ENVIRONMENTAL ASSESSMENT/REGULATORY IMPACT REVIEW/ FINAL REGULATORY FLEXIBILITY ANALYSIS

For a Regulatory Amendment to Revise the Maximum Retainable Amounts of Groundfish in the Arrowtooth Flounder Fishery

Implemented Under the Authority of the
Fishery Management Plan
for the
Groundfish Fishery of the Gulf of Alaska

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Date: March 3, 2009

Abstract: This Environmental Assessment/Regulatory Impact Review/Final Regulatory Flexibility Analysis (EA/RIR/FRFA) evaluates the environmental impacts, costs and benefits, and small entity impacts of a proposed regulatory amendment. The proposed amendment would increase the maximum retainable amounts (MRAs) of selected groundfish in the arrowtooth flounder fishery in the Gulf of Alaska (GOA). The purpose of the proposed amendment is to reduce the amount of regulatory discards of otherwise marketable groundfish in the developing arrowtooth flounder fishery. This EA/RIR/FRFA addresses the requirements of the National Environmental Policy Act, Presidential Executive Order 12866, and the Regulatory Flexibility Act.

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Executive Summary

This Environmental Assessment/Regulatory Impact Review/Final Regulatory Flexibility Analysis (EA/RIR/FRFA) evaluates the environmental impacts, costs and benefits, and small entity impacts of a proposed regulatory amendment. The proposed amendment would increase the maximum retainable amounts (MRAs) of selected groundfish in the arrowtooth flounder fishery in the Gulf of Alaska (GOA). The purpose of the proposed amendment is to reduce the amount of regulatory discards of otherwise marketable groundfish in the developing arrowtooth flounder fishery. This EA/RIR/IRFA addresses the requirements of the National Environmental Policy Act, Presidential Executive Order 12866, and the Regulatory Flexibility Act.

In October 2006 the North Pacific Fishery Management Council (Council) received a proposal from industry to revise the MRAs of groundfish in the arrowtooth flounder fishery in the GOA. The problem statement made by the industry may be summarized as follows:

> When the MRAs for the directed GOA arrowtooth flounder fishery were set in regulations in 1994, the Council chose to set incidental catch allowances at zero for a wide group of species, to prevent vessels from using arrowtooth flounder as a basis species for retention, since there was no market for arrowtooth flounder. Arrowtooth flounder is now a viable target fishery and efforts to improve retention of many groundfish species utilized by the trawl sectors are constrained by MRAs in the directed GOA arrowtooth flounder fishery. MRAs are a widely used groundfish management tool to reduce targeting on a species and slow harvest rates as an allocation approach. However, sometimes species managed with MRAs must be discarded, even though economic incentives exist to retain that species. Thus, the MRA forces regulatory discards of some species that might otherwise be retained without undermining the intent of the MRA as a tool to reduce overall harvest rates. This regulatory amendment would evaluate raising the MRAs for some species in the directed GOA arrowtooth flounder fishery, to provide increased opportunity for retention of species harvested by the trawl sectors, and, thus, reduce overall discards in this sector, while not subjecting incidentally caught species to increased allocation concerns.

The MRA of a species closed to directed fishing is the maximum weight of that species that may be retained onboard a vessel, calculated as a percentage of the weight of the retained catch onboard the vessel of each species open to directed fishing (the basis species). Table 1 lists the proposed MRAs for incidental catch species, relative to arrowtooth flounder as a basis species, under each alternative. Note that the basis species under each alternative is arrowtooth flounder and that the MRA percentages for each incidentally caught species are found in the columns.

The alternatives consider increasing the MRAs in the arrowtooth flounder fishery for deep-water flatfish, rex sole, flathead sole, shallow-water flatfish, Atka mackerel, sablefish, aggregated rockfish, and skates. None of the alternatives consider changing the existing MRAs in the arrowtooth flounder fishery for pollock, Pacific cod, the "other species" category (squid, octopus, sharks, and sculpins), or forage fish.

Alternative 1, the no action or status quo alternative, would leave the MRAs for groundfish in the arrowtooth fishery unchanged from those in current regulations.

Alternative 2, (the preferred alternative) would set the MRAs for incidental catch species, relative to arrowtooth flounder as a basis species, as per the industry proposal.

Alternative 3 would set the MRAs for incidental catch species, relative to arrowtooth flounder as a basis species, near recent high catch levels associated with the arrowtooth flounder target.

The action area covers the entire GOA. Under Alternative 2 (the preferred alternative) and Alternative 3, the MRAs for selected groundfish species in the arrowtooth flounder fishery would be increased from current levels. Increased MRAs would allow increased retention of groundfish, closed to directed fishing, during the arrowtooth flounder fishery. Increased retention of these incidentally caught groundfish would reduce regulatory discards. The opportunity for increasing retention may result in an increased catch of these incidental catch species in the arrowtooth flounder fishery. However, even if the amounts of groundfish retained in the arrowtooth flounder fishery increased, total removals of each species would be maintained within the total allowable catch (TAC) levels for each species, established through the harvest specifications process. The impacts of the harvest strategies and resulting TAC amounts were analyzed in the Alaska Groundfish Harvest Specifications Environmental Impact Statement (NMFS 2007a). This proposed action would have no additional impacts on the GOA environment, beyond those analyzed in the EIS.

The eastern and western distinct population segments (DPS) of Steller sea lions (SSL) and their designated critical habitat occur in the GOA. The western DPS is listed as endangered and the eastern DPS is listed as threatened under the Endangered Species Act (ESA). NMFS has jurisdiction, under the ESA, over SSL and is responsible for the conservation and recovery of the species. One of the potential effects of the groundfish fisheries on SSL is competition for the prey species pollock, Pacific cod, and Atka mackerel. The MRAs for pollock and Pacific cod are not proposed to be revised, under any of the alternatives. However, Alternatives 2 and 3 propose increases in the MRA for Atka mackerel in the arrowtooth flounder fishery, which could lead to an increase in the total catch of Atka mackerel in SSL critical habitat. Although it is difficult to predict how an increase in MRAs will change the fishing behavior of participants in the arrowtooth flounder fishery, neither Alternative 2 or 3 is expected to significantly change the timing of the arrowtooth flounder fishery, or the total catch of Atka mackerel in this fishery. The catch of Atka mackerel in the arrowtooth flounder fishery has been low in the past and the participants in this fishery have had opportunities in all of the other GOA groundfish fisheries to retain Atka mackerel under the MRAs established in those fisheries. Localized depletion of Atka mackerel was not identified as a concern with a 20 percent MRA for Atka mackerel in these other groundfish fisheries.

The current directed fishery for arrowtooth flounder is described in more detail in Section 2.4 of this document. In the GOA, the arrowtooth flounder fishery is almost exclusively prosecuted using bottom trawl gear. Although the arrowtooth flounder fishery is open to hook-and-line, pot, and jig gear types, these gear types do not target arrowtooth and the small amount of incidentally caught arrowtooth taken in other groundfish fisheries is discarded. In recent years, CVs participating in the arrowtooth flounder fishery generally fish for Pacific cod and pollock during those respective roe seasons. Following the seasonal closure of these fisheries, vessels target arrowtooth flounder until the second seasonal halibut bycatch cap for the deep-water complex is reached (usually in May). The CPs participating in the arrowtooth flounder fishery enter the fishery following the closure of rock sole and yellowfin sole in the Bering Sea. Most of the harvest of arrowtooth flounder occurs from March through May. Depending upon the availability of the halibut PSC allowance for the trawl fisheries, vessels may also target arrowtooth flounder in October and November. After the arrowtooth flounder fishery closes in the spring, these vessels generally shift to several different targets; notably flatfish species in the shallow-water complex, rockfish, pollock, and Pacific cod as the seasonal allowances of these targets become available. The implementation of the Rockfish Pilot Program in the Central GOA in 2007, may result in shifts in effort and timing of the arrowtooth flounder fishery.

Given the general trend in the price for arrowtooth flounder, increasing the MRAs for incidentally caught species could provide enough of an economic incentive for some trawl vessels to target arrowtooth flounder more often. Under Alternative 1, those groundfish species with an MRA set at zero that are closed to directed fishing must be discarded, regardless of the value of the species. Under Alternative 2 (preferred alternative) and Alternative 3, high valued bycatch species that are closed to directed fishing could be retained up to the MRA, thus potentially increasing the vessel's net revenue, while targeting arrowtooth flounder.

In designing the alternatives for this action, it was the intent to keep the MRAs for several species at or near status quo levels, to reduce the economic incentive for vessels to use arrowtooth flounder fishery to increase catch of pollock, Pacific cod, sablefish, aggregated rockfish, and forage fish. However, there is the potential for increased catch of some MRA species. Under Alternative 2 (preferred alternative) and Alternative 3, increased retention of some MRA species is likely, over status quo levels. The likelihood for a "top off" fishery[1] is higher for those species with proposed MRAs significantly higher than their average bycatch rate, while less likely for species with proposed MRAs at or near their average bycatch rate. In general, the development of a "top off" fishery is dependent upon a number of issues, including, but not limited to, the price of the species, whether there is a potential buyer, accessibility of the species, storage availability, and the ability to process the species. In addition, the potential for a vessel to "top off" on a specific species varies across vessels. A vessel with the ability to limit incidental catch or the ability to discard low valued fish, while targeting arrowtooth flounder, provides more discretion for "topping off" on specific species.

Increasing the MRAs for the directed arrowtooth flounder fishery, under Alternatives 2 and 3, would likely increase the demand for halibut PSC that is apportioned to the deep-water species complex. Given that halibut PSC is not apportioned between targets included within the deep-water complex for trawl gear, the pace of fishing could increase, as trawl vessels race to harvest more of the species in the deep-water complex fisheries, before halibut PSC is fully utilized and fisheries close.

In October 2007, the Council selected Alternative 2 as its preferred alternative. The Council believes that Alternative 2, which raises the MRAs for all flatfish, Atka mackerel, and skates to 20 percent (from zero percent under the status quo) offers the best approach to reducing discards of otherwise marketable fish in the arrowtooth flounder fishery. The preferred alternative raises the MRAs for these species in the arrowtooth flounder fishery, to a level equal to the MRAs established for the other groundfish fisheries.

A Final Regulatory Flexibility Analysis (FRFA) was prepared to evaluate the impacts on small entities of the alternatives for revising the MRAs for groundfish in the GOA, using arrowtooth flounder as a basis species. An estimated 18 trawl CVs that qualify as small entities under the Regulatory Flexibility Act participate in the arrowtooth flounder fishery could be affected by the alternatives. No CPs that met the criteria for small entities were identified as participating in the arrowtooth flounder fishery. Alternative 2 (preferred alternative) and Alternative 3 would provide an opportunity to retain additional, economically valuable groundfish species in the arrowtooth flounder directed fishery. This would be beneficial to the affected small entities. No negative impacts on small entities are believed to be associated with either Alternative 2 or 3.

[1] "Topping off" is the intentional targeting of an MRA species that is closed to directed fishing.

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1 Environmental Assessment

1.1 Introduction

This Environmental Assessment/Regulatory Impact Review/Final Regulatory Flexibility Analysis (EA/RIR/FRFA) evaluates the environmental impacts, costs and benefits, and small entity impacts of a proposed regulatory amendment. The proposed amendment would increase the maximum retainable amounts (MRAs) of selected groundfish in the arrowtooth flounder fishery in the Gulf of Alaska (GOA). The purpose of the proposed amendment is to reduce the amount of regulatory discards of otherwise marketable groundfish in the developing arrowtooth flounder fishery. This EA/RIR/FRFA addresses the requirements of the National Environmental Policy Act, Presidential Executive Order 12866, and the Regulatory Flexibility Act.

The National Environmental Policy Act (NEPA) requires an assessment of the biological, social, and economic consequences of fisheries management alternatives. It provides the members of the public an opportunity to be involved in and influence decision-making on Federal actions.

This EA analyzes the effects of potential revisions to the MRAs for groundfish in the arrowtooth flounder fishery in the GOA. The action area effectively covers the entire Gulf of Alaska. The affected human environment includes the natural and physical environment as well as relevant economic and social conditions.

1.1.1 Purpose and Need

The proposed action would increase the MRAs for groundfish in the arrowtooth flounder fishery in the GOA. MRAs are the primary tool NMFS uses to regulate the catch rate of species closed to directed fishing, but not on bycatch-status. The MRA of a species closed to directed fishing is the maximum weight of that species that may be retained onboard a vessel, calculated as a percentage of the weight of the retained catch onboard the vessel of all groundfish species open to directed fishing (the basis species). The purpose of the proposed action is to provide an opportunity to trawl fishing operations targeting arrowtooth flounder to retain more groundfish, and, thus, reduce regulatory discards.

In 1994, the Council set most of the groundfish MRAs at zero, relative to retained amounts of arrowtooth flounder, to prevent vessels from using arrowtooth flounder (a species for which no market existed) as a basis species for retention of more readily marketable species. At that time, there were concerns that fishing vessel operators would target arrowtooth flounder to increase the retainable amounts of valuable species, closed to directed fishing, and increase bycatch amounts of Pacific halibut. Increased halibut bycatch rates could result in reaching halibut bycatch limits before the total allowable catches (TACs), established for other trawl target fisheries, were harvested.

Since 1997, markets for arrowtooth flounder have developed and this species now attracts a target fishery. As a result, representatives for the GOA trawl industry now advocate changing the MRAs for GOA groundfish, to expand the use of arrowtooth flounder as a basis species for the retention of groundfish closed to directed fishing. Products made from arrowtooth flounder

now include whole fish, surimi, headed and gutted (both with and without the tail on), fillets, frills or engama (fleshy fins used for sashimi and soup stock), bait, and meal.

In October 2006, the Council received a proposal from industry to revise the MRAs of groundfish in the arrowtooth flounder fishery in the GOA. The problem statement, made by the industry and adopted by the Council, may be summarized as follows:

> When the MRAs for the directed GOA arrowtooth flounder fishery were set in regulations in 1994, the Council chose to set incidental catch allowances at zero for a wide group of species, to prevent vessels from using arrowtooth flounder as a basis species for retention, since there was no market for arrowtooth flounder. Arrowtooth flounder is now a viable target fishery, and efforts to improve retention of many groundfish species utilized by the trawl sectors are constrained by MRAs in the directed GOA arrowtooth flounder fishery. MRAs are a widely used groundfish management tool to reduce targeting on a species and slow harvest rates, as an allocation approach. However, sometimes species managed with MRAs must be discarded, even though economic incentives exist to retain that species. Thus, the MRA forces regulatory discards of some species that might otherwise be retained, without undermining the intent of the MRA as a tool to reduce overall harvest rates. This regulatory amendment would evaluate raising the MRAs for some species in the directed GOA arrowtooth flounder fishery, to provide increased opportunity for retention of species harvested by the trawl sectors, and, thus, reduce overall discards in this sector, while not subjecting incidentally caught species to increased allocation concerns.

Although not explicit in the problem statement, the Council recognizes that revising the MRAs of higher valued groundfish, taken incidentally in the arrowtooth flounder fishery, provides a *de facto* economic incentive to induce entry into the arrowtooth flounder fishery. As noted in the Regulatory Impact Review (RIR) analysis, higher MRAs will likely be a significant factor in a decision to participate in the arrowtooth flounder fishery.

1.1.2 Scope of this Environmental Assessment

The Council on Environmental Quality (CEQ) regulations encourages agencies preparing NEPA documents to eliminate repetition as described in the following statement:

> Whenever a broad environmental impact statement has been prepared (such as a program or policy statement) and a subsequent statement or environmental assessment is then prepared on an action included within the entire program or policy (such as a site specific action) the subsequent statement or environmental assessment need only summarize the issues discussed in the broader statement and incorporate discussions from the broader statement by reference and shall concentrate on the issues specific to the subsequent action. (40 CFR 1502.20)

This process of referencing existing NEPA documents is referred to as "tiering." In 40 CFR 1508.28, the CEQ regulations further define tiering as the coverage of general matter in broader environmental impact statements with subsequent narrower statements of environmental analyses incorporating by reference the general discussion and concentrating solely on the issues specific to the statement subsequently prepared. The CEQ regulations further note that tiering is appropriate when the sequence of statements or analysis is from a program, plan, or policy

environmental impact statement to a program, plan, or policy statement or analysis of lesser scope or to a site-specific statement or analysis.

This EA relies heavily on the information and analysis contained in the Alaska Groundfish Harvest Specifications Final Environmental Impact Statement (NMFS 2007a, hereafter referred to as "Groundfish EIS"), available on the NMFS Alaska Region web site at http://www.fakr.noaa.gov. This EA often refers to the Groundfish EIS to focus the analysis on the current issues and eliminate repetitive discussions. The Groundfish EIS describes the status of the environment and analyzes the impacts of the groundfish fisheries harvest strategies and resulting TAC levels on the human environment.

This EA also relies heavily on the information and analysis contained in the Council's annual Stock Assessment and Fishery Evaluation (SAFE) Report for the Groundfish Resources of the Gulf of Alaska (NPFMC 2007), available from the Council web site at http://www.fakr.noaa.gov/npfmc/SAFE. The SAFE Reports contain the status of the groundfish stocks, the results of the NMFS trawl surveys, the annual management fisheries report, stocks assessments, and an economic report.

This proposed action would change the MRA allowances of groundfish using arrowtooth flounder as a basis for retention. This EA details the specific impacts of the proposed action.

1.2 Description of Alternatives

The alternatives establish MRAs for incidental catch species relative to arrowtooth flounder as a basis species over a range of values. Alternative 1 (status quo) has the lowest MRA percentages; Alternative 2 has the highest, and the Alternative 3 percentages are intermediate. The MRAs for each incidental catch species relative to arrowtooth flounder as a basis species within each alternative are compared in Table 1. Note that the basis species under each alternative is arrowtooth flounder and that the MRA percentages for each incidentally caught species are found in the columns.

Alternative 1, the no action or status quo alternative, would leave the MRAs for groundfish in the arrowtooth flounder fishery unchanged from those in current regulations.

Alternative 2 (preferred alternative) would set the MRAs for incidental catch species relative to arrowtooth flounder as a basis species as per the industry proposal.

Alternative 3 would set the MRAs for incidental catch species relative to arrowtooth flounder as a basis species near recent high catch levels associated with the arrowtooth flounder fishery.

The alternatives consider increasing the MRAs in the arrowtooth flounder fishery for deep-water flatfish, rex sole, flathead sole, shallow-water flatfish, Atka mackerel, sablefish, aggregated rockfish, and skates. None of the alternatives would alter the existing MRAs in the arrowtooth flounder fishery for pollock, Pacific cod, the "other species" category (squid, octopus, sharks, and sculpins), or forage fish.

