ENVIRONMENTAL ASSESSMENT
for the Issuance of an Exempted Fishing Permit to Test a Trawl Gear Modification to Reduce Bycatch Rates for Pacific Halibut in the Central Gulf of Alaska Pacific Cod Trawl Fishery

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Abstract: This document is an Environmental Assessment (EA) of the potential impacts of issuing an exempted fishing permit (EFP) to allow for the testing of a halibut excluder device on trawl vessels in the Central Gulf of Alaska (GOA) Pacific cod fishery. The purpose of the EFP is to exempt the applicant from observer coverage and certain fishery closures to allow the project to be conducted without disruption and without impacting other GOA trawl fisheries. The project is intended to collect information on a new trawl gear modification that may lower halibut bycatch in the Central GOA trawl fishery. The analysis found no significant impacts on the human environment for this action.

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Abbreviations

ABC	Allowable Biological Catch
ADF&G	Alaska Department of Fish and Game
AFSC	Alaska Fishery Science Center
BSAI	Bering Sea and Aleutian Islands
CEY	Constant Exploitation Yield
CFR	Code of Federal Regulation
CPUE	Catch Per Unit of Effort
DMR	Discard Mortality Rate
EA	Environmental Assessment
EFH	Essential Fish Habitat
EFP	Exempted Fishing Permit
EIS	Environmental Impact Statement
FMP	Fishery Management Plan
FONSI	Finding Of No Significant Impact
GOA	Gulf of Alaska
IPHC	International Halibut Commission
NEPA	National Environmental Protection Act
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
MSA	Magnuson Stevens Fishery Conservation and Management Act
OFL	Overfishing Level
NPFMC	North Pacific Fishery Management Council
PSC	Prohibited Species Catch
SAFE	Stock Assessment and Fishery Evaluation
TAC	Total Allowable Catch

Executive Summary

The proposed exempted fishing permit (EFP) supports a project to test a device on trawl gear that may reduce Pacific halibut bycatch rates for the for Central Gulf of Alaska (GOA) trawl fishery. Pacific halibut bycatch is controlled by a prohibited species catch (PSC) limit that is essentially a common property quota. Once reached, PSC limits trigger the closure of a fishery regardless of the target species quota available for harvest. These closures impose a cost on the industry in the form of unharvested quota. A reduction in bycatch rates for PSC may allow the fishery to harvest a greater proportion of the total allowable catch quota for certain groundfish species. One method to reduce bycatch rates is to install trawl gear devices that exclude non-target species such as Pacific halibut. The proposed EFP will test a new halibut excluder device designed to reduce halibut bycatch. The proposed EFP is also consistent with Magnuson-Stevens Fishery Conservation and Management Act National Standard 9 which seeks to minimize bycatch and bycatch mortality.

The EFP is necessary to allow the applicant to test a halibut excluder device in the Central GOA trawl fishery with certain exemptions from fishery closures, prohibited species catch (PSC) limits, and observer requirements. The objective of the EFP is to study a halibut excluder designed to reduce bycatch rates for inshore catcher vessels that target Pacific cod in the Central GOA. The information from the project will be used to determine (1) if the excluder device can reduce Pacific halibut bycatch rates by at least 40 percent; (2) the level at which the excluder reduces target species catch; and (3) the feasibility of using the excluder device in the Central GOA trawl fishery. Additionally, the degree to which the excluder accomplishes the goals and objectives will be evaluated by the applicant and Alaska Fishery Science Center (AFSC). Improved information may lead to improved designs and the potential use of excluders in the GOA. . The degree to which the excluder meets the goals and objectives will be evaluated by the applicant and AFSC.

The alternatives are limited to the status quo (Alternative 1) and the issuance of the EFP (Alternative 2). Alternative 2 would issue an EFP with the following regulatory exemptions: (1) The EFP would exempt the applicant from Central GOA directed fishing closures implemented under §§ 679.20, 679.21, 679.23 or 679.25. Retained amounts of groundfish other than Pacific cod would be limited to the relevant maximum retainable amount specified in Table 10 of 50 CFR part 679, using Pacific cod as the basis species from which maximum retainable amounts would be calculated; (2) PSC limits for halibut; and (3) observer requirements while the EFP is being prosecuted. The total amount of groundfish allowed to be harvested annually is 1,300 mt, of which 950 mt will likely be Pacific cod. Halibut mortality for the proposed EFP is limited to 90 mt. The permit would be effective August 1, 2006 through August 30, 2006. Regional Administrator may extend the EFP to allow for further testing of the excluder device in August 2007. Extension of the EFP is contingent on the sampling plan and gear modifications being approved by the AFSC.

The environmental effects of Alternative 2 are limited to PSC (halibut), marine mammals, groundfish, the benthic environment, and socioeconomic components. The effect of the action on PSC, marine mammals, the benthic environment, and groundfish is insignificant. Socioeconomic effects primarily are potential future effects, which cannot be predicted. Possible cumulative effects identified included the use of a halibut excluder device in the trawl fishery and revenue generated from the proposed EFP.

Comparison of Alternatives and Selection of a Preferred Alternative

Alternative 2 had no significant environmental impacts identified and potential socioeconomic or cumulative socioeconomic effects identified. Alternative 1 had no additional environmental impacts beyond those already identified in previous analyses. Alternative 1 would not provide for the testing of a halibut excluder device, nor would it allow the collection of information that may inform future bycatch reduction studies. Alternative 2 is the preferred alternative because it provides for the testing of a bycatch reduction device in the Central GOA and meets the purpose and needs of this project.

1.0 Purpose and Need

The purpose of the proposed EFP is to support a project to test a modification to trawl gear called a halibut excluder that may reduce halibut bycatch in the Gulf of Alaska (GOA) trawl fishery. Pacific halibut bycatch is controlled by a prohibited species catch (PSC) limit that is essentially a common property quota. Once reached, PSC limits trigger the closure of a fishery regardless of the available target species total allowable catch (TAC) available for harvest. Moreover, because multiple target species are under a single PSC limit, a PSC limit may result in the TAC for multiple fisheries not being harvested. For example, PSC harvest by the inshore Pacific cod fishery resulted in the closure of the deep water flatfish fishery before all the allocated catch is harvested.

A reduction in PSC rates through the use of a halibut excluder device may allow more Pacific cod and shallow-water flatfish TAC to be harvested. The proposed project would provide data about bycatch reduction methods for trawl gear that would otherwise be logistically difficult and expensive for the National Marine Fisheries Service (NMFS) and the industry to collect. The proposed project would also respond to bycatch reduction mandates in the Magnuson Stevens Conservation Act. The EFP is needed to provide exemptions from certain regulations to facilitate the bycatch reduction experiment.

1.1 Background

Prohibited Species Bycatch

Groundfish fisheries off of Alaska also catch non-groundfish species. Some of these non-groundfish species are themselves the objects of valuable targeted fisheries. These species include Pacific halibut, salmon, king and Tanner crabs, and herring. Provisions were incorporated early in the development of Fishery Management Plans (FMPs) to prohibit the retention of these species by foreign fleets (hence the expression "prohibited species"). As the groundfish fisheries were Americanized during the 1980s, the prohibited species issue became one of allocation between the domestic groundfish fisheries and other domestic fisheries such as pollock and Pacific cod.

During the mid 1980s, restrictions on the domestic groundfish fishery began to increase, due primarily to problems with incidental catches of non-target species. In 1983, Amendment 3 to the Bering Sea and Aleutian Island (BSAI) FMP established prohibited species catch policy for domestic fisheries, and defined prohibited species to include crab, halibut, herring, and salmon. The most far-reaching of these actions was the halibut PSC limit which, when met, closes fisheries from additional activity for the remainder of the season. Other PSC limits were not as onerous, triggering area closures rather than closing entire fisheries.

A PSC limit in a fishery is essentially a common property quota. Although the purpose is to limit PSC, the effect of the cap is to create a quota that allows the catch, but not the retention of PSC by the participants in the target fishery. Access to a PSC limit is highly competitive with the value of the PSC quota being associated with the value of the target species catch restrained by PSC catch. Furthermore, the average PSC bycatch rate for a fishery translates into an effective target fishery quota on catch in the target fishery if the TAC is not completely harvested. This situation encourages excessively rapid catch of the PSC as individual vessels "race" to catch their intended target species before the fishery's PSC apportionment is taken and the fishery closed.

The "race for the fish," and attendant high prohibited species bycatch rates, occur because the competition created by PSC does not encourage individual fishing operations to take full account of the costs of their actions when they make fishing decisions[1]. An operation that fished "dirty," that is, an operation that fished with high rates of associated prohibited species bycatch, obtained a benefit that accrued to it alone: cheaper groundfish. But the operation did so by hastening the closure of the groundfish fishery. If the closure came before the target groundfish TAC was fully caught, the entire groundfish fleet would incur a cost associated with the value of the foregone groundfish (unharvested TAC). The operation that was fishing dirty would bear some of this cost, but much of it would be borne by other operations in the fishery. No single operation would fully bear the costs of dirty fishing. However, dirty operations would realize economic benefits from their actions by shifting a large part of their bycatch costs to other operations. Thus, dirty operations do not have an incentive to control prohibited species catch rates.

If all the operations in a targeted groundfish fishery controlled their bycatch, the fishery could operate longer and produce larger volumes of fish for the participants. However, no party could be excluded from the benefits of a longer fishery. Thus, an operator that did not effectively control bycatch would be able to "free ride" on the efforts of those fishermen that did control bycatch. This creates an incentive structure that does not encourage bycatch reduction measures for any single operation. Without incentives for an individual operation, a group of fishermen may fail to take actions that would have a positive net benefit for them as a group.

Bycatch of Pacific Halibut in the GOA Trawl Fishery

The incidental catch of Pacific halibut in GOA trawl fisheries is managed under a PSC quota of 2,000 mt that is an overall limit on halibut mortality. Mortality rates for halibut that are specific to target groundfish fisheries are set annually based on observer data describing the condition of discarded halibut in previous years and to calculate a discard mortality rate (DMR). The halibut mortality cap for the GOA groundfish trawl fisheries is divided into seasonal apportionments (Table 1.1) which are further sub-divided into "deep-water" and "shallow-water" complex categories (Table 1.2). Seasonal and fishery-complex apportionments are set by NMFS based on annual recommendations by the North Pacific Fishery Management Council (NPFMC). To monitor halibut bycatch mortality allowances and apportionments, NMFS uses observed halibut bycatch rates, DMR estimated by the International Pacific Halibut Commission (IPHC), and estimates of groundfish catch to project when a fishery's halibut bycatch mortality allowance or seasonal apportionment is reached.

