


MEMORANDUM

TO: Council and AP Members
FROM: Chris Oliver 
Executive Director
DATE: June 1, 2006
SUBJECT: Groundfish Management

ESTIMATED TIME 2 HOURS

ACTION REQUIRED

- a) Review EFP to test a halibut excluder for GOA cod trawl fishery
- b) Receive progress report on trawl salmon excluder research

BACKGROUND

- a) Review EFP to test a halibut excluder for GOA cod trawl fishery

An EFP submitted by the Marine Conservation Alliance Foundation proposes to test a halibut excluder device designed to reduce halibut bycatch rates in the Pacific cod trawl fishery in the Gulf of Alaska. The EFP application is attached as Item D-1(a)(1). The environmental assessment for the EFP was mailed to you on May 22nd and is attached as Item D-1(a)(2).

The objective of this EFP is to study a halibut excluder designed to reduce bycatch rates for smaller inshore trawl catcher vessels targeting Pacific cod in the Central GOA. The following performance goals will be used to measure the ability of the proposed EFP to meet the stated objective: (1) compared to an unmodified trawl, the excluder device should result in at least a 40 percent reduction in the halibut bycatch rate (kilogram of halibut per metric ton of allocated groundfish); (2) compared to an unmodified trawl, the excluder device should not reduce the target species catch by more than 10 percent; and (3) the excluder must be functional for a typical GOA trawl vessel which has limited deck space and may have only aft reels. The degree to which the excluder meets the goals and objectives will be evaluated by the applicant and Alaska Fishery Science Center.

Two alternatives are analyzed in the EA: 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) trawl closures in the Central GOA for reasons other than overfishing concerns; (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. Regulations describing maximum retainable (MRA) amounts apply; however, Pacific cod is designated as the basis species from which retainable amounts are to be calculated. The permit would be effective August 1, 2006 through August 30, 2006. The 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, and socioeconomic components. The effect of the action on PSC, marine mammals, 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.

NMFS staff and the EFP applicants will be available to present the EFP and the EA at this meeting.

b) Receive progress report on trawl salmon excluder research

A progress report on the on-going EFP to test a salmon excluder device in the pollock trawl fishery will be provided at this meeting. This EFP continues on previous work in past years evaluating various excluder device configurations on the ability to reduce chum and Chinook salmon bycatch in the pollock trawl fishery. Chum and Chinook bycatch has been elevated in recent years in the pollock fishery. This on-going EFP has been working to develop behaviorally-based avoidance device configurations placed within the intermediate of the trawl net which allow salmon to escape without harm prior to being captured in the pollock trawl cod end.

The presentation at this meeting will focus upon results from the fall 2005 and winter 2006 tests conducted with catcher vessels and catcher processors. Information will also be provided on plans for the fall 2006 sampling protocol. PIs from the project will be available to provide an overview of their continued work under this EFP.



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE

Alaska Fisheries Science Center
7600 Sand Point Way N.E.
Bldg. 4, F/AKC
Seattle, Washington 98115-0070

24 March 2006

MEMORANDUM FOR: Douglas Mecum

FROM: Douglas P. DeMaster 

SUBJECT: Exempted Fisheries Permit (EFP) Application – Evaluate the Effectiveness of a Halibut Excluder Device for the Gulf of Alaska Trawl Cod Fishery

AFSC staff has reviewed the attached EFP application from the Marine Conservation Alliance Foundation. EFP application is forwarded with a recommendation for approval.





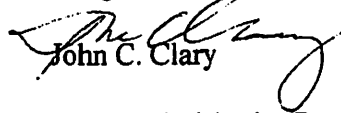
**UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE**

Alaska Fisheries Science Center
7600 Sand Point Way N.E.
Bldg. 4, F/AKC
Seattle, Washington 98115-0070

21 March 2006

MEMORANDUM FOR: Douglas P. DeMaster

FROM:


John C. Clary

SUBJECT:

Exempted Fisheries Permit (EFP) Application – Evaluate the Effectiveness of a Halibut Excluder for the Gulf of Alaska Trawl Cod Fishery

AFSC staff has reviewed the attached EFP application from the Marine Conservation Alliance Foundation (MCAF). Under this EFP, MCAF proposes to field test a halibut excluder device designed to reduce halibut by-catch rates for smaller inshore trawlers that target Pacific cod in the Gulf of Alaska. The performance goal is to reduce the halibut by-catch rate measured in kilograms of halibut per metric ton of allocated groundfish by at least 40% over an unmodified net. At the same time, the catch rate of the target species should be minimized and should not be reduced by more than 10% (measured in metric tons of cod per hour). Work under the EFP must also evaluate the functionality and handling aspects of the excluder for use on a typical GOA trawler. "Sea samplers" will collect catch data. Dr. Craig Rose will provide technical assistance and oversight.

EFP application is forwarded with a recommendation for approval.



**Revised application for an exempted fishing permit (EFP) to evaluate the effectiveness of a halibut excluder for the GOA trawl cod fishery
May 2006**

Original date of Application: March 02, 2006

Name, mailing address, and phone number of applicant:

John R. Gauvin (principal investigator)
2104 SW 17th Street
Burien, WA 98166
206 660-0359

Purpose and Goals of the EFP: The objective of the EFP is to conduct a rigorous field test of a halibut excluder designed to reduce halibut bycatch rates for smaller “inshore” catcher vessels that target Pacific cod in the Gulf of Alaska. The performance goal for this project is to reduce the halibut bycatch rate in terms of kilograms of halibut per metric ton of allocated groundfish by at least 40% over an unmodified net. At the same time, reductions in catch rate for the target species should be minimized (measured in terms of metric tons of cod per hour) compared to an unmodified net. Finally, the test must also evaluate the functionality and handling aspects of the halibut excluder for use on typical Gulf of Alaska trawl vessel which have limited deck space and may have aft net reels only. Considerations for functionality and handling involve evaluating whether the device can be rolled onto the typical vessel’s net reel without damage. Other performance variables include resistance to clogging and other maintenance problems. All these performance considerations are critical to the development of an effective halibut excluder which in turn will contribute to the achievement of the total allowable catch of Pacific cod within the halibut PSC cap for the GOA cod fishery.

Justification for the EFP: Mandates to reduce bycatch and bycatch mortality are set out in the Magnuson-Stevens Act. The trawl cod fishery has greatly exceeded its seasonal halibut allowance during the last three September 1 cod fisheries. Additionally, the PSC overage created by the fall inshore cod fishery has had collateral effects on the early closure of the deep water flatfish fishery which was closed prior to the attainment of its halibut bycatch limit to help reduce the overage in the overall halibut PSC cap for the GOA trawl fisheries. The test of a halibut excluder proposed in this application can only be successfully undertaken outside of the regular open access fishery. This is because cod trawlers cannot effectively test the halibut excluder via the regular cod fishery in a manner consistent with the experimental protocol described below. Additionally, *ad hoc* development of bycatch reduction devices typically does not provide scientifically valid performance data and can lead to abandonment of an experimental device before its actual performance has been thoroughly evaluated.

Names of participating vessels, copies of vessel Coast Guard documents, names of vessel masters: This information will be supplied after the review process is completed.

Target and incidental species harvested: The Table 2 from the EFP application materials (included immediately below in this summary) provides total estimated catches for the EFP as well as per vessel estimates of catches. The applicant is requesting that 1,300 MT of groundfish (approximately 950 tons of which is expected to be Pacific cod) and 80 MT of halibut mortality be made available for this EFP test and that these not count against the TACs and trawl halibut prohibited species cap for the Gulf of Alaska. The experimental design section of the description of the EFP research below explains how the requested quantities of groundfish and halibut PSC mortality were derived. As is explained below, actual halibut mortality rate is expected to be lower because the actual mortality rate will likely be lower than the “official” mortality factor for the fishery that was applied for the estimates in the table below. This is because once accounted for by sea samplers aboard each EFP vessel, halibut will be returned to the sea with minimal injury. We expect that the halibut taken for each tow will be returned to the sea within 20 minutes of the time when the boat’s cod end is brought on deck. Further, retention of groundfish during the EFP fishing will be conducted in a manner that complies with the MRA regulations for the regular GOA trawl cod fishery.