1.2.1 Alternative 1: Status Quo (No Action)

Under this alternative the MRAs of incidental catch of groundfish relative to arrowtooth flounder as a basis species are unchanged. These amounts are listed under Alternative 1 in Table 1 and in Table 10 to 50 CFR part 679 (Appendix 1). This is the No Action or status quo alternative. Under this alternative only pollock, Pacific cod, species in the "other species" complex (squid, shark, octopus, and sculpins), and forage fish may be retained relative to arrowtooth flounder as a basis species. All other incidental species must be discarded relative to retained arrowtooth flounder.

Retention of incidental species relative to arrowtooth flounder is highly restricted compared to other groundfish species (see Appendix 1). The MRA for incidental species relative to arrowtooth flounder as a basis species was changed in 1994 (59 FR 18229; July 27, 1994), in 1997 (62 FR 11109; March 11, 1997), and in 2006 (71 FR 12626, March 13, 2006). At the time of these changes, concerns centered on fishing vessel operators targeting arrowtooth flounder to increase retainable amounts of valuable species closed to directed fishing (topping off) and thereby increase bycatch amounts of Pacific halibut. Increased halibut bycatch rates could result in reaching halibut bycatch limits before the TACs established for other trawl target fisheries were harvested. Recently the value of arrowtooth flounder has increased and the species has developed into a legitimate target.

Many incidental species assigned an MRA of zero are caught in conjunction with arrowtooth flounder when the incidental species are open to directed fishing. Under those conditions retention of the incidental species is not restricted. Retention of incidental species is restricted when the fishery is closed to directed fishing due to TAC considerations (e.g., skates, Atka mackerel, some rockfish targets, trawl sablefish, and forage fish are closed all year to directed fishing) or when limited by a trawl halibut mortality closure.

1.2.2 Alternative 2 (preferred alternative): Set MRAs as per Industry Proposal

Under this alternative MRAs for incidental catch of groundfish relative to arrowtooth flounder as a basis species would be established at the levels proposed by industry. The intent of the proposal is to reduce regulatory discards and increase utilization of marketable fish. The proposal will also reduce violations of the MRA restrictions incurred when vessels are unable to completely discard incidentally caught species that are currently restricted to zero retention. Compared to Alternative 1 the MRAs for pollock, Pacific cod, "other species," and forage fish are unchanged. The MRAs for the remaining incidentally taken species are increased from zero. The MRAs for sablefish and rockfish are raised from zero to 1 percent and 5 percent, respectively. The MRAs for flatfish species, skates, and Atka mackerel are increased from 0 to 20 percent.

Because pollock and Pacific cod are fully utilized in directed fisheries and are forage species for the endangered Steller sea lion, the industry's proposal specifically did not wish incidental catch to increase through potential topping off. The increases proposed for rockfish and sablefish approximate estimated incidental catch rates (Tables 4 through 7) and are proposed to reduce regulatory discards of marketable fish without providing an incentive to top off.

The proposed MRAs for deep-water flatfish, rex sole, flathead sole, shallow-water flatfish, skates, and Atka mackerel are greater under Alternative 2 than under Alternatives 1 and 3 (Table 1) and would increase from 0 to 20 percent. Allowing retention of these species may increase catch to some degree, but will primarily reduce discards.

Skates, Atka mackerel, some rockfish targets, and sablefish (in the trawl fisheries) are closed to directed fishing throughout the year to prevent exceeding the TACs and in the case of Atka mackerel to provide greater prey availability for Steller sea lions. The Atka mackerel MRA is proposed at 20 percent to be consistent with most other incidental catch species. Skates are raised from zero to 20 percent because they are currently discarded as an incidental species relative to arrowtooth flounder. The sablefish MRA is proposed at 1 percent to allow retention of incidental catch of this highly valuable species but to discourage potential topping off. An increase of the MRA for sablefish as an incidental species beyond 1 percent could encourage increased catch of sablefish in the arrowtooth flounder fishery and interfere, for example, with allocations made under the GOA Rockfish Pilot Program (see Section 1.6).

The aggregated rockfish MRA is established at relatively low level to accommodate the limited amount of incidental catch of rockfish in the arrowtooth flounder fishery and to discourage topping off. Rockfish in the Central GOA are regulated under the Rockfish Pilot Program.

In October 2007 the Council selected Alternative 2, the industry proposal, as its preferred alternative. The Council believes that Alternative 2 which raises the MRAs for all flatfish, Atka mackerel, and skates to 20 percent from zero percent offers the best approach to reducing discards of otherwise marketable fish in the arrowtooth flounder fishery. The preferred alternative raises the MRAs for these species in the arrowtooth flounder fishery to a level equal to the MRAs established for the other groundfish fisheries.

1.2.3 Alternative 3: Set MRAs near Recent High Catch Levels Associated with the Arrowtooth Flounder Fishery

Under Alternative 3 MRAs for incidental catch relative to arrowtooth flounder as a basis species would be set near recent highest annual incidental catch rates of species landed in conjunction with arrowtooth flounder. Data from NMFS' Catch Accounting System (CAS) from 2003 through 2006 in Tables 4 through 7 show rates of catch when arrowtooth flounder is identified as the target.

Under Alternative 3, the MRAs are unchanged from Alternatives 1 and 2 for pollock, Pacific cod, other species, and forage fish to respond to concerns expressed in the industry proposal. The rates for deep-water flatfish, rex sole, flathead sole and shallow-water flatfish were derived from Tables 4 through 7. The highest rate for an individual species or species group across the years was identified and the rounded up to the nearest 5 percent. Rounding up the amount provided for potential higher catches and simplifies Table 1.

Compared to Alternative 1 the MRAs in Alternative 3 are set higher for deep-water flatfish, rex sole, flathead sole, shallow-water flatfish, sablefish, rockfish, Atka mackerel, and skates. Compared to Alternative 2, Alternative 3 MRAs are unchanged for rockfish and sablefish and

would be lower for deep-water flatfish, rex sole, flathead sole, shallow-water flatfish, Atka mackerel, and skates.

The intent of this alternative is to (1) reduce regulatory discards and improve the utilization of groundfish incidentally taken in the arrowtooth flounder directed fishery, (2) prevent an increase in groundfish catch in the arrowtooth flounder fishery substantially beyond recent associated catch levels, and (3) continue to keep MRAs for important Stellar sea lion prey species (pollock, Pacific cod, forage fish, and Atka mackerel) at low levels.

1.2.4 Alternatives Considered but not Carried Forward

Two additional alternatives were considered but not carried forward for further analysis in this EA because they did not adequately address the problem statement. One alternative would have set the MRAs for incidental groundfish caught in the arrowtooth flounder directed fishery at levels equal to the MRAs established for incidental species caught in other groundfish targets in the deep-water complex (deep-water flatfish, rex sole, sablefish, and rockfish) (See Appendix 1). This alternative was considered initially as an upper limit.

This alternative was not considered further as the pollock, Pacific cod, sablefish, and rockfish fisheries are fully developed fisheries. These species are predominately caught in directed fisheries. To a large extent, while trawl sablefish is not opened as a directed fishery, it is an acknowledged top off fishery and a significant portion of TAC is allocated to the trawl sablefish fishery. If this alternative were implemented the MRAs would revert back to those levels used prior to 1994. An increase in the MRAs for pollock, Pacific cod, sablefish, and rockfish could encourage topping off using arrowtooth flounder as a basis for retention of groundfish of greater value. This alternative would have allowed potential increased catch through topping off fishing for pollock and Pacific cod in areas where catch of these species are limited as part of measures developed to protect the endangered Steller sea lion (SSL). This has the potential to increase the harvest of important SSL prey species in critical habitat resulting in some localized depletion of these prey species. For these reasons the analysis of this alternative was not carried forward.

The second alternative would have set MRAs at levels equal to recent average (2003 through 2006) catch in the arrowtooth flounder fishery (Tables 4 through 7). This alternative was not developed further because by setting MRAs at average levels regulatory discards would still be required on occasion. In addition, the proposal would have raised the MRA for Pacific cod above the current and industry proposed level and prevented the retention of any Atka mackerel in the arrowtooth flounder fishery.

1.3 Affected Environment

This chapter describes the human environment, including the physical environment, habitat, groundfish life history, marine mammals, seabirds, crab fisheries, a management history, the harvesting sector, the processing sector, and community and social conditions. The detailed background information provided in the documents described below are incorporated by reference. In addition to the factors discussed in the Groundfish EIS, this action specifically concerns the management of the MRAs in arrowtooth flounder fishery. A description of the arrowtooth flounder fishery, along with a description of current MRA management, is included here.

1.3.1 Gulf of Alaska Environment

The action area includes the entire Gulf of Alaska. The documents listed below contain extensive information about the fishery management areas, fisheries, marine resources, ecosystem, social, and economic elements of the GOA groundfish fisheries. Rather than duplicate an affected environment description here, readers are referred to these documents. This list is a partial listing of NEPA documents that have been prepared for GOA fishery management measures. Internet links to these documents, as well as a comprehensive list of NEPA documents that have been prepared by NMFS, Alaska Region and the Council are at http://www.fakr.noaa.gov/index/analyses/analyses.asp. Any additional information beyond what is included in the following references is contained in the section addressing each particular resource component in Section 1.4.

Alaska Groundfish Harvest Specifications Final Environmental Impact Statement (NMFS 2007a). This EIS provides decision makers and the public with an evaluation of the environmental, social, and economic effects of alternative harvest strategies for the federally managed groundfish fisheries in the Gulf of Alaska and the Bering Sea and Aleutian Islands management areas. The EIS examines alternative harvest strategies that comply with Federal regulations, the GOA FMP, and the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act). These strategies are applied to the best available scientific information to derive the total allowable catch estimates for the groundfish fisheries. The EIS evaluates the effects of different alternatives on target species, non-specified species, forage species, prohibited species, marine mammals, seabirds, essential fish habitat, ecosystem relationships, and economic aspects of the GOA fisheries.

Stock Assessment and Fishery Evaluation (SAFE) Report for the Groundfish Resources of the Gulf of Alaska (NPFMC 2007). Annual SAFE reports contain a review of the latest scientific analyses and estimates of each GOA species' biomass and other biological parameters. This includes the acceptable biological catch specifications used by NMFS in the annual harvest specifications. The SAFE report also includes summaries of the available information on the GOA ecosystem and the economic condition of the groundfish fisheries off Alaska. This document is available from http://www.afsc.noaa.gov/refm/stocks/assessments.htm.

Alaska Groundfish Fisheries Final Programmatic Supplemental Environmental Impact Statement (Final PSEIS, NMFS 2004). A Final PSEIS was prepared to evaluate the fishery management policies embedded in the BSAI and GOA groundfish FMPs against policy-level alternatives. NMFS issued a Record of Decision for the Final PSEIS on August 26, 2004, effectively implementing a new management policy that is ecosystem-based and more precautionary when faced with scientific uncertainty. The PSEIS serves as the primary environmental document for subsequent analyses of environmental impacts on the groundfish fisheries. Chapter 3 of the Final PSEIS provides a detailed description of the affected environment, including extensive information on fishery management areas, marine resources, and marine habitat in the North Pacific Ocean. For more information, see the Final PSEIS and related documents at http://www.fakr.noaa.gov/sustainablefisheries/seis/default.htm.

1.3.2 MRA Regulations and Management Function in GOA Groundfish Fisheries

MRA regulations establish the calculation method and MRAs for groundfish species that are closed to directed fishing. The MRA is calculated as a percentage of the retained amount of species closed to directed fishing relative to the retained amount of basis species or species groups open for directed fishing. All MRA accounting is computed based on round weight equivalent. Appendix 1 lists retainable percentages for GOA incidental groundfish species used to calculate an MRA. Amounts that are caught in excess of the MRA percentage must be discarded. Current regulations limit vessels to MRAs at any time during a fishing trip.

50 CFR part 679.2 defines a fishing trip as follows:

> (i) With respect to retention requirements of MRA, an operator of a catcher/processor or mothership processor vessel is engaged in a fishing trip from the time the harvesting, receiving, or processing of groundfish is begun or resumed in an area until
>
> (A) The effective date of a notification prohibiting directed fishing in the same area under § 679.20 or § 679.21;
>
> (B) The offload or transfer of all fish or fish product from that vessel;
>
> (C) The vessel enters or leaves an area where a different directed fishing prohibition applies;
>
> (D) The vessel begins fishing with different type of authorized fishing gear; or
>
> (E) The end of a weekly reporting period, whichever comes first.

MRAs are the primary tool NMFS uses to regulate the catch of species closed to directed fishing. The MRA table is a matrix of proportions representing a range of rates of expected or accepted incidental catch of species closed to directed fishing relative to target species. As a management tool, MRAs rely on the ability of the vessel operator to selectively catch the target species. The target species is called a basis species in regulation. The species closed to directed fishing is the incidental species. The MRA percentages are intended to slow the rate of harvest of a species when insufficient TAC or PSC amounts are available to support a directed fishery.

NMFS prohibits directed fishing for a species to avoid reaching a TAC (typically established for conservation reasons), reaching an amount or percentage of groundfish included in the annual specifications for a gear and species or species group, or for a prohibited species limit (e.g., halibut limits). When NMFS prohibits directed fishing, retention is allowed up to an amount calculated with the MRA. The MRA table (Table 10 to 50 CFR part 679 and Appendix 1 of this document), shows retainable proportions of incidental species relative to species open to directed fishing. Vessel operators calculate the MRA through three basic steps. First, they identify and calculate the round weight of the basis (or target) species onboard. Next, they identify the appropriate fraction from the MRA table, and then multiply that rate against the round weight of the basis species. The calculated maximum amount limits retention of the incidental species. A vessel will typically discard catch of the incidental species in excess of that amount to avoid violation of current regulation. The catcher/processor vessel operator calculates the MRA at any time for the duration of the fishing trip, often referred to as an “instantaneous” calculation. The shoreside catcher vessel operator calculates the MRA upon returning to port for delivery of retained catch.

When NMFS prohibits directed fishing on a groundfish species, MRAs buffer the amount of catch of species on bycatch status occurring in the open directed fisheries. Ideally, the application of an MRA rate slows catch of a species so that harvest can be managed up to the TAC by the end of the year. Beyond management of a TAC to obtain optimum yield, MRA calculations perform two additional functions. First, MRAs limit retention to species' expected or accepted incidental catch rate. Alternately, the MRA functions as a trip limit for retention of incidental catch of a species. This function allows for limited targeting of a species up to the MRA ("topping off").

For several incidental/basis species combinations, the use of low MRA rates may reduce the incentive for topping off that would occur in the absence of this tool. In these cases, the MRAs represent the expected catch of an incidental species absent deliberate action by the vessel operator to maximize that incidental catch. The requirement to not exceed MRA proportion at any time during a trip limits the vessel operators' ability to maximize catch. This restriction is used to limit total catch of species with low TACs (relative to the species caught in the directed fisheries), at greater risk of being caught in excess of the overfishing level, and of high value. Several rockfish species and sablefish meet these criteria in the GOA.

Current regulations establish a relatively high MRA for particular species. For example, a generous rate of 35 percent for arrowtooth flounder as an incidental species is applied to open groundfish targets as a basis species (Appendix 1). Several directed trawl fisheries incurred high arrowtooth flounder incidental catch rates. The higher MRA allows for increased indirect targeting on arrowtooth flounder. For other species where restricting catch to an incidental rate is not a consideration, regulations establish a default MRA rate of 20 percent.

1.3.3 Arrowtooth Flounder Fishery

Arrowtooth flounder (*Atheresthes stomias*) range from central California to the eastern Bering Sea and are currently the most abundant groundfish species in the Gulf of Alaska. Prior to 1990, flatfish catch in the GOA was reported as an aggregate of all flatfish species. The principal flatfish targets at that time were rock sole (shallow-water flatfish), rex sole and Dover sole (deep-water flatfish). Substantial amounts of arrowtooth flounder and other flatfish were discarded at sea because of undesired species, size, or sex. Total GOA catch of arrowtooth flounder, including targeted and incidental catch, has ranged between 13,000 mt (1998) and 27,645 mt (2006). The catch of arrowtooth flounder in the targeted fishery has increased from 6,767 mt (1997) to 15,344 mt (2006). The vast majority of arrowtooth flounder catch is taken by trawl gear. Catches of arrowtooth flounder in recent years have approached established TACs in some areas. In order to reduce potential discards of arrowtooth flounder, the Council raised the TAC for arrowtooth flounder from 5,000 mt to 8,000 mt in the Western GOA in 2001 and from 25,000 mt to 30,000 mt in the Central GOA in 2007.

The MRA regulations identify basis and incidental species retention on different timeframes and species compositions than the Catch Accounting System (CAS) target calculations; therefore, Tables 4 through 7 do not show catch associated only with arrowtooth flounder as a basis species. Vessels may retain several species open to directed fishing. If several species are open to directed fishing and are landed together (which is generally the case), the predominant retained

species is assigned as the target. The display of annual retained and discarded species within the arrowtooth flounder target therefore does not reflect the MRA proportions, but rather, a dynamic of multiple target species caught together in the trawl groundfish fishery. These tables list all the species that are caught in conjunction with arrowtooth flounder. The information was calculated from discard rates observed from at-sea sampling and industry reported retained catch. Table 2 includes discarded and retained GOA arrowtooth flounder from 1997 to 2007. Most apparent in Table 2 is the increase in the percent of arrowtooth flounder retained, which increased from a low of 16 percent in 1998 to a high of low of 36 percent in 2005. Table 3 breaks down the retention and discard of arrowtooth flounder by gear type and processing component in 2006. Tables 4 through 7 present the catch of groundfish associated with the arrowtooth flounder fishery by the NMFS catch accounting system from 2003 through 2006.

The proportion of arrowtooth flounder that is retained has increased in recent years indicating that the species has become a legitimate target. Catch data in Table 2 indicate the retention status of arrowtooth flounder for 1997 through 2007. For the entire groundfish fleet, recent discards (1997 through 2007) of the total arrowtooth flounder catch have ranged between 84 percent in 1998 to 36 percent in 2005. When catches have been assigned by the NMFS catch accounting system (Tables 4 through 7) from 2003 through 2006 the amount of arrowtooth flounder retained has ranged from 72 percent in 2003 to 83 percent in 2006. The absolute amount of arrowtooth flounder has increased as well.

In the GOA the arrowtooth flounder fishery is almost exclusively prosecuted by CPs and CVs using bottom trawl gear. Although arrowtooth flounder is open to hook-and-line, pot, and jig gear, very small amounts of arrowtooth flounder are harvested by other these gear types, and then only as incidental catch in other fisheries and is subsequently discarded. Table 3 shows that within the trawl catch about 56 percent are taken by CVs and 44 percent by CPs in 2006.