[1] The technical economic terms for the issues in these paragraphs are "common property," "externality" (imposing costs on others that one doesn't fully account for in one's decision making), and "public good" (no one in a defined group can be excluded from enjoying the benefits of this good if it is provided).

Table 1.1 Final 2006-2007 halibut PSC limits, allowances, and apportionments for GOA trawl gear.

Trawl Gear	
Dates	Amount in mt (%)
January 20 – April 1	550 (27.5)
April 1- July 1	400 (20)
July 1 – September 1	600 (30)
September 1 – October 1	150 (7.5)
October 1 – December 31	300 (15)
Total	**2,000 (100)**

GOA halibut bycatch in the Pacific cod trawl fishery and other trawl fisheries targeting shallow-water flatfish species is managed as a PSC allocation between the shallow-water and deep-water species complex. If the seasonal amount of halibut bycatch mortality is exceeded in the shallow-water or deep-water species complex, then the overage is deducted from the same species complex in the proceeding season. After the final season, halibut PSC overages are deducted from the complex which did not experience an overage. The same methodology is employed for the deep water species complex.

Table 1.2. The 2006 apportionments of halibut PSC for the GOA between the trawl gear deepwater species complex and the shallow water species complex.

Season	Shallow – water	Deep-water	Total
January 20-April1	400	100	500
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	n/a	n/a	300

The shallow-water flatfish and Pacific cod share the same seasonal halibut PSC allowances (shallow-water complex) and are thus subject to externalities resulting from PSC catch. The attainment of the halibut PSC limit early in the fall has left a large proportion of the GOA deep and shallow-water flatfish TAC underutilized. The deep-water and shallow water flatfish trawl fishery was closed before reaching their respective TACs in 2003, 2004 and 2005. In 2005, the deep-water flatfish and shallow-water flatfish fisheries harvested 12 percent and 65 percent of their TAC, respectively. Similar TAC utilization levels for the flatfish fisheries occurred in 2003 and 2004. Moreover, overages of the halibut PSC cap for the GOA shallow water complex were 2 percent and 35 percent for 2004 and 2005, respectively.

According to participants in the Pacific cod trawl fishery, the occurrence of overages in the shallow-water complex halibut PSC allocation is in part due to the 2001 Steller sea lion protection regulations. Changes in the rules governing the Pacific cod fishery in 2001 shifted a portion of the trawl cod fishing to later in the year than would otherwise have occurred. Trawlers have testified to the NPFMC that halibut bycatch rates in the Pacific cod trawl fishery increased when a large portion of the fishing was mandated to occur later in the year. The reason offered for this was that fishing was shifted outside of the timing of spawning and pre-spawning aggregations of cod that peak in the spring. Lower catch per unit of effort (CPUE) may have occurred because Pacific cod are less tightly schooled in the fall months. The lower CPUE was reported by industry to be offset with longer tows which increased halibut bycatch.

The trawl industry has also indicated that harvesting of Pacific cod in the summer and fall results in higher PSC catch rates because of a greater spatial overlap with halibut. Halibut are thought to migrate to shallower water in the summer and fall which would suggest greater overlap with Pacific cod. Given the likely persistence of sea lion regulations requiring the Pacific cod fishery to operate in the winter, spring, and fall months, the need for reduced halibut bycatch rates in the Pacific cod fishery is salient to operators.

Evolution of the Halibut Excluder Device

Since the inception of PSC limits in the late 1980s, the trawl sector has explored gear adjustments and changes in fishing methods designed to reduce PSC and increase utilization of TAC. Early efforts involved informal agreements among members of trawl associations to reduce towing speeds to avoid catching larger halibut. However, a reduction in towing speed reduced catch rates for the larger sole species targeted by the trawlers and thus offset incentives to reduce halibut bycatch by increasing costs. Therefore, this bycatch reduction method was not considered economically viable by the industry.

Starting in the mid-1990s, the Bering Sea trawling industry entered into informal agreements designed to reduce PSC catch rates (Gauvin et al. 1995). These voluntary agreements use observer monitoring information obtained by Sea State Inc. to inform individual vessels about the geographical distribution of PSC rates. Sea State Inc. is able to download proprietary catch data submitted to NMFS on a real time basis because flatfish catcher processors waived confidentiality rights through an informal agreement. As a result, Sea State Inc. is able to review catch data and advise vessel operators about PSC hotspots to avoid.

The utility of the Sea State program in the GOA is reduced by the large number of at-sea and shoreside fishery participants and data requirements. In 2005, a subset of GOA at-sea and shoreside flatfish and Pacific cod trawlers participated in a pilot program similar to the Sea State model used by Bering Sea flatfish fishermen. The pilot program revealed two primary problems associated with participants voluntarily avoiding halibut bycatch in the GOA: (1) participants could not obtain data within an appropriate time period to identify spatially-specific bycatch rates for vessels subject to the 30 percent observer coverage level; and (2) the lack of assigned rights to bycatch and target species. Without assigned property rights to shoreside delivery trawlers, the program could not effectively create an incentive structure for participants to avoid PSC hotspots The marginal cost of PSC bycatch was not greater than the marginal costs associated with avoiding PSC bycatch or those costs associated with vessels not participating in the Sea State Program. Therefore, the program was discontinued.

Modification to trawl gear to reduce halibut bycatch

In addition to industry-based voluntary programs designed to avoid PSC, catcher-processors successfully developed and used gear modifications to reduce halibut bycatch rates. These halibut excluders have been used extensively for deep-water flatfish fishing in the GOA (Gauvin and Rose, 2000). Halibut excluders have demonstrated a reduction of up to 85 percent in halibut bycatch per unit ton of target species catch. Field tests have demonstrated that loss rates for deep-water flatfish are generally less than 15 percent.

Several design considerations must be field tested before the halibut excluder is widely used in the GOA flatfish and Pacific cod fisheries. The first consideration is that most typical shoreside delivery trawlers rely on aft net reels and generally have very limited deck space. This necessitates that the halibut excluder be constructed of flexible materials that can be rolled onto net reels. Second, Pacific cod morphology (head size) prevents them from swimming through a grate positioned across the trawl intermediate. In field trials, Pacific cod escapement rates have generally been as high as halibut escapement rates. For this reason, any halibut excluder for the Pacific cod fishery would be designed to exploit the morphology and behavioral differences between Pacific cod and halibut.

Dr. Craig Rose of the AFSC conducted cooperative research to explore the potential for a "soft" halibut sorting grid constructed of webbing which could easily roll on net reel and thus be useful to GOA trawlers. Additionally, Dr. Rose developed a halibut excluder with slotted panels on the sides of the trawl intermediate. The slotted panels allow fish with flat bodies (such as halibut) to pass through the trawl with minimal loss of Pacific cod. In 2000, a field test of the halibut excluder in the Bering Sea demonstrated that halibut catch rates were reduced by approximately 80 percent and catch rates for Pacific cod were reduced by 15 percent. However, the excluder device is not appropriate for smaller GOA catcher vessels because the excluder is not constructed of flexible materials which allow for storage on a reel.

The halibut excluder described in the proposed EFP addresses the design issues of previous halibut excluder devices. The excluder device used for the EFP can be rolled with net reel and will allow halibut to swim through slotted panels that are placed on the sides of the trawl intermediate. The slots in the escapement panels are designed to accommodate the morphology of halibut and the expected size differences of cod and halibut encountered in the GOA Pacific cod fishery. The applicant expects approximately 40 percent of the halibut (by weight) will escape the trawl.

1.2 Project Area

The EFP would authorize the permit holder to fish in the Central GOA. This area is also described as Statistical Area 620 and 630 for purposes of fisheries management. See Figure 1 for the location of Area 620 and 630, which include waters in the Exclusive Economic Zone. Specifically, EFP fishing will occur in the following areas: Portlock Bank; Albatross Bank; in the vicinity of the Trinity Islands; and Chirikof. These areas are described in Figure 2.

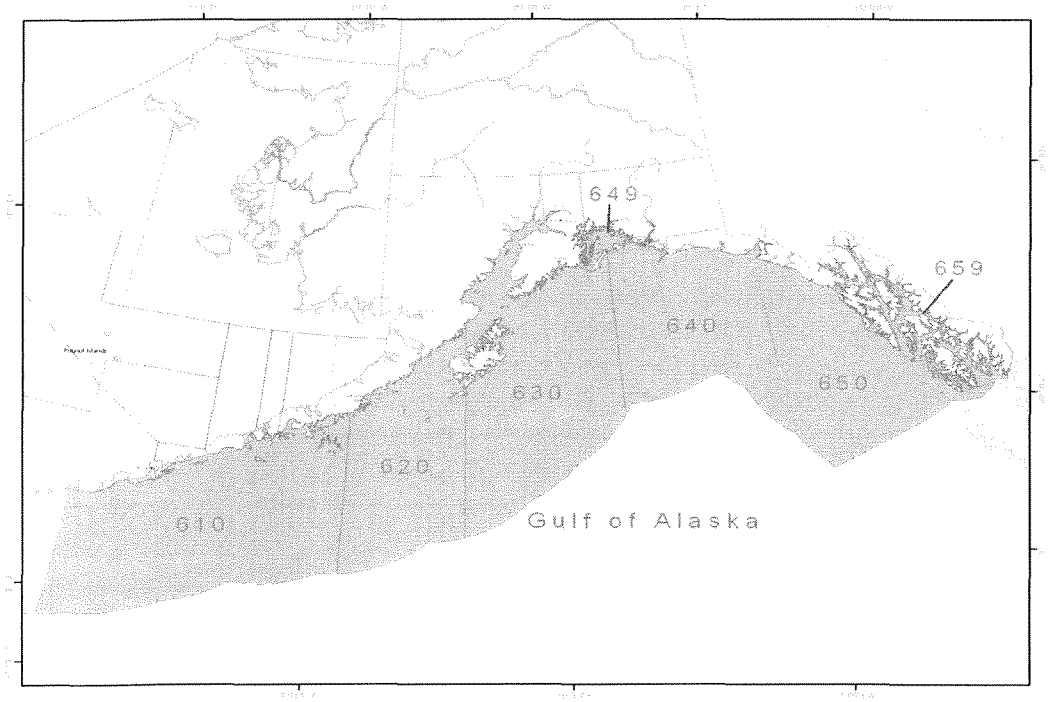

Figure 1 Central GOA management area (statistical areas 620 and 630)

