for those overfished species likely to be caught in the whiting fishery: widow, canary, darkblotched rockfish, and Pacific ocean perch (a separate cap for the same species would be applied to the catcher-process sector). In addition, the current endangered species act (ESA)-listed Chinook salmon bycatch management measure, a triggered 100-fathom closure, and an ESA consultation threshold would continue in effect. Status quo management (trip limits) would be used for other bycatch species. In addition, an amount would be deducted from allocations to the trawl sector for these species to account for the expected small amounts of bycatch. Caps on overfished species would be expected to indirectly limit bycatch of these other species.

Motherships and catcher-processors are already subject to full observer coverage, so few changes in the current monitoring program are needed under this alternative. Shore-based whiting vessels must land all their catch, allowing full dockside monitoring. Under this alternative, this full retention requirement would continue, possibly with additional monitoring to better detect at-sea discards.

3.3.3.1 New Permit Requirements

Mothership processor permit: Historically, any vessel with the proper groundfish LE permit could enter this sector as a processor. The Council adopted a stopgap measure to limit participation, which would be replaced by a new mothership permit under this alternative. Permit qualification would be based on whiting processing history.

Shore-based processor permit: Similarly, a new shore-based processor permit would be created under this alternative. Only those processors possessing one of these permits could receive whiting during the first two years of the program. Thereafter, any shore-based processor could receive whiting.

Catcher vessel permit: New, separate LE permit endorsements would be created for catcher vessels participating in either the mothership or shoreside co-op sectors. Qualification for a permit would be based on past participation in the relevant whiting sector.

3.3.3.2 Co-op Formation and Allocation

Each year, catcher vessels would be able to choose to join a co-op or fish in a non-co-op fishery. If a vessel chooses to fish in a co-op, it would have to deliver all of its catch to the processor in its co-op (a mothership or shoreside facility). If a catcher vessel wishes to change its co-op membership, it would have to first fish for a year in the non-co-op fishery before joining the new co-op.

Each co-op that is formed would receive an allocation of the sector's overall whiting allocation, based on the combined catch history associated with each member's LE permit. Although the co-op allocation would be based on particular LE permits' catch history, vessels in the co-op would be able to arrange to have another vessel harvest all or a portion of their catch if they do not want to participate in the fishery.

The non-co-op fishery would receive an allocation based on the collective catch history of vessels that choose not to join a co-op, in a fashion similar to the co-op allocations. However, harvest would be further controlled in the non-co-op fishery through season restrictions. A vessel fishing in the non-co-op fishery would not be obligated to deliver to any one processor.

3.3.3.3 Control Limits

Shoreside and mothership co-ops would be subject to control limits similar to those described for the IFQ program. Shoreside whiting catcher vessel permit holders would be limited in terms of their control of co-op shares (recognizing that one entity could own multiple permits). In the mothership sector, the mothership processors and associated catcher vessels would be limited with respect to how much of the allocation they could process or control through co-op shares. Table 1 summarizes these limits.

3.3.3.4 Co-op Operation

Co-ops are expected to facilitate coordination and cooperation among members with respect to harvest strategy. Although co-op members would be guaranteed catch opportunity equal to the portion of the allocation they brought into the co-op through their catch history, the co-op allocation, in general, is pooled. Members could jointly agree on the specifics of harvesting.

Two or more co-ops could reach an inter-co-op agreement to coordinate harvest strategy and pool whiting and bycatch cap allocations. Various standards for both co-op and inter-co-op contractual agreements

would be established, both to aid NMFS in its fishery management role and to prevent any member from being unduly disadvantaged by co-op participation.

3.3.3.5 Management of the Non Co-op Fishery

For the duration of any given year, a permitted catcher vessel could participate in the non-co-op fishery, but the structure of this sector is intended to encourage co-op participation. Non co-op fishery participants would not have the surety of a buyer that a processor co-op obligation represents and could not easily coordinate fishing strategy in the way they are expected to in co-ops. In essence, it would be expected to function as an Olympic-style fishery with individual vessels competing against one another to catch the largest portion of the allocation.

3.3.3.6 Mothership and Catcher Vessel Quota Limits

As in the IFQ alternative, ownership limits would be imposed so that no single entity can accumulate too large a share of the overall sector allocation, based on the catcher vessel permits they own. Processors would be limited in terms of the share of the particular sector's allocation (mothership or shoreside) they could process.

3.3.4 Catcher-processor Sector Cooperatives

The catcher-processor sector currently operates under a single, voluntary co-op. A permit endorsement would be created to limit participation in the sector. Historically any vessel with the proper groundfish trawl LE permit could participate. The Council adopted a stopgap measure to limit participation, which would be replaced by the catcher-processor cooperative provisions of the trawl rationalization program. There is concern that new entrants could disrupt the current voluntary co-op. Provisions allow for implementing an IFQ program if the current voluntary co-op system were to fail. Few other changes are proposed for this sector under the alternatives.