Table 2: Estimated groundfish catch and halibut mortality of the halibut excluder EFP

	# of tows	trips	groundfish (MT)	P. cod (MT)	other groundfish (MT)	Halibut catch (MT) assuming 40% excluder effect and excluder used on treatment tows for EFP(50% of tows)	Halibut mortality (MT) assuming "official" mortality rate (61%)
<u>Vessel 1</u>	15	2 or 3	215	156.4	24.5	21.6	13.2
<u>Vessel 2</u>	15	2 or 3	215	156.4	24.5	21.6	13.2
<u>Vessel 3</u>	15	2 or 3	215	156.4	24.5	21.6	13.2
<u>Vessel 4</u>	15	2 or 3	215	156.4	24.5	21.6	13.2
<u>Vessel 5</u>	15	2 or 3	215	156.4	24.5	21.6	13.2
<u>Vessel 6</u>	15	2 or 3	215	156.4	24.5	21.6	13.2
<u>EFP total</u>			1,290.0	938.4	147.2	129.6	79.1

Other requested exemptions from the regular fishery regulations for the EFP: The applicant requests that the six vessels selected for the EFP testing be exempted from their regular (30%) observer coverage requirements. The exempted fishing permit holder will require that each vessel participating in the test will have a "sea sampler" on board the vessel throughout its EFP fishing and that halibut catch is estimated via an on-deck census for each tow during the EFP testing. The at-sea sampling procedures needed for the EFP will focus on accounting for the effects of the excluder on halibut catch rates. This sampling procedure differs from the normal sampling priorities and procedures of at-sea observers techniques used for the regular fishery. Species composition sampling will occur at the processing plant where the at-sea observers will conduct species composition sampling during the offload and prior to the EFP vessels returning to the EFP testing. Sea samplers hired for this project will be former or current fishery observers who are in good standing with the Observer Program but are not currently working as observers for the regular groundfish fishery.

Disposition of allocated groundfish species caught in the EFP: Participants selected for participation in the experiment can legally retain all groundfish catches in accordance to the MRA standards for GOA Pacific cod fishery that would be applicable to the open access fishery.

Expected impacts on marine mammals and endangered species: None. Fishing will be conducted in accordance with the regulations affecting the areas open to Pacific cod directed fishing for the Gulf of Alaska (when that fishery would normally be open). Further, according to the principles of the current Biological Opinion for the Western population of Steller sea lions, fishing for cod during the time when the EFP test will occur (August) is thought to have lesser effects on sea lion foraging opportunities than during the winter months.

Type and size of vessels and gear: Expected participants are Central Gulf of Alaska shoreside catcher vessels that commonly participate in trawl cod fishery in the GOA. Gear will be normal cod trawls with modifications in the net to exclude halibut (modifications to experimental tows only) and slower towing speeds for vessels fishing with the excluder device.

Approximate time and place for exempted fishing under EFP: The field test portion of the EFP is expected to last approximately 10-14 consecutive days sometime in August 2006. The location for the test will be the common areas of the Central Gulf of Alaska where directed trawling for Pacific cod occurs.

Signature of Applicant:

Detailed explanation of the request for and EFP to develop an effective halibut excluder for GOA trawl catcher vessels targeting cod

Part One: Introduction

Purpose and need for an EFP to test the performance of a halibut excluder device for the Gulf of Alaska cod fishery

For the last two fall (B season) cod fisheries, halibut mortality attributable to the trawl cod fishery in the Gulf of Alaska has greatly exceeded its seasonal allowance. Overages of the fourth-quarter halibut PSC cap (for the GOA shallow water complex) amounted to roughly 550% of the seasonal cap in 2004, and 350% in 2005. The fall cod TACs for the Central and Western Gulf are managed under the same seasonal halibut mortality cap which is the September 1st halibut PSC allowance of 150 metric ton of halibut mortality. Because of the large overages in the halibut cap, the deep complex flatfish fisheries also did not open for the October fishery to prevent exceeding the annual halibut mortality cap for the GOA.

In 2004, the Central Gulf was able attain its cod TAC (actually 20% overage) but clearly would not have been able to do so had the fishery been closed when it had actually attained its seasonal halibut mortality cap. In 2005, fall cod catch fell short of the CGOA B season cod TAC by approximately 1,700 metric tons (12%) and once again, this relatively large percentage of the TAC that was harvested would not have been possible had the fishery been limited to its seasonal halibut mortality allowance. Approximately 60% and 0% of the B season cod TAC for the Western GOA was taken in 2004 and 2005 respectively. These percentages similarly reflect fishing that was funded by the overage in the seasonal halibut mortality allowance. Table 1 below reports the catch and halibut mortality performance figures for the fall (B Season) trawl cod for the last three years based on data published on the NOAA Alaska Region website.

Table 1: Cod and halibut catch in WGOA and CGOA 2003-2005

Year/Area	fall inshore TAC area (MT)	cod per catch (MT)	Cod catch (MT)	Percent taken	GOA-wide halibut mort. cap (MT)*	GOA-wide Halibut mortality (MT)*	Percent usage
<u>Western Gulf of Alaska</u>							
2003	5,562		3,786	68%	150	n/a	n/a
2004	6,104		3,677	60%	150	n/a	n/a
2005	5,647		1,641	29%	150	n/a	n/a
<u>Central Gulf of Alaska</u>							
2003	8,166		4,482	55%	150	287	191%
2004	8,093		9,761	121%	150	819	546%
2005	9,031		8,008	89%	150	520	347%

Note: The Central and Western Gulf of Alaska trawl cod fisheries are managed under the same halibut PSC cap

While the degree to which the seasonal halibut allowance was exceeded in 2003 was lower, the same basic pattern occurred for fall cod in both the Central and Western Gulf. Approximately 55-70% of the TACs were taken in the two management areas and the seasonal halibut allowance was exceeded by 191%.

According to participants in the trawl cod 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 cod fishery in 2001 shifted a larger portion of the trawl cod fishing to later in the year than would otherwise have occurred. Trawlers have testified to the North Pacific Council that halibut bycatch rates for cod fishing were driven up when a larger portion of the fishing was mandated to be later in the year. The reason

offered for this was that fishing was shifted outside of the timing of pre-spawning aggregations of cod that peak in the spring. Lower catch per unit of effort is thought to have occurred because cod are less tightly schooled in the fall months. This spawned longer tows and higher halibut bycatch rates as more area is swept with lower CPUE. Another factor that has been identified by the trawl industry is that moving more cod fishing to the late summer and fall actually places more of the fishery into a time window when there is more 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.

Previous efforts to date to reduce halibut bycatch in the shoreside trawl fisheries of the Central Gulf of Alaska: For several years, Gulf trawlers have requested that the Council and NMFS consider changing the seasons of trawl cod fishing to closer to the way they were prior to the 2001 sea lion regulation changes. But given the persistence of low population levels for sea lions, it appears that major changes to cod seasons appear unlikely for now. For this reason, in 2004 Central Gulf trawlers initiated development of new approaches to the management of halibut bycatch.

Starting in 2004, Central Gulf trawlers undertook two new initiatives to reduce halibut bycatch and increase utilization of cod and flatfish ABCs. Through some funding made available from the Alaska Fisheries Development Foundation (AFDF), the Alaska Draggers Association contracted for a study of spatially-specific tradeoffs between target and halibut bycatch rates. This study examined the question of whether observer data could be used to identify fishing areas and seasonality of fishing that would be expected to produce positive tradeoffs in target catch rates relative to halibut bycatch rates. The results showed that some fairly strong patterns of positive tradeoffs did exist in observer data from 2000 through 2003. But the lack of an individual quota or cooperative management system makes effective utilization of these opportunities difficult at best. This is because many of the fishing grounds where improved tradeoffs might be found are in fact rather distant from the port of Kodiak, the major Central Gulf of Alaska fishing port. Under a race for fish that exists in the current Olympic fishery, the prevailing incentive is to race to catch fish as fast as possible before the cod TAC or the halibut PSC cap is attained in lieu of spending more time traveling to more distant fishing grounds.

Through continued funding from AFDF in 2005, the Alaska Dragger's Association organized an industry-led halibut bycatch monitoring program modeled after the Sea State program in the Bering Sea. This effort attempted to use industry self-reporting of observer data on a fast turn-around basis to identify halibut bycatch "hotspots". Once identified, peer pressure was mobilized in an effort to get fishermen to move to areas with lower bycatch rates. While some success with data reporting and peer pressure was achieved, the current regulations governing deployment of observers proved to be an impediment to successful cooperative bycatch avoidance. Due to logistical problems with getting observers in Gulf ports and under a system where fishermen are responsible for selecting when to carry observers on their vessels to meet a 30% of the fishing days coverage requirement, there are periods of time when observer coverage levels are high and others where coverage is minimal. For the 2005 initiative, the rather uneven observer coverage over the weeks of the fisheries essentially failed to provide a consistent source of spatial information on halibut bycatch over the course of the fishery. The self reporting did produce more timely catch and bycatch data for in-season managers than would have been available through the normal data reporting system and this allowed fishery participants to alert NMFS of the need to close the fishery earlier than would otherwise have occurred due to the higher than expected halibut bycatch usage.

Evolution of the trawl gear modification idea for reducing halibut bycatch: Throughout these efforts to improve industry management of halibut bycatch in the Central Gulf trawl fisheries since 2004, fishermen have repeatedly observed that trawl gear modification to reduce halibut bycatch in the flatfish and cod fisheries may be the most feasible approach to the objective of increasing yields of target species and avoiding overages in the halibut caps. The prospect for use of these existing devices was generally thought to be low due to the fact that rigid halibut sorting grates cannot easily be rolled onto trawl net reels. This limitation is particularly problematic for catcher vessels with aft net reels, a set up that is common on the shoreside-delivery trawlers in the CGOA.