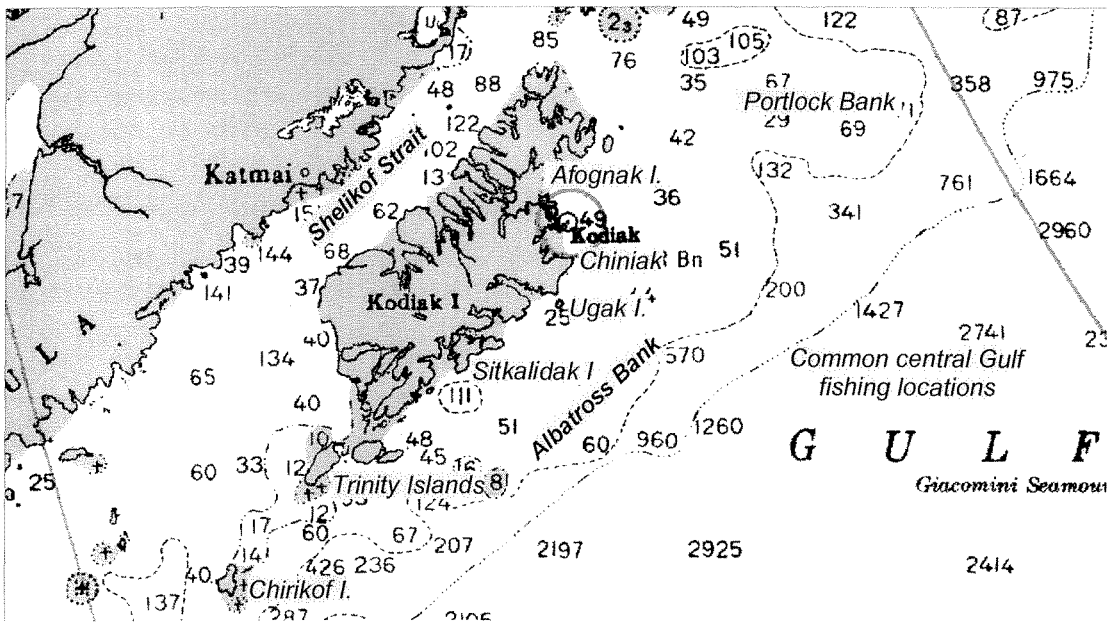

Figure 2 Description of the EFP fishing areas.

1.3 Current EFP Proposal

The objective of the proposed EFP is to conduct a rigorous field test of a halibut excluder designed to reduce halibut bycatch rates for inshore catcher trawl vessels targeting Pacific cod in the GOA. The performance goal for this project is to reduce the halibut bycatch rate (kilograms of halibut per metric ton of allocated groundfish) by at least 40 percent compared to an unmodified net. The project will also measure any effects on the catch rate for the target species (measured in terms of metric tons of cod per hour) compared to an unmodified net. Finally, the proposed EFP will evaluate the functionality and handling aspects of the excluder for use on typical GOA trawl vessels. Consideration for functionality and handling involve evaluating whether the device can be rolled on a typical Central GOA shoreside trawl vessel's net reel without damage as well as resistance to clogging and other maintenance problems. These performance aspects are critical to the development of an effective halibut excluder that may lower halibut bycatch rates in the Pacific cod fishery.

The proposed EFP will occur during a two week period between August 1, 2006, and August 31, 2006. The project may be extended by the Regional Administrator to occur during a two week period between August 1, 2007 and August 30, 2007. Continuation of the experiment in 2007 would allow refinement of the trawl gear modification and time to address statistical issues discovered during the 2006 experiment. August was chosen by the applicant because trawl vessels are not fishing for Pacific cod and are thus available to fish the EFP permit.

EFP fishing may occur any time during the permitted time period, but permitted vessels must meet all sampling requirements, including having observer program certified samplers onboard when the experiment is being conducted. Expected participants are Central GOA shoreside catcher vessels that commonly participate in the trawl fishery for Pacific cod (30 percent observer

vessels). Gear will be normal Pacific cod trawl gear with modifications to the net to exclude halibut and slower towing speeds for vessels using the excluder device.

The EFP is necessary to allow the applicant to test a halibut excluder device in the Central GOA with certain exemptions from fishery closures, and requirements. The trawl fisheries may be closed by NMFS to prevent (1) exceeding a TAC amount of a target species; (2) reaching an overfishing level of a non-target groundfish species; or (3) exceeding the PSC limit for Pacific halibut. These regulatory exemptions are being considered because the information gathered about the harvest of target and incidentally taken species will allow the applicant to further modify gear to be more selective and thus reduce halibut bycatch rates. The proposed EFP would allow the applicant to continue harvesting groundfish up to the amount specified in the permit unless NMFS determines there are overfishing concerns.

The integrity of the sampling plan associated with the EFP is dependent on an adequate number of trawl tows being made to allow statistical comparisons between the test groups. Because of this requirement, it is necessary to allow sufficient groundfish and halibut mortality to ensure the experiment is completed. Premature termination of the experiment would compromise the sampling protocol and statistical conclusions about the halibut excluder and would thus not meet the experimental goals. Without the regulatory exemptions described under Alternative 2, the experiment could be prematurely terminated.

2.0 Description of Alternatives

This EA provides an analysis of potential impacts resulting from issuing the EFP permit. Two alternatives are presented in this analysis: issuance of the EFP (Alternative 1) and no issuance of the EFP permit (Alternative 2). Alternative 2 exempts the applicant from the minimum amount of regulation needed to achieve the experiment's goal as described in Section 1.0.

No other alternatives are considered because of the statistical requirements needed to conduct the experiment (Section 1.0) and the process through which EFPs are issued. The proposed action is based on an EFP application that describes a carefully designed experiment developed by the applicant in consultation with the AFSC. The experiment is specifically designed to meet a set of scientific goals that require the regulatory exemptions outlined under Alternative 2. It is not reasonable for NMFS to develop alternative experiments that could be implemented under an EFP, especially when no application would be received to implement any of those alternative experiments under an EFP. For NMFS to develop additional alternatives to what is presented in this EA, an additional EFP application outlining an alternative experimental design would be required. This is not reasonable given the time frame in which the project is to be completed and the applicants sampling resources (i.e., financial, vessels, and staff).

In this analysis, the alternatives are evaluated for all direct, indirect, and cumulative effects on resources, species, and issues within the action area (Central GOA) as a result of the preferred alternative. Because of the need to adhere to the experimental design as presented in the EFP application and to meet the purpose of the project, no other alternatives than those presented below are proposed.

Alternative 1: No action alternative. The applicant's request for the halibut excluder EFP is not approved.

Alternative 2: Preferred alternative. The applicant's request for the halibut excluder EFP is approved.

Under this alternative, NMFS would issue the EFP with the following conditions:

1. Location and timing. The EFP will be authorized in the Central GOA from August 1, 2006 through August 30, 2006. The project may be extended by the Regional Administrator to occur during a two week period between August 1, 2007 and August 30, 2007. Continuation of the experiment in 2007 would allow refinement of the trawl gear modification and time to address statistical issues discovered during the 2006 experiment.

2. Amounts and disposition of halibut of groundfish. The total amount of groundfish species taken and retained may not exceed 1,300 mt. Of this amount, approximately 950 mt of Pacific cod is expected to be taken and 350 mt of other groundfish species. No more than 90 mt of halibut mortality may be accrued. All groundfish catch is exempt from TAC requirements and halibut mortality is exempt from being counted against the trawl halibut PSC limit. If the specified limits are reached, fishing activities under the EFP must stop. The NMFS Regional Administrator must be notified by the applicant before the EFP limits are reached.

   The amount of halibut bycatch mortality requested by the application is reasonable for the amount of Pacific cod anticipated to be taken during the project. At-sea observer data collected September 1 through 5, 2004 and 2005, from trawl catcher vessels with more than 500 kg of Pacific cod on board were used to estimate the amount of groundfish and halibut needed to meet the experimental needs for the EFP

   The following list provides the amounts of groundfish, halibut, and sablefish that are likely to be taken annually in this project:

   i. Groundfish , 1,300 mt
   ii. Halibut 90 mt

   The EFP will exempt the applicant from inseason actions except for actions that address overfishing. The applicant is also subject to all MRA regulations described in Table 10 to Part 679. Pacific cod harvest shall be used as the basis species for the calculation of retainable amounts. Groundfish may be retained for sale as described in Federal Regulation, but all halibut must be carefully released

3. Vessels and Gear: Expected participants are Central GOA shoreside catcher vessels that commonly participate in the trawl cod fishery in the GOA. All vessels will use trawl gear commonly used in the Pacific cod trawl fishery. A total of 92 tows will be made, with 46 of those tows using trawl gear modified to exclude halibut. Modified trawl gear will always be towed alongside non-modified trawl to facilitate statistical comparisons. The trawl modification will consist of a slotted escape panel mounted aft to a ridged or soft grate that is arranged to fit across the intermediate of the trawl. Up to four vessels would be permitted to fish under the EFP.

Regulatory Exemptions

Completion of the project would require the applicants' exemption from several groundfish regulations at 50 CFR part 679:

1. The EFP would exempt the applicant from trawl fishery closures in the Central GOA for reasons other than overfishing. The EFP would exempt the applicant from Central GOA directed fishing closures implemented under §§ 679.20, 679.21, 679.23 or 679.25. The EFP would allow for the harvest of up to 1,300 mt of groundfish species. The closure of the Central GOA trawl fisheries for reasons other than overfishing concerns would not prevent the continuation of fishing activities under the EFP. Retained amounts of groundfish other than Pacific cod would be limited to the relevant maximum retainable amount specified in Table 10 of 50 CFR part 679, using Pacific cod as the basis species from which maximum retainable amounts would be calculated.

2. The EFP exempts the applicant from regulations requiring observers to be on board the vessel. The permit would require an exemption from Sections 679.50, 679.7(a)(3), 679.7(g) while the experiment is being conducted. The vessels would carry at-sea samplers while the experiment is being prosecuted. The at sea samplers would collect information on halibut bycatch, groundfish species composition (when feasible), and the general performance of the gear. Information on species composition data for all tows will also be obtained at the processing plant.