3.3.5 Adaptive Management Program for Whiting Sectors

An adaptive management program, similar in intent and structure of that described under Alternative 2 would be established for each of the whiting sectors such that only participants in a given sector would be eligible for the adaptive management amounts deducted from each sector's whiting allocation.

3.4 Alternative 4: IFQs for a Single Shore-based Sector and Co-ops for the Whiting At-Sea Sectors

Two sub-alternatives, Alternative 4a and 4b, were considered in the analysis to compare and contrast certain program elements. The Council ultimately chose Alternative 4b as their preferred alternative. Differences between the two sub-alternatives are noted. All common elements are part of the preferred alternative. Council decision making on a preferred alternative occurred over several meetings from June 2008 to June 2009.

3.4.1 Catch Control Tool

Alternative 4 uses IFQs as the management tool for a combined whiting and nonwhiting shoreside sector and cooperatives for the two at-sea whiting sectors.

3.4.2 IFQ Program for the Shoreside Sector

Initial Allocation: In contrast to Alternative 2, where initial allocation is based on catch history alone, under this alternative, the initial allocation of QSs would be based on both catch history during the qualification period and an equal allocation of the catch history associated with buyback permits, as described under Alternative 3. Under Alternative 4a, equal sharing of buyback history would apply to the combined shoreside sector only; co-op shares for catcher vessels in the whiting mothership sector would be based on catch history alone. Under Alternative 4b (the preferred alternative) the equal sharing provision would apply to both the shoreside sector and the mothership sector. Since the catcher-processor sector would continue to operate as a single voluntary co-op, catch history assignment is unnecessary; the co-op has access to the full sector allocation.

Allocation of Overfished Species: Under Alternative 4, overfished species QSs would be distributed according to the area-based formula described above under Alternative 3. However, there are no equal sharing element based buyback permits except for canary rockfish under the preferred alternative (Alternative 4b), while in Alternatives 3 and 4a, IFQ based on buyback permit history is distributed equally for overfished species, as it is for nonoverfished species. This difference in the preferred alternative (Alternative 4b) resulted from a reconsideration adopted by the Council at their November 2009 meeting. Canary rockfish bycatch tends to be episodic and unpredictable and has occurred across a range of target strategies. The Council decided that an allocation formula for canary rockfish that included the equal sharing element (so that every permit gets at least some minimum level of canary rockfish IFQ) would lower the risk of some harvesters being forced out of the fishery because they did not possess, and could not obtain (due to expected high cost), the canary rockfish IFQ needed to cover their bycatch.

Accumulation Limits and Grandfather Clause: Table 1 compares accumulation limits across the alternatives. Alternative 4a contains the grandfather clause allowing QS holdings in excess of accumulation limits based on initial allocation. Alternative 4b (the preferred alternative) does not contain the grandfather clause. Permit holders who would receive QSs in excess of the accumulation limits would have two years to divest their excess QSs to any willing receiver. This would occur in the third and fourth years of the program, since QS transfers are prohibited in the first two years of the program. Any QSs not divested at the end of the fourth year would be forfeited, and the excess QSs would be reallocated to other permit holders below the limit. Before divesture, these quota holders are free to use the QPs derived from their excess QSs. This is meant to smooth the transition for those fishery participants with historically large catches.

Initial Allocation of IFQ to Processors: Under Alternative 4a, 50 percent of shoreside whiting would be allocated to processors based on processing history. Under Alternative 4b (the preferred alternative), 20 percent of shoreside whiting would be allocated to processors.

Species Covered: Alternative 4a does not include a halibut IBQ; Alternative 4b (the preferred alternative) does include a halibut IBQ. Alternative 4b would not use IFQs as the catch control tool for selected management units. Table 2 shows management units that would have IFQs for which separate QSs/QPs would be established and those for which IFQ would not be issued under Alternative 4b. Species for which IFQ is not issued would continue to be managed with current tools, such as cumulative landing limits. Part of the trawl allocation for nonwhiting management unit species taken in the at-sea whiting sectors would be set aside to accommodate catches in those sectors; the remainder would be available for harvest in the shoreside sector.

Adaptive Management Program: Alternative 4a would implement an adaptive management program for the combined shoreside sector reserving 10 percent of the QSs for all species (as in Alternative 2b).