Additionally, physical limitations of deck space on shore-based catcher vessels in the Gulf make rigid halibut excluder generally problematic even on vessels with a forward net reel.

To assist the Central Gulf of Alaska catcher vessel fleet with the development of gear modifications to reduce halibut bycatch in the shallow water flatfish fishery, Dr. Craig Rose of the Alaska Fisheries Science Center at the request of the Alaska Dragger's Association conducted a research charter during the summer of 2005. The goal of this work was to explore potential for a "soft" halibut sorting grid constructed of webbing which could easily roll on net reel and thus be useful to Kodiak trawlers. Unfortunately, the video and catch data from the 2005 research showed only very limited selectivity was achieved for the soft excluder device and the potential for clogging and tear-ups in regular commercial scale fishing appeared high. The tendency for large halibut and skates to become entrained on the large-mesh soft sorting panel resulted also in reductions in surface area for sorting and high levels of loss of target species.

As the results of this work were disseminated, however, discussions of the potential for an adaptation of one of Dr. Rose's earlier halibut devices for reducing halibut bycatch began. In a 2000 field test in the Bering Sea, that device was shown to reduce halibut catch rates in the Bering Sea trawl cod fishery by approximately 80% while reducing cod catch rates by only 15%. If that device could be constructed of less rigid plastic materials that allow it to be wound onto the net reel, significant reductions in halibut bycatch rates might be achieved. Less dramatic reductions in halibut bycatch would be expected in the Gulf of Alaska, however, given the larger size of halibut relative to cod compared to the Bering Sea. But even with most of the reduction aimed at halibut in the smaller size range, such savings could be worthwhile. Additionally, fishermen pointed out that other measures such as adjustments in towing speed might be used in combination with the excluder to reduce catches of larger halibut.

An attractive element of the idea is that the cod/halibut excluder device relies on a behavioral escapement response instead of relying on the sorting of all catch as it passes through a grate across the intermediate of the trawl. Thus larger fish such as skates would be far less likely to clog the flow of fish through the net. From this thinking emerged the central idea leading up to the EFP test proposed in this application.

Part Two: Design elements of EFP tests of a halibut excluder for the GOA trawl cod fishery

Objectives for this test of a halibut excluder for the GOA cod fishery

The overall objective of the exempted fishing permit (EFP) requested in this application is to conduct a scientifically valid test of the adapted halibut excluder described below. While valid in terms of scientific methods, the objective is also to conduct testing under conditions closely resembling the actual fishing done on Central Gulf of Alaska trawlers, particularly the fishery as it is expected to be conducted in the future under Gulf rationalization. The method used for determining the effect of the excluder compared to an unmodified net is through paired comparisons of tows conducted simultaneously in the same fishing grounds. Simultaneously conducting experimental and control tows should help to reduce variation in fishing conditions. This is important because conditions affecting halibut bycatch are known to shift in a matter of hours in the Gulf of Alaska

In addition to requesting an allocation of groundfish and halibut PSC that will not be deducted from the Central GOA TAC nor the Gulf-wide halibut PSC cap, the EFP seeks permission to redirect observer sampling duties slightly in order to address the scientific priorities of EFP test. This set of adjustments to fishing and sampling under the EFP will allow participants selected for the test to conduct fishing according to the experimental protocol as well as allowing adequate enumeration of the effects of the device on cod and halibut catch rates. The ability to sell all legally retainable groundfish (as per the regular directed fishing allowances for the GOA cod trawl fishery) will help offset the costs that EFP participants will incur purchasing necessary gear for the test and carrying and assisting with the testing and catch sampling protocol.

Experimental Fishing and Catch Accounting Protocol for the EFP test

Based on the experimental design parameters discussed below, a total of 46 pairs of tows in the cod target are needed to ensure a sufficiently high probability of being able to correctly conclude that the device actually achieves the expected reduction in halibut bycatch rates. After careful consideration, the use of a single vessel to conduct the test was rejected in favor of using six vessels working in three sets of pairs for the following reasons. The foremost reason for selecting six vessels was that cod catch rates and halibut bycatch conditions are known to change rapidly in the Gulf of Alaska. A single GOA catcher vessel does not have the capability to rapidly switch between two different nets (control and experimental) with relative ease. Likewise, removal of the excluder device from the trawl intermediate into which it is sewed for alternating tows is not thought to be practical because the second tow in a pair would likely be started at least three hours after the first tow in the pair was completed. The long delay between tows could greatly increase the variance that would need to be explained in the test. Therefore, while conducting the test with a single vessel might be considered the best way to minimize the "boat effect" on catch rates, the benefit from being able to conduct simultaneous control and treatment tows is thought to be the most critical for the success of the test. Finally, given the relatively large number of pairs of tows needed for the experiment, it is more practical to use three sets of paired vessels so that the testing can occur over a manageable time period.

So the pairing for the EFP will be done as simultaneously paired tows conducted by two vessels forming one of the three pairs for the EFP testing. One vessel in a given pair will make a tow with the excluder and the other will tow without the excluder and cover an adjacent towpath where ambient conditions can be assumed to be as close as possible to the tow with the excluder. Each of the six vessels will make a total for 15 tows during the experiment and approximately half of each participating vessel's tows will be made with the excluder installed in the net. Vessels selected to conduct the test will be typical of the catcher vessels that participate in the Central GOA inshore cod fishery. Companies applying for the EFP field work will propose their vessel for the EFP as well as naming another vessel that they wish to be paired with during the EFP. In the case where a single company owns two vessels that are proposed as a pair for the EFP, one application for both vessels will suffice provided the separate required information for each vessel is provided in the application. Joint applications are also acceptable provided the necessary information is provided for each vessel in the application.

Each vessel comprising a pair must be sufficiently well matched in terms of horsepower, fishing characteristics, and nets used for the EFP so as to minimize variation in the catch that is due to factors other than the halibut excluder. This is necessary to minimize the "boat effect" as a source of variation. One vessel in each pair will be randomly selected to have the halibut excluder installed for its first fishing trip and the other vessel will fish without the excluder for its first trip. The excluder will be switched to the other vessel in each pair for the second trip and so forth for a total of 15-16 tows per vessel during the EFP (approximately 2-3 trips overall per vessel based on normal tow size in the regular cod fishery). The vessels working together to form experimental pairs (simultaneous treatment and control tows) must fish in close proximity and in unison so that they essentially cover the same fishing grounds as outlined below.

For each pair of vessels, fishing locations and tow paths will be selected by the vessel that does not have the excluder installed during that trip. The vessel equipped with the excluder will have to simultaneously conduct matching "shadow tows". This means towing immediately adjacent to the towing path of the vessel without the excluder. The vessel towing the net without the excluder will also be responsible for deciding when the nets for the two vessels should be hauled back. Under normal circumstances, the vessel without the excluder will contact the other vessel and announce that it is time for both vessels to haul back. One exception to this rule is when either one of the vessels needs to haul back due to a large quantity of catch for a particular haul. In that event, both vessels will have to haul back at that time. An overall time limit of four hours of towing duration will also be in effect during the EFP.

In reviewing applications for participation in the test, the NMFS review team formed for this purpose will select applicants based on the goal of minimizing "vessel effect" between the pairs of vessels and the nets used by each pair of vessels in order to minimize variation from sources other than the effects of the excluder. Factors such as

experience fishing together and information to demonstrate a good working relationship will also be taken into consideration by the NMFS application review team. Information on how vessel owners can apply to participate in this EFP will be made available through a request for proposals (RFP) developed by the EFP principal investigator (applicant) in consultation with the NMFS application review team. Criteria that will be used to judge applications will be clearly spelled out in the RFP materials.

Once the nets are hauled back for the pair of vessels working together, sea samplers hired for this project will work with the vessel crew to account for the halibut bycatch from each (experimental and control) net in the experimental pair. There will be one sea sampler on each vessel throughout the duration of the EFP trials. The cod end will be emptied into the vessel's holding tank(s) at a sufficiently slow pace to allow crew members working under the direction of the sea sampler to remove all the halibut from the catch. Crew members will be responsible for carrying or sliding the halibut to the area where the sea sampler is stationed so that the sea sampler can "tick off" the length of each halibut on a length grid for later conversion into number and overall weight of halibut per tow. Vessels participating in the EFP must agree in writing to retain all catches except Pacific halibut in order to allow for dockside sampling to accurately estimate species composition (per trip) so that all EFP catches can be accounted for. Sea samplers will do species composition sampling at the processing plant during the vessel offload and the vessel will remain at the processing plant until all fish from a trip are offloaded and species composition sampling by the sea sampler is completed.

Because the catch sampling and accounting needs for this experiment require changes to the normal duties of fishery observers, we are requesting that we be permitted to substitute our sea samplers on each vessel for their normal observer coverage. As described before, we need to place a higher priority on accounting for halibut catch than would otherwise occur in regular NMFS observer coverage. Additionally, we need to have sea samplers on each vessel for the duration of the experiment and we need our sea samplers to account for the halibut catch for each tow.

