

**ENVIRONMENTAL ASSESSMENT**  
**for the Issuance of an Exempted Fishing Permit for Using Commercial Pollock Fishing**  
**Vessels for Acoustic Surveys within Portions of Steller Sea Lion Protection Areas in the**  
**Aleutian Islands Subarea**

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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 pollock fishing vessels to conduct acoustic surveys and limited pollock harvest within selected areas of Steller sea lion protection areas in the Aleutian Islands subarea. The purpose of the EFP is to assess pollock abundance in a portion of the Aleutian Islands and to test the technical feasibility of setting quotas for pollock at a finer temporal and spatial resolution using near real-time acoustic surveying. Exemption from certain pollock fishing closure areas within Steller sea lion protection areas in the Aleutian Islands subarea would be necessary to ensure sufficient quantities of pollock are encountered to conduct the test and to compensate the study participant. The project is intended to improve the Aleutian Islands pollock stock assessment, conservation, and management. The analysis found no significant impacts on the human environment for this action.

**Public Comments Due: December 12, 2006**

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## **Executive Summary**

The exempted fishing permit (EFP) would support a project to assess the abundance and distribution of Alaska pollock (*Theragra chalcogramma*) in portions of the Aleutian Islands (Areas 541 and 542) susceptible to an Adak-based small boat fishery and to test the technical feasibility of setting pollock quotas at a finer temporal and spatial resolution using near real-time acoustic surveying. The data collected may improve the information available for stock assessments and thereby improve pollock harvest management.

The project would be conducted between 173° W and 179° W longitude. The selected study area would be used for acoustic surveys, fishing to verify survey data, and commercial fishing to compensate for survey expenses and collect additional biological data. The areas identified include waters within Steller sea lion protection areas. The EFP would permit vessels to harvest the verification and compensation fish (mostly pollock) over approximately six weeks in February through April. All pollock harvested will be counted against the Aleut Corporation's allocation for the directed pollock fishery in the Aleutian Islands. The allowable harvest level will be determined by the final size of the survey area (see attachment), but would not exceed 3,000 metric tons (mt) minus any fish taken in a state-managed Aleutian Islands pollock fishery prior to or during the study. Harvests also would not exceed 1,000 mt in any one degree longitude block, and commercial fishing would be limited to one vessel greater than 60 feet length overall (LOA) within a one degree block at any given time.

The EFP is necessary to allow the applicant to harvest pollock in Steller sea lion protection areas that are currently closed to pollock fishing. Two alternatives were analyzed in this EA. Alternative 1 is status quo with no permit issued. Alternative 2 would issue the permit. The environmental effects of Alternative 2 are limited to marine mammals and prohibited species components. No significant effects were identified. Even though no significant effects under this EA were identified for Steller sea lions, adverse effects are likely, and therefore, an Endangered Species Act Section 7 consultation must be completed before the EFP may be issued. The primary socioeconomic effects of Alternative 2 would be potential future improved pollock harvests through more accurate information on the status of pollock stocks. The State of Alaska has authorized a pollock fishery in nearly the same areas as described in the EFP, contingent on the EFP not being issued for 3,000 mt of harvest. The State action may cause cumulative effects beyond those already considered in previous National Environmental Policy Act analyses for the groundfish fisheries, but these effects have been determined to not be cumulatively significant.

## **Comparison of Alternatives and Selection of a Preferred Alternative**

Alternative 2 had no significant impacts identified. Alternative 1 had no additional environmental impacts beyond those already identified in previous analyses, except for the potential impact of the State waters pollock fishery on Steller sea lions. Additionally, Alternative 1 would not provide improved information for pollock stock assessments and potential improvement of pollock harvest management. Alternative 1 also would likely result in a State 3,000 mt pollock fishery prosecuted during the A season in the Aleutian Islands and inside Steller sea lion protection areas. Alternative 2 is the preferred alternative, because it has

no significant adverse impacts identified, would likely result in fewer impacts on Steller sea lions, and may improve future management of pollock resources in the Aleutian Islands.

## 1.0 Introduction

### 1.1 Background

The U.S. Congress, in Section 803 of the Consolidated Appropriations Act of 2004 (CAA, HR 2673), Public Law 108-199, required that future directed fishing allowances of pollock in the Aleutian Islands subarea be allocated to the Aleut Corporation. Only fishing vessels approved by the Aleut Corporation or its agents are allowed to harvest this allowance. To harvest the fish, the Aleut Corporation is only allowed to contract with vessels under 60 feet length overall (LOA), or vessels listed under the American Fisheries Act (AFA). The allocation was made to the Aleut Corporation to further the economic development of Adak, Alaska. The CAA requires half the Aleutian Islands pollock allocation be harvested by small boats (less than 60 feet LOA) in 2013 and beyond.

The Aleut Corporation harvested only 1.2 percent of its initial 2005 pollock allocation in part due to difficulty in finding pollock. In 2006, no additional pollock was harvested by the Aleut Corporation, beyond the amount taken under the 2006 EFP (897 mt, 16 percent of the annual allocation). The majority of pollock harvests in the Aleutian Islands subarea had historically been in Steller sea lion critical habitat until the entire subarea was closed to pollock fishing in 1999 (NMFS 2004 and 64 FR 3437, January 22, 1999). The Aleutian Islands subarea was reopened to pollock fishing outside of critical habitat with the 2003 Steller sea lion protection measures (68 FR 204, January 2, 2003).

NMFS has limited resources for pollock surveys in the Aleutian Islands subarea. Surveys have generally been bottom trawl surveys conducted every second or third summer. The 2005 Stock Assessment and Fishery Evaluation (SAFE) report for Aleutian Islands pollock used bottom trawl surveys and catch data to develop the stock assessment for this pollock stock (NPFMC 2005b). Because of the limited data available, the stock is currently managed at tier 5, as required by the Fishery Management Plan (FMP) for Groundfish of the Bering Sea and Aleutian Islands Management Area (BSAI). The study under the 2006 EFP demonstrated that a commercial vessel could be successfully used to conduct acoustic surveys of pollock in the Aleutian Islands (Barbeaux 2006). The proposed EFP would continue the work from 2006 to obtain baseline data on pollock abundance and distribution within the area susceptible to an Adak-based small boat fishery and to better assess the technical feasibility of setting fine temporal and spatial scale pollock quotas. The results may lead to new methods for managing pollock harvests in the Aleutian Islands subarea.

### 1.2 Purpose and Need

The purpose of the EA is to predict whether the impacts to the human environment resulting from this action will be significant. If the predicted impacts from issuing the EFP are not significant, no further analysis is necessary to comply with the requirements of the National Environmental Policy Act.

The purpose of the EFP is to use commercial fishing vessels to assess Alaska pollock abundance and distribution in the portions of the eastern and central Aleutian Islands (Areas 541 and 542)

susceptible to an Adak-based small boat fishery and to test the technical feasibility of setting pollock quotas at a finer temporal and spatial resolution using near real-time acoustic surveying. NMFS currently does not have resources to conduct acoustic surveys of pollock in the Aleutian Islands subarea. The acoustic and biological information from the project will provide a baseline assessment of pollock biomass and distribution in the area susceptible to an Adak-based small boat fishery and help to determine if the local aggregations of pollock are stable enough during the spawning season to allow for fine-scale spatial and temporal quotas. Additionally, genetic samples will be collected during this study that will be used for stock structure analysis. Better information may lead to improved conservation and harvest management at finer spatial and temporal scales for the Aleutian Islands subarea pollock.