Alternative 4b would implement a program where only nonwhiting species QSs would be reserved. In addition, under Alternative 4b during the first two years of implementation of trawl rationalization the adaptive management QPs would be passed through to QS holders in proportion to their holdings. Allocations of other species QPs under the program would begin in the third year, based on further specification of adaptive management program objectives and mechanisms.

Area Management: As in Alternative 2, there would be no area management provisions under Alternative 4b, except for existing area designations as shown in Table 2. Alternative 4a would have the same area designations described under Alternative 3.

Carryover of Unused QPs: As in Alternative 2, Alternative 4 contains the carry-over provision.

3.4.3 Mothership Sector Cooperative Structure

The mothership cooperative structure proposed under Alternative 4 is identical in most respects to that proposed in Alternative 3, with a few key differences. There are also some important differences between Alternative 4a and 4b. These are summarized below.

Under Alternative 4a, catcher vessels would be obligated to deliver 50 percent of their catch to the processor to which they are tied (compared to all their catch under Alternative 3). They would be free to deliver the remaining 50 percent to any mothership processor willing to receive it. As in Alternative 3, to change their processor affiliation they would have to participate in the non-co-op fishery first. Under Alternative 4b, catcher vessels would declare which co-op they would join before the beginning of the fishing year. They would then be obligated to deliver their catch to the associated mothership processor for that fishing season. In any subsequent year, they could change their affiliation without first participating in the non-co-op fishery through the pre-season declaration. Provision for a non-co-op fishery would still be included in the program structure. Any vessel not wishing to affiliate with a co-op could participate in the non-co-op fishery and deliver to any willing mothership processor.

Control limits for the mothership sector differ among the alternatives as shown in Table 1. In addition, under Alternative 4b, mothership catcher vessels would be subject to a usage limit as well as to a control limit. The usage limit is a limit on the amount any one vessel can catch and deliver to a processor. Since co-op shares would be pooled, and the allocation of catch opportunity among vessels would be decided by co-op members, it would be impossible to track the accumulation of co-op shares on a vessel in the way that QP vessel limits work in the IFQ program. The usage limit is an alternative approach to achieve the same end.

3.4.3 Catcher-processor Sector Cooperatives

The catcher-processor co-op structure would be the same as described for Alternative 3.

3.3.5.1 Adaptive Management Program for At-Sea Whiting Sectors

There would be no adaptive management program for the mothership and catcher-processor whiting sectors.

4 ENVIRONMENTALLY PREFERABLE ALTERNATIVE

NMFS is required by regulation to specify in the ROD "the alternative or alternatives which were considered to be environmentally preferable" (40 CFR 1505.29b)). The environmentally preferred alternative generally means the alternative that causes the least damage to the biological and physical environment; it also means the alternative that best protects, preserves, and enhances historic, cultural, and natural resources.

The environmentally preferred alternative for the trawl rationalization program is the preferred alternative. The comprehensive program addresses the goals and objectives identified early on in the planning process. In particular, it addresses multiple conservation objectives, leading to the conclusion that the preferred alternative is the environmentally preferred alternative. The program is expected to provide a basic management framework that will provide the most benefits to the nation for the public resource, including assigning personal accountability for the fisheries, providing opportunities for bycatch reduction, enhancing stock rebuilding through improved fishery information and full observer coverage, providing opportunities to maximize catch of targeted species while protecting species of concern, improving economic performance, helping to maintain community stability, improving safety, and addressing unforeseen circumstances through an innovative adaptive management provision. In sum, NMFS views trawl rationalization as a program that will help address conservation concerns and take a system that is not economically viable for many and turn it into one that will work for those who remain in the fishery after rationalization.

5 RATIONALE FOR SELECTION OF THE PREFERRED ALTERNATIVE (ALTERNATIVE 4B)

In addition to identifying the environmentally-preferred alternative, CEQ and NEPA implementing regulations require agencies in the ROD to state what decision was made, discuss how the decision was affected by the preferences among alternatives based on relevant factors including economic and technical considerations and agency statutory missions, and whether all practical means to avoid or minimize environmental harm from the alternative selected have been adopted, and if not, why they were not (40 CFR Part 1505.2(a)(b)(c)).

NMFS' rationale in choosing the preferred alternative focused on the need to carefully consider the balance of market power between harvesters and processors, as well as the importance to communities of maintaining processing capabilities along the coast. NMFS believed that an initial allocation of twenty percent of the whiting resource to eligible shoreside processors struck an appropriate compromise among these multiple factors. In addition, NMFS believed that the Adaptive Management Program (AMP) could be used to lessen potential impacts to processors and communities.

The need for a change from status quo is identified in the problem statement. After reviewing status quo and both the beneficial and adverse impacts of six trawl rationalization alternatives, NMFS' judgment was that the advantages of its final preferred alternative for trawl rationalization, Alternative 4b, outweighed the disadvantages.