Within-pair effects of the excluder on halibut catch rates (compared to the unmodified net) will be measured on a kilograms per hour and kilograms per ton of groundfish basis. The latter is clearly more problematic on a tow by tow basis because groundfish weight per haul can only be roughly determined by the volumetric estimate of each codend. Effects on halibut or cod catch rate per ton of groundfish, however, can also be estimated on a trip basis through catch weight by species from the processing plant. To achieve a sufficiently accurate of overall catch on a per trip basis, however, all vessels in the experiment will have to retain all catch except halibut during the EFP testing. Halibut weight per tow will be determined as described above.

Each sea sampler will maintain halibut catch data on a tow by tow basis as well as time and tow number references to ensure that the catch comparisons between experimental and control tows can be compared between the simultaneous sets of pairs achieved for each of the two sets of paired vessels. While the three sets of paired vessels may commence the test at the same time, it is probable that differences in fishing, pace of sampling and catch accounting, and time needed for offloading catch from vessels to shoreside processors will mean that the three pairs of EFP vessels will not work in concert throughout the EFP. This is not detrimental to the experimental goals although some overlap in fishing areas and timing would be helpful for making subjective evaluations of the potential differences between the two sets of paired vessels participating in the EFP test.

Desirable aspects of a halibut excluder for GOA cod trawls

The following are aspects of an effective excluder device that is practical to the industry.

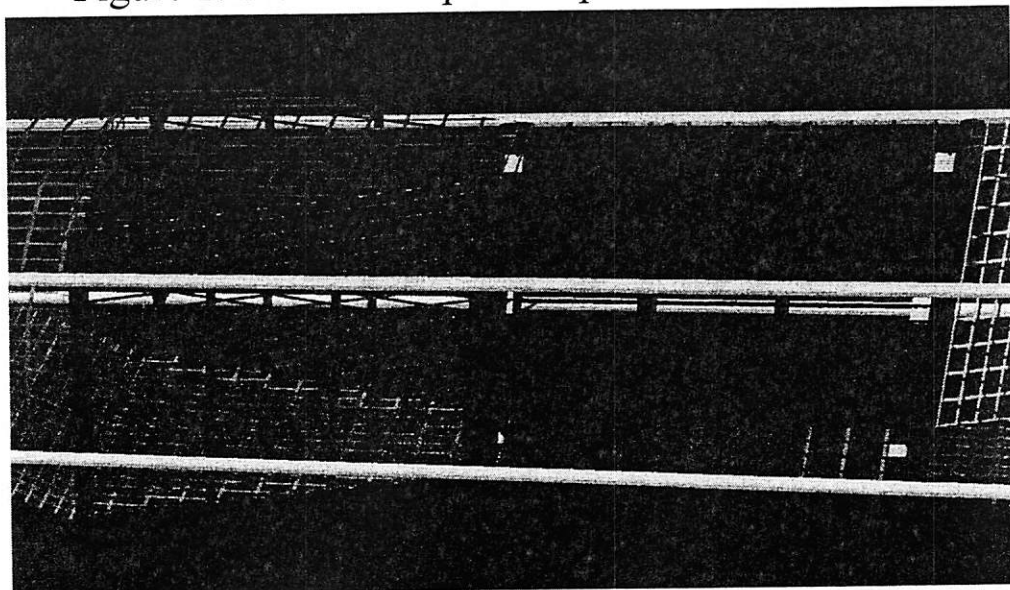
- 1) Releases a large percentage of the halibut that come into the trawl unharmed
- 2) Avoids significant reductions in cod
- 3) Functions with few failures or break downs and be resistant to clogging and debris jams.
- 4) Rolls easily onto the net reel and is not be damaged by the tension of the reel.
- 5) Overall durability and ease of function
- 6) Constructed from affordable materials that are readily available.

Design Elements of the halibut excluder for the EFP test:

The device that will be tested during the EFP is designed to meet the performance criteria above in the context of the deck space and net reel configurations and limitations of shoreside delivery trawl vessels that work in the Central Gulf of Alaska cod fishery. The earlier development and field testing of the "slot panel" excluder for the Bering Sea cod fishery resulted in the achievement of a greater halibut reduction than would be expected from its use in the Gulf cod fishery due to the relatively small size of Bering Sea halibut compared to those in the Gulf. Our expectation, however, is for at least a 40% reduction in halibut bycatch in terms of kilograms of halibut per hour or per ton of groundfish.

To maximize the functionality of fishing with the device in the Gulf of Alaska, we have selected a slotted escape panel (Figure 1) for the test in lieu of a rigid or soft (webbing) grate that is rigged to cut across the intermediate of the trawl. The grate across the intermediate design (whether rigid or flexible) has been successful for reducing halibut in the deep water flatfish fishery of the GOA but has not proven to be effective in the shallow water flatfish or the cod target fishery. Grates across the intermediate are designed to sort halibut on the concept that the smaller target will swim through the grate but halibut, which are larger, cannot do so and therefore swim up and out an escapement portal aft of the excluder (see Figure 2 for an example of a rigid sorting grate that is place across the intermediate). But this approach is problematic for the cod and shallow water flatfish targets because the skates tend to become stuck on the grate and cod escapement through the escapement portals can be high. Slotted panels installed on the sides of the intermediate are less likely to plug the intermediate than for rigid or webbing sorting grates that rely on the principal of smaller fish passing through a grate placed across the intermediate.

Figure 1. Slotted escapement panel halibut excluder

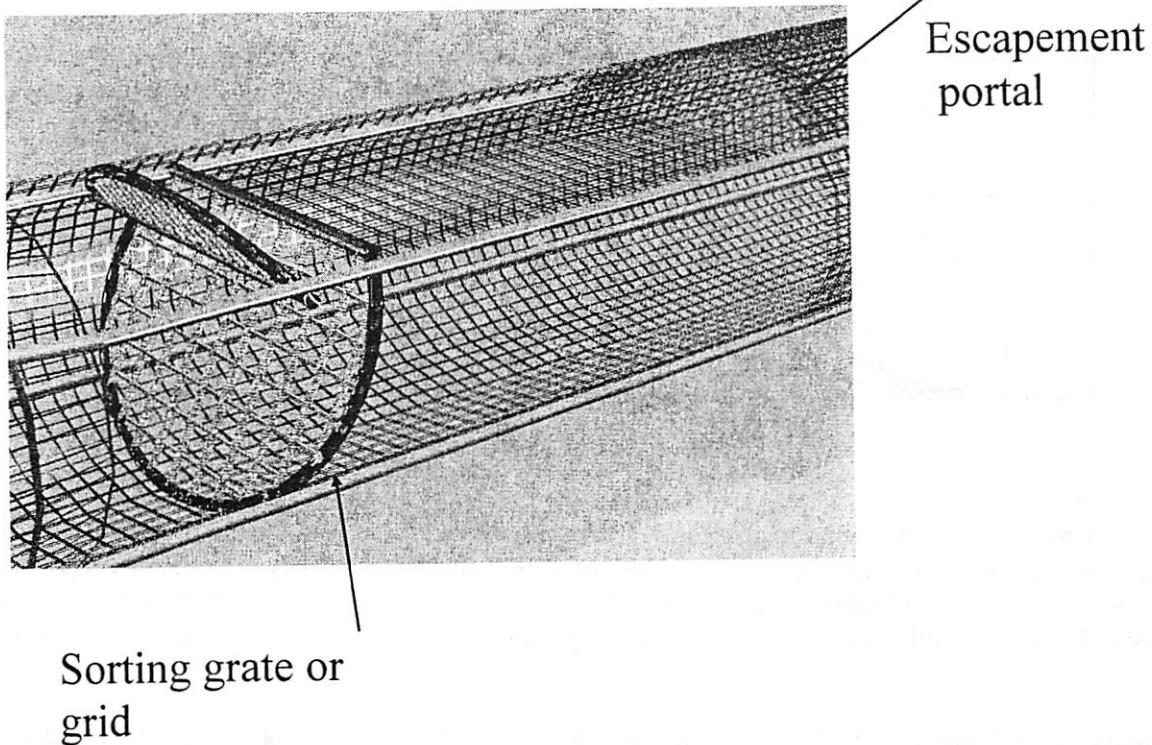


With the slotted escape panels placed on the sides of the intermediate, rods are tied into the intermediate to narrow the passage and slow down the water flow where the escapement slots are located. The sorting principal is that the relatively smaller-headed and flatter halibut will swim to the sides and pass through the slots, thus escaping the net. A smaller proportion of the cod can take advantage of the slots to escape because their relatively larger heads do not allow them to slip through the slots. The cod that can escape are also more likely to be smaller fish that are not the target of the fishery.

An important performance attribute here is that skates and large halibut that fail to respond to the other escapement enticements in the forward part of the net (the slower towing speed and sweep diverters) are likely to pass through the intermediate despite being slowed up where the intermediate is narrowed by the rods. Likewise, larger cod, these larger fish will eventually continue back to the cod end instead of clogging the flow of fish through the trawl.