Improved harvest management of the Aleutian Islands pollock stock is needed based on the high uncertainty in the stock structure and the potential effects of the fishery on Steller sea lion populations. This project is consistent with Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) national standard 1 which requires that conservation and management measures achieve optimal yield from a fishery. This project also enhances implementation of national standard 2 by providing improved data for the best scientific information available to use in pollock stock conservation and management.

Appendix A is the cruise plan, a detailed description of the work to be performed under the EFP. To verify the acoustic data and to compensate the participating vessel, a maximum of 3,000 mt of walleye pollock would be harvested within an area that includes waters within 0 nautical miles (nm) to 20 nm of Steller sea lion haulouts and rookeries. Conducting the project within Steller sea lion protection areas is necessary because pollock aggregations must be encountered, and historical information about pollock aggregations indicates that pollock are likely to occur inside protection areas. As seen in the 2005 and 2006 pollock fisheries, it may be difficult to conduct the project outside of the Steller sea lion protection areas because of the difficulty in finding sufficient quantities of pollock. The time period of the project is late February through April 30, 2007, with the possibility of renewing or modifying the permit for an extension up to 12 months to replicate the survey in 2008. Several years of surveying may be needed to provide enough information to determine the feasibility of setting quotas based on survey data (S. Barbeaux, personal communication. October 13, 2006).

The EFP is needed to allow the applicant to fish for pollock in the study area, inside Steller sea lion protection areas normally closed to pollock fishing and to conduct the survey work as designed by the Alaska Fisheries Science Center (AFSC). Exemptions from portions of the closure areas between 173 to 179 degrees west longitude are necessary to ensure enough pollock are encountered to verify acoustic signals and compensate the participants. As explained further in Section 4.1, historical information indicates that this area should have enough pollock to complete the project.

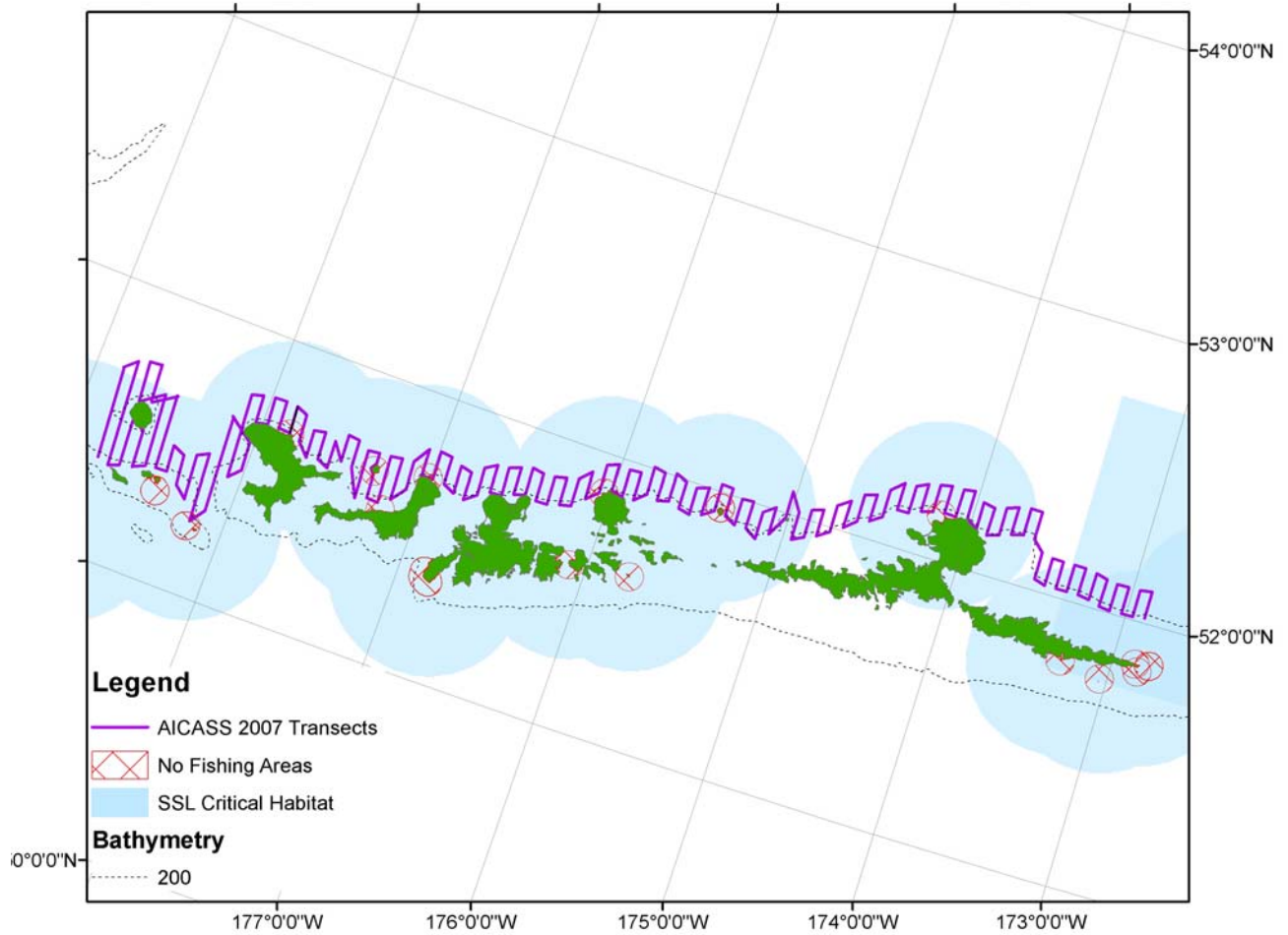
### 1.3 Project Area

The acoustic survey and supporting fishing will take place in the Aleutian Islands subarea in up to six one degree blocks between 173 and 179 degrees west longitude on the north side of the



Aleutian Island chain,. Fishing activities would include State waters which require permission from the Alaska Department of Fish and Game (ADF&G).

The study area is delimited by a northern boundary of 52° 35' N latitude, a southern boundary of 51° 35' N latitude, an eastern boundary of 173° 00' W longitude, and a western boundary of 179° 00' W longitude (Figure 1). This area is located within statistical areas 541 and 542 of the BSAI.