There are two primary drivers in the problem statement that guided this process: the first is the need to account for, control, and reduce bycatch, and the second is the need to provide for an economically sustainable fishery for the benefit of industry participants and fishery dependent communities. These needs are both reflected in the goal for this action discussed in Section 1.

5.1 Trawl Focus

Foremost, this goal reflects NMFS' understanding that trawl gear is the only gear that can viably harvest much of the groundfish that is economically important to the fishery and it is the only gear that can remove much of the biomass that is available for harvest within conservation constraints. Therefore, the focus is on improving management of the trawl fishery rather than considering direct reallocation of trawl harvest to other gears. While the focus was primarily on improving management of the existing trawl fishery, NMFS' action also provides opportunities for harvest using nontrawl gears through the scope of the program, which allows vessels with trawl permits to switch to nontrawl gears to take their quota in the IFQ program.

5.2 Bycatch Reduction Objective and Observer Coverage

This action responds to the identified need for bycatch control and the need for conservation through its focus on individual accountability for catch and bycatch. At present, total mortality for all species is measured and controlled by monitoring total landings and sampling 20 percent of the trawl trips to estimate bycatch rates (discard rates) that are then applied to landings to develop an estimate of total catch and mortality. With this approach, there is substantially less certainty about total catch and mortality than there are total landings. Further, while agencies are able to regulate total landings in the nonwhiting trawl fishery through two-month cumulative limit periods and influence bycatch rates with catch area restrictions and gear restrictions, they face difficulties in managing for total catch in the nonwhiting portion of the trawl fishery. The current monitoring system was designed to provide fleetwide total catch estimates over the course of a year. It was not intended as a tool for managing individual vessel discards in the nonwhiting trawl fishery or for providing for individual accountability.

The Pacific whiting fisheries monitoring is in place that is intended to manage for total catch. The at-sea fisheries use 100 percent observer coverage on both catcher-processors and motherships and document landings and discards that are occurring in those fisheries. The shoreside whiting fishery is exploring the feasibility of cameras intended to verify full retention of catch on board vessels in that fishery. Through a full retention program, the documentation of total catch of species in that fishery occurs dockside.

NMFS considered achieving individual accountability and improved mortality estimates through full retention rules in the nonwhiting fishery with compliance monitored through video cameras. However, the practicality of using cameras in the nonwhiting fishery is problematic because of the vessels' need to discard debris and prohibited species and the difficulty of monitoring holds for surreptitious catch sorting and discarding.

The other means identified for providing individual accountability for discarding is to require 100 percent observer coverage for vessels participating in the trawl sector. Full observer coverage, combined with a

shift from regulating landings to regulating catch, is a key element of the NMFS' preferred alternative. These elements provide for individual accountability for catch and some incentive for bycatch reduction.

5.3 Link between Bycatch Control and Need for Rationalization

Full at-sea monitoring and the switch from controlling landings to controlling catch would achieve the main conservation related objectives; however, 100 percent observer coverage for the nonwhiting fishery and observers/cameras for whiting catcher vessels would be costly. Even if the observers/cameras were not paid for by industry, there are still costs that a vessel incurs when it has an observer or camera on board. If vessels must pay for the cost of observers, then the burden is substantial, and it moves the fishery away from achieving social and economic objectives. As identified in the problem statement, the fishery is already under substantial economic stress. Imposing large additional costs to carry observers could devastate the fishery unless its overall economic health is also improved. Early on (in its strategic plan and Amendment 18), the Council identified rationalization as a way to improve the economic health of the fishery. Under a perfectly rationalized fishery, capacity would be reduced, and costs would be minimized so that the labor, capital, and other inputs used to capture the fish are no more than is absolutely necessary to fully take the amount that can be harvested while meeting conservation objectives. Thus trawl rationalization is viewed as a necessity for improving the health of the industry. Further, with 100 percent observer coverage, the Council would be able to better monitor total mortality of all groundfish species. Better mortality estimates would improve both stock assessments and the Council's ability to keep catch below the harvest limits developed based on those assessments, substantially contributing to conservation goals. Finally, rationalization based on a system that relies on transferable quotas enhances the incentive to avoid bycatch. Without transferable quota, the incentive is to reduce bycatch only to the point where all targeted species can be harvested. With transferable quotas, fishermen who can lower bycatch rates even further have a potential opportunity to sell their unused quota to others, thus benefiting from reducing their bycatch rate to a level lower than what was necessary for them to take their own available target harvest.