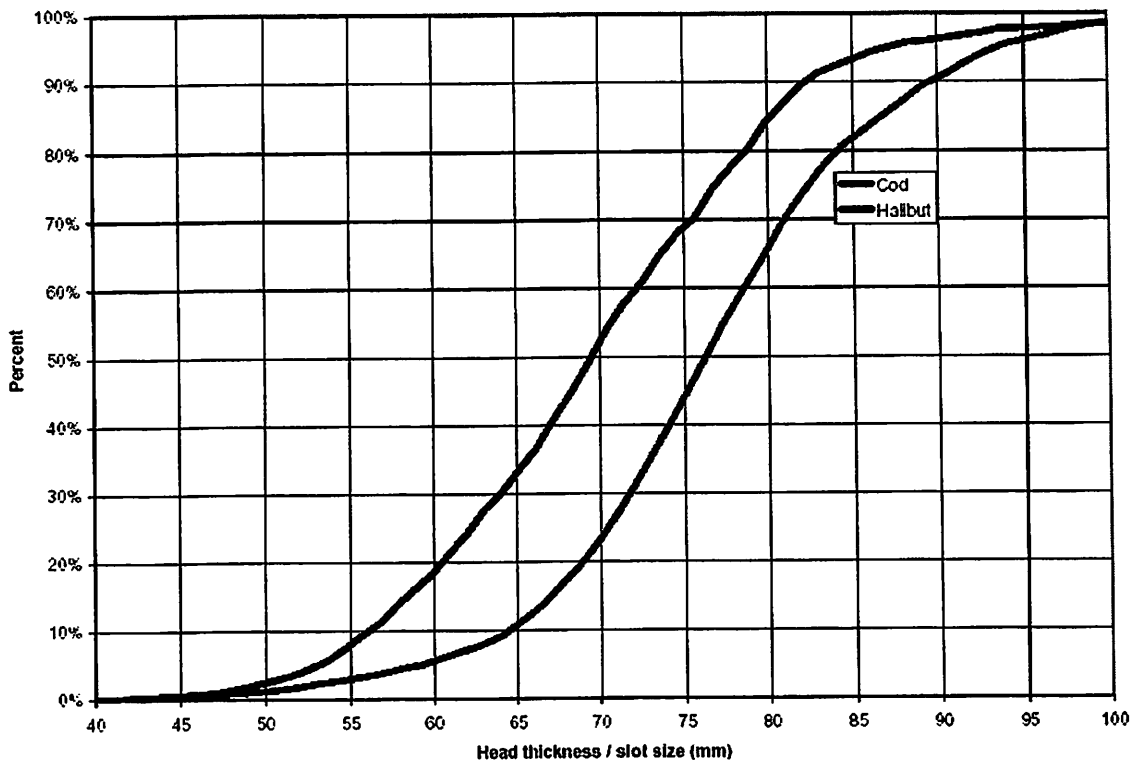
For rigid or webbing sorting grates rigged to sort across the intermediate, the larger fish do not use the escapement portal are likely to become stuck on the grate. This can cause more fish to fail to pass through the grate as designed and eventually the surface area for escapement can become so reduced that all the fish coming down the trawl end up stuck in the intermediate ahead of the grate. For his reasons, with fishing conditions like those in the Gulf where large skates are often abundant in cod fishing grounds, sorting grates can be extremely problematic.

Figure 2: Rigid sorting panel halibut excluder device



To achieve approximately 40% reduction in halibut catch rate, we currently anticipate that the vertical distance between the slots will need to be approximately 66 millimeters. This expectation is based on length composition data from the fall cod fishery over from 2004-2005. Differences in length between halibut and cod from observed hauls are converted into "head size" which is the most important dimension in determining ability to utilize the escapement opportunity between the slots (Figure 3). Even with the expected difference in ability of halibut to swim between the slots compared to cod, we expect that some "tweaks" to the orientation of the slots to favor the behavioral response of halibut rather than cod will be needed to reduce the escapement of cod. This is because approximately 10% of the cod based on the size would otherwise be able to swim out through the excluder.

Figure 3: Cumulative halibut and cod head thickness expressed in expected



To make the necessary adjustments to the configuration of the excluder prior to the EFP test, Dr. Rose has scheduled some pre-testing in late June or early July of 2006 using video observation capture devices early in the summer of 2006. In this manner, we will have pre-established the configuration that has the best chance of achieving at least 40% halibut escapement and hopefully minimal cod escapement as the gear configuration for the EFP test.

Additionally, we will conduct the EFP test with restrictions on towing speed that are aimed at reducing catch rates for larger halibut. The reduced towing speed will be done only on tows by the vessels that have the halibut excluder installed in their nets. Diverters along the trawl sweeps may also be used in the EFP test to reduce the catch rate of large halibut. The use of diverters will depend on whether work during the pre-test trials suggests potential additional benefit from their incorporation in the test. The combination of these additions to the design

of the slotted escapement panels that are principally designed around escapement of small halibut should create a cumulative escapement of at least 40% of the halibut. The length data on halibut catch between the experimental and control tows will help us make some inferences about which of these escapement inducing gear and fishing practices appears to be responsible for the performance results.

Expected benefits from this project:

A detailed report will be provided describing the device, how it was tested, and the degree of halibut and target catch reduction experienced from the test. The report will also hopefully provide some qualitative information that would indicate which factors and design elements were most critical to the effectiveness of the device. For instance, with length composition data on the halibut bycatch for the control and treatment tows, we anticipate being able to have some indicators of the portion of the reduction in the halibut bycatch rate that is likely attributable to the slotted escapement panel device as compared to the part of the reduction that is from the reduction in towing speed. The information from this test should be rather useful to the efforts of GOA catcher vessels to reduce their halibut bycatch rates. The initiative could be in the form of stepped up industry voluntary initiatives for reducing halibut bycatch or even regulations requiring use of the excluder for the GOA cod fishery once its performance is sufficiently demonstrated in the regular fishery. It is also anticipated that once GOA Rationalization is in place, strong incentives for large-scale industry adoption of the halibut excluder device would arise given that fishing cooperatives would likely establish performance guidelines for halibut bycatch reduction or other incentives in terms of the ability to access additional groundfish for fishermen with low halibut bycatch rates.

For the short run, one benefit to the EFP test is that as a condition for being selected for the EFP field testing, all successful applicants will have to agree that if they are selected for the EFP they will commit to using the excluder device in the regular 2006 GOA fall cod fishery starting on September 1, 2006. In making this commitment as part of their applications for the EFP work, a contingency clause would be included such that they would only be committed to using the device in the regular September 1st fall cod fishery opening if the EFP test demonstrated that the reduction in halibut bycatch rates (per hour or per MT of groundfish) was at least 40% and the loss of cod catch was estimated to be less than 10% by weight. So if the performance of the excluder meets these criteria, then six vessels during the regular fishery can be expected to have lower halibut bycatch rates than the other vessels in the fishery. More importantly, their use of the device in the regular fishery will help demonstrate the feasibility of use of the device to fishermen who are otherwise skeptical about modifying nets to reduce halibut catch rates.

Even if the device is not successful, the experiment has been designed to provide helpful data and information that can be used in the future to reduce halibut bycatch. In addition, the application and experimental process should help foster industry cooperation on the future development of gear modifications to reduce halibut bycatch in the cod and possibly shallow water flatfish fisheries of the Gulf of Alaska.

Part Three: Responsibilities of EFP applicant, NMFS, and applicants for the EFP field testing

EFP Applicant

The EFP applicant and principal investigator, John Gauvin, will administer all aspects of the EFP including development of materials for the request for proposals, project management for the field testing during the EFP, analysis of EFP data, preparation of draft and final EFP reports describing testing methods and findings, as well as other coordination duties necessary to the successful completion of the EFP work. The EFP applicant will supply up to two project field managers throughout the field work to oversee the EFP. The managers will rotate between vessels on different trips and will be available to troubleshoot problems throughout the testing. The EFP applicant will also be responsible for finding qualified sea samplers for the EFP field work as well as scheduling arrangements for ensuring that sea samplers are available for the EFP test. All technical aspects of this work will be undertaken in close coordination and with oversight from Dr. Craig Rose, Alaska Fisheries Science Center, RACE Division.

NMFS Alaska Fisheries Science Center

Dr. Craig Rose has agreed to provide the technical assistance described above in pre-testing the halibut excluder prior to the EFP test so that the EFP can test a device that through video evaluation at least, appears to create useful selectivity. Dr. Rose has also agreed to provide other assistance with technical and analytical aspects of the EFP testing, data analysis, and report preparation. The NMFS AFSC Race Division is also requested to serve as reviewer for EFP vessel applications for the field work. NMFS is asked to provide three NMFS scientists with experience in review of vessel charter applications to rank the applications bases on criteria established in the RFP that will be developed by the EFP applicant. The EFP applicant (permit holder) will first conduct an initial "pre-review" of applications to determine if they are complete. As time allows, applicants for the EFP field work will be informed by the EFP holder of any obvious deficiencies and items missing from their applications so that these can be remedied prior to the final due date for EFP field work vessel applications.