3. Halibut mortality from this project would create an additional burden on the GOA trawl industry if EFP related mortality is counted toward the annual halibut PSC limit and triggers closure of the GOA flatfish or Pacific cod fishery. Halibut mortality from this project would thus not be applied against the halibut PSC limits allocated to the Central GOA trawl fishery. The proposed EFP would exempt a vessel from halibut PSC limits at § 679.21(d)(3) and permit up to 90 mt of halibut mortality as determined through consultation with the International Pacific Halibut Commission (IPHC) and the AFSC.

3.0 Affected Environment

The NEPA documents listed below contain extensive information on the fishery management areas, marine resources, ecosystem, social and economic parameters of these fisheries and the harvest specifications. Rather than duplicate an affected environment description here, readers are referred to those documents. All of these are public documents and are readily available in printed form or over the Internet at links given in the references. Because this action is limited in area and scope, the description of the affected environment is incorporated by reference from the following documents:

Annual Harvest Specifications EA. The 2006-2007 harvest specifications were analyzed in an EA and a Finding of No Significance Impact (FONSI) determination was made prior to publication of the rule (NMFS 2006). Additionally, the ecosystem considerations section of the Stock Assessment and Fishery Evaluation reports is included as Appendix C to the 2006-2007 harvest specifications EA (NMFS 2006). It contains summaries and pointers to recent studies and information applicable to understanding and interpreting the criteria used to evaluate significance of impacts that will result from alternative harvest quotas. Appendix B contains the GOA stock assessment and fishery evaluation (SAFE) reports.

Groundfish Programmatic EIS. The Alaska Groundfish Fisheries Final Programmatic Supplemental Environmental Impact Statement (PSEIS) evaluates the fishery management policies embedded in the Bering Sea/Aleutian Islands and GOA groundfish FMPs against policy level alternatives and the setting of TACs, allowable biological catch (ABC), and overfishing level (OFL) at various levels (NMFS 2004). The PSEIS is available at

http://www.fakr.noaa.gov/sustainablefisheries/default.htm. This document contains a description of the impacts from the GOA groundfish fishery.

GOA Groundfish Rationalization Supplemental EIS. In this analysis, ongoing since May 2002, the Council is considering alternative management approaches to "rationalize" the GOA groundfish fisheries. Rationalization may improve the economic stability to the various participants in the fishery. These participants may include harvesters, processors, and residents of fishing communities. The Council is considering these new management policies at the request of the GOA groundfish industry to address its increasing concerns about the economic stability of the fisheries. Some of these concerns include changing market opportunities and stock abundance, increasing concern about the long-term economic health of fishing dependent communities, and the limited ability of the fishing industry to respond to environmental concerns under the existing management regime. The Council may consider rationalizing the fishery through individual fishing quotas, allocations to communities or processors, or cooperatives. Alternatively, the Council may choose to modify the License Limitation Program or maintain the existing management system. As yet, specific alternatives have not been selected, and the SEIS will guide the Council in its decision making process. For more information see the http://www.fakr.noaa.gov/ sustainablefisheries/goa_seis/default.htm.

Essential Fish Habitat Identification and Conservation in Alaska EIS. This EIS reexamines the effects of fishing on EFH in waters off Alaska, presents a wider range of alternatives, and provides a thorough analysis of potential impacts on EFH caused by the groundfish fishery. The analysis provides a description of managed groundfish species, marine mammals, and the socioeconomic environment in the Central GOA trawl fishery. The analysis indicates that there are long-term effects of fishing on benthic habitat features off Alaska and acknowledges that considerable scientific uncertainty remains regarding the consequences of such habitat changes for the sustained productivity of managed species. The EIS is found at http://www.fakr.noaa.gov/habitat/seis/efheis.htm.

Steller Sea Lion Protection Measures Final Supplemental Environmental Impact Statement (SEIS). This SEIS evaluates alternatives to mitigate potential adverse effects as a result of competition for fish between Steller sea lions under a no action alternative as well as other alternatives that would substantially reconfigure the GOA and BSAI groundfish fishery. Impacts are disclosed, both significantly positive and significantly negative as required by NEPA. A biological opinion prepared according to the Endangered Species Act is included for the preferred alternative. This document also describes the life history characteristics of Steller sea lions and potential interactions with the groundfish fishery. For more information see http://www.fakr.noaa.gov/sustainablefisheries/seis/sslpm/default.htm.

For those stocks where information is available, none are considered overfished or approaching an overfished condition and all are managed within the 2006-2007annual harvest specifications. The ABC, OFL, and TAC amounts for each target species or species group for 2006 is specified in the *Federal Register* (71 FR 10870, March 3, 2006). Table 4.2 shows the 2005-2007 TAC and ABC amounts for the Central GOA groundfish fisheries and for several fisheries with GOA wide specifications.

Further details about the affected environment are found in Section 4.0 which describes the resource components potentially affected by the proposed action.

4.0 Environmental and Economic Consequences

Environmental Components Potentially Affected

The issuance of the EFP is limited in scope and will likely not affect all environmental components of the GOA. This project involves the taking of groundfish species in the Central GOA using trawl gear. The EFP would require harvested groundfish to be counted against the annual TAC limits. Table 4.1 shows the potentially affected environmental components. Because under Alternative 1 (no action) the EFP permit would not be issued, no effects beyond those described in the documents listed in Section 3.0 of this EA would occur.

Table 4.1 Resources potentially affected by EFP Alternatives

	Potentially Affected Component							
Alternatives	Physical	Benthic Comm.	Groundfish	Marine Mammals	Seabirds	Non specified Species	Prohibited Species	Socioeconomic
1	N	N	N	N	N	N	N	Y
2	N	Y	Y	Y	N	N	Y	Y

N = no impact beyond status quo anticipated by the option on the component.
Y = an impact beyond status quo is possible if the option is implemented.

Under Alternative 2, the gear type and method of harvest would not change from current practices. Therefore, no effects beyond those already identified are expected on the physical environment, non specified and forage species, and seabird components of the environment (NMFS 2006). As illustrated in Table 4.1, the following five potential environmental components may be impacted under Alternative 2:

1. Groundfish species: Issuance of the EFP would permit the harvesting of target groundfish species and prohibited species (Pacific halibut) using trawl gear in the Central GOA. Potential effects on the environment can occur from direct removals of groundfish from the ocean through harvesting, bycatch of non-target species, and environmental impacts resulting from the use of the fishing gear. The EFP would exempt the applicant from TAC requirements which may result in harvest above the 2006 TAC. Therefore, because groundfish may be taken above the TAC, additional impacts on groundfish other than those identified in the 2006-2007 harvest specification (NMFS 2006) may occur.

2. Marine Mammals: Steller sea lions in the project area may be impacted from the removal of certain groundfish species above their respective TACs as specified in the 2006-2007 harvest specifications (NMFS 2006). One species in particular, Pacific cod, is important prey for Steller sea lions. Because issuance of the EFP would allow the harvest of groundfish above the TAC level, the marine mammal component could have impacts beyond those described in the 2006-2007 annual harvest specification EA (NMFS 2006) and is thus considered a potentially affected. The applicant would not be exempt from Federal regulations for Steller sea lions.

3. Halibut prohibited species catch (PSC): The effects from PSC catch under Alternative 2 are limited to incidental mortality for Pacific halibut. Alternative 2 would allow up to 90 mt of halibut mortality each year the experiment is conducted.

4. Benthic community: This action may have impacts on the benthic environment and associated areas designated as essential fish habitat (EFH). Alternative 2 would exempt the applicant from inseason closure of the directed fishery resulting from exceedence of the TAC or PSC, and seasonal closure of the directed Pacific cod trawl fishery. Therefore, because the applicant will be trawling during an otherwise closed period and may exceed the TAC amounts for groundfish, there could be additional impacts than those analyzed in the annual harvest specification EA (NMFS 2006). The applicant would not be exempt from EFH regulations.

5. Social and economic impacts: This action may also have socioeconomic impacts on the industry and the applicant. Issuance of this EFP would allow the applicant to generate revenue from the sale of groundfish caught during the course of the experiments. Thus, economic benefits may be accrued by the applicants. The successful development of a halibut excluder device may also impact the efficiency of the trawl fishery to avoid bycatch and reduce costs associated with PSC while potentially increasing costs associated with the modification of existing gear and behavioral changes required to effectively fish the exclusion device.

Table 4.1 shows the components of the human environment and the potential impacts beyond status quo (Alternative 1), and require further analysis. The issuance of the EFP is limited in scope and will likely not affect all environmental components of the GOA. Analysis is included for those environmental components that may have an impact beyond those already described in previous NEPA analysis for status quo.

This section forms the scientific and analytical basis for the issue comparisons across alternatives. As a starting point, Alternative 2 is perceived as having the potential to affect one or more components of the human environment. Significance of effect is determined by considering 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 the impact (short versus long term), magnitude of impact (minor versus major), and degree of risk (high versus low level of probability of an impact occurring). Further tests of intensity include (1) the potential for compromising the sustainability of any target or nontarget species; (2) substantial damage to marine habitats and/or essential fish habitat; (3) impacts on public health or safety; (4) impacts on endangered or threatened species, or critical habitat of listed species; (5) cumulative adverse effects; (6) impacts on biodiversity and ecosystem function; (7) level of social or economic impacts; and (8) degree of controversy (NOAA Administrative Order 216-6, Section 6.02).

Differences between direct and indirect effects are primarily linked to the time and place of impact. Direct effects are caused by the action and occur at the same time and place. Indirect effects occur later in time and/or are further removed in distance from the direct effects (40 CFR 1508.27). For example, the direct effects of an alternative which lowers the harvest level of a target fish could include a beneficial impact to the targeted stock of fish, a neutral impact on the ecosystem, and an adverse impact on net revenues to fishermen, while the indirect effects of that same alternative could include beneficial impacts on the ability of Steller sea lions to forage for prey, neutral impacts on incidental levels of prohibited species catch, and adverse impacts in the

from of economic distribution effects, for example, reducing employment and tax revenues to coastal fishing communities.