**Figure 1 Study Area Including Acoustic Survey Transects for the Aleutian Islands Pollock EFP**

## 2.0 Descriptions of Alternatives

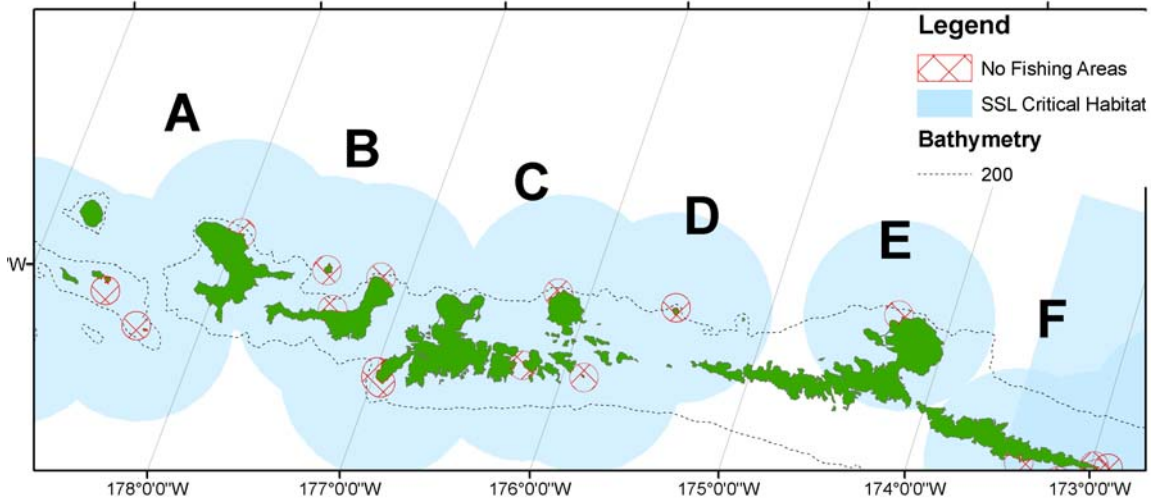
The applicant has worked with NMFS AFSC to develop the project, which has been approved by the AFSC (Demaster 2006). Completion of the project would require the applicant's exemption from several regulations under 50 CFR part 679, including portions of the Steller sea lion protection area closures as identified in Figure 1 and listed in Table 4 to 50 CFR part 679. Because meeting the purpose and need of this project is only possible within the context of the experimental design, the alternatives are limited to the following:

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

**Alternative 2:** Issue the EFP including the following exemptions and conditions. The EFP would allow the applicant to use one to four vessels to conduct the survey portion of the experiment as designed in cooperation with the AFSC and up to four vessels to conduct the compensatory fishing portion of the project. Details of the experiment are contained in Appendix A. The exemptions only apply to Federal waters. Any fishing activities in State waters (within 0 nm to 3 nm) would require an ADF&G Commissioner's permit. The EFP may be modified to include an additional year of fishing under the EFP under the same conditions. The following lists the regulations that are considered for exemption under Alternative 2 and those regulations that need consideration during implementation of the project.

1. **§ 679.7(a)(2):** This regulation states that persons are prohibited from conducting any fishing contrary to notification of inseason actions, closures, or adjustments under §§ 679.20, 679.21, 679.22, and 679.25. Nearly all the groundfish harvested will be pollock, with small amounts of Pacific ocean perch also expected to be taken. A small potential exists that the pollock fishery in the Aleutian Islands subarea may be restricted due to northern, shortraker or roughey rockfish bycatch. As long as the bycatch of these rockfish species remain below the overfishing level, the applicant would be exempt from these potential pollock fishery closures.

2. The amount of groundfish taken and retained during work performed under the EFP shall not exceed the allowable harvest calculated as described in Appendix A and shall not exceed 3,000 mt. This limit includes fish harvested under the EFP and any harvest in the State waters pollock fishery in the Aleutian Islands during the year. The combined harvest under the EFP and the State of Alaska pollock fishery in the Aleutian Islands cannot exceed 3,000 mt. The majority of this harvest is expected to be pollock. If either limit is reached, fishing activities under the EFP must stop. No more than 1,000 mt of groundfish shall be harvested from a single one degree block of longitude in the study area. In addition, no more than one fishing vessel greater than 60 feet LOA can fish in a single, one degree block concurrently. If the 1,000 mt limit is reached in a block, fishing activities under the EFP must stop in the block. The Regional Administrator must be notified before the limit is reached, if modification of the EFP is to be considered. Considerations may include, but are not limited to (1) the present amount of harvest of groundfish species by the groundfish fisheries compared to the annual total allowable catch amounts (TACs), (2) the progress of the project to date, and (3) the potential impacts of any modification of the EFP.



**Figure 2 Study Area showing 1 degree longitude blocks (A-F) limited to 1,000 mt and one fishing vessel greater than 60' LOA at a time.**

3. **§ 679.20(e):** Maximum retainable amounts of incidentally taken species are specified in 50 CFR part 679 Table 11 for the BSAI. The applicant will be exempt from these amounts for groundfish to allow the retention of all groundfish. By retaining the incidentally caught groundfish, the applicant will be able to accurately document the species weight and composition and compare this information to the acoustic data.

All retained groundfish species will be counted against the annual TAC amounts (50 CFR 679.20).

4. All prohibited species taken will be handled as required by regulation and counted against any prohibited species limits that apply to the Aleutian Islands directed pollock fishery (50 CFR 679.21). All Chinook salmon taken will count against the Chinook salmon prohibited species limit of 647 fish, as established for the Aleutian Islands directed pollock fishery (50 CFR 679.21(e)(1)(ix)).

5. **§ 679.22(a)(8)(i)(B) and (ii):** These regulations establish 20 nm closures around Steller sea lion haulouts and rookeries in the Aleutian Islands subarea and close the Sequam Foraging Area to pollock fishing. The permit would exempt the applicant from pollock fishery closures in Table 4 of 50 CFR part 679 only in the waters of the study area, as described above in Section 1.3 and that portion of the Sequam Foraging Area located in the EFP study areas. Fishing may occur within 0-3 nm of haulouts in the study area to verify acoustic survey data. No more than 10 mt of groundfish may be harvested in an acoustic survey data verification tow. The applicant must work with the NMFS scientist to ensure that the amount of groundfish harvested within 0 nm to 3 nm of a haulout is the minimum amount necessary to verify the acoustic survey data.

6. The effective date of the permit would be February 15 through April 30, 2007. The permit may be modified to extend the valid dates up to 12 additional months in the case of

unforeseen circumstances that prevent completion of the project within the effective dates of the permit or if the applicant and NMFS determines that the study should continue for an additional year.

7. **§ 679.28 (c)(3)(ii)(D) and (g)(7)(iv)** The shoreside plant accepting deliveries of harvest under this EFP must operate under the Catch Monitoring and Control Plan regulations, as described under 679.28(g).

8. **§ 679.50(c):** A NMFS-certified observer must be available at the Adak plant to observe 100 percent of the shoreside deliveries of fish taken under the EFP. 50 CFR 679.50(d)(1) requires shoreside plants to have an observer present at the facility each day it receives or processes groundfish, if more than 1,000 mt of groundfish are processed in a month. Considering the fish harvested under this EFP and other potential shoreside deliveries, it is possible that more than 1,000 mt of groundfish will be delivered to the Adak plant in a month, and therefore, the daily observer coverage would apply.

The participating vessel owner or operator will be exempt from catcher vessel observer requirements at § 679.50(c) during the survey portion of the experiment only, because a NMFS scientist or contracted acoustic and biological technicians must be on board the vessel at all times during that phase of the project. These personnel are responsible for ensuring the activities are conducted as described in the project plan and that attempts are made to resolve any problems in a manner that will not invalidate the work. The NMFS scientist will ensure the data required to track compliance, normally provided by a vessel observer, are provided to NMFS inseason management.

9. **§ 679.23(i)** Catcher vessels harvesting pollock are excluded from harvesting pollock in two management areas in one season. If the determination to issue this permit is not made by middle of January 2007 the vessels participating in this project may choose to fish the Gulf of Alaska in the A season. In such case, the vessel owners or operators would be exempt from this exclusive fishing season only for 2007. This exclusion is reasonable because of the investment in equipment to participate in the project and because the owner or operator cannot anticipate whether the EFP will be issued and may experience economic loss if not exempted from the restriction. In addition, the project manager may not be able to acquire another vessel with the necessary sonar equipment to do the work in a timely manner. If an EFP determination is made by the middle of January, this exemption would not be necessary.