Vessel Owner Applicants for EFP: In addition to the preparation of applications to participate in the EFP field work, all applicants must agree in writing that, if selected for the EFP test, they will agree to follow the experimental fishing protocol as described in the RFP for participation in the field test. Successful applicants will be responsible for paying for the costs of sea sampler coverage throughout the EFP field testing. Additionally, successful applicants will pay all of their vessel costs during the field work and will be responsible for purchasing the excluder materials and all installation costs. Vessel owners selected for the EFP field work must agree to make the data from the EFP work available to the experimental fishing permit holder for purposes of the analysis and generation of draft and final reports of results. EFP applicants (and/or the processors who receive fish from the EFP work) may be requested to make a donation to a "not for profit" foundation based on a per pound assessment for the landed amount of cod during the EFP. Any donations received from this EFP would be used to defray the costs of the EFP field testing and any remainder will be earmarked for use in future projects to reduce bycatch in GOA fisheries.

Timing for tasks associated with the experiment

The month of August of 2006 is the target time for conducting the EFP test. Figure 4 below outlines the anticipated timing for each EFP task leading up to August of 2006. Given that final approval of the EFP application may not be possible before July, some important steps in preparation for the EFP, such as the circulation of the RFP to select vessels for the EFP test and the selection of vessels for the EFP will likely need to be undertaken prior to final approval. In that case, all RFP materials and decisions by the NMFS vessel selection panel will be noticed and treated as "preliminary" and "subject to final NMFS approval of the EFP application".

Figure 4: Anticipated timeline and milestones for the GOA halibut excluder for cod fishery EFP

Task	Feb- 06	Mar- 06	Apr- 06	May- 06	Jun- 06	Jul- 06	Aug- 06	Sep- 06	Oct- 06	Nov- 06	Dec- 06
draft EFP to AFSC	x										
AFSC internal review	x	X									
NMFS AK Region review											
NPFMC review			x								
circulation of draft RFP			x	x							
NMFS pre-test charter					X	x					
EFP permit received						x					
vessel selection panel						x					
EFP field work							X				
data analysis								x			
draft report of findings								x	x		
SSC review									x	x	
report to NPFMC											x
final report of findings											x

Part Four: Experimental Design

The principal variables of interest for this experiment are the catch rates (kg/hr) of Pacific cod and halibut from tows with and without the experimental device. Auxiliary environmental data, including depth, temperature, light level, speed, and time of day will be collected and analyzed for any important factors which may be associated with the selectivity of the device under the fishing protocol for the test. The sample unit for all variables will be the trawl tow.

All tows will be conducted in pairs (statistical blocks), consisting of simultaneous sets of pairs of tows with and without the device conducted by three pairs of vessels. For purposes of practicality, the switching of the excluder and reduction of the towing speed to reduce halibut bycatch will be done on a trip by trip basis. Each vessel serving as the control for that trip will select the fishing area for each tow during that trip. The experimental vessel for each pair will make a simultaneous "shadow" tow adjacent to its control vessel for each tow during that trip. Thus paired tows will be conducted simultaneously in as close together as practical in space and time, using "identical" nets within the pairs of vessels and the same fishing procedures except for the addition or removal of the device and the lower towing speed for the vessel serving as treatment for that set of pairs.

The experiment will be conducted on six vessels, dividing the number of pairs needed for the experiment needed to achieve the target level of statistical power (46 pairs or 92 tows total as explained below) equally between the six vessels. This is needed to gauge the effects of vessel-specific variation on the performance of the device selected for the test and to complete the experiment in a reasonable amount of time (a long time duration could mean the experiment is conducted under conditions of varying groundfish and halibut abundance, which could affect results). The experiment is expected to take 10-12 days of fishing. This is based on an average of 6 tows per trip and 2-3 trips per vessel to complete the EFP work. Based on our previous experience with GOA catcher vessels, we believe that this anticipated testing schedule will allow for sufficient time for the additional time needed for conducting a census of the halibut catch on each vessel tow under the supervision of the sea sampler.

Towing will occur in the normal fishing areas available to the regular commercial cod trawl fishery in the Central Gulf of Alaska. A small number of test tows of short duration (20-30 minutes) may be carried out to determine if the species mix is suitable before commencing experimental tows at a new site. Because accounting for the groundfish catches (catch other than halibut) during the experiment may have to be done on a trip total basis, catch from any of these brief test tows will be returned to the sea from the deck. Results of these tows will not be used in the analysis. Tows will also not be used for the data analysis if the trawl suffers such significant damage that it is considered unlikely to have fished in an otherwise normal manner. If this occurs on one of the tows comprising a pair, the pair will need to be removed from the data set and another pair will be started. Catch from these tows will however count towards the groundfish and halibut catch limits for the EFP.

The captain or other wheelhouse crew will record the start and end times of each tow as well as the average speed, depth, captain's estimate of catch weight and whether the device was installed. A self-contained data-logger will be attached to the trawl net during every tow to measure the depth, temperature, and light level during fishing.

As described above, a procedure will be used under the supervision of the sea samplers on the vessels participating in the test to work on deck to remove all the halibut from each tow, and then measure and return them to the sea as soon as proper accounting has occurred. These procedures will be done under the direct supervision of the sea sampler and EFP fishing will not occur if sea conditions or other factors do not allow full halibut accounting for the effects of the excluder on halibut catch rates. Crew members will be instructed as part of the EFP fishing protocol on the proper methods to sort and handle halibut from the catch and move them to the area on deck where the sea sampler is stationed. The sea sampler will check off the lengths of each halibut so that weight equivalents can be used to generate an estimate of weight of halibut per tow. If numbers of halibut are extremely high on some tows, sea samplers may have to resort to counting the number of halibut and collecting a sub-sample of lengths of the halibut in that tow.

Based on past experience with deck sorting halibut on catcher processors and catcher vessels, all the halibut from a given tow can normally be returned to the sea with minimal injury under these controlled conditions in less than 20 minutes from the time the net is brought on deck. This obviously requires the assistance of crew members in the handling and conveyance of halibut to the sea sampler, as described above.

The EFP applicant will supply up to two additional project field managers throughout the field work to oversee the EFP. The managers will rotate between vessels on different trips and will be available to troubleshoot problems throughout the testing. In addition, Dr. Rose or one of his employees will be invited to help with gear issues or other technical aspects of the work including underwater camera work to help understand the working of the excluder if feasible.

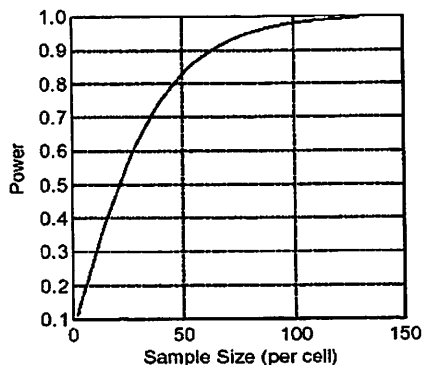
Statistical power for the EFP test

The target number of pairs of tows for the EFP was arrived at from the following considerations. The minimal expected effect of the excluder on halibut catch rates compared to an unmodified net fished at the regular towing speed for the cod fishery is a 40% reduction. This was derived from the differential in head size from halibut that were measured by observers during the fall cod fishery from 2004-2005. The Power analysis below is based on differences between log transformed catches of halibut between the pairs of tows and an expected standard deviation within pairs of 1.37. This standard deviation was calculated from observed tows in the last two regular fall cod fisheries (2004 and 2005) which were paired in a *post hoc* using a pairing routine to select pairs based on minimization of location differences of the haulback positions as well as minimization of the time difference of recorded net retrieval time. A 40% reduction in halibut catch corresponds to an effect of $\ln(.6) = 0.51$. The desired power for of the test is 0.80 (or 80% which is standard for most power analyses) and the Alpha for our test was selected to be 0.10. While the standard Alpha of 0.05 would have been preferable, the larger number of pairs needed to meet this higher standard (60 pairs) was deemed to be infeasible. Based on these parameters selected for the power analysis, 46 pairs are needed (Figure 5 below).