The section below contains an explanation of the significance criteria. The significance ratings are as follows: beneficial, adverse, insignificant, and unknown. Where sufficient information on direct and indirect effects is available, rating criteria are quantitative in nature. In other instances, where less information is available, the discussions and rating criteria used are qualitative. In instances where criteria to determine an aspect of significance (significant adverse, insignificant, or significant beneficial) do not logically exist, no criteria are noted. These situations are termed "not applicable" in the criteria tables. An example of an instance where criteria do not logically exist, is the evaluation of the impact vector of incidental take on a declining stock of marine mammals. In that situation, an increase in take that caused a downward change in the population trajectory by greater than 10 percent is significant adverse. Any level below that which would have an effect on population trajectories is insignificant because the stock is continuing to decline regardless of fishery effects. There is no logical significant beneficial alternative (a reduction in take resulting in a beneficial effect on the population trajectory). Therefore, a criterion for significant beneficial would not be applicable (NMFS 2004).

The rating terminology used to determine significance is the same for each resource, species, or issue being treated; however, the basic "perspective" or "reference point" differs depending on the resource, species, or issue being treated. The reference point relates to the biological environment. For each resource or issue evaluated, specific questions were considered in the analysis. In each case, the questions are fundamentally tied to the respective reference point. The generic definitions for the assigned ratings are as follows:

S+ Significant beneficial effect in relation to the reference point; this determination is based on interpretations of available data and the judgment of the analysts who addressed the topic.

I Insignificant effect in relation to the reference point; this determination is based upon interpretations of data, along with the judgment of analysts, which suggests that the effects are small and within the "normal variability" surrounding the reference point. When evaluating an economic or management issue it is used when there is evidence the alternative does not positively or negatively affect the respective factor.

S- Significant adverse effect in relation to the reference point and based on interpretations of data and the judgment of the analysts who addressed the topic.

U Unknown effect in relation to the reference point; this determination is made in the absence of information or data suitable for interpretation with respect to the question of the impacts on the resource, species, or issue.

NE No effect is anticipated from implementation of the action.

4.1 Groundfish

Designated target groundfish species and species groups in the GOA are walleye pollock, Pacific cod, deep-water flatfish[2], rex sole, flathead sole, shallow water flatfish[3], arrowtooth flounder, sablefish, Pacific ocean perch, shortraker rockfish, rougheye rockfish, other rockfish, northern rockfish, pelagic shelf rockfish, thornyhead rockfish, big skates, longnose skates, other skates, demersal shelf rockfish, Atka mackerel, and other species[4]. This EA cross-references and summarizes the status of the stock information in the SAFE reports (NPFMC 2005). For detailed life history, ecology, and fishery management information regarding groundfish stocks in the GOA see Section 3.3 in the final PSEIS (NMFS 2001) and the 2006 harvest specification EA (NMFS 2006).

[2] The deep-water flatfish complex is composed of the following species: Dover sole, Greenland turbot, and deep-sea sole.

[3] The shallow-water flatfish complex is composed of all flatfish excluding deepwater flatfish, flathead sole, rex sole, and arrowtooth flounder.

[4] The other species complex is composed of all shark species, all octopus species, all sculpin species, and all species of squid.

Table 4.2 2005-2007 groundfish Central GOA TACs and ABCs, and 2006 GOA wide OFL.

Species	2005 Harvest	2005 TAC	2005 ABC	2006 TAC	2006 ABC	2007 TAC	2007 ABC
Central GOA							
Pacific cod Inshore	22,234	22,577	33,117	25,565	37,873	25,565	27,206
Pacific cod Offshore	361	2,509		2,840		2,840	
DW Flat	403	3,340	3,340	4,139	4,139	1,446	1,446
Rex Sole	1,600	7,340	7,340	5,506	5,506	5,207	5,207
Flathead Sole	1,912	5,000	30,020	5,000	25,195	5,000	26,111
SW Flatfish	4,562	13,000	27,250	13,000	24,258	13,000	27,258
Arrowtooth Flounder	16,947	25,000	168,950	25,000	134,906	25,000	140,640
Sablefish (trawl)	998	1,450	7,250	1,247	6,370	1,274	5,630
Northern Rockfish	4,210	4,283	4,283	3,608	3,608	3,608	3,608
POP	8,065	8,535	8,535	7,418	7,418	7,660	7,660
SR/RE	345	881	881	961	961	949	949
Thornyhead	388	1,010	1,010	989	989	989	989
PSR	1,845	3,067	3,067	3,262	3,262	3,318	3,318
Other rockfish	565	300	300	386	386	386	386
Big Skate	793	2,463	2,463	2,250	2,250	2,250	2,250
Longnose Skate	965	1,972	1,972	1,969	1,969	1,969	1,969
GOA-Wide							
Atka mackeral	882	600		1,500	4,700	1,500	4,700
Other species	2,255	13,871		13,856	na	12,229	na
Other skates	687	1,327		1,617	1,617	1,617	1,617

* TAC does not include amount for state water fishery.

The reference point for significance determination for the effects on target groundfish species is the capacity of the stock to maintain benchmark population levels or harvest rate of subject species as specified in 2006-2007 harvest specification EA (NMFS 2006). The 2006-2007 harvest specification EA sets benchmark harvest levels in accordance with requirements described by the MSA. Perhaps the most influential of these standards is MSA National Standard 1 which states: "Conservation and management measures shall prevent overfishing while achieving, on a continuing basis, the optimal yield from each fishery for the United States Fishing industry (16 U.S.C 1851). These benchmarks include OFLs, ABCs, and TACs. The OFLs and ABC levels reflect sustainable harvest levels based on science and the GOA fishery management plan (FMPs). The annual TACs reflect policy choices for allowable catch levels and are always specified less than or equal to OFL and ABC benchmarks. Table 4.3 summarize the significance criteria for evaluating the effects of the alternatives on groundfish in accordance with harvest benchmarks described in the 2006-2007 harvest specification EA.

Table 4.3 Criteria used to estimate the significance of effects on stocks of groundfish in the GOA.

Effect	Significant Adverse	Insignificant	Significant Beneficial	Unknown
Harvest of Groundfish Species	Reasonably expected to jeopardize the capacity of the stock to maintain benchmark population levels	Reasonably not expected to jeopardize the capacity of the stock to maintain benchmark population levels	NA	Insufficient information available

For the purposes of this analysis, groundfish harvest below the OFL level has a significant adverse impact on the stock and can be reasonably expected to jeopardize the capacity of the stock to maintain benchmark population levels. Because the project is geographically and temporally limited, as well as being limited to a small portion of the overall groundfish population, harvest of groundfish below the OFL is reasonably not expected to jeopardize the capacity of the stock to maintain benchmark population levels.

Effects on Groundfish

Issuance of the EFP will allow for the removal of up to 1,300 mt of groundfish (primarily Pacific cod) that would be exempt from the TAC for the Central GOA for 2006 and possibly 2007. At sea observer data collected September 1 through September 5, 2004 and 2005, from trawl catcher vessels with more than 500 kg of Pacific cod on board were used to estimate the amount of Pacific cod needed to meet the experimental needs for the EFP. This estimate was based on 190 tows made from trawl vessels fishing in NMFS statistical areas 620 and 630 (Figure 1.1). Using this information, the AFSC estimated that 950 mt of Pacific cod and 350 mt of other types of groundfish would be harvested each year the experiment is conducted.

In 2004 and 2005, harvest of Pacific cod was within 10 percent and 5 percent of the annual TAC for the Central GOA and Central GOA inshore allocation, respectively. Issuance of the EFP would likely result in Pacific cod harvest amounts ranging from 950 mt to 1,300 mt each year the

experiment is conducted. These amounts would not exceed the ABC for the GOA or Central GOA in 2004 and 2005. However, the Central GOA TAC in 2004 and the Central GOA inshore TAC in 2004 and 2005 would be exceeded by a small margin. The amount of Pacific cod harvested under Alternative 2 comprises a small portion of the 2005 Central GOA and GOA ABC. Issuance of this EFP would comprise 9 percent (950 mt) to 12 percent (1,300 mt) of the unharvested Central GOA ABC. Similar harvest levels are observed for 2004. The difference between the 2005 TAC and ABC are similar to those reported in the 2006 and 2007 harvest specification. Moreover, the amount of harvest under the EFP is a small portion of the difference between the ABC and TAC. Issuance of this EFP would likely not result in the exceedence of the Central GOA ABC in 2006 or 2007 and would thus be rated insignificant.

Table 4.4 2004 – 2007 Pacific cod harvest, TAC, ABC, and unharvest TAC and ABC for the Central GOA, GOA wide, and Central GOA inshore (trawl only).

		Harvest	TAC	ABC	Unharvested TAC	Unharvested ABC
GOA-Wide	2006	NA	52,264	68,859	NA	NA
	2005	47,403	44,433	58,100	-2,970	10,627
	2004	56,654	48,033	62,810	-8,621	6,156
Central	2006	NA	28,405	37,873	NA	NA
	2005	22,595	25,086	33,117	2,491	10,522
	2004	27,438	27,116	35,000	-322	7,562
Central Inshore*	2006	NA	25,565	NA	NA	NA
	2005	22,234	22,577	NA	343	NA
	2004	25,507	24,404	NA	-1,103	NA

* Pacific cod removals by catcher vessels are applied against the Central GOA inshore allocation. Central GOA ABC limits apply for the Central GOA inshore allocation.

Issuance of the EFP would allow for the removal of groundfish species other than Pacific cod. An estimated 350 mt of non-Pacific cod groundfish species would be harvested under Alternative 2. The amount of non-cod groundfish to be harvested is based on the previously described harvest estimates provided by the AFSC. The following groundfish species or species groups could be affected by the additional harvest because their annual TAC or ABC is at or near full allocation: sablefish, shortraker and rougheye rockfish, northern rockfish, other rockfish, Atka mackerel. Alternative 2 will not impact other non-Pacific cod groundfish species including Atka mackerel because the additional harvest associated with this EFP are within their 2005 unharvested TAC levels, or the groundfish species are rarely encountered in the inshore trawl fishery (i.e., Pacific Ocean perch and Atka mackerel).

Sablefish harvest in the Central GOA has been within 2 percent to 10 percent of the annual TAC for 2004 and 2005. The overall Central GOA TAC was exceeded by 650 mt in 2004, but the Central GOA trawl fishery TAC had approximately 450 mt of unharvested sablefish. In 2005, 624 mt of sablefish Central GOA TAC was unharvested.