The limited amount of arrowtooth flounder taken by hook-and-line gear is incidental to the sablefish and Pacific cod fisheries. Within CVs, the hook-and-line fishery for sablefish takes the vast majority. Additional amounts are taken in the CP hook-and-line fishery for sablefish and their fishery for Pacific cod. Within the CP hook-and-line fisheries, about half of the arrowtooth flounder caught was retained. Within the CV hook-and-line fishery, all arrowtooth flounder was discarded.

Trawl-caught arrowtooth flounder is distributed among several targets and tends to group based on processing mode. Figure 1 shows that CPs take arrowtooth flounder predominately in the arrowtooth flounder target, followed by rex sole, flathead sole, and small amounts in the rockfish target. CVs likewise take the majority of their arrowtooth flounder in the arrowtooth flounder target followed by pollock, shallow-water flatfish (the catch is predominately rock sole), rockfish, and Pacific cod.

In general, the majority of the harvest of arrowtooth flounder occurs between March and May. Depending upon the availability of the halibut PSC allowance for the deep-water complex thorough October 1, vessels may also target arrowtooth flounder in October and November if there is remaining halibut PSC available to support the trawl fisheries at that time. Catch patterns for the Central GOA show that most of the directed fishing for arrowtooth flounder occurs in the spring following the closure of the Pacific cod A season. In the Western GOA, most of the directed fishing for arrowtooth flounder occurs during the spring by CPs coming from the Bering

Sea after the rock sole and yellowfin sole closures. Following the seasonal closures of these fisheries, vessels target arrowtooth flounder until the second seasonal halibut bycatch cap for the deep-water complex is reached, which is most often in May. Generally, after the arrowtooth flounder fishery closes, these vessels shift to several different targets; notably flatfish species in the shallow-water complex, rockfish, pollock, and Pacific cod as the seasonal allowances of these targets become available. The implementation of the Rockfish Pilot Program in the Central GOA in 2007 may result shifts in effort and timing of the arrowtooth flounder fishery. Figure 2 shows that in 2006 the catch of arrowtooth flounder peaked in April while lesser amounts continued to be harvested later in the year from July through October.
Historically arrowtooth flounder has had limited value compared too many other groundfish species in the GOA. Prior to 1994, the species was used as a very low valued basis species to target species closed to directed fishing. For example arrowtooth flounder was retained on CVs and CPs as a basis for retaining sablefish. Once the sablefish and arrowtooth flounder were delivered to a plant, the arrowtooth flounder was either sent to a meal plant or discarded. At that time, there were concerns that fishing vessel operators would target arrowtooth flounder to increase the retainable amounts of valuable species closed to directed fishing and increase bycatch amounts of Pacific halibut. Increased halibut bycatch rates could result in reaching halibut PSC limits before the TACs established for other trawl target fisheries were harvested.

Markets for arrowtooth flounder have gradually been developing since 1997. Although arrowtooth flounder market prices fluctuate widely, this species now supports a viable target fishery. The principle buyers of arrowtooth flounder are China and Japan. The primary product for arrowtooth flounder is the frill, which is the fleshy fins used for engawa, a type of sushi. Engawa, normally a premium sushi made from halibut or Greenland turbot, is more affordable using arrowtooth flounder. Unlike most other flatfish, the frill of the arrowtooth flounder is sufficiently sized to cover the rice on sushi, which is critical in sushi markets. The primary market for arrowtooth flounder engawa is Japan. A secondary product for arrowtooth flounder is fillets. A large portion of the arrowtooth flounder fillets exported to China are processed there and then reimported to the U.S. markets as inexpensive flounder. Some arrowtooth flounder processed in Japan is also sold as fillets in the Japanese market. Recently, some arrowtooth flounder fillets have shown up in European markets.

Average gross earnings per round metric ton of retained arrowtooth flounder received by both shoreside processors and CPs increased from 2001 to 2005 are displayed in Table 8. For shoreside processors, these estimates include the product value of catch from both Federal and State of Alaska fisheries. For CPs, they include only the product value from catch counted against Federal TACs. These price approximations are based on a combination of weekly production reports, Alaska Commercial Operators Annual Reports (COARs), and blend and other catch accounting data, and tend to support anecdotal observations from the Groundfish Data Bank that prices for this species have increased in recent years.

1.3.4 Groundfish MRAs for the Arrowtooth Flounder Fishery

In 1994 the Council chose to prohibit the use of arrowtooth flounder as a basis for calculating retainable amounts of groundfish species closed to directed fishing in the GOA (59 FR 18229; July 27, 1994). In 1994 it set most of the groundfish MRAs at zero relative to retained amounts

of arrowtooth flounder to prevent vessels from using arrowtooth flounder as a basis species for retention.

In 1997 the Council recommended revising the MRAs for pollock and Pacific cod from 0 to 5 percent and for aggregated forage fish from 0 to 2 percent. The 1997 proposed rule (62 FR 724; January 6, 1997) and final rule (62 FR 11109; March 11, 1997) to allow the use of GOA arrowtooth flounder as a basis species for pollock and Pacific cod when they are closed to directed fishing noted that a limited fishery for GOA arrowtooth flounder exists and that this species should be allowed as a basis species for the retention of pollock and Pacific cod. At that time, there were still concerns that fishing vessel operators would target arrowtooth flounder to increase the retainable amounts of valuable species closed to directed fishing and increase bycatch amounts of Pacific halibut. Increased halibut bycatch rates could result in reaching halibut PSC limits before the TACs established for other trawl target fisheries were harvested. Current MRAs for groundfish in the arrowtooth flounder fishery are listed in Table 1 under Alternative 1 and Appendix 1.

Since 1997, markets for arrowtooth flounder have been developed and this species now supports a viable target fishery. As a result, representatives for the GOA trawl industry now support changing the MRAs for GOA groundfish to expand the use of arrowtooth flounder as a basis species for the retention of groundfish closed to directed fishing. This change would provide the opportunity to the trawl fishing industry to retain more groundfish and reduce regulatory discards. In 2006 as part of Amendment 69 to the GOA FMP to revise the manner in which the annual TAC for the "other species" complex is established the Council recommended that the MRA for "other species" using arrowtooth flounder as a basis species be set at 20 percent (71 FR 12626, March 13, 2006).

Recently the total gulf wide retained catch of arrowtooth flounder, including targeted and incidental catch, has increased while discards have decreased (Tables 2 and 3). The vast majority of arrowtooth flounder catch is taken by trawl gear. Catches of arrowtooth flounder in recent years have approached established TACs in some areas. In order to reduce potential regulatory discards of arrowtooth flounder, the Council raised the TAC for arrowtooth flounder from 5,000 mt to 8,000 mt in the Western GOA in 2001 and from 25,000 mt to 30,000 mt in the Central GOA in 2007. With the development of the arrowtooth flounder fishery the amount of halibut mortality attributed to the arrowtooth flounder fishery has increased dramatically from 78 mt in 1997 to 616 mt in 2006. This increase makes less halibut mortality available to support the other directed groundfish fisheries in the trawl deep-water complex (deep-water flatfish, rex sole, and rockfish) from January 20 to October 1 and to all groundfish fisheries after October 1. Rockfish are also part of the deep-water complex, but beginning in 2007 under the Central GOA Rockfish Pilot Program; rockfish will be allocated a specific portion of the third seasonal deep-water complex halibut PSC allowance.

In February 2007 NMFS staff presented a discussion paper to the Council on the industry proposal to revise the MRAs for groundfish in the arrowtooth flounder fishery (NMFS 2007b).

Tables 4 through 7 show species caught within the arrowtooth flounder target by year (2003-2006). The CAS calculates single targets based on all retained catch and may include several species opened to directed fishing that are caught together. Targets are assigned to CPs on a weekly basis and to CVs on a landing basis. These data generally represent aggregate catch of

multiple landing reports from CV and weekly production or observer reports from catcher/processors where arrowtooth flounder is calculated as the most prevalent species retained. Some of the discards identified in Tables 4 through 7 may be reduced and retention increased as a result of the adoption of either Alternative 2 or 3.

1.3.5 Social and Economic Environment

The social and economic environment is described in detail in Chapter 2 as part of the Regulatory Impact Review.

1.4 Environmental Effects of the Alternatives

An EA is prepared pursuant to NEPA to determine whether an action will result in significant effects on the human environment. An effect on a part of the environment may be either direct or indirect and beneficial or adverse. If the environmental effects of the action are determined not to be significant based on an analysis of relevant considerations, the EA and resulting finding of no significant impact are the final environmental documents required by NEPA. If an analysis concludes that the action is a major Federal action that would significantly affect the human environment, an environmental impact statement (EIS) must be prepared.

NEPA significance is determined by considering both the context in which the action will occur and the intensity of the action. The context in which the action will occur includes the specific resources, ecosystem, and the human environment affected. The intensity of the action includes the type of impact (beneficial versus adverse), duration of impact, and other factors (see 40 CFR 1508.27(b)). NEPA regulations contain a listing of considerations to use to determine intensity, as does NOAA Administrative Order 216-6.

Context: The context for the proposed action is groundfish fishing in the GOA and the effects of this action are directly limited to the GOA. The proposed action would make various revisions to the MRAs for groundfish using arrowtooth flounder as a basis species in the GOA. The effects on society within the GOA are on individuals directly and indirectly participating in the groundfish fisheries.

Intensity: A listing of considerations to determine the intensity of the impacts can be found at 40 CFR 1508.27(b) and in NOAA Administrative Order 216-6. The proposed action would make various revisions to the MRAs for groundfish using arrowtooth flounder as a basis species in the GOA. The intensity of this action is believed to be low because it is not likely to change the harvest of groundfish, but would reduce discards currently required by regulation. The harvest of groundfish would continue to be constrained by TAC and PSC limits.

The environmental impacts generally associated with fishery management actions are effects resulting from interactions with (1) targeted groundfish species, (2) non-specified species, (3) forage species, (4) prohibited species, (5) marine mammals, (6) seabirds, (7) benthic habitat and essential fish habitat, (8) the ecosystem, and (9) the economic and social conditions. This action would have no impacts on non-specified species, forage species, seabirds, habitat, or the ecosystem not previously considered in the harvest specification EIS (NMFS 2007a). Therefore, this analysis will focus on the environmental components that could potentially be affected by

this action; stocks of targeted groundfish, prohibited species, Steller sea lions (SSL), and the economic and social conditions.

The affect of the alternatives on social and economic conditions are analyzed in Chapters 2 and 3.

1.4.1 Effects on Groundfish Stocks

This action proposes three alternatives for MRAs for groundfish in the arrowtooth flounder fishery in the GOA, two of which would increase the MRAs for groundfish using arrowtooth flounder as a basis species in Table 10 to 50 CFR part 679 (Appendix 1) that are applicable to deep-water flatfish, rex sole, flathead sole, shallow-water flatfish, sablefish, rockfish, Atka mackerel, and skates. None of the alternatives considered would revise the current MRAs for pollock, Pacific cod, the "other species" category (sharks, squid, octopus, and sculpins), or forage fish.

Alternative 1, the status quo or no action alternative, would not revise the MRAs for groundfish species in the arrowtooth flounder fishery. Overall the full harvest of the TACs established for the groundfish species have been found to have no adverse effects on the groundfish species (NMFS 2007a). The effect of arrowtooth flounder fishery on groundfish species is limited primarily by the TAC established for arrowtooth flounder and by the amount of the halibut PSC allowed in the trawl fisheries. For these reasons, Alternative 1 would have no impacts on groundfish stocks beyond those analyzed in the Groundfish Harvest EIS (NMFS 2007a).

Under Alternatives 2 and 3, the MRAs for groundfish in the arrowtooth flounder fishery would be increased from current levels. Increased MRAs would allow increased retention of groundfish closed to directed fishing in the arrowtooth flounder fishery. Increased retention of these incidentally caught groundfish would reduce discards. The opportunity for increasing retention may result in an increased catch of these incidental catch species in the arrowtooth flounder fishery. However, even if the amounts of groundfish retained in the arrowtooth flounder fishery increased, total removals of each species would be maintained within the TACs for each species established through the harvest specifications process. The impacts of the harvest strategies and resulting TAC amounts were analyzed in the Alaska Harvest Specifications Environmental Impact Statement (NMFS 2007a). This proposed action would have no additional impacts on the GOA environment beyond those analyzed in the EIS.

Estimates of discards in the groundfish fisheries are based on observer estimates which are not as accurate as landing and production reports. By allowing increased retention of groundfish in the arrowtooth flounder fisheries estimates of catch would be improved. Under Alternatives 2 and 3 the principal benefits would be to allow vessels participating in the arrowtooth flounder fishery the opportunity to reduce discards, as would be required under Alternative 1, of otherwise marketable groundfish and increase the utilization of these groundfish while still constrained by TAC limitations.

1.4.2 Prohibited Species

Prohibited species include salmon, steelhead trout, herring, halibut and king and Tanner crab. The effect of the arrowtooth flounder fishery on prohibited species is limited primarily by the TACs established for arrowtooth flounder, by the amount of the halibut PSC allowed in the trawl fisheries, and by seasonal and year round area closures to the use of trawl gear. In the GOA PSC limits have been established for halibut on a seasonal and annual basis which limits the impact on the halibut stock. No PSC limits have been established for salmon, crab, or herring. To minimize impacts on crab stocks the State has closed extensive areas of its waters to the use of bottom trawl gear and in Federal waters areas of historical crab habitat and abundance are closed to the use of bottom trawl gear on seasonal basis (Type 2 areas) and on a year round basis (Type 1 areas). In Federal waters additional areas (Type 3 areas) have also been identified for possible future closures. While not specifically designed to do so these area closures also reduce impacts on salmon in marine waters near their spawning habitat and on the spawning habitat of herring in nearshore waters.

Most of the arrowtooth flounder fishery in the Western GOA occurs 70 to 150 km offshore east of Dutch Harbor and another offshore area 70 to 100 km south of Sand Point. In the Central GOA most of arrowtooth flounder fishery occurs 10 to 40 km east of Cape Barnabas, in the northern half of the Shelikof Strait, and 30 to 70 km northeast and 60 to 90 km southwest of Chirikof Island. Additional harvest of arrowtooth flounder occurs as incidental catch throughout the GOA (source NMFS Catch-In-Areas Database, 2005).

Table 8 lists the annual incidental catch of prohibited species in the arrowtooth flounder fisheries in the GOA from 2003 through 2007. The incidental catch of salmon and crab are in numbers of individual animals, including all sizes and both sexes. The catch of arrowtooth flounder is in mt as is the incidental catch of herring and halibut. Between 2003 and 2007 the average number of incidental catch per mt of arrowtooth flounder catch has been 0.07 Chinook salmon, 0.03 other salmon, 0.00 red king crab, and 2.47 Tanner crab. Between 2003 and 2007 the average mortality of incidental catch per mt of arrowtooth flounder catch has been 0.002 mt of herring and 0.022 mt of halibut. In 2007 the total catch of Tanner crabs GOA wide in all groundfish fisheries amounted to 0.14 percent of the estimated number of individual Tanner crabs by the ADF&G Kodiak and South Peninsula crab surveys. Incidental catch of Tanner crab at these levels have no adverse effects on stocks of Tanner crab, whose populations experience extreme variation in numbers of animals annually of as much as 30 percent.

Alternative 1, the status quo or no action alternative, would not revise the MRAs for groundfish species in the arrowtooth flounder fishery. Overall the full harvest of the TACs established for the groundfish species have been found to have no adverse effects on the prohibited species (NMFS 2007a). The effects of arrowtooth flounder fishery on prohibited species is limited primarily by the TAC established for arrowtooth flounder, by the amount of the halibut PSC allowed in the trawl fisheries, and by seasonal and year round area closures to the use of trawl gear. For these reasons, Alternative 1 would have no impacts on the stocks of prohibited species beyond those analyzed in the Groundfish Harvest EIS (NMFS 2007a).

Under Alternatives 2 and 3, the MRAs for several species of groundfish in the arrowtooth flounder fishery would be increased from current levels. Increased MRAs would allow increased retention of groundfish closed to directed fishing in the arrowtooth flounder fishery. Incidental

catch rates of prohibited species would not be expected to increase or decrease. The incidental catch amounts of prohibited species would be expected to increase or decrease with an increase or decrease in the amount of arrowtooth flounder harvested. However, even the amount of arrowtooth flounder harvested in the fishery increased, total removals of prohibited species would not be expected to increase to adverse levels for the reasons discussed above. The impacts of the harvest strategies and resulting TAC amounts on prohibited species were analyzed in the Alaska Harvest Specifications Environmental Impact Statement (NMFS 2007a). Under Alternative 2 or 3 the proposed action would have no additional impacts on stocks of prohibited species in the GOA t beyond those analyzed in the EIS.

1.4.3 Steller Sea Lions

The eastern and western distinct population segments (DPS) of Steller sea lions (SSLs) and their designated critical habitat occur in the GOA. The western DPS is listed as endangered and the eastern DPS is listed as threatened under the Endangered Species Act (ESA). NMFS has jurisdiction under the ESA over SSLs and is responsible for the conservation and recovery of the species. To ensure the Alaska groundfish fisheries are not likely to result in jeopardy of extinction or adverse modification of critical habitat, SSL protection measures were implemented in 2003 and further revised in 2004 for the GOA (68 FR 204, January 2, 2003 and 69 FR 75865, December 20, 2004). These protection measures control the overall harvest of principal prey species (pollock, Pacific cod, and Atka mackerel) and provide temporal and spatial dispersion of harvests to avoid competition for prey between SSLs and the groundfish fisheries.

Three types of effects on SSLs could occur from the groundfish fisheries. First, groundfish fisheries incidentally take SSLs during fishing operations. Second, groundfish fisheries also may disturb SSLs so that they are unable to perform behaviors necessary for survival such as foraging, resting and reproduction. The third potential effect of the groundfish fisheries on SSLs is the potential competition for the prey species pollock, Pacific cod, and Atka mackerel.

The alternatives considered in this analysis would not result in changes in the fisheries that are likely to increase the potential for incidental takes or disturbance of SSLs because the alternatives do not propose measures that are likely to change the location or timing of the arrowtooth flounder fishery or the gear type that would used in this fishery in a manner that would increase interactions with SSLs. The MRAs for pollock and Pacific cod are not proposed to be revised under any of the alternatives and management of these species will remain as described in the management measures considered in the SSL Protection Measures SEIS (NMFS 2001). Because Alternative 1 makes no change to the management of the GOA fisheries, it would have no effects on SSLs or their designated critical habitat regarding prey competition beyond those already considered under previous consultations.