Figure 5: Power analysis for and EFP to test a halibut excluder for the GOA fall cod fishery

Alpha =	0.100
Power =	0.800
Model =	One Sample t-test with alternative 'not equal'
Mean under the Alternative =	0.510
Mean under the Null =	0.000
Standard Deviation =	1.370
Expected Difference =	0.510
Effect Size =	0.372
Noncentrality parameter =	0.372 * sqrt(sample size)
SAMPLE SIZE	POWER
(per cell)	
42	0.767
43	0.775
44	0.784
45	0.792
46	0.800

Power Curve (Alpha = 0.100)



Expected groundfish and halibut catch for the EFP:

To evaluate the amount of groundfish catch of different species that would be expected from 92 tows (46 pairs) that are typical of the catch in the fall Central Gulf cod fishery, observer data from the last two fall cod fisheries were examined. For 190 observed tows in sub-areas 620 and 630 occurring between Sept 1 - 5 2004 and 2005, the tows made by catcher boats that had more that 500 kg of cod had the following characteristics:

- Average total tons 14.0 mt
- Average Cod catch 10.2 mt
- Average Halibut catch 2.2 mt
- Average tow duration 135 minutes

These averages were used in Table 2 below to evaluate the groundfish, Pacific cod, and halibut catches of each of the six vessels participating in the EFP. For the estimated halibut mortality, the following assumptions were made. First it was assumed that each vessel would be using the halibut excluder during half of its EFP tows and that the halibut catch rates for the excluder would be 40% lower than the average halibut catch rate for observed tows from the 2004-2005 cod fisheries. Lastly, the mortality rate used for the regular cod fishery (61%) was used as an upper bound of the halibut mortality for the EFP. In reality, we expect that the methods for measurement and quick return to the sea used during the EFP will have lower expected mortality than occurs in the regular fishery.

Table 2: Estimated groundfish catch and halibut mortality of the halibut excluder EFP

	# of tows	trips	groundfish (MT)	P. cod (MT)	other groundfish (MT)	Halibut catch (MT) assuming 40% excluder effect and excluder used on treatment tows for EFP(50% of tows)	Halibut mortality (MT) assuming "official" mortality rate (61%)
<u>Vessel 1</u>	15	2 or 3	215	156.4	24.5	21.6	13.2
<u>Vessel 2</u>	15	2 or 3	215	156.4	24.5	21.6	13.2
<u>Vessel 3</u>	15	2 or 3	215	156.4	24.5	21.6	13.2
<u>Vessel 4</u>	15	2 or 3	215	156.4	24.5	21.6	13.2
<u>Vessel 5</u>	15	2 or 3	215	156.4	24.5	21.6	13.2
<u>Vessel 6</u>	15	2 or 3	215	156.4	24.5	21.6	13.2
<u>EFP total</u>			1,290.0	938.4	147.2	129.6	79.1

DRAFT 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

May 2006

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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.

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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 devices in trawl gear designed to 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 smaller “inshore” catcher vessels that target Pacific cod in the Central GOA. The following performance goals will be used to measure the ability of the proposed EFP to meet the stated objective: (1) compared to an unmodified trawl, the excluder device should result in at least a 40 percent reduction in the halibut bycatch rate (kilogram of halibut per metric ton of allocated groundfish); (2) compared to an unmodified trawl, the excluder device should not reduce the target species catch by more than 10 percent; and (3) the excluder must be functional for a typical GOA trawl vessel which has limited deck space and may have only aft reels. The degree to which the excluder meets the goals and objectives will be evaluated by the applicant and Alaska Fishery Science Center.

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) trawl closures in the Central GOA for reasons other than overfishing concerns; (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. Regulations describing maximum retainable (MRA) amounts apply; however, Pacific cod is designated as the basis species from which retainable amounts are to be calculated. 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, and socioeconomic components. The effect of the action on PSC, marine mammals, 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 this environmental assessment (EA) is to predict whether the impacts to the human environment resulting from the proposed action will be significant. If the predicted impacts from issuing the exempted fishing permit (EFP) are not significant, no further analysis is necessary to comply with the requirements of the National Environmental Protection Act (NEPA).

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 overage may result in the TAC for multiple fisheries not being harvested. For example, PSC overages created 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 bycatch rates through the use of a halibut excluder device may allow more Pacific cod and shallow-water flatfish species 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. Moreover, the proposed project would 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 closed¹.

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 decisions¹. 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 the 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 effectively 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 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 further 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, 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-April 1	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 fraction 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 Alaska Fisheries Science Center 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. Thus, because the escapement slots allow 65 mm of vertical clearance, 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 includes 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.

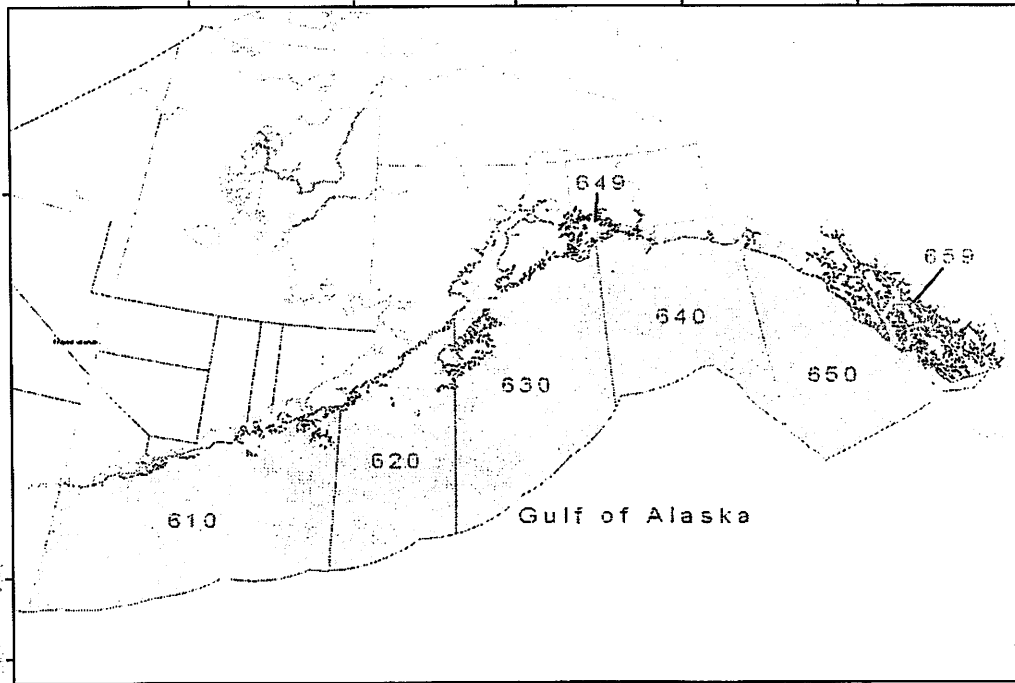


Figure 1 Central GOA management area (statistical areas 620 and 630)

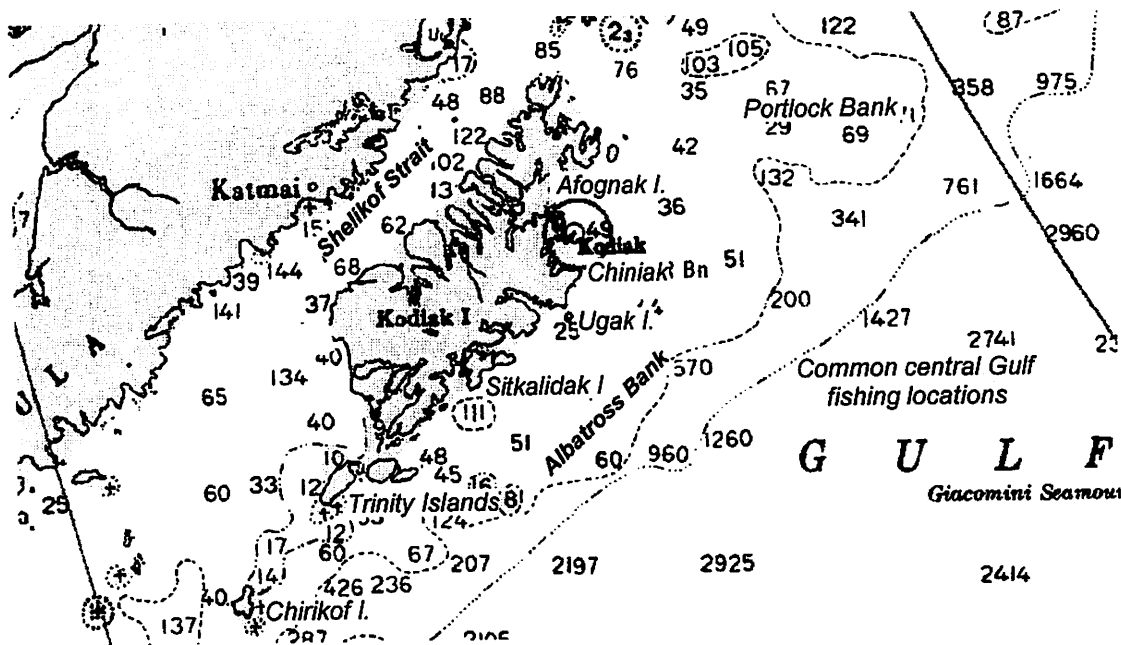


Figure 2 Description of the EFP fishing areas.

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 smaller “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. Therefore, fishing activities under the proposed EFP are exempt from all trawl fishery closures except for closures addressing 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 as described in Section 1.0 and Alternative 2.