The proposed EFP would require the permit holder follow MRA regulations using Pacific cod as the basis species. MRA requirements allow up to 1 percent of the total basis species weight to be sablefish. Therefore, assuming that 950 mt to 1,287 mt of Pacific cod would be harvested under

Alternative 2, the maximum amount of sablefish harvested would be between 9.5 mt and 13 mt for each year the experiment is conducted. This amount of sablefish is not likely to cause the total harvest to exceed the Central GOA TAC or the inshore Central GOA TAC in 2006 or 2007. Moreover, fishing practices in 2006 and 2007 are likely to be the same as fishing in 2005 which would result in an underharvest of sablefish in the Central GOA trawl sector. Thus, the sablefish harvest would remain well below the OFL and is therefore likely to be insignificant.

Rougheye and shortraker rockfish (RE/SR) are combined into a single Central GOA TAC, which is equal to the ABC for the group. MRA requirements allow up to 5 percent of the total basis species weight to be RE/SR. Therefore, under MRA requirements, the harvesting of 950 mt to 1,239 mt of Pacific cod as described under Alternative 2 would result in 47.5 mt to 62 mt of RE/SR harvest. This amount of rockfish harvest would comprise between 6 percent and 9 percent of the 2005 unharvested TAC (690 mt) and 3 to 5 percent of the 2004 unharvested TAC (1,449 mt). Harvest of SR/RE in 2006 and 2007 is expected to be similar to 2005. Thus, SR/RE harvest under Alternative 2 is likely to be below the Central GOA TAC, ABC and the GOA OFL, and is therefore insignificant.

A study conducted by Clausen and Heifetz (2002) of northern rockfish caught in the Central GOA fishery showed that 89 percent of northern rockfish catch originated from the five fishing grounds in the Central GOA: Portlock Bank, Albatross Bank, an unnamed bank south of Kodiak Island that fishermen commonly refer to as the "Snakehead," Shumagin Bank, and Davidson Bank. In particular, the Snakehead Bank accounted for 46 percent of the northern rockfish catch during these years. The proposed EFP will occur in at least two of these fishing grounds: Portlock Bank and Albatross Bank, both of which cover large geographical areas. Thus, the proposed EFP may catch northern rockfish during the course of the experiment.

The estimated harvest of northern rockfish for the proposed EFP is less than 1 mt. Observer data shows that these species are rarely encountered during the Pacific cod trawl fishery. The low harvest amounts may be in part due to the shallower depths (~ 60 fathoms) at which Pacific cod are caught. The total harvest for the proposed EFP is below the unharvested TAC for 2004 (73 mt) and 2005 (347mt). However, the 2006 and 2007 TAC of 3,608 mt is 16 percent less than the 2005 TAC. This decline in allowable catch may result in the fishery harvesting up to the TAC/ABC level. Any ABC overages resulting from the EFP would likely be very small and well below the OFL. For example, at-sea observer data collected from trawl vessels with more than 500 kg of Pacific cod in 2004 and 2005 showed that of the 2,600 mt extrapolated total catch, there was an estimated 14 kg (0.014 mt) of northern rockfish harvested. Similar catch rates are expected for the proposed EFP. Therefore, the catch associated with this EFP will be well below the OFL and may be below the 2006-2007 ABC/TAC depending on fishery harvest levels. The effect on northern rockfish is therefore insignificant.

In the Central GOA, the "other rockfish" species complex is composed of slope rockfish and demersal shelf rockfish. This complex is designated by NMFS as bycatch only with the TAC equal to the ABC (Table 4.3). The TAC is usually harvested in the fishery by mid summer. For example, in 2005 and 2004, the TAC was harvested by July and the other rockfish complex was put on prohibited species status by NMFS, Alaska Region. Prohibited species status requires that all rockfish in the complex be discarded. Therefore, because the TAC is fully allocated to the fishery, Alternative 2 may harvest other rockfish above the 2006 and 2007 TAC and ABC of 364 mt for the Central GOA.

The at-sea observer data used to estimate Pacific cod harvest under Alternative 2 did not indicate any "other rockfish" caught. This may be because species within the other rockfish complex

prefer rocky habitat that is difficult to trawl. Only very small amounts of rockfish species within the "other rockfish" complex are likely to be caught. This catch level would not approach the GOA-wide OFL[5]. Moreover, harvest of the other rockfish complex for the entire GOA was 20 percent and 23 percent of the GOA wide ABC in 2005 and 2004, respectively. Because harvest levels of other rockfish are likely to be very small and the fishery is not approaching the OFL or GOA-wide ABC, the impact of Alternative 2 on other rockfish is rated insignificant.

4.2 Marine Mammals and ESA Listed Marine Mammals

Direct and indirect interactions between marine mammals and groundfish harvest may occur because of the overlap in the size and species of groundfish harvested in the fisheries that are also important marine mammal prey, and due to temporal and spatial overlap in marine mammal occurrence and commercial fishing activities.

Environmental impacts from the alternatives are analyzed by addressing the following three questions: (1) does the proposed harvest level of groundfish result in an increase in direct interactions with marine mammals (incidental take and entanglement in marine debris); (2) does the proposed harvest level remove prey species at levels or in areas that could compromise the foraging success of marine mammals (harvest of prey species); and (3) does the proposed harvest level modify marine mammal behavior (disturbance)?

Significant incidental take of marine mammals is determined by predicting whether the proposed harvest levels will result in a take that exceeds the potential biological removal (PBR) The PBR is the maximum number of animals that may be removed from a marine mammal stock while allowing that stock to reach or maintain its optimum sustainable population. The PBR is used for marine mammals because it is the value determined through the marine mammal stock assessments (Angliss and Lodge 2004) to identify the level at which animals may be removed from the stocks while the stocks achieves sustainable populations. As long as take is maintained within the PBR, the take is considered not significant. Significance ratings for each question are summarized in Table 4.5.

[5] In 2003, 2004, and 2005, the unharvested portion of the OFL was 4,375 mt, 4,252mt , and 4,817 mt, respectively

Table 4.5 Criteria for determining significance of impacts to marine mammals.

	Incidental take and entanglement in marine debris	Harvest of prey species	Disturbance
No impact	No incidental take by fishing operations, and no entanglement in marine debris	No competition for key marine mammal prey species by the fishery.	No disturbance of mammals or their prey.
Adverse impact	Mammals are taken incidentally to fishing operations, or become entangled in marine debris	Fisheries reduce the availability of marine mammal prey.	Fishing operations disturb marine mammals or the prey of marine mammals.
Beneficial impact	There is no beneficial impact.	There are no beneficial impacts.	There is no beneficial impact.
Significantly adverse impact	Incidental take is more than PBR	Competition for key prey species likely to constrain foraging success of marine mammal species causing population decline.	Disturbance of mammal or prey field such that population is likely to decrease.
Significantly beneficial impact	Not applicable	Not applicable	Not applicable
Unknown impact	Insufficient information available on take rates	Insufficient information as to what constitutes a key area or important time of year	Insufficient information as to what constitutes disturbance.

Effects on Marine Mammals and ESA Listed Marine Mammals

Because of the type of gear and target fishery, the marine mammal species that may be impacted are limited. According to the proposed List of Fisheries for 2006 (71 FR 20941, April 24, 2006), the western stock of Steller sea lions are the only marine mammal with mortality documented from observer data in the GOA trawl fishery. Pacific cod has been identified as a principal prey species for Steller sea lions. The proposed EFP would catch groundfish commonly used as a principle food source for Steller sea lions which are listed as an endangered species within the study areas. Reduction in local abundance of Pacific cod could be more energetically costly to foraging marine mammals.

Pacific cod harvest levels for the proposed EFP will be limited to an amount to not exceed the ABC specified by the 2006-2007 harvest specification EA (NMFS 2006). The 2006 Pacific cod ABC for the Central GOA is 37,873 mt, which is an increase of 4,756 mt from 2005. GOA Pacific cod spawning biomass for 2006 is estimated at a value of 165,000 mt. This is approximately 26 percent above the $B_{40\%}$ value of 132,000 mt, which indicates that 40 percent of the equilibrium spawning biomass would be obtained in the absence of fishing. Thus, the current

equilibrium biomass is well above the biomass that requires the closure of the directed fishery because of Steller sea lion protection measures. Moreover, no disturbance in addition to status quo is expected from fishing under the EFP because the applicants will be not exempt from existing Steller sea lion regulations designed to protect important habitat areas.

The additional harvest of Pacific cod is a small increase over the TAC, well below the ABC, and is located outside Steller sea lion protection areas. Therefore, because of the location and amount of harvest that would occur under the EFP, incidental take, competition, and disturbance of Steller sea lions is not expected in 2006 or 2007. Fishery activities under the EFP would be consistent with existing Steller sea lion protection measures as analyzed in previous consolations. Therefore, effects from the EFP are not expected to disturb Steller sea lions, result in competition for prey, or significantly increase the potential for an incidental take.

Considering the short duration of the experiment (a two- week period in August 2006 and August 2007), limited harvest of Pacific cod, and compliance with Steller sea lion closure areas, the effects on Steller sea lions from issuing the EFP are discountable. Moreover, because the effect of the action is insignificant, it is not likely to jeopardize the continued existence of the western population of Steller sea lions, or adversely modify their critical habitat. As a result, the EFP is not likely to adversely affect Steller sea lion or their critical habitat.

The GOA stock of harbor seals also may be resident in the area where fishing under the EFP may occur (Angliss and Lodge, 2004). Disturbance is a possibility for this species but would not be likely to cause population level effects based the type of fishing gear used, the limited amount of fishing during the projects duration, and the amount of fish harvested. No incidental take of harbor seals in the GOA Pacific cod trawl fishery has been reported, based on the proposed List of Fisheries for 2006. Pacific cod is a principle prey species for harbor seals. The amount of Pacific cod harvested during the proposed EFP will be within the ABC. The small amount of Pacific cod harvest, location of harvest, and temporal scale in which harvest will occur make competition between fishing under the EFP and harbor seals unlikely. Therefore, effects of the EFP on harbor seal populations in the Central GOA are expected to be insignificant for 2006 or 2007.