The SSL protection measures in place for Atka mackerel in the GOA prohibit directed fishing for Atka mackerel at any time during the year anywhere in the GOA. Atka mackerel is placed on bycatch status at the beginning of each year. Amounts of Atka mackerel up to the MRA may be retained, but catch of Atka mackerel in excess of the MRA must be discarded. Alternative 1 would leave the MRA for Atka mackerel in the arrowtooth flounder fishery unchanged at 0 percent. Alternative 2 would raise the MRA for Atka mackerel in the arrowtooth flounder fishery from 0 percent to 20 percent, while Alternative 3 would raise the MRA for Atka

mackerel to 5 percent. By increasing the MRA, Alternatives 2 and 3 would allow increased retention of Atka mackerel in the arrowtooth flounder fishery. The concern for SSLs would be if allowing increased retention of Atka mackerel would encourage fishermen to catch more Atka mackerel because they now could retain some or all of it.

To understand the potential impacts of the alternatives on SSL, we need to understand the current conditions for SSL in the area, their use of Atka mackerel during the year, and how that use may overlap with potential fishing activities. Counts of non-pup sea lions in 2006 were essentially unchanged from 2004 counts in the eastern and western survey areas in the GOA and have increased between 2000 and 2004 (Fritz et al. 2006). In a study of sea lion scats between 1999 and 2005, Atka mackerel was an important part of the sea lions' diet during summer months in the Western GOA (Table 9).

Tables 4 through 7 show the catch of Atka mackerel associated with the arrowtooth flounder fishery from 2003 through 2006. The catch of Atka mackerel in this fishery has been very low (42 mt in 2003, 2 mt in 2004 and 2006, and 9 mt in 2005). The 2008 and 2009 Atka mackerel TAC recommend by the Council is 1,500 mt and the acceptable biological catch is 4,700 mt, unchanged from 2007. Therefore, recent catches of Atka mackerel in the arrowtooth flounder fishery has represented a small proportion of the total catch of Atka mackerel in all GOA groundfish fisheries. The full harvest of the Atka mackerel TAC within the constraints of the SSL protection measures (closure to directed fishing) is not expected to increase competition to the point of having a population effect on SSLs because the TAC is well below the acceptable biological catch. In addition, as described in Section 1.3.3, there is very little targeting of arrowtooth flounder in the summer months. Therefore, as long as the arrowtooth flounder fishery continues to occur primarily outside of summer months, there is little likelihood of an increased total catch of Atka mackerel in the Western GOA during the time of the year that Atka mackerel appears to be most important as SSL prey under either Alternative 2 or 3.

Most of the arrowtooth flounder fishery in the Western GOA occurs 70 to 150 km offshore east of Dutch Harbor and another offshore area 70 to 100 km south of Sand Point. In the Central GOA most of arrowtooth flounder fishery occurs 10 to 40 km east of Cape Barnabas, in the northern half of the Shelikof Strait, and 30 to 70 km northeast and 60 to 90 km southwest of Chirikof Island. Additional harvest of arrowtooth flounder occurs as incidental catch throughout the GOA (source NMFS Catch-In-Areas Database, 2005).

Table 10 presents the catch of Atka mackerel (GOA wide) and arrowtooth flounder in the Western GOA in 2007 broken into three seasons. The first season pre-rockfish is from January 1 to July 1, the rockfish season in 2007 in the Western GOA was from July 1 to August 6, and the post rockfish season was from August 6 to December 31. Most of the incidental catch of Atka mackerel in the GOA occurs during the rockfish fishery in the Western GOA offshore at depths of 60 to 120 fathoms. The 2007 gulf wide incidental catch of 1,442 mt of Atka mackerel mostly from the Western GOA (1,266 mt) and Area 620 of the Central GOA (155 mt). Of these amounts 734 mt were retained by catcher processors and 28 mt were retained by catcher vessels in the Western GOA. In the Central GOA 126 mt were retained by catcher processors and 4 mt were retained by catcher vessels. Once the TAC for Atka mackerel is reached Atka mackerel must be treated as a prohibited species and may not be retained in any groundfish fishery. Given that the annual Atka mackerel TAC (1,500 mt) is at present almost entirely taken during the rockfish fisheries in Western GOA during the summer there would be little incentive to top off

on Atka mackerel during the pre or post rockfish seasons during the spring or fall which could lead to prohibited species status for Atka mackerel in all groundfish fisheries.

However, if the arrowtooth flounder fishery does occur in the summer months in the future and if increasing the MRA for Atka mackerel leads to an increase in the catch of Atka mackerel within SSL protection areas, these conditions could lead to localized depletion of Atka mackerel that were not previously considered. This behavior would have less of an effect in the Eastern and Central GOA where it appears there is very little or no dependence on Atka mackerel by SSLs. Increased catch of Atka mackerel inside the protection areas in the Western GOA in the summer would be more of a concern due to the apparent potential competition for Atka mackerel between SSLs and the fisheries that may occur.

Alternative 3 (increase Atka mackerel MRA to 5 percent) has less of a potential to lead to an increased catch of Atka mackerel in the future than does Alternative 2 (increase MRA to 20 percent). However, the MRA for Atka mackerel in all of the other GOA groundfish fisheries, except arrowtooth flounder, is 20 percent already. Therefore, Alternative 2 would increase the MRA for Atka mackerel in the arrowtooth flounder fishery to the MRA that applies for all of the other GOA groundfish fisheries. The impact of a 20 percent MRA in all of the other GOA groundfish fisheries was considered in development of the current SSL protection measures and was not identified as a management measure that would lead to localized depletion of Atka mackerel inside SSL critical habitat.

Although it is difficult to predict how an increase in MRAs will change the fishing behavior of participants in the arrowtooth flounder fishery, neither Alternative 2 or 3 is expected to significantly change the timing of the arrowtooth flounder fishery or the total catch of Atka mackerel in this fishery. The catch of Atka mackerel in the arrowtooth flounder fishery has been low in the past and the participants in this fishery have had opportunities in all of the other GOA groundfish fisheries to retain Atka mackerel under the MRAs established in those fisheries. Localized depletion of Atka mackerel was not identified as a concern with a 20 percent MRA for Atka mackerel in these other groundfish fisheries.

1.5 Cumulative Effects

NEPA requires that EAs analyze the potential cumulative effects of a proposed action and its alternatives. An EA must consider cumulative effects when determining whether an action significantly affects environmental quality. Cumulative effects are those combined effects on the quality of the human environment that result from the incremental impacts of the proposed action when added to other past, present, and reasonably foreseeable future actions (40 CFR 1508.7, 1508.25(a), and 1508.25(c)). Cumulative impacts can result from individually minor, but collectively significant, actions over time. The concept behind cumulative effects analysis is to capture the total effect of many actions over time that would be missed by evaluating each action individually.

The potential direct and indirect effects of the GOA groundfish fisheries on target species and prohibited species are detailed in the Groundfish Harvest EIS (NMFS 2007a). Direct effects include fishing mortality, changes in biomass, and spatial and temporal concentration of catch that may lead to a change in the population structure. Indirect effects include the changes in prey

availability and changes in habitat suitability. Indirect effects are not anticipated to occur with any of the alternatives analyzed because the proposed action would not change overall fishing practices that indirectly affect prey availability and habitat suitability. To the extent practicable, this analysis incorporates the cumulative effects analysis in the Groundfish Harvest EIS (NMFS 2007a).

No additional past, present, or reasonably foreseeable cumulative negative impacts on the natural and physical environment have been identified that would accrue from any of the alternatives considered for the proposed action. Cumulatively significant negative impacts on these resources are not anticipated with the proposed action because no negative direct or indirect effects on GOA resources have been identified.

1.6 Future Considerations and Pending Actions

There are a number of actions that have been implemented or that currently are being developed that will affect the GOA groundfish fisheries, including the arrowtooth flounder fishery.

2008-2009 GOA Groundfish Harvest Specifications

The annual harvest specifications establish annual ABC, TAC, PSC and various other catch limits for two year, overlapping cycles. In the final groundfish harvest specifications established for 2007-2008, NMFS increased the TAC for arrowtooth flounder in the Central GOA from 25,000 mt in 2006 to 30,000 mt for the 2008 and 2009 fishing years. This action was taken primarily to avoid regulatory discards of arrowtooth flounder as the fishery develops. Should the 2008 and 2009 TACs for arrowtooth flounder be fully utilized under Alternative 1, regulatory discards of other groundfish species would be expected to increase slightly if the arrowtooth flounder TACs were fully harvested. Halibut mortality in the arrowtooth flounder fishery would also be expected to increase making less halibut mortality available to support other directed groundfish fisheries, most notably the deep-water flatfish and rex sole fisheries through October 1 and all groundfish fisheries later in the year.

Central GOA Rockfish Pilot Program

The Rockfish Program in the Central GOA began in 2007. Three principal rockfish targets, Pacific ocean perch, northern rockfish, and pelagic shelf rockfish, are allocated to participating user groups. For those vessels fishing in cooperatives specific amounts of associated secondary species (Pacific cod, rougheye and shortraker rockfish, thornyhead, and sablefish) are also allocated. MRAs will not apply for those species and those not taken incidentally may be taken by directed fishing. For those vessels fishing in the limited access fishery lower MRAs then at present will apply. A specific amount of the third seasonal apportionment of halibut mortality from the deep-water complex will be allocated to those vessels participating in cooperatives. The arrowtooth flounder fishery is not expected to have any effect on the Rockfish Program fishery. However the flexibility accorded to vessels participating in the Rockfish Program may allow more vessels to enter the arrowtooth flounder fishery. In 2007 vessels participating in the Rockfish Program greatly reduced the amount of halibut mortality in the rockfish fisheries. This was achieved through the use of pelagic trawl gear rather than bottom trawl gear to target rockfish. As a result 128 mt of additional halibut mortality became available to support all trawl groundfish fisheries (including arrowtooth).

GOA Rationalization

The development of a Gulf Rationalization program has slowed pending additional social and economic analyses of potential impacts. Still a rationalization program could include many of the management measures incorporated into the Rockfish Program including a more comprehensive review and revision of MRAs for groundfish as basis species.

Fisheries Recordkeeping and Reporting Revisions

NMFS is preparing a regulatory amendment to 50 CFR part 679 that will make several revisions to recordkeeping and reporting requirements. It will implement an interagency electronic reporting system, called E-landings, for use by shoreside seafood processors; provide an option for the use of electronic logbooks rather than paper logbooks by CVs, CPs, and motherships; provide more uniform language; and revise permit-related regulations. These changes are intended to improve the method and procedures for recordkeeping and reporting for the fishery programs administered by NMFS, Alaska Region, the Alaska Department of Fish and Game, and the International Pacific Halibut Commission. E-landings can be currently used to report landings and production data for groundfish statewide, Individual Fishing Quota (IFQ)/Community Development Quota (CDQ) crab and Community of Adak golden king crab, and halibut and sablefish IFQ. E-landings is intended to simplify and standardize reporting across fisheries and make fisheries data more readily and accurately available to fisheries managers and the fishing industry. In the future, the system will include landings and production data reports for shellfish, salmon, and other fisheries.

Private Sector Actions

The current development of halibut excluder devices for trawl gear could reduce halibut mortality in the arrowtooth flounder fishery. In the GOA halibut mortality is the major constraint on further development of the arrowtooth flounder and other flatfish fisheries. Several shoreside vessels plan to experiment with using pelagic trawl gear to target arrowtooth flounder in 2008 with the goal of reducing bycatch.

2 Regulatory Impact Review: Economic Impacts of the Alternatives

This chapter provides information on the economic and socioeconomic impacts of the alternatives, as required by Executive Order 12866 (E.O. 12866). This chapter includes a description of the purpose and need for the action and the management objects, a description of the alternatives proposed to meet those objectives, identification of the individuals or groups that may be affected by the action, the nature of those impacts (quantifying the economic impacts where possible), and discussion of the tradeoffs.

The preparation of an RIR is required under E.O. 12866 (58 FR 51735; October 4, 1993). The requirements for all regulatory actions specified in E.O. 12866 are summarized in the following statement:

> *In deciding whether and how to regulate, agencies should assess all costs and benefits of available regulatory alternatives, including the alternative of not regulating. Costs and Benefits shall be understood to include both quantifiable measures (to the fullest extent that these can be usefully*

estimated) and qualitative measures of costs and benefits that are difficult to quantify, but nonetheless essential to consider. Further, in choosing among alternative regulatory approaches agencies should select those approaches that maximize net benefits (including potential economic, environmental, public health and safety, and other advantages; distributive impacts; and equity), unless a statute requires another regulatory approach.

E.O. 12866 requires that the Office of Management and Budget (OMB) review proposed regulatory programs that are considered to be "significant." A "significant regulatory action" is one that is likely to

- 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, local or tribal governments or communities;
- Create a serious inconsistency or otherwise interfere with an action taken or planned by another agency;
- Materially alter the budgetary impact of entitlements, grants, user fees, or loan programs or the rights and obligations of recipients thereof; or
- Raise novel legal or policy issues arising out of legal mandates, the President's priorities, or the principles set forth in this Executive Order.

Under the Magnuson-Stevens Act, the United States has exclusive fishery management authority over all marine fishery resources found within the EEZ. The management of these marine resources is vested in the Secretary of Commerce (Secretary) and in the Regional Fishery Management Councils. The groundfish fisheries in the Gulf of Alaska (GOA) EEZ are managed under the FMP for Groundfish of the GOA.

The authority to alter the application of MRAs to groundfish fisheries, including changing MRA percentages for groundfish in the arrowtooth flounder fishery in the GOA is granted to NMFS under the Magnuson-Stevens Act. To the extent that MRAs may slow bycatch, the statutory authority for bycatch reduction measures is specifically addressed in Sec. 301(a) of the Magnuson-Stevens Act. That section establishes National Standard 9–Bycatch, which directs the Councils to minimize bycatch to the extent practicable and to minimize mortality of bycatch when it cannot be avoided.

Regulations for the GOA MRAs and how they are calculated are found at 50 CFR 679.20 parts (e) and (f) and in Table 10 to Part 679.

2.1 Purpose and Need for Action

The proposed action would increase the MRAs for groundfish in the arrowtooth flounder fishery in the GOA. MRAs are the primary tool NMFS uses to regulate the catch rate of species closed to directed fishing, but not on bycatch-status. The MRA of a species closed to directed fishing is the maximum weight of that species that may be retained onboard a vessel, calculated as a percentage of the weight of the retained catch onboard the vessel of all groundfish species open to directed fishing (the basis species). The purpose of the proposed action is to provide an opportunity to trawl fishing operations targeting arrowtooth flounder to retain more groundfish, and, thus, reduce regulatory discards.

In 1994, the Council set most of the groundfish MRAs at zero, relative to retained amounts of arrowtooth flounder, to prevent vessels from using arrowtooth flounder (a species for which no market existed) as a basis species for retention of more readily marketable species. At that time, there were concerns that fishing vessel operators would target arrowtooth flounder to increase the retainable amounts of valuable species, closed to directed fishing, and increase bycatch amounts of Pacific halibut. Increased halibut bycatch rates could result in reaching halibut bycatch limits before the total allowable catches (TACs), established for other trawl target fisheries, were harvested.

Since 1997, markets for arrowtooth flounder have developed and this species now attracts a target fishery. As a result, representatives for the GOA trawl industry now advocate changing the MRAs for GOA groundfish, to expand the use of arrowtooth flounder as a basis species for the retention of groundfish closed to directed fishing. Products made from arrowtooth flounder now include whole fish, surimi, headed and gutted (both with and without the tail on), fillets, frills or engama (fleshy fins used for sashimi and soup stock), bait, and meal.

In October 2006, the Council received a proposal from industry to revise the MRAs of groundfish in the arrowtooth flounder fishery in the GOA. The problem statement, made by the industry and adopted by the Council, may be summarized as follows:

> When the MRAs for the directed GOA arrowtooth flounder fishery were set in regulations in 1994, the Council chose to set incidental catch allowances at zero for a wide group of species, to prevent vessels from using arrowtooth flounder as a basis species for retention, since there was no market for arrowtooth flounder. Arrowtooth flounder is now a viable target fishery, and efforts to improve retention of many groundfish species utilized by the trawl sectors are constrained by MRAs in the directed GOA arrowtooth flounder fishery. MRAs are a widely used groundfish management tool to reduce targeting on a species and slow harvest rates, as an allocation approach. However, sometimes species managed with MRAs must be discarded, even though economic incentives exist to retain that species. Thus, the MRA forces regulatory discards of some species that might otherwise be retained, without undermining the intent of the MRA as a tool to reduce overall harvest rates. This regulatory amendment would evaluate raising the MRAs for some species in the directed GOA arrowtooth flounder fishery, to provide increased opportunity for retention of species harvested by the trawl sectors, and, thus, reduce overall discards in this sector, while not subjecting incidentally caught species to increased allocation concerns.

Although not explicit in the problem statement, the Council recognizes that revising the MRAs of higher valued groundfish, taken incidentally in the arrowtooth flounder fishery, provides a *de facto* economic incentive to induce entry into the arrowtooth flounder fishery. As noted in the Regulatory Impact Review (RIR) analysis, higher MRAs will likely be a significant factor in a decision to participate in the arrowtooth flounder fishery.

2.2 MRA Regulations

MRA regulations establish the calculation method and MRAs for groundfish species that are closed to directed fishing. The MRA is calculated as a percentage of the retained amount of species closed to directed fishing, relative to the retained amount of basis species or species groups open for directed fishing. All MRA accounting is computed based upon processed product that is converted to round weight equivalents, using standardized product recovery rates. Table 10 of 50 CFR part 679 (see Appendix 1) lists retainable percentages for GOA incidental groundfish species, used to calculate an MRA. Amounts that are caught in excess of the MRA percentage must be discarded. Current regulations limit vessels to MRAs at any time during a fishing trip.

A fishing trip is defined at 50 CFR part 679.2 as:

> (i) With respect to retention requirements of MRA, an operator of a CP or mothership processor vessel is engaged in a fishing trip from the time the harvesting, receiving, or processing of groundfish is begun or resumed in an area until
>
> (A) The effective date of a notification prohibiting directed fishing in the same area under § 679.20 or § 679.21;
>
> (B) The offload or transfer of all fish or fish product from that vessel;
>
> (C) The vessel enters or leaves an area where a different directed fishing prohibition applies;
>
> (D) The vessel begins fishing with different type of authorized fishing gear; or
>
> (E) The end of a weekly reporting period, whichever comes first.

MRAs are the primary tool NMFS uses to regulate the catch of species closed to directed fishing. The MRA table is a matrix of proportions representing a range of rates of expected or accepted incidental catch of species closed to directed fishing, relative to target species. As a management tool, MRAs rely on the ability of the vessel operator to selectively catch the target species. The target species is called a basis species in regulation. The species closed to directed fishing is the incidental species. The MRA percentages are intended to slow the rate of harvest of a species, when insufficient TAC or PSC amounts are available to support a directed fishery.