### 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 these documents. All are public documents and are available in printed form or over the Internet at the 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 available at: <http://www.fakr.noaa.gov/index/analyses/analyses.asp>.

Amendment 84a to Modify Existing Chinook and Chum Salmon Savings Areas Environmental Assessment/Regulatory Impact Review /Initial Regulatory Flexibility Analysis (EA/RIR/IRFA) (NPFMC 2005c): The North Pacific Fishery Management Council has recommended analysis of potential changes to the management of salmon bycatch in the BSAI. Salmon is primarily taken in the pollock trawl fisheries and current management measures have not prevented the BSAI groundfish fisheries from exceeding the incidental take statement for Chinook salmon under the last biological opinion on Endangered Species Act (ESA)-listed Chinook salmon. Closures of the Chinook Salmon Savings Areas have been triggered by the pollock fishery exceeding the Chinook salmon limit of 29,000 fish in the Bering Sea in 2004, 2005, and 2006. These closures appear to increase rates of salmon bycatch by shifting the pollock fleet out of areas that currently have lower bycatch rates. Increased salmon bycatch outside the closure areas may be due to shifts in salmon distribution. Section 3 contains the latest information regarding the pollock fisheries in the BSAI and salmon bycatch, including harvest and bycatch rates, locations, and potential effects on salmon species by the groundfish fisheries. This document provides information to support the analysis of the proposed EFP's effects on PSC species.

Amendment 82 for the Aleutian Islands Directed Pollock Fishery EA/RIR (NMFS 2005). Amendment 82 to the BSAI groundfish FMP established the direct pollock fishery in the Aleutian Islands as required by the CAA. Section 3.0 contains a detailed description of the Aleutian Islands pollock fishery history and catch data and Steller sea lion issues, including population trends and historical protection measures for the groundfish fisheries. This document provides the background and effects information regarding the pollock fishery in the Aleutian Islands subarea.

Harvest Specification EA. The 2006 and 2007 harvest specifications were analyzed in an EA and a finding of no significant impact (FONSI) determination was made prior to publication of the final harvest specification (NMFS 2006a). This document contains the information on the status of target species (Stock Assessment and Fishery Evaluation (SAFE) Reports in Appendix A) and contains the latest significance analysis of the effects on the groundfish species and on all other components of the human environment. Additionally, the ecosystem considerations section of the SAFE reports is included as Appendix C to the 2006 and 2007 harvest specifications EA. The stock assessment for Aleutian Islands pollock (Appendix C) shows that the stock is not considered overfished nor approaching an overfished condition. The SAFE report also contains summaries and references 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. This document provides the most recent examples of significance criteria for determining impacts on the human environment which is appropriate for this EA.

Alaska Groundfish Programmatic Supplemental Environmental Impact Statement (PSEIS) (NMFS 2004). This programmatic SEIS was completed August 2004. This document evaluated the fishery management policies of the BSAI and GOA groundfish FMPs against policy level alternatives and the setting of TACs and acceptable biological catch amounts (ABCs) at various levels. This document provides a comprehensive review of the groundfish fisheries, the affected environment and potential impacts.

Steller Sea Lion Protection Measures SEIS (NMFS 2001). This document includes a detailed description of the Steller sea lion protection measures and the biological opinion for these measures (Appendix A to NMFS 2001). Extensive descriptions and analysis of the effects of the groundfish fisheries on Steller sea lions and other components of the human environment are included. This document is important for the description of the impacts of groundfish fisheries on Steller sea lions and their critical habitat.

Alaska Groundfish Harvest Specifications DRAFT Environmental Impact Statement (NMFS 2006b) This document provides an evaluation of the environmental, social, and economic effects of alternative harvest strategies for the federally managed groundfish fisheries in the GOA and the BSAI. The EIS examines alternative harvest strategies that comply with Federal regulations, the FMPs for the GOA and BSAI groundfish fisheries, and the Magnuson-Stevens Act. The harvest strategies are applied to the best available scientific information to derive the total allowable catch for the groundfish fisheries. This document has the most recent analysis of potential impacts of the groundfish fisheries on the human environment and is based on the latest information available. Much of the information from this document will be adopted by reference for purposes of this EA.

## 4.0 Environmental and Economic Consequences

### *Environmental Components Potentially Affected*

The issuance of the EFP is limited in scope and will not likely affect all environmental components of the BSAI. This project involves the taking of groundfish species, primarily pollock, in a portion of the Aleutian Island between 173 and 179 degrees west longitude using pelagic trawl gear. The applicant requested that the groundfish taken be counted against the TACs. In 2005 and 2006, most of the Aleutian Islands pollock TAC was unharvested (about 1.2 percent and 16 percent respectively, of initial annual TAC harvested based on NMFS inseason data). In 2006, the only directed harvests were those associated with the 2006 EFP, totaling less than 1,000 mt. If harvests are similar to the past two years, the TAC and ABC for pollock are not likely to be approached in 2007 or in 2008, even with the harvest anticipated under the EFP. An exemption from the TAC limits is therefore not necessary to facilitate the project.

No effects beyond those already identified (NMFS 2006b) are expected on the physical environment, benthic communities, non-specified and forage species, target species, and seabird components of the environment for the following reasons:

- The amounts of groundfish taken will be applied against the TACs.
- The anticipated duration of the project is approximately 6 weeks, inclusive of the before and after surveys and commercial fishing.
- The anticipated duration of commercial fishing between surveys is approximately three weeks.
- The area of harvest is limited.
- The gear type and method of harvest would not change from current practices.

Ecosystem effects also are not expected due to the short duration of the activity, the limited amount of harvest, the gear type, and the relatively small area identified for the activity. Ecosystem effects are usually evaluated based on large scale activities (with respect to time, place or amount of harvest).

Table 4.0-1 shows the potentially affected environmental components. The 2005 Aleutian Islands groundfish fishery will be the baseline for purposes of this analysis. Because the location of fishing and the amount of pollock harvest would change from the 2005 fishery, three potential environmental sectors may be impacted: marine mammals, PSC, and socioeconomic. Because fishing is limited to pelagic trawl gear, and this gear is not used in contact with the bottom in the Aleutian Islands, there would be no impacts on benthic habitat. Fishing activities under the EFP may impact Steller sea lions in the closure areas. Under PSC, the effects are limited to Pacific halibut and Pacific salmon, which may be taken during the project. Socioeconomic effects may occur by allowing fishing under the EFP in areas that historically have yielded pollock. More potential exists for the Aleut Corporation to harvest an additional portion of their pollock allocation compared to pollock harvests in 2005 and 2006. This additional harvest would not be available to be reallocated to the Bering Sea pollock fishery. However, if the Bering Sea TAC is set equal to ABC for 2007 and 2008, it would not be possible to reallocate unharvested Aleutian Island pollock to the Bering Sea pollock fishery.

**Table 4.0-1 Resources potentially affected by the alternatives**

Alternatives	Potentially Affected Component								
	Physical	Benthic Comm.	Groundfish	Marine Mammals	Seabirds	Non - specified and forage species	Prohibited Species	Ecosystem	Socio-economic
1	N	N	N	N	N	N	N	N	N
2	N	N	N	Y	N	N	Y	N	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.