5.4 Choosing Between Status Quo and Trawl Rationalization: Broad-Level Council Concerns and Tradeoffs

The Council considered if there was a potential for achieving some of the goals and objectives through other types of modifications to status quo. The Council considered whether modifications such as extending the duration of the two-month cumulative trip limit periods and a full retention requirement might achieve some of the important objectives. Extension of cumulative limit periods would decrease the Council's opportunity to make inseason adjustments and would be expected to increase the number of vessels taking their full limits. This would move the fishery in the direction of individual permit quotas without generating the degree of benefits expected from a regular IFQ program. However, extending the two-month cumulative trip limit reduces the number of opportunities the Council has for making adjustments to catch limits to stay within allowable catch levels, thus increasing the possibility of exceeding ABCs and OYs established by the Council. Extension of the length of the cumulative limit periods was an option that had been previously considered and rejected by the Council. For the whiting fishery, there is a need to end the derby because of safety and waste issues; however, the bioeconomics of the fishery does not lend itself to management through cumulative limit periods used in the nonwhiting fishery. While Amendment 15 has resolved some of these issues, the trawl rationalization program would implement a longer-term solution. The Council considered maximized retention in the Pacific whiting fishery, and NMFS is currently considering it for approval as regulations to implement Amendment 10 to the Groundfish FMP. Maximized retention for the nonwhiting fishery was considered as a monitoring option under the IFQ program, but was rejected. The Council was not able to identify other ways to

modify status quo that would be as effective as trawl rationalization in moving the fishery toward its most important goals and objectives.

Under status quo, the trawl fishery is viewed as economically unsustainable due to the number of participating vessels, excess capacity, a regulatory approach that constrains efficiency, and the status of certain groundfish stocks along with the measures in place to protect those stocks. Regardless of the deficiencies of status quo, the Council had to determine whether trawl rationalization, would be an improvement over status quo. In particular, the Council debated whether the economic benefits expected from increased harvest and efficiency would be sufficient and occur early enough in the program to help the fishermen handle the increased costs of the program. The broadly held view by Council members was that the potential for improving the economics of the fishery through trawl rationalization was substantial enough to overwhelm the risks and uncertainties. Council members noted that, due to cumulative limit management, the amount of one highly marketable fish species that had gone unharvested in a recent year was nearly enough to alone cover observer program costs, and reported discard rates and wastage were unacceptable. Given the under-harvest of available OYs, the Council believed it was important to the fishermen and the public to provide an opportunity to achieve the OYs and develop markets for additional fish products. Furthermore, the program would provide the fishery an opportunity to increase profits, not just through harvest expansion, but also through a variety of mechanisms leading to cost reductions. For the nonwhiting fishery, an economically healthy fishery would also be expected to result in some improvement in safety. For the whiting fishery, an end to the derby would create substantial safety improvements. In addition to the potential for safety and strong economic benefits, Council members noted the substantial conservation benefits expected from 100 percent monitoring of catch. This would help reduce bycatch and discards and rebuild stocks that are suffering partially because of discards.

While the trawl rationalization program would move the fishery toward some of its most important goals and objectives, in order for the program to realize those benefits, a large amount of consolidation would have to occur, resulting in fewer people employed in the fishery. Council members acknowledged and expressed concern about the expected consolidation and its impacts and noted the need to attend to the potential for disproportionate impacts on some communities. There was also concern that the potential accumulation of wealth under the IFQ program should have corresponding levels of benefit for the nation, and that state implementation costs be addressed. Finally, Council members expressed an interest in maintaining the character of the fleet and a diversified industry. Balancing the need for consolidation to generate adequate levels of benefit with the potential adverse impacts of consolidation was a major challenge. At the same time, status quo (buyback program and cumulative limits) has resulted in consolidation in the fleet and a redistribution of vessels along the coast. Because of the high degree of concern about impacts on communities and maintaining some sharing of benefits (both among harvesters and between harvesters, processors, and others dependent on the fishery) the Council made a number of tradeoffs in the trawl rationalization program that may prevent the program from reaching the full degree of economic efficiency that might otherwise be achievable through rationalization.

In taking this action, the Council acknowledged that work will have to continue to monitor the program and to make adjustments in response to program performance. Even prior to implementation, the Council will continue to work on provisions for Community Fishing Associations and an Adaptive Management Program. While there may be unintended and unanticipated consequences, there will be an opportunity to modify the program through a review process, and a data collection process will be implemented to support that review.

Overall, the Council viewed the trawl rationalization program as addressing many of the difficult, time-consuming management problems it has struggled with under status quo. It is expected to provide a basic management framework that will provide the most benefits to the nation for the public resource, including assigning personal accountability for the fisheries, providing opportunities for bycatch reduction,

enhancing stock rebuilding through improved fishery information and full observer coverage, providing opportunities to maximize catch of targeted species while protecting species of concern, improving economic performance, helping to maintain community stability, improving safety, and addressing unforeseen circumstances through an innovative adaptive management provision. In sum, the Council views trawl rationalization as a program that will help address conservation concerns and take a system that is not economically viable for many and turn it into one that will work for those who remain in the fishery after rationalization.