NMFS prohibits directed fishing for a species, to avoid reaching a TAC (typically established for conservation reasons), reaching an amount or percent of groundfish included in the annual specifications for a gear and species or species group, or for a prohibited species limit (e.g., halibut limits). When NMFS prohibits directed fishing, retention is allowed up to the amount established as the MRA. The MRA table 10 at 50 CFR part 679, shows retainable proportions of incidental species, relative to species open to directed fishing. Vessel operators calculate the MRA through three basic steps. First, they identify and calculate the round weight of the basis (or target) species on board. Next, they identify the appropriate fraction from the MRA table, and then multiply that rate against the round weight of the basis species. The calculated maximum amount limits retention of the incidental species. A vessel will typically discard catch of the incidental species in excess of the permissible amount, to avoid violation of current regulation. The catcher/processor vessel (CP) operator must calculate the MRA in real time, at any time during the fishing trip, often referred to as an “instantaneous” calculation. The shoreside catcher vessel (CV) operator calculates the MRA upon returning to port for delivery of retained catch.

A groundfish fishing trip begins when fishing gear is deployed by a vessel and meets any of the regulatory conditions of a fishing trip at § 679.2. By regulation, several conditions end a trip for a CP (based on whichever condition occurs first): (1) NMFS prohibits directed fishing for any species in the Federal reporting area where the vessel is fishing, (2) the vessel offloads, (3) the vessel moves into an area where a directed fishing closure exists, (4) the vessel switches gear, or (5) the weekly reporting period ends. A trip defines the period during which a vessel operator calculates the amount of incidental species retained.

At the time NMFS prohibits directed fishing for a specific groundfish species, MRAs buffer the amount of catch of that species that may occur in other directed groundfish fisheries that remain open.

For several incidental/basis species combinations, the use of low MRA rates may reduce the incentive for topping off that would occur in the absence of this tool. In these cases, the MRAs represent the expected catch of an incidental species, absent deliberate action by the vessel operator to maximize that incidental catch. The requirement to not exceed the MRA proportion at any time during a trip, limits the vessel operators' ability to maximize catch value. This restriction is used to limit total catch of species with low TAC amounts (relative to the species caught in the directed fisheries), placing the species at greater risk of being caught in excess of the overfishing level. These MRA species also tend to be higher valued catch (e.g., some rockfish species, as well as sablefish, meet these criteria in the GOA).

Current regulations establish a relatively high MRA for particular species. For example, a generous rate of 35 percent for arrowtooth flounder as an incidental species is applied to open groundfish targets as a basis species (Appendix 1). Experience of NMFS managers has demonstrated that several directed trawl fisheries have incurred high arrowtooth flounder incidental catch rates. The higher MRA allows for increased indirect targeting on arrowtooth flounder. For other species, where restricting catch to an incidental rate is not a consideration, regulations establish a default MRA rate of 20 percent.

2.3 Description of Alternatives

The alternatives establish MRAs, over a range of values, for incidental catch species, relative to arrowtooth flounder as a basis species. Alternative 1 maintains the existing MRA percentages, which are zero, with the exception of pollock (5 percent), Pacific cod (5 percent), "other species" (20 percent), and forage fish (2 percent). Alternative 2 would increase the MRA percentages for most species to 20 percent. Alternative 3 would increase the MRA percentages for most species at a more modest level compared to Alternative 2. Table 1 lists the MRA percentages under each of the alternatives for comparison. Note that the basis species, under each alternative, is arrowtooth flounder and that the MRA percentages for each incidentally catch species are found in the columns.

2.3.1 Alternative 1: Status Quo (No Action)

Under this alternative the MRAs of incidental catch of groundfish relative to arrowtooth flounder as a basis species are unchanged. These amounts are listed under Alternative 1 in Table 1 and in

Table 10 to 50 CFR part 679 (Appendix 1). Under this alternative only pollock, Pacific cod, and species which comprise the "other species" complex (squid, shark, octopus, and sculpins) and forage fish may be retained relative to arrowtooth flounder as a basis species. All other incidental species must be discarded relative to retained arrowtooth flounder.

Many incidental species assigned an MRA of zero are caught in conjunction with arrowtooth flounder when the incidental species are open to directed fishing. Under those conditions retention of the incidental species is not restricted. Retention of incidental species is restricted only when the fishery is closed to directed fishing due to TAC considerations (e.g., skates are closed all year to directed fishing) or when limited by a trawl halibut mortality closure.

2.3.2 Alternative 2 (preferred alternative): Set MRAs as per Industry Proposal

Under this alternative, MRAs for incidental catch of groundfish, relative to arrowtooth flounder as a basis species, would be established at the proposed levels (see Table 1). The intent of the proposal is to reduce regulatory discards and increase utilization of marketable fish. The proposal could also reduce violations of the MRA restrictions incurred when vessels are unable to completely discard incidentally caught species that are currently restricted to zero retention. Compared to Alternative 1, the MRAs for pollock, Pacific cod, "other species", and forage fish are unchanged. The MRAs for the remaining species are increased. Sablefish and rockfish are raised to 1 percent and 5 percent, respectively. Flatfish species, skates, and Atka mackerel are increased to 20 percent.

Because pollock and Pacific cod are fully utilized in directed fisheries, and are prey species for the endangered Steller sea lion, it is the intent of the alternative to limit incidental catch, so as not to increase the potential for topping off. The increases in the MRA for rockfish and sablefish are based on estimates of the incidental catch rates (Tables 4 through 7) and are proposed to reduce regulatory discards of marketable fish without providing an incentive to top off.

In October 2007, the Council selected Alternative 2 as its preferred alternative. The Council believes that Alternative 2, which raises the MRAs for all flatfish, Atka mackerel, and skates to 20 percent, offers the best approach to reducing discards of otherwise marketable fish in the arrowtooth flounder fishery. The preferred alternative raises the MRAs for these species in the arrowtooth flounder fishery to a level equal to the MRAs established for other groundfish fisheries in the GOA.

2.3.3 Alternative 3: Set MRAs near Recent High Catch Levels Associated with the Arrowtooth Flounder Fishery

Under Alternative 3, MRAs for incidental catch, relative to arrowtooth flounder as a basis species, would be set near recent high annual catch rates of species landed in conjunction with arrowtooth flounder (see Table 1).

Like Alternatives 1 and 2, under Alternative 3, the MRAs are unchanged from status quo for pollock, Pacific cod, "other species", and forage fish to respond to concerns expressed in the industry proposal. Alternative 3 MRAs are unchanged for rockfish and sablefish, compared to Alternative 2, and they are lower for deep-water flatfish, rex sole, flathead sole, shallow-water

flatfish, Atka mackerel, and skates. The rates for deep-water flatfish, rex sole, flathead sole and shallow-water flatfish were derived from Tables 4 through 7. The highest rate for an individual specie or species group, across the years, was identified and rounded up to the nearest 5 percent.

The intent of this alternative is to (1) reduce regulatory discards and improve the utilization of groundfish incidentally taken in the arrowtooth flounder directed fishery, (2) prevent an increase in groundfish catch in the arrowtooth flounder fishery, substantially beyond recent incidental catch levels, and (3) continue to keep MRAs for important Steller sea lion prey species (pollock, Pacific cod, and Atka mackerel) at low levels.

2.4 Description of the GOA Arrowtooth Flounder Fishery

Arrowtooth flounder (*Atheresthes stomias*) range from central California to the eastern Bering Sea and are currently the most abundant groundfish species in the Gulf of Alaska. Prior to 1990, flatfish catch in the GOA was reported as an aggregate of all flatfish species. The principal flatfish targets at that time were rock sole (shallow-water flatfish), rex sole, and Dover sole (deep-water flatfish). Substantial amounts of arrowtooth flounder and other flatfish were discarded at sea, as undesired species, size, or sex. Total GOA catch of arrowtooth, including targeted and incidental catch, has ranged between 13,000 mt (1998) and 27,645 mt (2006). The catch of arrowtooth flounder in the target fishery has increased from 6,767 mt in 1997, to 15,344 mt in 2006. The vast majority of arrowtooth flounder catch is taken by trawl gear. Catches of arrowtooth flounder in recent years have approached established TACs in some areas. In order to reduce potential discards of arrowtooth, the Council raised the TAC for arrowtooth flounder from 5,000 mt, to 8,000 mt, in the Western GOA in 2001, and from 25,000 mt, to 30,000 mt, in the Central GOA in 2007.

The MRA regulations identify basis and incidental species retention on different timeframes and species compositions, than the CAS target calculations. Therefore, Tables 4 through 7 do not show catch associated only with arrowtooth flounder as a basis species. Vessels may retain several species open to directed fishing. If several species are open to directed fishing and are landed together (which is generally the case), the predominate retained species is assigned as the target. The display of annual retained and discarded species within the arrowtooth flounder target, therefore, does not reflect the MRA proportions, but rather, a dynamic of multiple 'target' species, caught together in the trawl groundfish fishery. These tables provide all the species that are caught in conjunction with arrowtooth flounder. The information was calculated from discard rates observed from at-sea sampling and industry reported retained catch. Table 2 includes discarded and retained GOA arrowtooth flounder from 1997 to 2007. Most apparent in Table 2 is the increase in the percent of arrowtooth flounder retained, which increased from a low of 16 percent in 1998, to a high of 64 percent in 2005. Table 3 breaks down the retention and discard of arrowtooth flounder, by gear type and processing component in 2006. Tables 4 through 7 present the catch of groundfish attributed to the arrowtooth flounder fishery by the NMFS catch accounting system, from 2003 through 2006.

The proportion of arrowtooth flounder that is retained has increased in recent years indicating that the species has become a legitimate target. Catch data in Table 2 indicate the retention status of arrowtooth flounder for 1997 through 2006. For the entire groundfish fleet, recent discards (1997 through 2006) of the total arrowtooth flounder catch have ranged between 84 percent in

1998 to 36 percent in 2005. When catches have been assigned by the NMFS catch accounting system (Tables 4 through 7) from 2003 through 2006 the amount of arrowtooth flounder retained has ranged from 72 percent in 2003 to 83 percent in 2006. The absolute amount of arrowtooth flounder has increased as well.

In the GOA the arrowtooth flounder fishery is exclusively prosecuted by CPs and CVs using bottom trawl gear. Although arrowtooth flounder is open to hook-and-line, pot, and jig gear, very small amounts of arrowtooth flounder are harvested by other these gear types, and then only as incidental catch in other fisheries and is subsequently discarded. Table 3 shows that within the trawl catch about 56 percent are taken by CVs and 44 percent by CPs.

The limited amount of arrowtooth flounder taken by hook-and-line gear is incidental to the sablefish and Pacific cod fisheries. Within CVs, the hook-and-line fishery for sablefish takes the vast majority. Additional amounts are taken in the CP hook-and-line fishery for sablefish and their fishery for Pacific cod. Within the CP hook-and-line fisheries, about half of the arrowtooth flounder caught was retained. Within the CV hook-and-line fishery, all arrowtooth flounder was discarded.

Trawl-caught arrowtooth flounder is distributed among several targets and tends to group based on processing mode. Figure 1 shows that CPs take arrowtooth flounder predominately in the arrowtooth flounder target, followed by rex sole, flathead sole, and small amounts in the rockfish target. CVs likewise take the majority of their arrowtooth flounder in the arrowtooth flounder target followed by pollock, shallow-water flatfish (the catch is predominately rock sole), rockfish, and Pacific cod.

In general, the majority of the harvest of arrowtooth flounder occurs during the March to May time frame (see Figure 2). Depending upon the availability of the halibut PSC allowance for the deep-water complex thorough October 1, vessels may also target arrowtooth flounder in October and November, if there is remaining halibut PSC available to support the trawl fisheries at that time. Catch patterns for the Central GOA show that most of the directed fishing for arrowtooth flounder occurs in the spring, following the closure of the Pacific cod A season. In the Western GOA, most of the directed fishing for arrowtooth flounder occurs during the spring, by CPs coming from the Bering Sea, after rock sole and yellowfin sole closures. Following the seasonal closures of these fisheries, vessels target arrowtooth flounder until the second seasonal halibut bycatch cap for the deep-water complex is reached, which is most often in May. Generally, after the arrowtooth flounder fishery closes, these vessels shift to several different targets; notably flatfish species in the shallow-water complex, rockfish, pollock, and Pacific cod as the seasonal allowances of these targets become available. The implementation of the Rockfish Pilot Program in the Central GOA in 2007 and, potentially, Amendment 80, may result in shifts in effort and timing of the arrowtooth flounder fishery.

Historically, arrowtooth flounder has had limited value, compared to many other groundfish species in the GOA. Prior to 1994, the species was used as a very low valued basis species to target species closed to directed fishing. For example, arrowtooth flounder was retained on CVs as a basis for retaining sablefish. Once the sablefish and arrowtooth flounder were delivered to a plant, the arrowtooth flounder was either sent to a meal plant or discarded. In 1994, all MRAs relative to arrowtooth flounder were set at zero. In 1997, the MRAs for Pacific cod and pollock were set at 5 percent, and for forage fish at 2 percent. The 1994 and 1997 actions shared the

intent of improving the use of halibut bycatch mortality, relative to the other trawl groundfish targets, and slowing the catch rate of sablefish. The 1997 rule also intended to increase utilization of pollock and Pacific cod in the directed arrowtooth flounder fishery. At that time, there were concerns that fishing vessel operators would target arrowtooth flounder to increase the retainable amounts of valuable species, closed to directed fishing, and increase bycatch amounts of Pacific halibut. Increased halibut bycatch rates could result in reaching halibut bycatch limits, before the TACs established for other trawl target fisheries were harvested.

Since 1997, markets for arrowtooth flounder have gradually been developing. Although arrowtooth flounder market prices fluctuate widely, this species now supports a viable target fishery. The principle buyers of arrowtooth flounder are China and Japan. The primary product for arrowtooth flounder is the frill, which is the fleshy fins used for engawa, a type of sushi. Engawa, normally a premium sushi made from halibut or Greenland turbot, is more affordable using arrowtooth flounder. Unlike most other flatfish, the frill of the arrowtooth flounder is sufficiently sized to cover the rice on sushi, which is critical in sushi markets. The primary market for arrowtooth flounder engawa is Japan. A secondary product for arrowtooth flounder is fillets. A large portion of the arrowtooth flounder fillets shipped to China are processed and exported to the U.S. markets as inexpensive flounder. Some portion arrowtooth flounder processed in Japan is also sold as fillets in the Japanese market. Recently, some arrowtooth flounder fillets have shown up in European markets.

Average gross earnings, per round metric ton of retained arrowtooth flounder, received by both shoreside processors and CPs, increased from 2001 to 2005. These are displayed in Table 10. For shoreside processors, these estimates include the product value of catch from both Federal and State of Alaska fisheries. For CPs, they include only the product value from catch counted against Federal TACs. These price approximations are based on a combination of weekly production reports, Alaska Commercial Operators Annual Reports (COARs), and blend and other catch accounting data, and tend to support anecdotal observations from the Alaska Groundfish Data Bank that prices for this species have increased in recent years. Table 16 provides annual wholesale price per metric ton of GOA Atka mackerel, flatfish, flathead sole, POP, rockfish, and sablefish, from 2001 to 2005, for the trawl CP sector.

2.5 Expected Effects of the Alternatives

This section provides an analysis of three alternatives: (1) Status Quo/No Action, (2) industry proposed MRAs, and (3) MRAs near recent high incidental catch levels. Assessing the effects of the alternatives involves some degree of speculation. In general, the effects arise from the actions of individual participants in the fisheries under the incentives created by the different alternatives. Predicting these individual actions and their effects is constrained by incomplete information concerning the fisheries, including the absence of complete economic information and well-tested models that predict behavior under different institutional structures. In addition, exogenous factors, such as stock fluctuations, market dynamics, and macro condition in the global economy, will influence the responses of the participants under each of the alternatives.

2.5.1 Alternative 1: Status Quo/No Action

Under Alternative 1, the MRAs would not be revised for groundfish species in the GOA directed arrowtooth flounder fishery. Maintaining the existing MRAs would continue to require trawl CVs and CPs to discard any groundfish species that have a zero MRA, if those fisheries were closed to directed fishing. For a more detailed description of status quo, see the background section of the Regulatory Impact Review (Section 2.3). Overall, the status quo alternative is likely to result in the continuation of existing practices and patterns. However, in the future, if the price of arrowtooth flounder continues to increase, the economic incentive for trawl vessels to target arrowtooth will likely increase. Under Alternative 1, this potentially could result in higher regulatory discards of valuable incidental catch species.

Frequently, vessels targeting arrowtooth flounder also harvest lesser amounts of flathead sole, shallow- and deep-water flatfish, or "other species", which are open to directed fishing. These flatfish amounts allow for the lawful retention of small amounts of groundfish species harvested with arrowtooth flounder that might otherwise require thorough sorting of catch and at-sea discards. To date, NOAA Fisheries Enforcement has not observed any significant amounts of groundfish that were required to be discarded, being retained and landed concurrent with directed arrowtooth flounder landings. In addition, monitoring compliance with MRAs in the arrowtooth flounder fishery has not required high levels of enforcement resources.

2.5.2 Alternatives 2 and 3

2.5.2.1 Impacts to the Arrowtooth Flounder Fishery

Under Alternatives 2 and 3, trawl sectors targeting GOA arrowtooth flounder could retain a higher percentage of the incidentally caught groundfish, when the latter are closed to directed fishing. Table 17 provides closure dates for GOA shallow-water and deep-water complexes, for 2005 and 2006. As noted in Table 17, many of the species are open to directed fishing concurrently with arrowtooth flounder. For purposes of apportioning halibut PSC in the GOA, groundfish species are divided into the deep-water and shallow-water complex. Arrowtooth flounder is grouped with deep-water flatfish, rex sole, sablefish, and rockfish in the deep-water species complex. When the deep-water complex is open to directed fishing, arrowtooth flounder, rex sole, and deep-water flatfish can be retained at rates unrestricted by the MRA tables. Likewise, when the shallow-water complex is open concurrently with the deep-water complex, flathead sole and shallow-water flatfish can be retained without proportional restrictions. However, as shown in Table 17, it is possible the shallow-water complex can close to directed fishing when the seasonal halibut PSC allocation for that complex is fully utilized, while the deep-water complex is still open for directed fishing. In addition, many of the rockfish species (thornyhead, shortraker, and rougheye) are closed to directed fishing, on January 1, due to insufficient TAC. As a result, these species are placed on bycatch status, and could be retained up to the MRA percentage, under Alternatives 2 and 3, in the arrowtooth flounder target fishery. Covert targeting of rockfishes closed to directed fishing, under the guise of MRA retention, could have undesirable consequences for these populations.