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. The significance of the potential 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 human environment affected. The intensity of the action includes the type (beneficial versus adverse), duration (short versus long term), and magnitude (minor versus major), and degree of risk (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) significant 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 following ratings are used for significance: beneficial, adverse, insignificant, and unknown. When sufficient information on direct and indirect effects is available, rating criteria are quantitative. In other instances, when less information is available, the discussions and rating criteria used are qualitative. In instances where criteria to determine an aspect of significance (adverse, insignificant, or 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 more than 10 percent is considered significantly 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 significantly beneficial alternative (a reduction in take resulting in a beneficial effect on the population trajectory). Therefore, a criterion for significantly beneficial is not applicable (NMFS 2004). Significance is not determined for socioeconomic effects because the significance of these effects alone do not trigger the need for an EIS.

The rating terminology used to determine significance is the same for each resource, species, or issue being evaluated. However, the basic “perspective” or “reference point” differs depending on the resource, species, or issue being evaluated. 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.
- 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 Significance Criteria for Prohibited Species

As defined in the BSAI groundfish FMP, the prohibited species resource component includes,

“...those species and species groups the catch of which must be avoided while fishing for groundfish, and which must be returned to sea with a minimum of injury except when their retention is authorized by other applicable law . . .” (NPFMC 2005a, page 10).

The BSAI groundfish FMP specifically lists Pacific halibut, Pacific herring, Pacific salmon, steelhead, king crab, and Tanner crab as prohibited species.

Fishermen are not permitted to retain prohibited species (unless specifically provided for in regulation). Fisheries are often subject to PSC harvest thresholds, and to restrictions on fishing activity when these thresholds are triggered. These thresholds and restrictions are provided for in the BSAI FMP in Section 3.6.2 (NPFMC 2005a) and in regulations at 50 CFR 679.21.

These PSC limits and their associated measures were implemented under amendments to the groundfish FMPs and through regulatory amendments. EAs were prepared for these actions. These EAs determined that these groundfish fisheries restrictions would have insignificant impacts on the human environment, including PSC species. These conclusions were located in the EAs and accompanying FONSI. These analyses are available from the NMFS Alaska Region website at [www.fakr.noaa.gov](http://www.fakr.noaa.gov). Table 4.0-2 describes the significance criteria for evaluating effects on prohibited species.

**Table 4.0-2 Criteria used to estimate the significance of impacts on incidental catch of prohibited species**

Type of Impact	Criteria
No impact	No incidental take of the prohibited species in question.
Adverse impact	There are incidental takes of the prohibited species in question.
Beneficial impact	Natural at-sea mortality of the prohibited species in question would be reduced – perhaps by the harvest of a predator or by the harvest of a species that competes for prey.
Significantly adverse impact	Fisheries are subject to operational constraints under PSC management measures. Groundfish fisheries without the PSC management measures would be a significantly adverse effect.
Significantly beneficial impact	No benchmarks are available for significantly beneficial impact of the groundfish fishery on the prohibited species, and significantly beneficial impacts are not defined for these species.
Unknown impact	Not enough information is available to determine nature of impacts.

## 4.2 Significance Criteria for Marine Mammals and ESA-Listed Marine Mammals

Direct and indirect interactions between marine mammals and groundfish harvest may occur due to 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.

Impacts of the alternative are analyzed by addressing three questions: (1) Do the proposed harvest levels result in increases in direct interactions with marine mammals (incidental take and entanglement in marine debris)? (2) Do the proposed harvest levels remove prey species at levels or in areas that could compromise foraging success of marine mammals (harvest of prey species)? and (3) Do the proposed harvest levels 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 Outlaw 2005) to identify the level at which animals may be removed from the stocks while maintaining 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 4.0-3.

**Table 4.0-3 Criteria for determining significance of impacts to marine mammals.**

	<b>Incidental take and entanglement in marine debris</b>	<b>Harvest of prey species</b>	<b>Disturbance</b>
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 during fishing operations, or become entangled in marine debris	Fisheries reduce the availability of marine mammal prey	Fishing operations disturb marine mammals
Beneficial impact	No beneficial impacts	No beneficial impacts	No beneficial impacts

	<b>Incidental take and entanglement in marine debris</b>	<b>Harvest of prey species</b>	<b>Disturbance</b>
Significantly adverse impact	Incidental take is more than PBR or is a substantial amount in comparison to estimated population for species with no PBR	Competition for key prey species likely to constrain foraging success of marine mammal species causing population decline	Disturbance of mammal 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, important time of year, or prey species	Insufficient information as to what constitutes disturbance

### 4.3 Alternative 1 Impacts

Alternative 1 is the status quo and is thoroughly analyzed in the Groundfish Harvest Specifications draft EIS (DEIS; NMFS 2006b). The DEIS analysis for prohibited species, marine mammals and socioeconomic effects is incorporated in this analysis by reference. The reader may refer to Section 7 for prohibited species, Section 8 for marine mammals, and Section 12 of the DEIS for the socioeconomic analyses for the status quo. In the 2006-07 harvest specifications EA, the significance analysis determined that the status quo would not have a significant impact on the human environment (NMFS 2006a). No new information is known that would result in a different determination for the direct and indirect effects of status quo.

The conclusions of the DEIS (NMFS 2006b) for status quo for prohibited species is that management measures are in place to limit the impacts of incidental catches on salmon and halibut species. Not enough information is available to understand the potential impacts of the status quo on salmon biomass, but the Council is taking further actions to reduce salmon incidental catch through Amendment 84 (NPFMC 2005c). Very few halibut and salmon are expected to be taken under the status quo in the action area, and therefore the impacts of status quo are much less than those described in the DEIS.

The impacts of status quo on marine mammals is only a concern for Steller sea lions based on the analysis in the DEIS. In general, the status quo is not expected to cause incidental takes of marine mammal above the PBRs for each species; and for nearly all mammals, competition for prey is not a concern. Harvest under status quo may lead to competition with Steller sea lions for prey species; but the area considered for this action is limited, and existing Steller sea lion

protection measures would limit the potential impact of the status quo so that population level effects would be unlikely.

The cumulative effect of the status quo is a potential concern for Steller sea lions and is further addressed in Section 5.0 of this EA. If the EFP is not issued, the State of Alaska has authorized a fishery in an area inside the EFP study area for 3,000 mt. If the EFP is not issued based on a determination that the harvest under the EFP may cause adverse modification of critical habitat, the implementation of the State fishery would need to be offset by mitigation measures for the Federal fisheries to ensure critical habitat is not modified. The determination that an action may adversely modify critical habitat is an indication that population level effects may be possible if mitigation is not implemented. Therefore, the cumulative effects of the status quo may be significant if the EFP is found to adversely modify critical habitat and mitigation measures in the Federal fisheries to offset the State fishery impacts are not implemented. The effects of the potential State pollock fishery on Steller sea lions and their critical habitat are further explained in Section 5.0 of this EA.

The socioeconomic impacts of Alternative 1 would be less beneficial than Alternative 2. Under Alternative 1, less of the Aleutian Islands pollock TAC is likely to be taken and therefore less revenue would be available for economic development. The effects would be limited to those participating in the pollock fishery in the Aleutian Islands. If a portion of the Aleutian Islands pollock could be rolled over to the eastern Bering Sea pollock fishery, Alternative 1 would be more beneficial to the participants in the eastern Bering Sea pollock fishery than Alternative 2. This is unlikely to occur in 2007 or 2008 since the proposed TAC for the eastern Bering Sea pollock fishery is the same as the proposed ABC (NMFS 2006b).