5.5 Choice between IFQs and Co-ops for Each Trawl Sector

Under an IFQ program, each vessel acquires the quota necessary to prosecute its own fishing strategy, and each vessel is individually responsible to the fishery management agency for complying with the program and covering its harvest with quota. Under a co-op program, an allocation is given to the co-op and the co-op then distributes the allocation to its participating vessels. The co-op agreement and managers determine the amounts each vessel will harvest, and the vessels are responsible to the co-op for complying with the terms of the co-op agreement. In some cases, the allocation received by the co-op is determined by the history associated with each of the permit holders who are members of the co-op. The fishery management agencies do not track the transfer of harvest opportunity among co-op members, nor do they track each vessel's catch against allocations to that vessel. The fishery management agencies hold the co-op as a whole responsible for staying within its limits and the individual vessels responsible for complying with other aspects of the program, such as requirements to carry an observer.

The Council looked at rationalization for the four groundfish trawl sectors: nonwhiting shoreside, whiting shoreside, mothership whiting, and catcher-processor whiting. IFQs were considered for each fishery and co-ops were considered for each of the three whiting sectors.

5.5.1 Choice for the Shoreside Nonwhiting Sector

The whiting fisheries are more homogeneous in terms of fishing strategies, the timing of the fishery, and their geographic distribution. This homogeneity lends itself more to the type of centralized management provided by the co-op.

5.5.2 Choice for the Shoreside Whiting Sector

The shoreside whiting fishery is viewed as having greater homogeneity among participants than the nonwhiting fishery, but less homogeneity than the other whiting fisheries. Representatives of the harvesting and processing sectors reached a compromise agreement and recommended that under an IFQ program there be a 20 percent allocation of whiting QS to processors. This allocation to processors addressed concerns about the effects of trawl rationalization on market power balance between the harvesting and processing sectors. Also contributing to the decision to manage the shoreside whiting sector under IFQs was the opportunity that managing the two sectors together provided for resolving intersector allocation issues between them.

5.5.3 Choice for the Mothership Whiting Sector

For the mothership fishery, the Council had more latitude to consider regulating processors, since processing facilities in this sector are on vessels and, therefore, come under the Council's authority within the MSA. While the Council had authority to limit new entry for processing vessels, NOAA General Counsel advised the Council that absent a strong conservation rationale it would not have the authority to regulate economic relationships between vessels and processors that would otherwise be determined in

the marketplace; i.e., the Council's authority to recommend processor ties was limited. On this basis, the Council developed a processor tie provision that only required a vessel to commit its production to a particular processor for the coming year and did not extend that obligation to any subsequent year. This requirement came about after hearing public testimony indicating that the absence of certainty regarding catcher vessel deliveries in the mothership portion of the Bering Sea pollock fishery nearly led to the bankruptcy of a mothership company engaged in that fishery. The declaration procedure is intended to facilitate some business planning certainty to the mothership for the coming year. Even though the processor tie provision had to be severely weakened, the co-op alternative was still viewed as providing some balance of marketing power between mothership harvesters and processors, because it created an LE system for mothership processors, thereby strengthening their position vis à vis harvesters. The co-op alternative also had the advantage of encouraging vessels to work together and share information about catch rates through the co-op structure. Some savings in administrative costs were also expected because the co-op will track transfers of allocation among vessels, alleviating the need for NMFS to handle that task. Finally, some Council members voiced a preference for supporting industry participants by addressing their issues through co-op efforts and less governmental involvement. Under the IFQ program for the mothership sector, the issue of market power balance might have been addressed through an initial allocation of QS to processors (something like the 20 percent that was given to shoreside processors), but the IFQ program alternative did not include an LE system for mothership processors. Additionally, the IFQ program did not provide the incentive and structure for information sharing about bycatch. Finally, the mothership co-op alternative was originally developed through a consensus between the majority of mothership sector harvester and processor participants, and the participants in that consensus continued to support the co-op alternative, even with the substantially weakened processor tie provision.

Managing the mothership sector under an IFQ program would have provided an opportunity to reduce management costs and allocation controversy by combining the mothership and shore-based sectors under a single IFQ program. However, there were also concerns that vessels participating in the mothership sector might have an economic advantage over the traditional shoreside fleet and that if the catcher vessel fishery (shoreside and mothership catcher vessels) were managed under a single IFQ program the mothership catcher vessels might use that advantage to purchase more QS, redistributing harvest within the fleet and among communities, causing disruption and adverse social consequences.