Increasing the MRAs could be a factor in a decision to participate in the arrowtooth flounder fishery. The economic characteristics of the trawl CP and CV sectors vary widely. It is possible that some participants will take into consideration the economic value of the bycatch species in

the directed arrowtooth flounder fishery to estimate the benefit of targeting arrowtooth flounder. Under Alternative 1, those groundfish species with an MRA set at zero, when closed to directed fishing, must be discarded, regardless of the value of the species. This is, of course, precisely the purpose and intent of "closing" directed fishing and strictly controlling incidental bycatches.

Under Alternatives 2 and 3, high valued species that are "closed" to directed fishing could be retained, up to the MRA, thus, potentially increasing the vessel's net revenue, while targeting arrowtooth flounder. These alternatives also provide a strong economic incentive to harvest these otherwise unavailable high valued species, up to their MRA amounts. This has proven to include the practice of "topping off" by targeting the MRA species directly, until MRA levels are obtained.

In those cases were an operation is not able to economically prosecute a target arrowtooth flounder fishery, under Alternative 1's MRA rules, increasing the MRAs for high valued groundfish species in the arrowtooth flounder directed fishery, as proposed under Alternatives 2 and 3, could be enough of economic incentive to induce entry into the arrowtooth flounder target fishery.

2.5.2.2 Impacts on Species Other than Arrowtooth Flounder

In designing the alternatives for this action, it was the intent to keep the MRA for several species at or near status quo levels, to reduce the economic incentive for vessels to use arrowtooth flounder fishery to increase catch of pollock, Pacific cod, sablefish, aggregated rockfish, and forage fish. Despite the increased success of the arrowtooth flounder fishery in recent years, many of the MRA species still command a higher price in the market (see Table 16). As a result, under Alternatives 2 and 3, increased retention of some MRA species is likely, compared to the status quo alternative. In general, the development of a "top off" fishery is dependent upon a number of issues, including, but not limited to, the price of the species, whether there is a potential buyer, accessibility of the species, storage availability, and the ability to process the species. In addition, the potential for a vessel to "top off" on a specific species varies across vessels. A vessel with the ability to limit incidental catch or the ability to discard low valued fish, while targeting arrowtooth flounder, provides more discretion for "topping off" on specific species.

Table 20 shows observed trawl hauls by percentile, for each of the incidental catch species during the 2003 to 2006 fishing years. For example, the arrowtooth flounder haul at the 75th percentile in terms of shortraker/rougheye rockfish, included approximately 3.5 pounds of these species for each one hundred pounds of arrowtooth. The table also shows the total observed tons of the incidentally caught species, and the number of the hauls in which the incidental catch species was observed. For example, of the 2,536 directed arrowtooth hauls, 792 had shortraker/rougheye rockfish, which totaled 84 tons. The table also includes the average bycatch rate for each incidental catch species, determined by dividing the observed metric tons of each of the incidental catch species by observed metric tons of arrowtooth flounder.

Management will address any increase in the incidental catch or bycatch in the GOA arrowtooth flounder fishery, by increasing the amount reserved from the directed fishing allowance for these species or by placing these species on prohibited status sooner, to remove any incentive for targeting. As noted in the background section of this proposed action, most of the incidental

species are assigned MRAs greater than zero relative to the basis species. Few of the relatively high MRAs are fished to their maximum amount, or have large impacts on the directed fishery, if one exists, for the incidental species.

2.5.2.3 Halibut PSC Effects

Management of the GOA trawl groundfish fishing is highly influenced by halibut bycatch mortality. Trawl groundfish fisheries are divided into two general categories; the deep-water complex and the shallow-water complex[2]. Each complex is allocated a portion of a 2,000 mt halibut mortality limit which is allocated across five seasons. The final season in October is not apportioned between the two complexes (Table 18).

With the development of the arrowtooth flounder fishery, the amount of halibut mortality attributed to it has increased dramatically. Table 9 shows that the halibut mortality in the arrowtooth flounder fishery has increased from 78 mt in 1997, to 616 mt in 2006. This, in turn, reduces the halibut PSC mortality available to support the other directed groundfish fisheries in the trawl deep-water complex (deep-water flatfish, rex sole, and rockfish), from January 20 to October 1, and to all groundfish fisheries after October 1.

Harvest of the deep-water flatfish TAC has historically been limited, in no small part, because of halibut PSC constraints. The TAC set for deep-water flatfish includes Dover sole, Greenland turbot, and deep sea sole. Historically, the TAC for deep-water flatfish has been relatively small. The 2006 Western Gulf TAC was set at 420 mt, and the Central Gulf TAC was set at 4,139 mt. During the 2006 fishing year, only 8 mt (2 percent) of the Western Gulf deep-water flatfish TAC, and 372 mt (9 percent) of the Central Gulf deep-water flatfish TAC, were harvested. Deep-water flatfish harvests in previous years were reported to be at similar levels.

Rex sole and arrowtooth flounder are other deep-water flatfish species that are valued by the trawl sectors and harvested under the deep-water species complex allotment. These flatfish species are also constrained by halibut mortality limits. During the 2006 fishing year, 30 percent, 53 percent, and 0 percent of the rex sole TACs were harvested in the Western, Central, and West Yakutat areas of the GOA, respectively. During the 2006 fishing year, 26 percent, 102 percent, and 1 percent of the arrowtooth flounder TACs were harvested in the Western, Central, and West Yakutat areas of the GOA, respectively. Although the arrowtooth flounder market is currently showing some signs of saturation, as revealed through weakening prices, markets in the future are likely to accept additional deliveries of this species, if they can be harvested. The primary constraint on their harvest is the availability of halibut PSC.

A specific amount of halibut PSC mortality is apportioned to the deep-water species complex (Table 19). The deep-water species complex allotment is set for the entire GOA. The allotment is

[2] At §679.21 (d)(3)(iii) these fisheries are defined as follows: (A) Shallow-water species fishery. Fishing with trawl gear during any weekly reporting period that results in a retained aggregate catch of pollock, Pacific cod, shallow-water flatfish, flathead sole, Atka mackerel, and "other species" that is greater than the retained aggregate amount of other GOA groundfish species or species group. (B) Deep-water species fishery. Fishing with trawl gear during any weekly reporting period that results in a retained catch of groundfish and is not a shallow-water species fishery as defined under paragraph (d)(3)(iii)(A) of this section.

not divided by sub-area in the GOA. Therefore when the halibut mortality allotment for the deep-water complex is taken, all the deep-water fisheries in the GOA are closed to directed fishing.

Information on deep-water closures that occurred as a result of halibut mortality in the GOA is provided in Table 13 and shows that halibut bycatch has traditionally caused fisheries in this group to close. Recall that these closures are Gulf-wide, so the closures apply to the Western, Central, West Yakutat, and Eastern Areas of the GOA.

Increasing the MRAs for the directed arrowtooth flounder fishery, as proposed under Alternatives 2 and 3, would likely increase the demand for halibut PSC that is apportioned to the deep-water species complex. Given that halibut PSC is not apportioned between trawl sectors, the pace of fishing could increase, as trawl vessels race to harvest more of their target species in the deep-water complex fisheries, before halibut PSC is fully utilized and all sector-fisheries close.

Trawl vessels that participate in GOA fisheries are expected to continue to harvest deep-water complex species that allow them to generate the greatest profits, within the halibut PSC bycatch limits. Other flatfish targets (shallow-water flatfish, rex sole, flathead sole, deep-water flatfish) are far less abundant in the GOA than arrowtooth. Vessels targeting these flatfish species receive higher prices per metric ton, but lower catches per fishing day, compared to arrowtooth. What arrowtooth flounder lacks in value it makes up for in volume. An average shoreside trawl vessel can fill its fish holds in a single day targeting arrowtooth.

2.5.2.4 Regulatory Discards

Under Alternative 1, with the exception of pollock, Pacific cod, "other species", and forage fish, all incidentally caught groundfish species, when closed to directed fishing, must be immediately discarded in the arrowtooth flounder target fishery. Under Alternative 2 and 3, incidentally caught groundfish species, when closed to directed fishing, may be retained up to the MRA while targeting arrowtooth flounder, thus potentially reducing regulatory discards. Given recent actions by the Council in the BSAI to reduce discards, reduction of regulatory discards would likely improve the retention rate for trawlers in the GOA.

Table 14 shows total catch and discard rates in the 2006 GOA trawl arrowtooth flounder target by processing component. It displays the annual general mix of species and the associated discard rates attributed to the trawl arrowtooth flounder target.

The multiple species 'arrowtooth flounder target' consists of higher-valued species (all often open to directed fishing) that are retained at a high rate. Table 14 indicates a distinction between processing modes in the types of species retained within the broad arrowtooth flounder target. Figure 1 likewise indicates distinctions between CPs and CVs in targets where arrowtooth flounder is caught.

Table 15 shows the amount of retained catch, by processing component, by species in descending order. The top three species retained by CPs after arrowtooth flounder are rex sole, Pacific cod, and flathead sole. Trawl CPs are predominately part of the offshore component, which are very restricted in their ability to target Pacific cod. Pacific cod in this case could be retained relative to arrowtooth flounder, rex sole, and flathead sole. Note, some trawl CPs are

part of the inshore component, which have more opportunity to target Pacific cod. When the Pacific cod fishery is open for directed fishing, vessels can retain Pacific cod in conjunction with arrowtooth flounder without the MRA restriction.

The top three species retained by CVs after arrowtooth flounder are flathead sole, pollock, and shallow-water flatfish (likely rock sole). Often during the year all three of these species are open concurrently to directed fishing.

Reviewing total and retained catch for the CV and CP sectors reveals that arrowtooth flounder is often a directed fishery and it can be taken in combination with other targets or species open to directed fishing. Depending on the actual incidental catch rates and status of the fisheries, some of the incidental catch of species closed to directed fishing associated with an arrowtooth flounder target may be retained against other species open to directed fishing and taken within the arrowtooth flounder target. Conversely, some species may be discarded because of the limited (or zero) MRAs that are calculated against arrowtooth flounder. To the extent that this occurs, more species may be retained as a result of the proposed changes to the MRAs, thus reducing regulatory discards.

Under the 2006 final groundfish harvest specifications, all skates were closed to directed fishing because most of the available quotas were necessary as incidental catch. Not enough skate TAC was available to conduct a directed fishery. Table 7 shows discard rates for skates ranging from 95 percent for 'other' skates, 69 percent for longnose skates, and 23 percent for big skates. Although a direct relationship between skate discards and the arrowtooth flounder fishery cannot be succinctly demonstrated in the CAS, it may be that some of the discards are associated with arrowtooth flounder MRA restrictions. An increase of the MRA as proposed from 0 percent to 10 or 20 percent could increase retention of a species currently discarded relative to arrowtooth flounder.

2.5.2.5 Enforcement Effects

For the CP fleet, compliance with MRAs is enforced during at-sea and dockside boardings, as well as by analysis of Weekly Production Reports and other documents. For the CV fleet, MRAs are enforced at landings. Processors are prohibited from possessing or processing groundfish taken or retained in violation of Magnuson-Stevens Act regulations, including MRA overages. Timely notification of NOAA Fisheries Enforcement relieves this unlawful possession burden on the processor and alerts enforcement to a possible violation. During 2006, the Office of Enforcement processed approximately 70 groundfish "overage" violations. In recent years, the overall numbers of groundfish MRA violations has been declining. About a third of these annual MRA violations occur during the arrowtooth flounder/flatfish directed fisheries, during March through June. Within this arrowtooth flounder/flatfish target, overage species were generally evenly divided between Pacific cod, sablefish, and skates.

Under Alternatives 2 or 3, NOAA Fisheries Enforcement does not anticipate any significant increase in the amount of MRA overages. For Pacific cod, no change is anticipated from status quo. For product quality reasons, processors place timely landing requirements upon vessels targeting arrowtooth flounder. It is believed these time limitations, combined with the low MRA amount (1 percent), would limit the profitability and desirability of topping off activities for

sablefish. Under Alternatives 2 and 3, the MRA for skates would increase from zero to either 20 percent or 10 percent. Based upon current observations of the fleet, it is not anticipated that overages of skates would increase under either alternative. Qualitatively, there is an expectation the incidence of skate MRA overages would decrease under Alternative 2 or 3.

NOAA Fisheries Enforcement does not foresee any significant negative impact upon their resources by this action, and this action may reduce the numbers of administrative violations requiring enforcement response. NOAA Fisheries Enforcement supports the reduction of regulatory discards, anticipated by this action.

2.6 Effects on Net Benefit to the Nation

Net benefits to the Nation would likely increase under Alternatives 2 or 3, relative to Alternative 1, under the assumption that fewer regulatory discards means greater utilization of fishery resources; less waste; and increased efficiency. As noted elsewhere, there may be a potential downside, however, if covert targeting of species with limited TACs, and/or species on bycatch-status, come under increased pressure (e.g., "topping off") due to higher MRAs in the arrowtooth fishery. Furthermore, if the changes in arrowtooth MRAs result in significantly accelerated attainment of PSC allowances, TAC amounts of more valuable groundfish species may be stranded (e.g., for lack of halibut mortality). These outcomes could counter any benefit gains, leaving the "net" impact to the Nation uncertain.

The difference in net benefits to the Nation between Alternatives 2 and 3 are likely small, with Alternative 2 having a slightly higher prospect of yielding benefits to the Nation, as compared to Alternative 3, due to higher MRAs in Alternative 2 (this, ignoring the issues outlined in the paragraph immediately above). Under Alternative 1, the current management of GOA arrowtooth flounder would continue, thus the net benefit to the Nation would likely remain close to current levels.

The potential for an increase in net benefit to the Nation, under Alternatives 2 or 3 is, by-in-large, attributable to increased retention of (unavoidable) incidentally caught GOA groundfish species, up to the new, higher MRAs. These gains are called into question if the higher retained incidental catches are not of "unavoidable" interceptions, but of covert targeting, and if PSC allowanced are taxed. The increased retention of incidental catch in the arrowtooth flounder directed fishery may increase the net value to the trawl sectors, thus increasing producer surplus, all else equal.

3 Final Regulatory Flexibility Analysis (FRFA)

3.1 Introduction

This Final Regulatory Flexibility Analysis (FRFA) evaluates the impacts on small entities of alternatives designed to revise the maximum retainable amounts (MRAs) of groundfish that may be retained in the arrowtooth flounder fishery in the Gulf of Alaska (GOA) management area of the EEZ off Alaska.

This FRFA addresses the statutory requirements of the Regulatory Flexibility Act (RFA) of 1980, as amended by the Small Business Regulatory Enforcement Fairness Act (SBREFA) of 1996 (5 U.S.C. 601-612).

3.2 The Purpose of an FRFA

The RFA, first enacted in 1980, was designed to place the burden on the government to review all regulations to ensure that, while accomplishing their intended purposes, they do not unduly inhibit the ability of small entities to compete. The RFA recognizes that the size of a business, unit of government, or nonprofit organization frequently has a bearing on its ability to comply with a Federal regulation. 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 that 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 on the consideration of alternatives that may minimize the impacts while still achieving the stated objective of the action.

On March 29, 1996, President Clinton signed the SBREFA. Among other things, the new law amended the RFA to allow judicial review of an agency's compliance with the RFA. The 1996 amendments also updated the requirements for a final regulatory flexibility analysis, including a description of the steps an agency must take to minimize the significant economic impact on small entities. Finally, the 1996 amendments expanded the authority of the Chief Counsel for Advocacy of the Small Business Administration (SBA) to file amicus briefs in court proceedings involving an agency's violation of the RFA.

In determining the scope, or "universe," of the entities to be considered in an FRFA, NMFS generally includes only those entities that can reasonably be expected to be directly regulated by the proposed action. If the effects of the rule fall primarily on a distinct segment, or portion thereof, of the industry (e.g., user group, gear type, geographic area), that segment would be considered the universe for the purpose of this analysis. NMFS interprets the intent of the RFA to address negative economic impacts, not beneficial impacts, and thus such a focus exists in analyses that are designed to address RFA compliance.

Data on cost structure, affiliation, and operational procedures and strategies in the fishing sectors subject to the proposed regulatory action are insufficient, at present, to permit preparation of a "factual basis" upon which to certify that the preferred alternative does not have the potential to result in "significant adverse impacts on a substantial number of small entities" (as those terms are defined under RFA).

Because, based on all available information, it is not possible to certify this outcome, should the proposed action be adopted, this FRFA has been prepared for Secretarial review.

3.3 What is Required in an FRFA?

Under 5 U.S.C., Section 604(a) of the RFA, each FRFA is required to contain:

- A succinct statement of the need for, and objectives of, the rule;
- A summary of the significant issues raised by the public comments in response to the initial regulatory flexibility analysis, a summary of the assessment of the agency of such issues, and a statement of any changes made in the proposed rule as a result of such comments;
- A description of and an estimate of the number of small entities to which the rule will apply or an explanation of why no such estimate is available;
- A description of the projected reporting, recordkeeping and other compliance requirements of the proposed rule, including an estimate of the classes of small entities that will be subject to the requirement and the type of professional skills necessary for preparation of the report or record; and
- A description of the steps the agency has taken to minimize any significant economic impact on small entities consistent with the stated objectives of applicable statutes, including a statement of the factual, policy, and legal reasons for selecting the alternative adopted in the final rule and why each one of the other significant alternatives to the rule and considered by the agency affecting small entities was rejected.

3.4 What is a Small Entity?

The RFA recognizes and defines three kinds of small entities: (1) small businesses, (2) small non-profit organizations, and (3) small government jurisdictions.

Small business. Section 601(3) of the RFA defines a small business as having the same meaning as "small business concern," which is defined under Section 3 of the Small Business Act. "Small business" or "small business concern" includes any firm that is independently owned and operated and not dominant in its field of operation. The SBA has further defined a "small business concern" as one "organized for profit, with a place of business located in the United States, and which operates primarily within the United States or which makes a significant contribution to the U.S. economy through payment of taxes or use of American products, materials or labor…A small business concern may be in the legal form of an individual proprietorship, partnership, limited liability company, corporation, joint venture, association, trust or cooperative, except that where the firm is a joint venture there can be no more than 49 percent participation by foreign business entities in the joint venture."

The SBA 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 not in excess of $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 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. Finally, 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.