4.3 Prohibited Species

The only prohibited species managed in the groundfish fisheries in the GOA is Pacific halibut. Alternative 1 is the status quo and would have no additional effects on prohibited species that have not already been analyzed (NMFS 2004). Alternative 2 would allow for additional halibut mortality beyond the PSC limit established for the GOA trawl fisheries. The EFP would specify that up to 90 mt of halibut mortality outside of the annual PSC is permitted for the proposed EFP in 2006 and 2007. Application of halibut caught during the EFP to the annual PSC limit would further constrain harvest of target groundfish species in the GOA trawl fisheries. For this reason, the applicant would be exempt from applying halibut mortality from the EFP against the PSC limit for the GOA trawl fishery.

The reference point for significance determination for the effects on PSC is the capacity of the stock to maintain benchmark population levels. Table 4.5 summarizes the significance criteria for evaluating the effects of the alternatives on Pacific halibut.

Table 4.6 Criteria used to estimate the significance of effects on stocks of Pacific halibut in the GOA.

Effect	Significant Adverse	Insignificant	Significant Beneficial	Unknown
Incidental catch of halibut	Reasonably expected to jeopardize the capacity of the stock to maintain benchmark population levels	Reasonably not expected to jeopardize the capacity of the stock to maintain benchmark population levels	NA	Insufficient information available

Benchmarks: Pacific halibut - estimated long term constant exploitation yield (CEY),
NA: not applicable.

The IPHC is responsible for the conservation of the Pacific halibut resource. The IPHC uses a policy of harvest management based on a constant exploitation rate. The constant exploitation rate is applied annually to the estimated exploitable biomass to determine a total constant exploitation yield (total CEY). The total CEY represents the total allowable harvest within an IPHC statistical area and is calculated as the product of the exploitable biomass and the harvest rate (a stock assessment parameter defined by the IPHC). The total CEY is estimated using a variety of stock assessment inputs including hook-and-line survey data, reported sources of mortality from the commercial fishery, and demographic information. To obtain a harvest limit for the directed fishery, the IPHC adjust the total CEY to account for the following sources of mortality: incidental catch in the groundfish fishery; wastage; personal use; and sport catch.

Incidental catch of halibut in the groundfish fisheries results in a decline in the standing stock biomass, a lowering of the reproductive potential of the stock by harvesting sub-adults and pre-recruits, and reduced short and long term yields to the directed hook-and-line fisheries. To compensate the halibut stock for these removals over the short term, halibut mortality in the groundfish fisheries is deducted on a pound for pound basis each year from the directed hook-and-line quota. Halibut incidentally taken in the groundfish fisheries are of smaller average size than those taken in the directed fishery, this results in further impacts on the long term reproductive potential of the halibut stock. This impact, on average, is estimated to reduce the reproductive potential of the halibut stock by 1.7 pounds for each 1 pound of halibut mortality in the groundfish fisheries. These impacts are discussed by Sullivan, *et al.* (1994).

The benchmark used to determine the significance of effects for Alternative 2 on the halibut stock is whether or not incidental catch of halibut during the project reasonably would be expected to lower the total CEY of the halibut stock in Area 3A. The total CEY is used as a benchmark measure because it represents a sustainable harvest limit within IPHC Area 3A.

Effects on Prohibited Species

The most recent stock assessment for Pacific halibut was conducted for Area 3A in December 2005 which provided stock size estimates for the 2006 fishery. This stock assessment utilizes scientific survey data and harvest data to project the estimated total CEY which is currently 22.5 percent of the exploitable halibut biomass in Area 3A. Results from the 2005 Pacific halibut stock assessment show the halibut resource to be healthy with total catch near record levels. Since 2003, the total CEY has declined by approximately 24 percent from the record high level of 40 million pounds in 2003. The 2006 total CEY in Area 3A was 32.18 million pounds which is approximately 2 percent lower than the 2006 CEY of 32.90 million ponds. During the same period, the exploitable biomass has remained between 143 and 146 million pounds.

The proposed EFP may take up to 90 mt of Pacific halibut in each year the project is prosecuted. The requested halibut mortality is <1 percent of the total CEY for Area 3A and less than 0.001 percent of the exploitable biomass. This amount of halibut mortality is not expected to lower the total CEY of the stock. Therefore, the halibut mortality requested for the EFP is not expected to decrease the total CEY of the halibut stock and the impact on PSC halibut is insignificant.

4.4 Benthic and Essential Fish Habitat

Benthic habitat is bottom living and non-living habitat between the shoreline and the 200 mile outer limit of the US EEZ. Benthic habitat is used synonymously with EFH in this analysis because the seafloor in the area where the EFP will be fished has been designated as EFH for at least one species. The 2005 EFH EIS (NMFS 2005) evaluates the long term effects of fishing on benthic habitat features, as well as likely consequences of those habitat changes for each managed stock based on the best available scientific information.

EFH is defined in the MSA as "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity." For the purpose of interpreting the definition of EFH, the EFH regulations at 50 CFR 600.10 specify that "waters" include aquatic areas that are used by fish and their associated physical, chemical, and biological properties and may include areas historically used by fish where appropriate; "substrate" includes sediments, hard bottom, structures underlying the waters, and associated biological communities; "necessary" means the habitat required to support a sustainable fishery and a healthy ecosystem; and "spawning, breeding, feeding, or growth to maturity" covers a species entire life cycle.

This analysis assumes that more than minimal and temporary impacts on EFH also would have adverse impacts on habitat-dependent species, including mammals, fish populations, seabirds, invertebrates, and living components of the habitat such as corals and sponges. Conversely, this analysis assumes that habitat modification that result in minimal or temporary effects on managed fish populations also would have negligible effects on other components of the ecosystem that rely upon the same habitats.

The criterion for significantly adverse effects on habitat is derived from the requirement at 50 CFR 600.815(a)(2)(ii) that NMFS must determine whether fishing adversely affects EFH in a manner that is more than minimal and temporary in nature. This standard determines whether Councils are required to take actions that prevent, mitigate, or minimize any adverse effects from fishing, to the extent practicable. Fishery impacts on benthic habitat are therefore rated insignificant if the fishery impacts are minimal or temporary in nature.

The final rule for EFH (67 FR 2343; January 17, 2002) does not define minimal and temporary, although the preamble to the rule states: "Temporary impacts are those that are limited in duration and that allow the particular environment to recover without measurable impact. Minimal impacts are those that may result in relatively small changes in the affected environment and insignificant changes in ecological functions." This EA follows the usage and criteria used in the EFH EIS (NMFS 2005). This criterion is described in Table 4.6.

The 2006-2007 harvest specification EA (NMFS 2006) describes the impacts on EFH for GOA managed species. The harvest specification EA concludes that although adverse effects from fishing may exist, the best available science does not identify adverse effects of fishing that are more than minimal and temporary in nature. Because the proposed EFP would allow the applicant to harvest above the 2006-2007 TAC specification for groundfish in the Central GOA, there could be additional impacts on EFH. Therefore, this analysis will determine if fishing as described under Alternative 2 will adversely impact EFH in a manner that is more than minimal or temporary in nature in 2006 and 2007.

Table 4.7 Significance criteria for essential fish habitat

	Fishery Impact on EFH
No impact	Fishing activity has no impact on EFH
Adverse impact	Fishing activity causes disruption or damage of EFH
Beneficial	Beneficial impacts of this action cannot be identified
Significantly adverse impact	Fishery induced disruption or damage of EFH that is more than minimal and not temporary
Significantly beneficial impact	No threshold can be identified
Unknown impact	No information is available regarding gear impact of EFH

Effects on Benthic and Essential Fish Habitat.

The proposed EFP will use nonpelagic trawl gear in areas commonly fished by the Central GOA trawl fishery for Pacific cod and flatfish. The applicants would target Pacific cod under the proposed EFP in August of 2006 and possibly in 2007. Nonpelagic trawl gear is designed to target groundfish species occupying habitat at or near the ocean bottom. As a result, the gear is designed to contact the sea floor during normal fishing operations. Contact with the seafloor may occur by several parts of the trawl, including doors, sweeps, and footropes. Most of the trawl's footprint results from the sweeps, followed by the footrope, with a relatively small area contacted by the doors (NMFS 2005). Because non pelagic trawl gear is a mobile gear used in contact with the bottom, this gear types may disturb larger areas of bottom habitat compared to other gear types used in Alaska fisheries.

Fishing under the EFP would occur in areas traditionally utilized by the Pacific cod trawl fishery. In the GOA, Pacific cod are most abundant in the Central GOA, where large schools are encountered at varying depths. Pacific cod are concentrated on the shelf edge and the upper slope (100 to 200 m deep) in the winter and spring. These fish over-winter in this zone and spawn from January to April; then they move to shallower waters (less than 100 m deep) in the summer (NMFS 2005). In 2006 and 2007, the GOA Pacific cod trawl fishery is divided into two seasons: the winter and spring "A" season which occurs January 20 through June 10; and the fall "B" season which occurs September 1 through November 1. The proportion of the annual Pacific cod TAC is split between the two fishing seasons: 60 percent is allocated for the winter and spring

season; and 40 percent is allocated for the fall season. The proposed EFP will occur in the late summer (August) when the fishery is traditionally closed and will be targeting Pacific cod in shallower waters.

As discussed in Section 4.1 of this analysis, the applicant estimated that 950 mt of Pacific cod would be harvested during the experiment. This amount may exceed the Central GOA inshore TAC by a small margin which may have impacts on EFH beyond those specified in the 2006-2007 harvest specifications (NMFS 2006). . In 2005, the additional 950 mt of Pacific cod that could be harvested under the proposed EFP would have resulted in an overage of 607 mt (3%) of inshore Pacific cod TAC. Assuming that 950 mt of Pacific cod are caught during the project and catch rates are similar to those observed during the trawl fishery, this small overage would reflect an increase in trawling effort as proposed by applicant. This additional effort would occur over a two week period and is thus very short in duration when compared to the Pacific cod fishery. Moreover, fishing effort would likely be distributed over a relatively large geographical area as described in Section 1.2 of this analysis and would thus likely not have a significant impact on EFH.

The shallow-water flatfish and the deep-water flatfish fisheries are prosecuted in the same geographical area as the Pacific cod fishery. The harvest specification EA discusses the impacts of trawling on EFH in regard to TAC levels. Because catch and harvest in these fisheries is limited by halibut PSC limits, the TAC has not been fully harvested in recent years. For example, approximately 8,440 mt of shallow-water flatfish TAC was unharvested in 2005. The deep-water flatfish fishery had similar TAC utilization levels in 2005, with 2,937 mt of the TAC remaining unharvested. Thus, a large amount of potential trawl effort in the shallow-water flatfish fishery is not being realized because of PSC constraints.