#### 4.4 Alternative 2 Impacts

##### 4.4.1 Marine Mammals and ESA-listed Marine Mammals

Because the study will be conducted in the limited area identified in section 1.3 of the Aleutian Islands, pelagic trawl gear is used, and the harvest targets pollock, the number of species of marine mammals that may be impacted is limited. According to the List of Fisheries for 2006 (71 FR 48802, August 22, 2006), marine mammal species that have been killed or injured by the BSAI pollock trawl fisheries and range into the Aleutian Islands are Dall's porpoise, harbor seals, minke whale, ribbon seal, western stock of Steller sea lions, killer whales, and humpback whales (Angliss and Outlaw 2005). Steller sea lions, sperm whales, fin whales, and humpback whales are listed as endangered species and occur in the action area. Pollock has been identified as a principal prey species for Steller sea lions, and fishing activities under the proposed action would occur in Steller sea lion protection areas, including critical habitat.

Several cetacean species were observed in the Aleutian Islands area during NMFS Steller sea lion research cruise in June 2001, and May and June 2002 (Hunt and Stabeno 2005). Areas surveyed in 2001 were from Seguam Pass to Seward, Alaska. Surveys in 2002 were from Unimak Pass to Tanaga Pass. Surveys were conducted in a series of 10 nm-wide cells centered on the island chain. Of the 259 individual humpback whales observed, nearly all occurred in the area between Samalga and Unimak Island with 3 individuals seen west of Samalga (Sinclair et

al. 2005). All sperm whales were west of Samalga, and only one of 118 fin whales observed was west of Unimak Pass (Sinclair et al. 2005). Other marine mammals sighted during this research include harbor and Dall's porpoise, Pacific white-sided dolphin, Baird's beaked whale, killer whales (resident and transient), and minke whales. Because the sightings of harbor porpoise, Pacific white-sided dolphin and Baird's beaked whales were rare, distribution of these species could not be inferred (Sinclair et al. 2005). Killer and minke whales were seen primarily west of Unimak Pass (Sinclair et al. 2005).

A recent, detailed analysis on the effects of the groundfish fisheries on marine mammals is in Section 8 of the Groundfish Harvest Specifications DEIS (NMFS 2006b). This DEIS details the potential incidental takes, competition for prey species, and disturbance that may occur for marine mammals throughout the BSAI and GOA. Much of that analysis is incorporated here by reference.

Table 4.4-1 lists the marine mammals that may range into the action area (from Table 8-3 in NMFS 2006b). For each species, the total groundfish incidental take is shown in relation to the PBR. Except for transient killer whales and humpback whales, the incidental take in the groundfish fisheries is well below the PBR or undetermined. In all cases the entire incidental take in the groundfish fisheries is below the PBR or is a very small amount (less than one animal per year) and is therefore insignificant. For this proposed action, the potential incidental take would be a minor portion of the annual take in the groundfish fisheries. The harvest under Alternative 2 is a very small portion of the entire groundfish fisheries harvests, in a discrete location for a short duration. The potential for incidental takes under Alternative 2 is much less than the potential for incidental takes for the entire groundfish fisheries. Because the effects of Alternative 2 on the incidental takes of marine mammals is much smaller than the groundfish fisheries as a whole, the overall incidental take of marine mammals under Alternative 2 is insignificant. In many cases the incidental take of marine mammals under Alternative 2 is not likely to occur due to no history of takes in the pollock fishery or the unlikely occurrence of the marine mammal in the action area during the study. These marine mammals are identified in Table 4.4-7 with "no impact" in the incidental take column.

**Table 4.4-1 Estimated mean annual mortality of marine mammals from observed BSAI and GOA groundfish fisheries compared to the total mean annual human-caused mortality and potential biological removal for each stock.** Mean annual mortality, expressed in number of animals, includes both incidental takes and entanglements, as data are available, and averaged over several years of data. Years chosen vary by species. Groundfish fisheries mortality calculated based on Angliss and Outlaw (2005).

Marine Mammal	Mean annual mortality, from BSAI and GOA groundfish fisheries	Total mean annual human-caused mortality *	PBR
**Steller sea lions (western)	10.8	217.9	231
Harbor seal (GOA)	0.6	827	868
Ribbon seal	0.8	194	Undetermined
Killer whale Eastern North Pacific AK resident	2.3	2.3	11.2
Killer whale Eastern North Pacific Northern resident	0	0	2.16
Killer whale GOA, BSAI transient	2.4	2.3	3.1
Pacific white-sided dolphin	0.8	4	Undetermined
Harbor porpoise BSAI	1.1	4	393
Dall's porpoise	5.9	38	1,537
**Humpback whale Western North Pacific	0.5	0.7	1.3
Beaked whale	0	0	undetermined
Minke whale Alaska	0.3	0.3	Undetermined
**Sperm whale North Pacific	0.5	0.5	Undetermined
**Fin whale Northeast Pacific	0.6	0.8	11.4
**Sea otter Southwest Alaska	0	97	830
* Does not include research mortality. Other human-caused mortality is predominantly subsistence harvests for seals, sea lions, otters, bowhead whales, and walrus. ** ESA-listed stock.			

### *Humpback Whales, Fin Whales, Sperm Whales and Killer Whales*

The potential effects on humpback and killer whales are limited to incidental take and disturbance. No record of sperm whale injury or mortality from trawl gear exists for the years 1989-2003 (Perez 2003). Pollock is not likely a major prey species for any of these whale species (NMFS 2000), and therefore, pollock harvested during the project would be unlikely to have significant impacts on prey availability.

Humpback whales that may occur in the study sites are likely from the Western North Pacific stock (Angliss and Outlaw 2005). This stock generally migrates to Japan during winter and spring, and therefore is unlikely to be in the study area during March or April. Also, the 2001 and 2002 surveys conducted by Sinclair rarely observed humpback whales west of Akutan Pass, and no fin whales were observed in the proposed action area (Sinclair et al. 2005). Because of the migration of the humpbacks and lack of fin whales, any potential for incidental take and disturbance are minimal; and therefore, no effects are likely for humpback or fin whales. Sperm whales are not known to be injured or killed by trawl fisheries. No ESA consultation for these species will be necessary for this proposed action, because the trawl harvest of pollock in this action is not likely to impact humpback, fin, or sperm whales.

Killer whales from the Gulf of Alaska, Bering Sea and Aleutian Islands transient stock and from the Alaska resident stock may be present in the project areas in March. Dall's porpoises also may be present based on the 2001 and 2002 surveys (Sinclair et al. 2005). Killer whales have been incidentally taken in the pollock fisheries in the BSAI. Only one Dall's porpoise was recorded taken in the area 541 trawl fishery between 1989 and 2001 (Perez 2003). Dall's porpoises eat a variety of fish and cephalopods (NMFS website <http://nmml.afsc.noaa.gov/education/cetaceans/dalls2.htm#>) and are not likely to experience competition for prey from the proposed action. Killer whales observed in the areas were primarily residents feeding on fish (Sinclair et al. 2005). Under the proposed action, up to four vessels operating for three weeks during two years is unlikely to deplete prey, disturb, or incidentally take killer whales or Dall's porpoise in amounts that would have population-level effects. Therefore, any effects on killer whales or Dall's porpoise are likely not significant.