The SBA has established "principles of affiliation" to determine whether a business concern is "independently owned and operated." In general, business concerns are affiliates of each other when one concern controls or has the power to control the other or a third party controls or has the power to control both. The SBA considers factors such as ownership, management, previous relationships with or ties to another concern, and contractual relationships, in determining whether an affiliation exists. Individuals or firms that have identical or substantially identical business or economic interests, such as family members, persons with common investments, or firms that are economically dependent through contractual or other relationships, are treated as one party with such interests aggregated when measuring the size of the concern in question. The SBA counts the receipts or employees of the concern whose size is at issue and those of all its domestic and foreign affiliates, regardless of whether the affiliates are organized for profit, in determining the concern's size. However, business concerns owned and controlled by Indian Tribes, Alaska Regional or Village Corporations organized pursuant to the Alaska Native Claims Settlement Act (43 U.S.C. 1601), Native Hawaiian Organizations, or Community Development Corporations authorized by 42 U.S.C. 9805 are not considered affiliates of such entities, or with other concerns owned by these entities solely because of their common ownership.

Affiliation may be based on stock ownership when (1) a person is an affiliate of a concern if the person owns or controls, or has the power to control 50 percent or more of its voting stock, or a block of stock which affords control because it is large compared to other outstanding blocks of stock; or (2) if two or more persons each owns, controls or has the power to control less than 50 percent of the voting stock of a concern, with minority holdings that are equal or approximately equal in size, but the aggregate of these minority holdings is large as compared with any other stock holding, each such person is presumed to be an affiliate of the concern.

Affiliation may be based on common management or joint venture arrangements. Affiliation arises where one or more officers, directors, or general partners, controls the board of directors and/or the management of another concern. Parties to a joint venture also may be affiliates. A contractor and subcontractor are treated as a joint venture if the ostensible subcontractor will perform primary and vital requirements of a contract or if the prime contractor is unusually reliant upon the ostensible subcontractor. All requirements of the contract are considered in reviewing such relationship, including contract management, technical responsibilities, and the percentage of subcontracted work.

Small organizations. The RFA defines "small organizations" as any not-for-profit 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 fewer than 50,000.

3.5 Need for and Objectives of this Action

The proposed action would increase the MRAs for groundfish in the arrowtooth flounder fishery in the GOA. MRAs are the primary tool NMFS uses to regulate the catch rate of species closed to directed fishing, but not on bycatch-status. The MRA of a species closed to directed fishing is the maximum weight of that species that may be retained onboard a vessel, calculated as a percentage of the weight of the retained catch onboard the vessel of all groundfish species open to directed fishing (the basis species). The purpose of the proposed action is to provide an opportunity to trawl fishing operations targeting arrowtooth flounder to retain more groundfish, and, thus, reduce regulatory discards.

In 1994, the Council set most of the groundfish MRAs at zero, relative to retained amounts of arrowtooth flounder, to prevent vessels from using arrowtooth flounder (a species for which no market existed) as a basis species for retention of more readily marketable species. At that time, there were concerns that fishing vessel operators would target arrowtooth flounder to increase the retainable amounts of valuable species, closed to directed fishing, and increase bycatch amounts of Pacific halibut. Increased halibut bycatch rates could result in reaching halibut bycatch limits before the total allowable catches (TACs), established for other trawl target fisheries, were harvested.

Since 1997, markets for arrowtooth flounder have developed and this species now attracts a target fishery. As a result, representatives for the GOA trawl industry now advocate changing the MRAs for GOA groundfish, to expand the use of arrowtooth flounder as a basis species for the retention of groundfish closed to directed fishing. Products made from arrowtooth flounder now include whole fish, surimi, headed and gutted (both with and without the tail on), fillets, frills or engama (fleshy fins used for sashimi and soup stock), bait, and meal.

In October 2006, the Council received a proposal from industry to revise the MRAs of groundfish in the arrowtooth flounder fishery in the GOA. The problem statement, made by the industry and adopted by the Council, may be summarized as follows:

> When the MRAs for the directed GOA arrowtooth flounder fishery were set in regulations in 1994, the Council chose to set incidental catch allowances at zero for a wide group of species, to prevent vessels from using arrowtooth flounder as a basis species for retention, since there was no market for arrowtooth flounder. Arrowtooth flounder is now a viable target fishery, and efforts to improve retention of many groundfish species utilized by the trawl sectors are constrained by MRAs in the directed GOA arrowtooth flounder fishery. MRAs are a widely used groundfish management tool to reduce targeting on a species and slow harvest rates, as an allocation approach. However, sometimes species managed with MRAs must be discarded, even though economic incentives exist to retain that species. Thus, the MRA forces regulatory

> discards of some species that might otherwise be retained, without undermining the intent of the MRA as a tool to reduce overall harvest rates. This regulatory amendment would evaluate raising the MRAs for some species in the directed GOA arrowtooth flounder fishery, to provide increased opportunity for retention of species harvested by the trawl sectors, and, thus, reduce overall discards in this sector, while not subjecting incidentally caught species to increased allocation concerns.

Although not explicit in the problem statement, the Council recognizes that revising the MRAs of higher valued groundfish, taken incidentally in the arrowtooth flounder fishery, provides a *de facto* economic incentive to induce entry into the arrowtooth flounder fishery. As noted in the Regulatory Impact Review (RIR) analysis, higher MRAs will likely be a significant factor in a decision to participate in the arrowtooth flounder fishery.

3.6 Public Comment

The proposed rule for this action was published on November 25, 2008 (73 FR 71592). Comments on the proposed rule were accepted through December 26, 2008. NMFS received two letters of comment on the proposed rule. Neither of these comments were on the Initial Regulatory Flexibility Act.

3.7 Number and Description of Small Entities Regulated by the Proposed Action

The entities directly regulated by this action are those CPs and CVs that target arrowtooth flounder in the EEZ of the GOA, using trawl gear. Some trawl vessels, along with fixed gear vessels, incidentally catch arrowtooth flounder in other directed fisheries, but most of this arrowtooth flounder is subsequently discarded.

Earnings from all Alaskan fisheries for 2006 were matched with the vessels that participated in the GOA arrowtooth flounder fishery for that year. Of the CVs directly regulated by this action, only 18 had gross earnings less than $4 million, thus categorizing them as small entities. Looking at the CPs, none had gross earnings less than $4 million, categorizing them as large entities.

3.8 Recordkeeping and Reporting Requirements

MRA accounting under the status quo (Alternative 1) is tracked by operators and audited by enforcement through comparison of the weight of processed product on Daily Cumulative Production Logbook reports for both basis and incidental species, and expanding those weight estimates by the published product recovery rates at 50 CFR 679. This review process would not change for Alternatives 2 or 3, and there will be no change to recordkeeping and reporting requirements under either of the proposed action alternatives.

3.9 Description of Significant Alternatives

The alternatives consider increasing the MRAs in the arrowtooth flounder fishery for deep-water flatfish, rex sole, flathead sole, shallow-water flatfish, Atka mackerel, sablefish, aggregated

rockfish, and skates. None of the alternatives consider changing the existing MRAs in the arrowtooth flounder fishery for pollock, Pacific cod, the "other species" category (squid, octopus, sharks, and sculpins), or forage fish. Alternative 1, the no action or status quo alternative, would leave the MRAs for groundfish in the arrowtooth fishery unchanged from those in current regulations. Alternative 2, (the preferred alternative) would set the MRAs for incidental catch species, relative to arrowtooth flounder as a basis species, as per the industry proposal. Alternative 3 would set the MRAs for incidental catch species, relative to arrowtooth flounder as a basis species, near recent high catch levels associated with the arrowtooth flounder target.

The effects of the preferred alternative on large and small participants are similar. Increasing the groundfish MRAs in the arrowtooth flounder fishery could increase retention of groundfish closed to directed fishing. Increased retention of these incidentally caught groundfish would allow vessels participating in the arrowtooth flounder fishery the opportunity to reduce discards of otherwise marketable groundfish and increase the utilization of these groundfish while still constrained by TAC limitations.

4 Consistency with Applicable Law and Policy

4.1 Magnuson-Stevens Act

4.1.1 National Standards

The Council's overarching mandate to guide it in managing bycatch is National Standard 9 which states, "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."

This amendment proposed to increase the MRAs for the directed GOA arrowtooth flounder directed fishery for selected species that are caught mostly by the trawl CV and CP sectors. As a result, the proposed action is consistent with National Standard 9.

Section 303(a)(9) – Fisheries Impact Statement

Section 303(a)(9) of the Magnuson-Stevens Act requires that any plan or amendment include a fishery impact statement which shall assess and describe the likely effects, if any, of the conservation and management measures on a) participants in the fisheries and fishing communities affected by the plan or amendment; b) participants in the fisheries conducted in adjacent areas under the authority of another Council, after consultation with such Council and representatives of those participants taking into account potential impacts on the participants in the fisheries, as well as participants in adjacent fisheries.

The alternative actions considered in this analysis are described in Chapter 2 of this document. The impacts of these actions on participants in the fisheries and fishing communities are evaluated in the RIR, Chapter 5.

5 References

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Tables

Table 1. Comparison of Maximum Retainable Amounts (Percentages) of Groundfish in the Arrowtooth Flounder Fishery in the Gulf of Alaska under Alternatives 1 through 3.

Incidental Catch Species	Alternative 1 %	Alternative 2 %	Alternative 3 %
Pollock	5	5	5
Pacific cod	5	5	5
Deep-water flatfish	0	20	5
Rex sole	0	20	10
Flathead sole	0	20	15
Shallow-water flatfish	0	20	5
Sablefish	0	1	1
Aggregated rockfish	0	5	5
Atka mackerel	0	20	5
Skates[1]	0	20	10
Other Species[1]	20	20	20
Forage fish	2	2	2

[1] For the years 2004 through 2006.

Table 2. Total TAC, catch, and disposition of GOA arrowtooth flounder from 1997 through 2007

Year	Annual TAC (mt))	Total (mt)	Discarded (mt)	Retained (mt)	Percent retained
1997	35,000	16,427	13,442	2,985	18
1998	35,000	13,000	10,943	2,057	16
1999	35,000	16,208	11,943	4,265	26
2000	35,000	22,982	13,044	9,938	43
2001	35,000	19,964	13,345	6,619	23
2002	38,000	20,413	10,381	10,032	49
2003	38,000	30,215	12,890	17,325	57
2004	38,000	15,325	6,665	8,660	56
2005	38,000	18,300	6,502	11,798	64
2006	38,000	27,645	11,617	16,208	58
2007	43,000	25,371	10,263	15,108	60

Table 3. 2006 Gulf of Alaska arrowtooth flounder catch by gear type and processing component

Gear Type	CPs (mt)	% of Total	CVs (mt)	% of Total	Total Catch (mt)
Non-pelagic trawl	11,873	48	13,098	52	24,971
Pelagic trawl	0	0	2,176	100	2,176
Trawl total	11,873	44	15,274	56	27,147
Hook-and-line	204	43	272	57	477
Grand Total	12,077	44	15,546	56	27,624

Note: Jig and pot gear had combined reported catches of less than 20 mt.

Table 4. 2003 Catch of groundfish attributed to the arrowtooth flounder fishery by the NMFS catch accounting system

Groundfish	Discarded (mt)	Retained (mt)	Total (mt)	Percent Retained	Associated Catch Rate[3] (%)
Arrowtooth flounder	4,338	11,146	15,484	72	
Atka mackerel	3	39	42	93	0.3
Deep-water flatfish	136	71	207	34	1
Flathead sole	97	311	408	76	3
Other species[2]	197	106	303	35	2
Northern rockfish	54	42	96	44	0.6
Pelagic Shelf Rockfish	18	17	35	48	0.2
Pacific ocean Perch	646	101	747	14	4.8
Other rockfish	71	5	76	6	0.5
Shortraker and Rougheye Rockfish	12	26	38		0.2
Thornyheads	7	70	77	91	0.6
All Rockfish [1]	808	260	1,069	24	7
Pacific cod	351	493	844	58	5
Pollock	69	279	348	80	2
Rex sole	62	929	990	94	6
Shallow-water flatfish	19	76	95	80	1
Sablefish	269	76	345	22	2

[1] Aggregate catch of all species of rockfish
[2] In 2003 the "other species" category included skates
[3] Ratio of total groundfish catch to total arrowtooth flounder catch

Table 5. 2004 Catch of groundfish attributed to the arrowtooth flounder fishery by the NMFS catch accounting system

Groundfish	Discarded (mt)	Retained (mt)	Total (mt)	Percent Retained	Associated Catch Rate[2] (%)
Arrowtooth flounder	1,367	4,614	5,981	77	
Atka mackerel	2	0	2	0	0.02
Big skates	11	183	194	77	3.2
Longnose skates	0	0	0	0	0
Other skates	25	152	177	86	3.0
All Skates	36	334	370	90	6.2
Deep-water flatfish	12	47	59	20	0
Flathead sole	85	702	788	89	13
Other species	17	5	22	21	0.4
Northern rockfish	10	12	23	55	0.4
Pelagic Shelf Rockfish	3	2	5	48	0.1
Pacific ocean perch	2	1	3	12	0.05
Other rockfish	0	0	0	0	0
Thornyheads	1	25	26	97	0.4
Shortraker and Rougheye rockfish	6	24	29	81	0.5
All Rockfish [1]	22	64	86	25	1.4
Pacific cod	128	353	481	73	8
Pollock	11	158	170	93	3
Rex sole	21	206	227	91	4
Shallow-water flatfish	17	253	270	94	5
Sablefish	29	22	52	43	1

[1] Aggregate catch of all species of rockfish
[2] Ratio of total groundfish catch to total arrowtooth flounder catch

Table 6. 2005 Catch of groundfish attributed to the arrowtooth flounder fishery by the NMFS catch accounting system

Groundfish	Discarded (mt)	Retained (mt)	Total (mt)	Percent Retained	Associated Catch Rate[2] (%)
Arrowtooth flounder	2,062	8,653	10,716	81	
Atka mackerel	1	8	9	88	0.08
Big skate	12	193	205	94	1.9
Longnose skate	57	312	369	85	3.4
Other skate	130	46	176	26	1.6
All skates	197	551	748	36	7
Deep-water flatfish	89	41	130	32	1.3
Flathead sole	153	1,077	1,230	88	11.5
Other species	121	14	135	10	1.3
Northern rockfish	26	8	33	23	0.3
Pelagic Shelf Rockfish	10	22	32	69	0.6
Pacific ocean perch	68	61	130	47	1.2
Other rockfish	6	1	7	17	0.1
Shortraker rockfish	1	5	6	82	0.1
Rougheye rockfish	0	7	8	97	0.1
Thornyheads	3	7	9	72	0.1
All Rockfish [1]	114	112	226	50	2.1
Pacific cod	163	453	616	74	6
Pollock	15	277	292	95	3
Rex sole	73	660	733	90	7
Shallow-water flatfish	10	96	106	90	1
Sablefish	37	64	102	63	1

[1] Aggregate catch of all species of rockfish
[2] Ratio of total groundfish catch to total arrowtooth flounder catch

Table 7. 2006 Catch of groundfish attributed to the arrowtooth flounder fishery by the NMFS catch accounting system

Groundfish	Discarded (mt)	Retained (mt)	Total (mt)	Percent Retained	Associated Catch Rate[2]
Arrowtooth flounder	2,668	12,676	15,353	83	
Atka mackerel	1	1	2	60	0.01
Deep-water flatfish	79	59	138	42	0.9
Big skate	37	123	161	77	1
Longnose skate	91	40	131	31	0.9
Other skate	55	3	59	5	0.4
All skates	183	166	349	48	2.3
Flathead sole	61	1,200	1,260	95	8
Other species	138	41	179	23	1.2
Northern rockfish	108	33	141	23	0.9
Pelagic Shelf Rockfish	26	104	130	80	0.8
Pacific ocean perch	181	37	218	17	1.4
Other rockfish	4	1	4	15	0.03
Shortraker rockfish	1	11	11	93	0.07
Rougheye rockfish	9	10	19	54	0.1
Thornyheads	3	18	21	87	0.1
All Rockfish [1]	332	225	557	40	3.6
Pacific cod	156	778	934	83	6
Pollock	84	671	756	89	5
Rex sole	43	1,060	1,103	96	7
Shallow-water flatfish	35	504	539	93	4
Sablefish	102	74	176	42	1

[1] Aggregate catch of all species of rockfish
[2] Ratio of total groundfish catch to total arrowtooth flounder catch

Table 8. Incidental Catch of Prohibited Species in the Arrowtooth Flounder Fishery in the Gulf of Alaska 2003-2007

Year	Arrowtooth Catch mt	Chinook Salmon #	Other Salmon #	Red King Crab #	Tanner Crab #	Herring mt	Halibut mt
2003	22,913	3,378	1,061	0	29,377	0.00	460
2004	15,257	359	2	0	33,123	0.00	289
2005	19,250	1,802	425	0	69,364	0.04	498
2006	21,452	414	429	0	89,114	0.05	632
2007	25,341	1,462	710	0	36,608	0.00	440
Average	20,843	1,483	525	0	51,519	0.02	464

Table 9. Comparison of Gulf of Alaska trawl halibut bycatch mortality by target species in 1997 and 2006

Target Species	1997 halibut mortality (mt)	2006 halibut mortality (mt)
Deep-water flatfish	228	-
Rockfish	261	186
Arrowtooth flounder	78	616
Rex sole	299	116
Pacific cod	604	347
Shallow flafish	451	632
Flathead sole	164	24
Other species	23	-
Pollock	5	82
Total	2,112	2,003

Table 10. Wholesale price per metric ton of arrowtooth flounder for the CPs and shoreside processors from 2001 to 2005

Year	CP ($ per round metric ton)	Shoreside processor ($ per round metric ton)
2001	259	98
2002	342	-
2003	344	-
2004	751	342
2005	717	556

Notes: A dash indicates that data were not available or were withheld to preserve confidentiality.
Data Source: weekly processor reports, commercial operator's annual report, Blend data 2000 to 2002, catch accounting system 2003 to 2005 for estimates of retained catch. National Marine Fisheries Service

Table 11. Frequency of occurrence of Atka mackerel in Steller sea lion scat 1999-2005 in the GOA

Region/Season	Number of scats analyzed	Percentage of samples containing Atka mackerel
Eastern GOA		
Summer	38	0
Central GOA		
Summer	85	1.18
Winter	204	1.96
Western GOA		
Summer	184	21.20
Winter	42	0

(NMML unpublished data, April 2007)

Table 12. Comparison of seasonal harvest of Atka mackerel (GOA wide) and arrowtooth flounder in the Western Gulf of Alaska in 2007

Season	Dates	Atka mackerel (mt)	Arrowtooth Flounder (mt)
Pre-rockfish	January 1 – July 1	68	2,136
Rockfish	July 1 – August 6	1,149	868
Post-rockfish	August 6 – December 31	225	134
Total Catch		1,442	3,138
TAC		1,500	8,000

Table 13. Deep-water complex trawl closures triggered by halibut bycatch over the past 5 years