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 and to meet the purpose of the project, no other alternative is proposed.

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

Alternative 2: Preferred alternative. The applicants 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.

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 permit would require an exemption from § 679.7(a)(2) which stipulates that persons are prohibited from conducting any fishing contrary to notification of inseason actions, closures, or adjustments under Sections 679.20, 679.21, 679.23, and 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>

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.

Table 4.1 Resources potentially affected by EFP Alternatives

Alternatives	Potentially Affected Component							
	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.

Because the gear type and method of harvest would not change from current practices, no effects beyond those already identified are expected on the physical environment, benthic communities, non specified and forage species, and seabird components of the environment (NMFS 2006).

Table 4.1 suggests that the following four potential environmental components may be impacted:

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).
5. **Social and economic impacts:** This action may also have socioeconomic impacts on the industry and the applicants. Issuance of this EFP would allow the applicants 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 form 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 flatfish², rex sole, flathead sole, shallow water flatfish³, arrowtooth flounder, sablefish, Pacific ocean perch, shortraker rockfish, roughey rockfish, other rockfish, northern rockfish, pelagic shelf rockfish, thornyhead rockfish, big skates, longnose skates, other skates,

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.

demersal shelf rockfish, Atka mackerel, and other species⁴. 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).

For those stocks where information is available, none are considered overfished or approaching an overfished condition and all are managed within the 2006 annual harvest specifications. The GOA Plan Team met in November 2005 to finalize the SAFE report and forward ABC and OFL recommendations to the Council for action at its December 2005 meeting. 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.

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 mackerel	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 has been 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 will 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 roughey 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 for the MRA calculation. 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 OFL⁵. 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. A recent biological assessment of the effects of the groundfish fisheries on ESA listed marine mammals determined that the Pacific cod trawl fishery was likely to adversely affect only Steller sea lions (personal communication, Melanie Brown, NMFS, Alaska Region P.O. Box 21688 Juneau, Alaska 99802). 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. Pacific cod has been identified as a principal prey species for Steller sea lions. Reduction in local abundance of Pacific cod could be more energetically costly to foraging marine mammals.

Pacific cod harvest levels for the proposed EFP are likely to be within 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 $B_{20\%}$ that requires the closure of the directed fishery for 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 and disturbance of Steller sea lions is not expected in 2006 or 2007.

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.

Any potential disturbance effects on sea otters and Steller sea lion are likely to be discountable, and therefore no consultation under section 7 is needed for this action (personal communication, Kaja Brix, Protected Resource Division, NMFS , PO Box 21668 Juneau, AK 99802). The overall effects of the EFP on Steller sea lions is therefore insignificant.

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 pounds. 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.

4.5 *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 act to 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 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. 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). The proposed EFP will occur in the late summer (August) 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). For example, 343 mt of the Central GOA inshore TAC for Pacific cod was not harvested 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. 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. The harvest specification EA discusses the impacts of trawling on EFH in regard to TAC levels. 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.

4.4 Effects on the Social and Economic Environment

Alternative 1 is the status quo and no additional socioeconomic effects beyond those already analyzed are expected (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 six vessels participating in the EFP is approximately 160 mt worth \$123,000 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 six 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 and earnings data for the type of vessels that will participate in the EFP work. Successful applicants for 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. 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. 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. This information can be used to estimate costs associated with the use of the halibut excluder device.

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 reduce halibut PSC catch rates and thus allow 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 during the fourth quarter shallow 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.

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).

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 to 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. Alternative 2 would provide for an EFP that would allow for the development of a halibut excluder device that may effectively reduce halibut bycatch rates in the Central GOA 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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8.0 References

- Angliss, R.P. and K.L. Lodge. 2004. Alaska Marine Mammal Assessments, 2003. U.S. Department of Commerce, NOAA Technical Memorandum NMFS-AFSC-144. 230 p.
- Clausen, D.M. AND Heifetz, J. 2002. The Northern Rockfish (*Sebastes polyspinus*) in Alaska: commercial fishery, distribution, and biology. Marine Fishery Review. 64(4):1-27.
- Gauvin, J.R., Haflinger, K, and M. Nerini. 1995. Implementation of a voluntary bycatch avoidance program in the flatfish fisheries of the eastern Bering Sea. Solving Bycatch: Solutions for Today and Tomorrow. Alaska Sea Grant College Program Report No. 96-03, University of Alaska, Fairbanks, pp.79-85.
- Gauvin, J.R. and Craig S. Rose. 2000. The effectiveness of a halibut excluder device and consideration of tradeoffs in its application. In: Micro-behavior and Macro-results: Proceedings of the Tenth Biennial Conference of the International Institute of Fisheries Economics and Trade. Oregon State University Press.
- NMFS. (2006). Environmental Assessment for the Total Allowable Catch Specifications for the Year 2006-2007 Alaska Groundfish Fisheries. National Marine Fisheries Service, Alaska Region, P.O. Box 21668, Juneau, Alaska 99802-1668.
- NMFS. (2005). Environmental Impact Statement for Essential Fish Habitat Identification and Conservation in Alaska. DOC, NOAA, National Marine Fisheries Service, Alaska Region, P.O. Box 21668, Juneau, Alaska 99802-1668. Accessed at <http://www.fakr.noaa.gov/habitat/seis/efheis.htm>
- NMFS. (2004). Alaska Groundfish Fisheries Final Programmatic Supplemental Environmental Impact Statement. June 2004. DOC, NOAA, National Marine Fisheries Service, Alaska Region, P.O. Box 21668, Juneau, Alaska 99802-1668. pp. Volumes I-VIII.
- NMFS. (2001). "EA/RIR for the Extension and Revisions of the Emergency Interim Rule for 2001 Harvest Specifications for the Alaska Groundfish Fisheries and for Steller Sea Lion Protective Fisheries Management Measures." No FONSI. EA transmittal letter dated July 20, 2001, DOC, NOAA, National Marine Fisheries Service, Alaska Region, P.O. Box 21668, Juneau, Alaska 99802-1668. p. 306.
- NMFS. (2001). Steller Sea Lion Protection Measures Final Supplemental Environmental Impact Statement. Implemented under the Fishery Management Plans for the Groundfish of the GOA and the Groundfish of the BSAI. 2001. NMFS, Alaska Region P.O. Box 21668, Juneau, AK 99801. November 2001. Available at <http://www.fakr.noaa.gov/sustainablefisheries/seis/sslpm/default.htm>.
- Sullivan, P.J., R.L. Trumble, and S.A. Adlersen. (1994). Pacific halibut bycatch in the groundfish fisheries: effects on and management implications for the halibut fishery. IPHC Scientific Report. No. 78: 28 p.

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May 25, 2006

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N.P.F.M.C.

Ms. Stephanie Madsen, Chair
North Pacific Fishery Management Council
605 West 4th avenue, Suite 306
Anchorage, AK 99501-2252

re: June Agenda Item D-1 EFP for GOA Trawl Cod fishery halibut excluder

Dear Stephanie,

The staff of the International Pacific Halibut Commission (IPHC) has reviewed the draft application (dated February 2006) for an Experimental Fishing Permit (EFP) to evaluate the effectiveness of a halibut excluder for the GOA trawl cod fishery. The experiment will test the effectiveness of a slotted escapement panel in the trawl intermediate, reduced tow speed, and diverters along the trawl sweeps at reducing halibut bycatch rates in trawls used by the shore-based cod trawl fishery. The applicant is requesting 80 mt (round weight, or 132,000 lbs net weight) of halibut bycatch to support the project.

The staff supports this project and the use of the requested bycatch. The IPHC has supported the development and use of gear modifications and more selective gear types and the proponents have a proven track record. We see this project as moving toward more selective, cleaner trawl gear for the GOA trawl fishery, which historically is the largest user of the GOA trawl fishery halibut PSC limit. For example, this fishery took 31% of the total trawl fishery halibut bycatch mortality in 2005. While 80 mt is not a minor amount, the potential for sizeable reductions in halibut bycatch mortality in subsequent years appears likely and is worth the 'investment' of the 80 mt.

IPHC staff will be in attendance at the meeting and can answer any questions the Council or SSC may have on this issue.

Sincerely yours,



Bruce M. Leaman
Executive Director

cc: Commissioners

Public Testimony Sign-Up Sheet

Agenda Item D-1 Groundfish Management

	NAME (PLEASE PRINT)	AFFILIATION
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2	X Julie Bunney	Groundfish Data Bank
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NOTE to persons providing oral or written testimony to the Council: Section 307(1)(I) of the Magnuson-Stevens Fishery Conservation and Management Act prohibits any person "to knowingly and willfully submit to a Council, the Secretary, or the Governor of a State false information (including, but not limited to, false information regarding the capacity and extent to which a United State fish processor, on an annual basis, will process a portion of the optimum yield of a fishery that will be harvested by fishing vessels of the United States) regarding any matter that the Council, Secretary, or Governor is considering in the course of carrying out this Act.