In conclusion, issuance of this EFP would likely result in minimal and temporary impacts on the benthic environment because of the short duration of EFP fishing, small amount of potential TAC overage for Pacific cod, and large amount of unharvested flatfish TAC (and associated fishing effort),. Therefore, issuance of the EFP would not likely have adverse impacts on EFH beyond the potential impacts described in the 2006-2007 harvest specification EA.

4.5 Effects on the Social and Economic Environment

Alternative 1 would not provide for the issuance of the EFP and would thus not change the social and economic environment effects from those described in the 2006-2007 Harvest Specification EA (NMFS 2006).

The social and economic effects of Alternative 2 are primarily related to the potential development of a new method for reducing halibut bycatch in the trawl fishery and revenue generated during the project. Participants in the project will receive revenue from the sale of groundfish taken during the project. The majority of groundfish will be Pacific cod and flatfish delivered to shoreside processors in Kodiak.

Gross revenue from Pacific cod catches per vessel are estimated using historical catch rates (based on observer samples) of trawl vessels fishing in the Central GOA. The expected catch of Pacific cod for each of the four vessels participating in the EFP is approximately 240 mt worth $185,000 based on an ex-vessel price of $0.35 per pound. This assumes that 960 mt of Pacific cod caught during the EFP is evenly distributed across four vessels and that 73 percent (960 mt) of the total groundfish catch is composed of Pacific cod. The total gross ex-vessel revenue from Pacific cod harvest is approximately $738,000 for each year the project is conducted. The total

gross revenue from Pacific cod if the project is extended in 2007 would be approximately $1.5 million dollars. This estimate assumes that Pacific cod prices in 2006 and 2007 are similar to those in 2005.

The majority of additional revenue generated from groundfish catches other than Pacific cod would be from catches of flatfish, rockfish, and skates. It is not possible to provide an accurate revenue estimate for these species because the amount of each species caught is unknown. Moreover, the excluder design would likely change the harvest rates typically observed in the trawl fishery.

Net revenue from the EFP fishing is not known do to the lack of cost data for the type of vessels that will participate in the EFP work. Vessel operators fishing the EFP must pay for the additional costs associated with the project such as the purchase/or construction of the excluder, at sea samplers, and vessel costs. Additionally, vessels fishing under the EFP will donate a percentage of the gross proceeds from Pacific cod (e.g. $0.04 or $0.05 per pound) to a not-for-profit foundation to help defray the costs of the EFP work and to fund future research on bycatch reduction in the GOA. Thus, it is not possible to predict the net revenue generated from the Pacific cod harvest or future revenue generated from decreased bycatch rates if the halibut excluder is successful. The following is a discussion of the types of impacts that may result from the EFP and future use of the halibut excluder device.

New Information

The methods developed during this EFP will inform future bycatch reduction designs and would thus be beneficial to the social and economic environment. The final report for the EFP will outline construction plans for the device, testing methodology, and an analysis of the gear's performance. The information collected during the EFP will also provide a qualitative analysis of the excluder design. This analysis will discuss the effectiveness of the design and indicate attributes of the design that may be improved. For example, halibut length composition data will provide information about the efficiency and utility of the slotted escapement panel devices as compared to gains in efficiency by adjusting towing speeds. This information can be used to estimate costs associated with the use of the halibut excluder device. The experimental design will allow hypothesis testing through paired testing. An advantage to this approach is that exogenous and endogenous factors such as towing speed, sea conditions, fish abundance/composition, and vessel effects can be evaluated.

The applicant is requiring that vessel operators participating in the EFP will commit to using the excluder device in the regular 2006 GOA fall Pacific cod fishery starting September 1, 2006. Participating operators would be committed to using the device if the EFP test demonstrated a reduction in halibut bycatch rates of at least 40 percent and the loss of Pacific cod catch was less than 10 percent by weight for their vessel. Their use of the excluder in the regular fishery will provide information about the feasibility of the device under commercial fishing conditions.

Future Use of the Excluder Device

Future use of halibut excluder devices in the GOA trawl fishery may have a beneficial impact by reducing halibut PSC catch rates and thus allowing more TAC to be caught in fisheries constrained by PSC limits. For example, the spring trawl fishery harvests a large portion of the annual PSC limit. Any PSC overages during the spring trawl fishery are deducted from the fall fishery. These overages results in the fourth quarter shallow-water and deep-water flatfish fisheries being constrained by PSC limits. Successful application of a halibut excluder device on

GOA trawl vessels would reduce PSC bycatch rates in both the spring and fall fishery and thus allow a greater amount of TAC to be harvested in the flatfish fishery.

Some of the gain in revenue from greater TAC utilization would be offset by costs associated with use of the excluder device. These costs include the purchase and installation of the excluder device, changes in fishing behavior (e.g., changing tow speeds), and potential loss of target species. Because the excluder device tested under Alternative 2 is not currently used in the trawl fishery, the type and magnitude of the costs associated with its use and gains in revenue are not known for certain. If costs associated with the excluder device are higher than the revenue stream, the device may impose costs on the trawl fishery. However, a beneficial impact may be accrued to other fisheries constrained by PSC catch through a reduction in seasonal trawl PSC catch rates.

5.0 Cumulative Effects

Analysis of the potential cumulative effects of a proposed action and its alternatives is a requirement of the NEPA. An environmental assessment or environmental impact statement must consider cumulative effects when determining whether an action significantly affects environmental quality. The Council on Environmental Quality (CEQ) regulations for implementing NEPA define cumulative effects as:

> "the impact on the environment, which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or nonfederal) or person undertakes such other actions. Cumulative effects can result from individually minor but collectively significant actions taking place over a period of time" (40 CFR 1508.7).

The cumulative effects of the current harvest specifications are discussed in detail in the Harvest Specifications EA (NMFS 2006) and are adopted here by reference. The Harvest Specifications EA is a recent and broad examination of potential cumulative effects for fisheries throughout Alaskan waters. The findings can therefore be applied to the Central GOA groundfish fishery. That EA concludes that the foreseeable future actions (ecosystem approaches to management, rationalization, traditional management tools, other government actions and private actions) will all lead to a reduction in the adverse effects of fishing on target species. Harvest from fisheries in subsequent years will put continuing pressure on groundfish stocks. However, these fisheries are expected to be managed in a sustainable manner and are subject to Tier-specific over fishing level (OFL) and ABC levels. Therefore, the fishery will be conducted under regulations that are substantially the same as those in place today. Future regulations may include ecosystem considerations. The EA states that these considerations should be at least as precautionary as regulations in place today. Expansion of State fisheries will most likely result in a reduction in the Federal TAC, or a greater harvest of an existing Federal TAC within State waters. The EA states that an expansion of State of Alaska fisheries would not be expected to result in overfishing. However, predicting the actual impact depends on the actions taken by the State.

The Harvest Specifications EA states that continued fishing and subsistence harvest are potentially the most important sources of additional adverse impacts on marine mammals, but concludes that a number of factors will tend to reduce impacts in the future (such as a trend toward ecosystem based management and fisheries rationalization).

The project may have several beneficial outcomes to the social and economic environment. If the project is successful, future use of the excluder device may have beneficial social and economic outcomes. Use of the excluder device may reduce halibut bycatch rates and would thus allow a greater amount of TAC to be harvested in several fisheries. The increased harvest may increase revenue to fishery participants. Moreover, information obtained during the project may inform future bycatch exclusion design studies focused on bycatch reduction in the trawl fishery.

In summary, the conclusion of the Harvest Specifications EA is that the past, present, and reasonably foreseeable future actions do not appear to require a change in the direct-indirect significance determinations with regard to the environmental components considered in that EA, including PSC species, marine mammals, and benthic communities which are analyzed in this EA. Section 4.5 also identifies RFFA for socioeconomic effects which are not analyzed for significance. An additional EFH RFFA is the EFH and AAPC protection measures which are likely the reduce the impacts of the groundfish benthic communities by protecting EFH and HAPL areas. The cumulative effect of this action with the EFH and HAPL action is not likely to be significant because overall adverse effects should be reduced. Based on the harvest specifications' cumulative effects analysis and on the analysis in this EA, no additional past, present or reasonably foreseeable future actions were identified. Thus, the direct, indirect and cumulative effects for the proposed action are not likely to significantly impact the human environment.

No additional past, present, or reasonably foreseeable cumulative impact issues have been identified that would accrue from Alternative 2.

6.0 Environmental Analysis Conclusions

Alternative 1 is the status quo. No EFP would be issued, and therefore, no additional effects would occur beyond those already identified and analyzed in the Final SEIS (NMFS 2004) and in the 2006 harvest specifications EA (NMFS 2006). For this reason, impact analyses in this EA were exclusively for Alternative 2. In addition to the Final PSEIS and the 2006 harvest specifications EA, the significance of impacts of the actions analyzed in this EA were determined through consideration of the following information as required by NEPA and 40 CFR 1508.27:

Context: For the issuance of the EFP, the setting of the proposed action is the Central GOA groundfish fisheries. The effects of the issuance of an EFP on society, within this area, are on individuals directly and indirectly participating in the trawl groundfish fisheries and on those who use the ocean resources. Because this action may allow for potential future use of a device that reduces Pacific halibut incidental catch, this action may have regional impacts on society.

Intensity: Listings of considerations to determine intensity of the impacts are in 40 CFR §1508.28(b) and in the NOAA Administrative Order 216-6, Section 6. Each consideration is addressed below in order as it appears in the regulations.

Comparison of Alternatives and Selection of a Preferred Alternative

Alternative 1 is the status quo and does not provide for the issuance of an EFP for development of a halibut excluder device. Alterative 2 would provide for an EFP that would allow for the development of a halibut excluder device that may reduce halibut bycatch rates if the excluder is used in the trawl fishery. Alternative 2 had no significant impacts identified and socioeconomic and cumulative socioeconomic effects were not known for certain. Alternative 1 had no additional environmental impacts beyond those already identified in previous analyses, but

Alternative 1 would not provide for the testing for a halibut excluder device and therefore would not meet the purpose and need of the action. Because Alternative 2 has no significant adverse impacts identified and provides the potential for reducing halibut PSC bycatch, Alternative 2 is the preferred alternative.

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