Year	Closure 1	Closure 2	Closure 3	Closure 4	Closure 5	Closure 6	Closure 7
2001	25-May	23-Jul	21-Oct				
2002	24-May	2-Aug	13-Oct	10-Nov			
2003	16-May	15-Oct					
2004	19-Mar	26-Apr	25-Jul	1-Oct			
2005	23-Mar	8-Apr	3-May	24-Jul	4-Sep	10-Sep	1-Oct

Source: NMFS

Table 14. GOA trawl arrowtooth flounder target retention and discards by species and processing component for 2006

Species	CVs		CPs		Both Processing Components	
	Total catch (mt)	Discard rate (%)	Total catch (mt)	Discard rate (%)	Total catch (mt)	Discard rate (%)
Arrowtooth flounder	9,235	11	6,108	28	21,452	12
Flathead sole	937	3	324	10	1,584	4
Rex sole	385	2	718	5	1,821	2
Pacific cod	343	7	591	22	1,525	10
Pollock	664	9	91	27	847	10
Shallow-water flatfish	484	3	55	37	594	6
Pacific ocean perch	44	69	174	86	392	46
'Other' species	119	66	59	100	238	58
Sablefish	30	44	146	61	323	32
Big skate	157	21			157	21
Northern rockfish	12	56	129	79	270	40
Deep-water flatfish	43	6	95	81	233	34
Longnose skate	74	46	56	100	187	49
Pelagic shelf rockfish	26	72	103	6	233	11
'Other' skate	40	98	18	87	77	72
Thornyhead rockfish	5	21	16	10	36	7
Rougheye rockfish	17	49	-	-	17	49
Shortraker rockfish	8	8	3	4	14	5
'Other' rockfish	3	78	1	100	6	64
Atka mackerel	<1	79	2	39	4	21

Table 15. GOA trawl gear retained catch by processing component and species in the arrowtooth flounder target for 2006

CPs		CVs	
Species	**Retained Catch (mt)**	**Species**	**Retained Catch (mt)**
Arrowtooth flounder	4,417	Arrowtooth flounder	8,258
Rex sole	685	Flathead sole	909
Pacific cod	459	Pollock	604
Flathead sole	291	Shallow-water flatfish (rock sole)	469
Pelagic shelf rockfish	97	Rex sole	375
Pollock	67	Pacific cod	319
Sablefish	57	Big Skate	123
Shallow-water flatfish (primarily rock sole)	35	Deep-water flatfish	41
Northern rockfish	27	Other skate	41
Pacific ocean perch	24	Longnose skate	40
Deep-water flatfish	18	Sablefish	17
Thornyhead rockfish	14	Pacific ocean perch	13
Shortraker	3	Rougheye	8
Unidentified Skate	2	Shortraker	8
Atka mackerel	1	Pelagic shelf rockfish	7
		Northern rockfish	5
		Thornyhead rockfish	4
		Unidentified Skate	1
		Other rockfish	1

Table 16. Wholesale price per metric ton of GOA groundfish for the CPs from 2001 to 2005 ($ per round metric ton)

Year	Atka mackerel	Flatfish	Flathead sole	POP	Rockfish	Sablefish
2001	1,170	2,055	887	378	685	4,509
2002	1,243	1,838	868	601	856	4,213
2003	850	1,957	872	665	975	4,948
2004	370	1,866	1,296	821	931	4,944
2005	558	2,230	1,397	1,372	1,117	5,117

Data Source: Weekly processor reports, National Marine Fisheries Service

Table 17. GOA trawl halibut closures by species complex for 2005 and 2006

2005 CLOSURES			2006 CLOSURES			
	Open	Closed		Open	Closed	Note
Shallow-water complex	20-Jan	19-Aug	**Shallow-water complex**	20-Jan	23-Feb	
	1-Sep	4-Sep		27-Feb	10-Jun	
	1-Oct	1-Oct		1-Jul	1-Sep	midnight
				6-Sep	6-Sep	12 hr
Deep-water complex	20-Jan	23-Mar		20-Sep	20-Sep	12 hr
	1-Apr	8-Apr		25-Sep	25-Sep	12 hr
	24-Apr	3-May		1-Oct	8-Oct	
	5-Jul	24-Jul				
			Deep-water complex	20-Jan	27-Apr	
	1-Sep	4-Sep				
	8-Sep	10-Sep		1-Jul	5-Sep	
	1-Oct	1-Oct	**Combined**	1-Oct	8-Oct	

Table 18. Recent apportionments of Pacific halibut PSC trawl limits between the trawl deep-water species fishery and shallow-water species fishery

Season	Shallow-water (mt)	Deep-water (mt)	Total (mt)
January 20–April 1	450	100	550
April 1–July 1	100	300	400
July 1–September 1	200	400	600
September 1–October 1	150	Any remainder	150
Subtotal January 20–October 1	900	800	1,700
October 1–December 31			300
Total			2,000

Table 19. GOA halibut bycatch allotments in 2005 for the deep-water species complex and dates closure notices were issued

Season Start	Season End	Amount of Halibut Allocation	Amount of Halibut Mortality
January 20	April 1	100mt	152mt
April 1	July 5	300mt	255mt
July 5	September 1	400mt	349mt
September 1	October 1	Any remainder	38mt
October 1	December 31	300mt*	

Sources: NOAA Fisheries website listings of 2005 Information Bulletins and Final 2005 GOA apportionments.

*No apportionment is made between the shallow-water and deep-water complex during the 5th season (October 1 – December 31).

Table 20. Proportion of incidental catch of secondary species in observed trawl hauls targeting arrowtooth flounder in the Gulf of Alaska, 2003-2006

Species	Hauls with species	Tons	Average Bycatch Rate	25th Percentile	50th Percentile	75th Percentile	90th Percentile	95th Percentile	100th Percentile
Arrowtooth Flounder	2536	11,004	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Flathead Sole	2229	876	7.96%	0.0163	0.0462	0.1440	0.3957	0.6318	0.9918
Pacific Cod	1937	843	7.66%	0.0267	0.0705	0.1819	0.4072	0.6024	0.9927
Rex Sole	2257	790	7.18%	0.0139	0.0560	0.1854	0.3998	0.5970	0.9960
Northern Rockfish	493	40	0.37%	0.0045	0.0081	0.0233	0.0755	0.1419	0.9298
Pacific Ocean Perch	911	217	1.97%	0.0053	0.0155	0.0619	0.2102	0.3744	0.9953
Shortraker/Rougheye Rockfish	792	84	0.77%	0.0063	0.0125	0.0348	0.1356	0.3605	0.9944
Thornyhead Rockfish	252	36	0.33%	0.0036	0.0203	0.1159	0.3847	0.6581	0.9712
Pollock	1013	220	2.00%	0.0083	0.0240	0.0752	0.2142	0.3713	0.9989
Sablefish	938	189	1.72%	0.0075	0.0188	0.0573	0.1945	0.3616	0.9841
Skates	499	155	1.41%	0.0214	0.0541	0.1253	0.2580	0.3807	0.9560
Shallow-water Flatfish	765	148	1.35%	0.0051	0.0138	0.1011	0.3823	0.6750	0.9979
Deep-water Flatfish	1152	107	0.98%	0.0062	0.0133	0.0333	0.0824	0.1434	0.9459
Other Species	398	69	0.62%	0.0117	0.0314	0.0993	0.2458	0.4756	0.9977
Forage Fish	78	26	0.23%	0.0314	0.0712	0.1281	0.2321	0.3591	0.5135
Atka Mackerel	188	14	0.13%	0.0054	0.0093	0.0213	0.0650	0.2118	0.7749

Source: NORPAC observer data

Note: The 100th percentile denotes the tow with the highest ratio of incidental species catch to arrowtooth flounder catch. For example, for pollock, the 100th percentile was 0.9989. That tow had 0.9989 pounds of pollock for every 1 pound of arrowtooth flounder, a nearly 1:1 ratio.

Figures

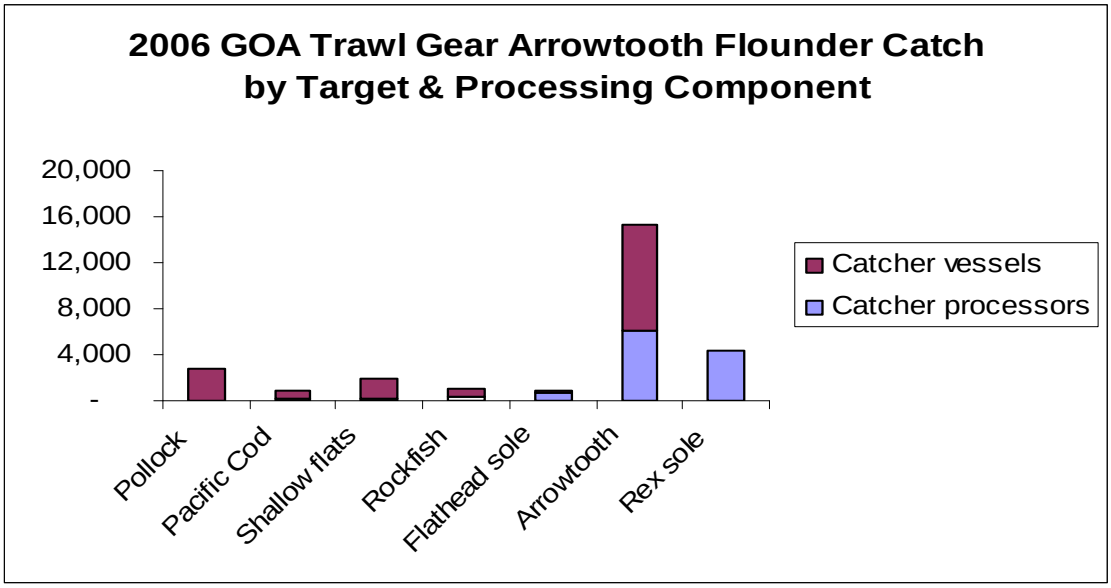

Figure 1. GOA trawl gear arrowtooth flounder catch by target and processing component for 2006

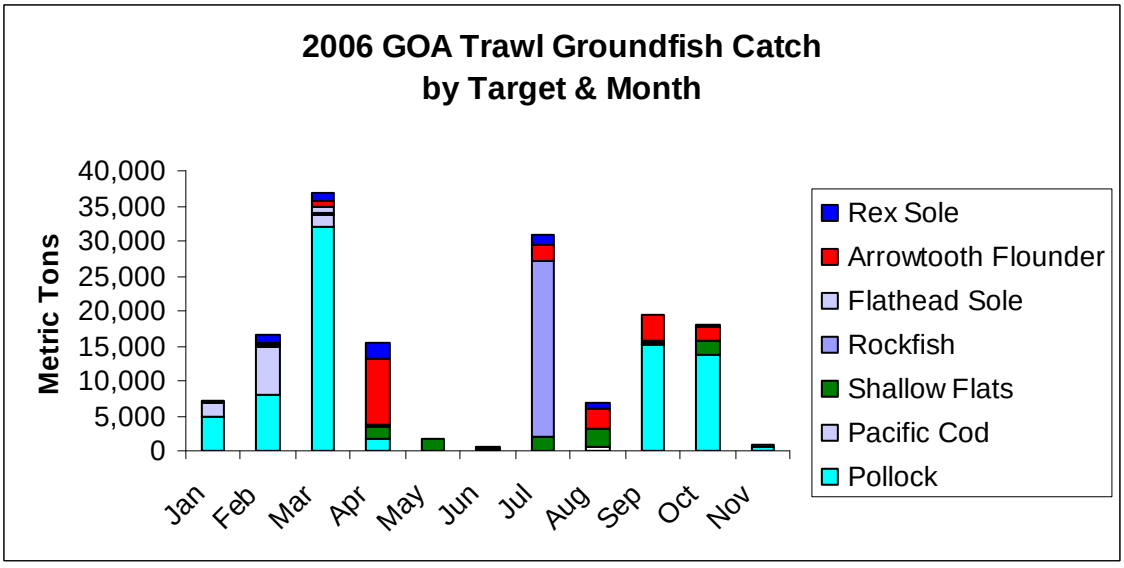

Figure 2. GOA trawl groundfish catch by target and month for 2006

APPENDIX 1. Table 10 to 50 CFR Part 679 (as proposed to be revised)

BASIS SPECIES		INCIDENTAL CATCH SPECIES (for DSR caught on catcher vessels in the SEO, see § 679.20 (j)[6])														
Code	Species	Pollock	Pacific cod	DW flat[(2)]	Rex sole	Flathead sole	SW Flat [(3)]	Arrowtooth	Sablefish	Aggregated rockfish[(8)]	SR/RE ERA [(1)]	DSR SEO (C/Ps only) [(6)]	Atka mackerel	Aggregated forage fish[(10)]	Skates [(11)]	Other species [(7)]
110	Pacific cod	20	na[9]	20	20	20	20	35	1	5	[(1)]	10	20	2	20	20
121	Arrowtooth	5	5	20	20	20	20	na[9]	1	5	0	0	20	2	0	20
122	Flathead sole	20	20	20	20	na[9]	20	35	7	15	7	1	20	2	20	20
125	Rex sole	20	20	20	na[9]	20	20	35	7	15	7	1	20	2	20	20
136	Northern rockfish	20	20	20	20	20	20	35	7	15	7	1	20	2	20	20
141	Pacific ocean perch	20	20	20	20	20	20	35	7	15	7	1	20	2	20	20
143	Thornyhead	20	20	20	20	20	20	35	7	15	7	1	20	2	20	20
152/ 151	Shortraker/ rougheye [(1)]	20	20	20	20	20	20	35	7	15	na[9]	1	20	2	20	20
193	Atka mackerel	20	20	20	20	20	20	35	1	5	[(1)]	10	na[9]	2	20	20
270	Pollock	na[9]	20	20	20	20	20	35	1	5	[(1)]	10	20	2	20	20
710	Sablefish	20	20	20	20	20	20	35	na[9]	15	7	1	20	2	20	20
Flatfish, deep water [(2)]		20	20	na[9]	20	20	20	35	7	15	7	1	20	2	20	20
Flatfish, shallow water [(3)]		20	20	20	20	20	na[9]	35	1	5	[(1)]	10	20	2	20	20
Rockfish, other [(4)]		20	20	20	20	20	20	35	7	15	7	1	20	2	20	20
Rockfish, pelagic [(5)]		20	20	20	20	20	20	35	7	15	7	1	20	2	20	20
Rockfish, DSR-SEO [(6)]		20	20	20	20	20	20	35	7	15	7	na[9]	20	2	20	20
Skates[(11)]		20	20	20	20	20	20	35	1	5	[(1)]	10	20	2	na[9]	20
Other species [(7)]		20	20	20	20	20	20	35	1	5	[(1)]	10	20	2	20	na[9]
Aggregated amount of non-groundfish species		20	20	20	20	20	20	35	1	5	[(1)]	10	20	2	20	20

Notes to Table 10 to Part 679						
1	Shortraker/rougheye rockfish					
			shortraker rockfish (152)			
			rougheye rockfish (151)			
		SR/RE ERA	shortraker/rougheye rockfish in the Eastern Regulatory Area (ERA).			
	Where numerical percentage is not indicated, the retainable percentage of SR/RE is included under Aggregated Rockfish					
2	Deep-water flatfish		Dover sole, Greenland turbot, and deep-sea sole			
3	Shallow water flatfish		Flatfish not including deep water flatfish, flathead sole, rex sole, or arrowtooth flounder			
4	Other rockfish		Western Regulatory Area	means slope rockfish and demersal shelf rockfish		
			Central Regulatory Area			
			West Yakutat District			
			Southeast Outside District	means slope rockfish		
			Slope rockfish			
			S. aurora (aurora)	*S. variegatus* (harlequin)	*S. brevispinis* (silvergrey)	
			S. melanostomus (blackgill)	*S. wilsoni* (pygmy)	*S. diploproa* (splitnose)	
			S. paucispinis (bocaccio)	*S. babcocki* (redbanded)	*S. saxicola* (stripetail)	
			S. goodei (chilipepper)	*S. proriger* (redstripe)	*S. miniatus* (vermilion)	
			S. crameri (darkblotch)	*S. zacentrus* (sharpchin)	*S. reedi* (yellowmouth)	
			S. elongatus (greenstriped)	*S. jordani* (shortbelly)		
			In the Eastern GOA only, Slope rockfish also includes *S. polyspinous*. (Northern)			
5	Pelagic shelf rockfish		*S. ciliatus* (dusky)	*S. entomelas* (widow)	*S. flavidus* (yellowtail)	
6	Demersal shelf rockfish (DSR)		*S. pinniger* (canary)	*S. maliger* (quillback)	*S. ruberrimus* (yelloweye)	
			S. nebulosus (china)	*S. helvomaculatus* (rosethorn		
			S. caurinus (copper)	*S. nigrocinctus* (tiger)		
			DSR-SEO = Demersal shelf rockfish in the Southeast Outside District (SEO). The operator of a catcher vessel that is required to have a Federal fisheries permit, or that harvests IFQ halibut with hook and line or jig gear, must retain and land all DSR that is caught while fishing for groundfish or IFQ halibut in the SEO. Limits on sale and requirements for disposal of DSR are set out at § 679.20 (j).			
7	Other species		sculpins	octopus	sharks	Squid
8	Aggregated rockfish [(12)]		Means rockfish of the genera *Sebastes* and *Sebastolobus* defined at § 679.2 except in:			
			Southeast Outside District (SEO)	where DSR is a separate category for those species marked with a numerical percentage		
			Eastern Regulatory Area (ERA)	where SR/RE is a separate category for those species marked with a numerical percentage		

Notes to Table 10 to Part 679			
9	N/A	not applicable	
10	Aggregated forage fish (all species of the following taxa)		
		Bristlemouths, lightfishes, and anglemouths (family *Gonostomatidae*)	209
		Capelin smelt (family *Osmeridae*)	516
		Deep-sea smelts (family *Bathylagidae*)	773
		Eulachon smelt (family *Osmeridae*)	511
		Gunnels (family *Pholidae*)	207
		Krill (order *Euphausiacea*)	800
		Laternfishes (family *Myctophidae*)	772
		Pacific herring (family *Clupeidae*)	235
		Pacific Sand fish (family *Trichodontidae*)	206
		Pacific Sand lance (family *Ammodytidae*)	774
		Pricklebacks, war-bonnets, eelblennys, cockscombs and Shannys (family *Stichaeidae*)	208
		Surf smelt (family *Osmeridae*)	515
11	Skates Species and Groups		
		Big Skates	702
		Longnose Skates	701
		Other Skates	700
12	Aggregated non-groundfish	All legally retained species of fish and shellfish, including IFQ halibut, that are not listed as FMP groundfish in Tables 2a and 2c to this part.	

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