The acoustic equipment used for the survey is used by nearly all vessels fishing in the Alaska groundfish fisheries for locating fish. The equipment operates at very low power (38 KHz) and is not known to cause any impacts on marine mammals, include those that may occur in the study areas (Steve Barbeaux, personal communication, December 13, 2006).

#### *Sea Otters and Harbor Seals*

The ESA-listed southwest Alaska distinct population segment of northern sea otters and the Gulf of Alaska stock of harbor seals also may occur in the EFP study area (Angliss and Outlaw, 2005). Disturbance is possible for both species, but would not likely cause population level effects based on a small number of vessels fishing for two to three weeks up to two years in a limited area. Sea otter diet primarily consists of invertebrates, and therefore, does not overlap with groundfish fisheries harvest. No record of incidental take by trawl gear of sea otters exists (NMFS, North Pacific Groundfish Observer Program, and vessel operator reports under the Marine Mammal Protection Act, December 2005 and List of Fisheries 2006). The incidental take of the GOA stock of harbor seals in the groundfish trawl fishery has been estimated at 0.4 animals per year but the portion of that take attributed to the pollock fishery is unknown (Angliss and Outlaw 2005). There is some diet overlap between the pollock fishery and harbor seals (based on ADF&G wildlife notebook, <http://www.adfg.state.ak.us/pubs/notebook/marine/harseal.php>), but the removal of pollock by a small number of vessels in a limited area in a two to three week time period in two years is not expected to compete with harbor seals at a level that might cause a population decline. Harbor seals eat a variety of fish, and therefore, may not experience as much competition as other marine mammals that are more dependent on pollock. Based on these considerations, the potential impact of the EFP is likely to be insignificant for sea otters and harbor seals. As found for the entire groundfish fisheries (Mecum 2006), any potential disturbance effect on sea otters is likely to be discountable, and therefore, no ESA consultation under section 7 would be needed for this proposed action for sea otters.

#### *Steller sea lions*

Further analysis of the effects of the proposed action on the western distinct population segment (DPS) of Steller sea lions is required because they are listed as endangered under the ESA, the

animals and their critical habitat occurs in the action area, and they are likely to compete with the pollock fishery for prey resources. All or a portion of critical habitat or 20 nm protection areas associated with 7 rookeries and 18 haulouts occur in the proposed action area. Seven of the haulouts do not meet the criteria of more than 100 non-pups to be considered a winter haulout and therefore, 9 of the 18 haulouts are considered year round or winter haulouts. Table 4.4-2 shows the sites that may have protection areas or critical habitat occurring in the EFP study area (NMFS 2006c). Animals also may be present in lower numbers at the other haulouts.

**Table 4.4-2. Haulouts and Rookeries with Critical Habitat or Protected Areas Designations that Occur in the EFP Study Area** (From Table 3.32 of the draft 2006 FMP biological opinion for the Alaska groundfish fisheries and NMFS 2006c)

Name of Site	Description	Season
Amilia E. Cape	Haulout	All
Amilia Sviech Harbor	Haulout	Summer
Atka N. Cape	Haulout	All
Little Tanaga Strait	Haulout	All
Kanage N. Cape	Haulout	Winter
Boborof	Haulout	Winter
Tagalak	New haulout	Winter
Kasatochi N. point.	Rookery	All
Great Sitkin I.	Haulout	Neither
Anagaksik I.	haulout	Neither
Adak Lake Point	Rookery	All
Gramp Rock	Rookery	All
Kanaga Ship Rock	Rookery/Haulout	All
Tanaga Bumpy Point	Haulout	Neither
Seguam/Saddleridge	Rookery	All
Tag	Rookery	All
Ulak Hasgox Point	Rookery	All
Unalga+Dinkum Rocks	Haulout	Winter
SEmisopochnoi/Petrel	Haulout/rookery	Winter
Amatignak/Nitrof Point	Haulout	Winter
Sagigik	Haulout	Neither
Tanadak (Amilia)	Haulout	Neither
Agligadak	Haulout/rookery	Summer
Ugidak	haulout	Neither
Kavalga	haulout	Neither

Rookery/haulout is a functional rookery currently listed as a haulout. Haulout/rookery is a functional haulout listed as a rookery.

Based on previous pollock fishing in the Aleutian Islands, the majority of the harvest under this EFP likely would occur in two sub-areas, Kanaga Sound and the west side of Atka Island. Non-pup Steller sea lion surveys at the proposed Kanaga Sound portion of the study area between 173 and 179 degrees west longitude have been conducted at haulouts on Boborof Island, Kanaga Island North Cape, Kanaga Island Ship Rock, and Kanaga Island Cape Miga. Very little harvest of pollock occurred in the Seguam Foraging Area between 1995 and 1998 (NMFS 2005) and very little harvest in the foraging areas is likely under the EFP. The Cape Miga site is not listed as Steller sea lion critical habitat nor identified as an important site in the draft biological opinion on the groundfish fisheries scheduled to be released for public review in 2007. The other three



sites are listed as critical habitat (NMFS 2001). Pups have not been counted at most of these sites, although aerial survey pup counts were made at the Kanaga Island Ship Rock haulout in 2001 and 2002 (92 and 113 pups, respectively)<sup>2</sup> and in 2005 (221 pups).<sup>3</sup> The number of pups at Kanaga Island Ship Rock qualifies the site as a rookery even though it is currently listed as a haulout. The Ship Rock rookery (non-listed rookery) is now larger than any of the listed rookeries in the western Aleutian Islands area and may be especially important to the recovery of the western population, especially the Central Aleutian Islands given an overall decline in pup numbers (NMFS 2006c).

Roughly 10 percent of Steller sea lions in the Central Aleutian Islands (Yunaska to Gramp Rock), a very large area which stretches 500+ miles, are found in Kanaga Sound in March at four haulouts. Kanaga Sound is much more important to non-pup sea lions in the winter based on counts; however, the Ship Rock rookery is very important in the summer (NMFS 2006c). Pup counts in the Central Aleutian Islands continues to decline but at a slower rate (2 percent decline from 2001-02 to 2005, compared to 72 percent decline comparing 2001-02 data to earlier counts)<sup>4</sup>.

Most surveys have been conducted during summer months, although some winter data are available for some sites for the years 1962 and 1965 (April surveys – winter/spring) and 1993, 1998, and 1999 (March surveys). Non-pup counts for Bobrof Island and Kanaga sites are provided below in Table 4.4-3.<sup>5</sup>

**Table 4.4-3 Steller sea lion non-pup counts at Kanaga Sound study area**

Survey Site	Month	Day	Year	Count
Bobrof Island	6	20	1992	150
	3	15	1993	190
	6	15	1998	13
	3	2	1999	76
	6	15	2000	0
	6	19	2002	28
	6	23	2004	49
Kanaga I. No. Cape	5	25	1959	0
	4	5	1962	0
	4	5	1965	0
	6	28	1979	309
	6	13	1985	155

<sup>2</sup> Fritz, L.W. and C. Stinchcomb. Undated manuscript. Aerial, ship, and land-based surveys of Steller sea lions (*Eumetopias jubatus*) in the western stock in Alaska, June and July 2003 and 2004. National Marine Mammal Laboratory, Seattle.