5.5.4 Choice for the Catcher Processor Whiting Sector

The catcher processor sector of the whiting fishery is already rationalized under a self-developed co-op program, entered into voluntarily by the participants in that fishery. The self-designed program was initially facilitated by (1) a license limitation program, which created a barrier making it very expensive for new catcher-processors to enter the fishery, and (2) the Council's specification of a whiting allocation for the catcher-processor sector. The program was further supported by Amendment 15, which established a Pacific whiting vessel license based on historical participation. Implementation of Amendment 15 prohibits new entrants and, thereby, maintains the current structure and stability of the catcher-processor co-op. The Pacific whiting vessel license was intended to be an interim measure until the Council fully considered trawl rationalization. During the development of the preferred alternative (Alternative 4b), the Council expressed concern that the structure of the co-op could deteriorate, resulting in a derby fishery. Therefore, it specified that in the event the co-op failed the fishery would be managed with an IFQ program and that an equal amount of QS would be issued to each permit with a catcher-processor endorsement.

5.6 Major Decisions in Designing the IFQ Program

With respect to IFQs, the Council considered programs that would manage each trawl sector under a separate IFQ system, one that would manage the shore-based trawl sectors together, but the two at-sea whiting sectors separately, and one that would manage all four trawl sectors under a single program. Under the Council-preferred alternative (Alternative 4b), the Council chose IFQ management for the shore-based whiting sector and the nonwhiting shore-based sectors and recommended managing them together as a single shore-based trawl sector. Managing the shore-based trawl fishery as a single sector is expected to increase the likelihood that available harvest will be fully taken. If the shore-based trawl sector were managed as two separate IFQ programs, the Council would have to allocate nonwhiting species taken incidentally in the whiting fishery to the shore-based whiting sector and nonwhiting trawl sectors. If the incidental catch allocations the Council provided to the shore-based whiting sector were not sufficient to allow the sector to take all of its whiting allocation, there would be no way for the shore-based whiting sector to acquire additional nonwhiting quota to cover its incidental catch, and whiting would go unharvested. At the same time, if the shore-based whiting sector were allocated more than the amount it needed to cover incidental catch, there would be no mechanism to move the excess back to the nonwhiting shore-based trawl fishery for its use, and the excess allocation would go unharvested. By managing the shore-based trawl sectors together under a single IFQ program, there is an increased likelihood that the market place will overcome constraining species issues as quota holders buy and sell quota to whomever can put it to best private use (i.e., to whomever is willing to pay the highest price for it).

Deciding on the groups which would receive an initial QS allocation was another major decision for the Council. One of the primary issues debated extensively was whether to give an initial allocation of QS to processors and, if so, in what amount. During Council discussion, it was noted that the MSA LAP Program provisions in Section 303A(5) require that the Council ensure fair and equitable initial allocations, including consideration of (1) current and historic harvests, (2) employment in the harvesting and processing sectors, (3) investments in and dependence on the fishery, and (4) the current and historical participation of fishing communities.

Congress specifically instructed the Council to fully analyze alternative program designs, including allocation of LAPs to harvest fish to fishermen and processors. Much of the Council's discussion about an allocation to processors revolved around the impact of both status quo and trawl rationalization on market power. It was noted that the U.S. economy relies on competition and on individuals and businesses acting in their own self interest for growth, innovation, price setting, and the allocation of resources. There was a sentiment that government should not interfere in business competition unless it is necessary for the public benefit.

In its preliminary preferred alternative, the Council recommended giving processors 20 percent of the shore-based allocation of QSs for all species except bycatch taken in the shore-based whiting fishery. Council members noted the difficulty of determining the correct percentage for a possible QS allocation to processors. Council members noted that the case for providing QSs to whiting processors seemed to be relatively clear but it was less clear for nonwhiting processors. The 20 percent approach chosen for the preliminary preferred alternative was believed by some to be a fair middle ground for public review and comment.

In its final preferred alternative, after further review of the analysis and public testimony, the Council recommended giving processors 20 percent of the QSs only for shore-based whiting and no QSs for shore-based nonwhiting. In taking this action, Council members expressed their concern that an initial allocation of QSs to nonwhiting processors would add too much to the market power of shore-based nonwhiting processors. Additionally, Council favored providing a 10 percent allocation for adaptive

management. The adaptive management program could be used not only to provide some amount of certainty and security to the larger processors, but also to provide flexibility to tailor a program that would provide some protection to smaller processors. In making its decision, the Council specified its intent that the adaptive management program be constructed in a manner to ensure that the program accomplishes this as one of its objectives.

Consideration was also given to allocating QSs to communities and crew members. However, communities expressed no interest in receiving an initial allocation of QSs. Therefore, the Council developed other mechanisms to address concerns about communities, including, but not limited to, the adaptive management program, a two-year moratorium on QS transfers, a five-year review that includes a community advisory committee, accumulation limits and a two-year review of some of the limits, the opportunity for communities to receive an initial QS allocation by acquiring a trawl permit, and a trailing action on community fishing associations. With respect to crew members, an initial allocation is difficult because there is limited historic information on the identity of crew members who have fished on trawl vessels. It is the Council's hope that by providing highly divisible QSs and ensuring that other elements of the program design facilitate crew ownership of QS, that crew members who want to do so will be able to incrementally accumulate QSs.

5.7 Major Decisions in Designing the Co-op Program

The most important and broadly controversial elements of the mothership co-op program design were the processor tie provisions and LE for mothership processors. These issues were covered above in the discussion of the Council's decision on whether to go with IFQs or co-ops for each of the whiting sectors.

For the catcher-processor co-op program, one of the most controversial design elements was the decision whether the catcher-processor co-op would be issued a permit. When the Council developed its preliminary preferred alternative on this issue, there was extensive debate on the question of whether the catcher-processor co-op would be designated as a LAP program and subject to a 3 percent fee. However, the Council was advised that if it provided an allocation for the co-op and required a co-op permit, then the program would be a LAP program. On this basis, the Council adopted the final preferred alternative in November 2008 and June 2009 which did not to require permits for co-ops. However in reviewing proposed regulations for program implementation and determining them to be necessary and appropriate ("regulatory deeming"), the Council reconsidered. In April 2010, the Council agreed that the regulations should include the co-op permit requirement. NMFS indicated that the Council will participate in subsequent deliberations on formulating cost recovery provisions. Through that process, the Council may determine what aspects of program cost may be attributed to a given fishery sector.

6 COMMENTS RECEIVED ON THE DEIS AND FEIS

A 45-day public comment period on the Draft Environmental Impact Statement (DEIS) commenced on December 4, 2009, as required by the CEQ regulations. NMFS and the Council have received a substantial number of public comments on the trawl rationalization program during Council meetings and during the public comment periods for the DEIS that analyze the impacts of Amendment 20. Some comments have supported the program, while others have criticizes different aspects of the program. Chapter 10 of the FEIS included responses to the comments received on the DEIS. NMFS received two additional public comments on the FEIS during the 30 day cooling off period that concluded on July 26,

2010, similar to comments received on the DEIS, which were addressed in the response to comments included in Chapter 10 of the FEIS.

7 MITIGATION MEASURES AND MONITORING

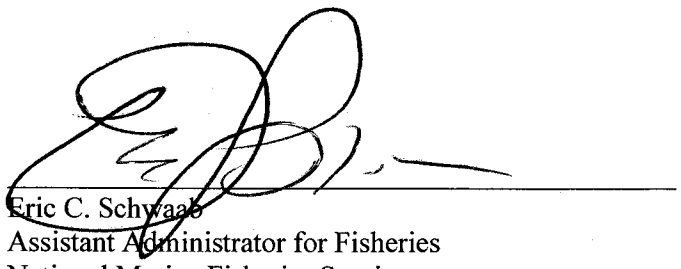
An EIS must discuss "means to mitigate the adverse environmental impacts" stemming from the proposed action (40 CFR 1502.16(h)), even if the adverse impacts are not by themselves significant. The mitigation measure incorporated into the proposed action and included in the preferred alternative (Alternative 4b) is the adaptive management provision, which annually sets aside up to 10 percent of the QPs in the shore-based IFQ fishery and up to 10 percent of the available aggregate harvest pounds for the Pacific whiting cooperative program. This harvest opportunity would then be allocated by the Council to meet specified objectives, including unforeseen impacts, such as geographic shifts in catch or landings, previously unidentified impacts to participants (e.g., processors), or unexpected barriers to new entry into the fishery.

8 SUMMARY FINDINGS

Through the EIS and the documentation in this ROD, NMFS has considered the objectives of the proposed action and has analyzed a reasonable range of alternatives that adequately address the objectives of the proposed action, and the extent to which the impacts of the action could be mitigated. NMFS has also considered public and agency comment received during the EIS review period. In balancing the projected effects of the various alternatives presented in the EIS and the public interest, NMFS has decided to implement the preferred alterative, Alternative 4B. Consequently, NMFS concludes that the approved alternative provides reasonable, practical and practicable means to avoid, minimize, or compensate for environmental harm from the action.

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Assistant Administrator for Fisheries
National Marine Fisheries Service

8/9/10
Date