<sup>3</sup> Memorandum for the record, October 20, 2005, Lowell Fritz, Charles Stinchcomb, and Wayne Perryman, National Marine Mammal Laboratory, Seattle.

<sup>4</sup> From the draft 2006 biological opinion, table 3.2, which is scheduled for release for public review in 2007. Available from [www.fakr.noaa.gov](http://www.fakr.noaa.gov).

<sup>5</sup> Steller sea lion pup and nonpup count data base, National Marine Mammal Laboratory, Seattle. <http://nmml.afsc.noaa.gov/AlaskaEcosystems/sslhome/Databases/Adult%20count%20database.htm>  
<http://nmml.afsc.noaa.gov/AlaskaEcosystems/sslhome/Databases/Pup%20count%20database.htm>

Survey Site	Month	Day	Year	Count
	5	4	1987	300
	6	20	1989	0
	6	22	1991	75
	6	20	1992	24
	3	15	1993	210
	6	29	1994	30
	6	22	1994	10
	6	18	1996	34
	3	4	1998	0
	3	2	1999	118
	6	15	2000	25
	6	19	2002	12
	6	15	2004	7
<b>Kanaga I. Ship Rock</b>				
	5	25	1959	0
	4	5	1962	0
	4	26	1965	150
	7	99	1977	24
	6	28	1979	168
	6	13	1985	314
	5	4	1987	40
	6	20	1989	0
	6	22	1991	92
	6	20	1992	93
	3	15	1993	98
	6	20	1994	172
	6	28	1994	177
	6	18	1996	146
	3	4	1998	0
	6	15	1998	164
	3	3	1999	196
	3	6	1999	232
	6	15	2000	156
	6	19	2002	242
6	15	2004	229	
<b>Kanaga I. Cape Miga</b>				
	4	5	1962	0
	4	26	1965	25
	7	99	1977	135
	6	28	1977	135
	6	13	1985	0
	5	4	1987	0
	6	20	1989	0
	6	18	1996	34
	3	2	1999	0
	6	15	2000	1
	6	15	2004	0

Non-pup Steller sea lion surveys near Atka Island in the study area have been conducted at a haulout on Atka Island at North Cape. No pup counts have been made at this site. As noted above for the Kanaga Sound area, most Steller sea lion surveys have been conducted during

summer months, although some winter data are available for some sites; on the Atka Island site there are winter counts for the years 1962 (winter/spring), 1993 and 1999. One survey conducted during April 1962 resulted in a count of 4,300 non-pups. Surveys during March 1993 and 1999 counted 138 and 230 non-pups, respectively. Non-pup counts for this site are provided below in Table 4.4-4.

**Table 4.4-4 Steller sea lion non-pup counts at Atka Island North Cape study area**

Month	Day	Year	Count
5	26	1959	550
4	6	1962	4300
6	25	1979	1192
6	12	1985	653
5	3	1987	855
6	17	1989	333
6	20	1990	153
6	21	1991	180
6	12	1992	80
6	19	1992	156
3	15	1993	148
6	17	1994	68
6	27	1994	38
6	18	1996	59
6	14	1998	156
3	2	1999	230
8	6	1999	203
8	6	1999	60
6	18	2000	76
6	19	2002	224
6	15	2004	383

Adult counts shown in Table 4.4-5 are from the adults count file [NMML.SSL.ADULT.ZIP](http://nmml.afsc.noaa.gov/AlaskaEcosystems/sslhome/Databases/Adult%20count%20database.htm) at: <http://nmml.afsc.noaa.gov/AlaskaEcosystems/sslhome/Databases/Adult%20count%20database.htm>. The table is based on sites listed for the Central AI and includes sites that are listed and not listed as important Steller sea lion locations. Winter season counts for 1993 and 1999 were used because they were the only years of comprehensive winter surveying. In 1999 replicate counts occurred on March 2 and 6, and the table values represent the maximum value of the two counts. Summer 2004 counts are the most recent complete counts.

**Table 4.4-5 Adult Steller sea lion counts in the Central Aleutian Islands**

Site Name	Longitude	Site Type	Mar-93 Adult Count	Mar-99 Adult Count (max)	Summer 2004 Adult Count
AGLIGADAK	172.54	Rookery	74	84	61
KASATOCHI/NORTH POINT	175.31	Rookery	126	116	667
ADAK/CAPE YAKAK	176.59	Rookery	0	114	209
ADAK/LAKE POINT	176.59	Rookery	346	359	799
GRAMP ROCK	178.20	Rookery	220	142	679
TAG	178.34	Rookery	129	108	242
ULAK/HASGOX POINT	178.57	Rookery	276	190	531

Site Name	Longitude	Site Type	Mar-93 Adult Count	Mar-99 Adult Count (max)	Summer 2004 Adult Count
TANADAK (AMLIA)	172.57	Haulout - listed	50	20	1
AMLIA/EAST CAPE	172.58	Haulout - listed	0	210	34
SAGIGIK	173.08	Haulout - listed	19	12	30
AMLIA/SVIECH. HARBOR	173.23	Haulout - listed	30	75	144
ATKA/NORTH CAPE	174.17	Haulout - listed	148	230	383
ANAGAKSIK	175.53	Haulout - listed	40	84	2
GREAT SITKIN	176.10	Haulout - listed	0	0	0
LITTLE TANAGA STRAIT	176.13	Haulout - listed	26	292	49
KANAGA/N CAPE	177.09	Haulout - listed	210	118	7
KANAGA/SHIP ROCK	177.22	Haulout - listed	98	232	229
BOBROF	177.27	Haulout - listed	190	76	49
TANAGA/BUMPY POINT	177.58	Haulout - listed	98	0	33
UGIDAK	178.30	Haulout - listed	37	8	25
KAVALGA	178.51	Haulout - listed	0	62	56
UNALGA+DINKUM ROCKS	179.04	Haulout - listed	167	84	19
AMLIA/CAPE MISTY	172.58	other	-	-	21
ATKA/CAPE KOROVIN	174.17	other	0	0	4
SALT	174.39	other	0	0	0
KONIUIJ/NORTH POINT	175.08	other	0	0	0
OGLODAK	175.27	other	64	77	86
IKIGINAK	175.29	other	-	0	0
FENIMORE	175.32	other	-	98	30
TAGALAK	175.40	other	30	150	91
CHUGUL	175.46	other	-	0	39
IGITKIN/SW POINT	175.57	other	-	0	0
KAGALASKA	176.23	other	43	119	48
ADAK/CRONE ISLAND	176.38	other	0	35	0
ADAK/CAPE MOFFET	176.48	other	-	8	0
ADAK/ARGONNE POINT	176.55	other	-	52	35
KANAGA/CAPE MIGA	177.11	other	-	0	0
KANAGA/CAPE CHUNU	177.39	other	-	5	9
TANAGA/CAPE SASMIK	177.54	other	0	0	122
ILAK	178.18	other	37	44	45
SKAGUL/S. POINT	178.35	other	-	0	1
OGLIUGA	178.40	other	-	11	49
GARELOI	178.48	other	-	98	-
SILAK	?	other	-	-	38

Incidental take and entanglement: By fishing inside protection areas, the proposed action may increase the likelihood of encountering Steller sea lions and the potential for incidental take. It is assumed that the number of Steller sea lions encountered inside protection areas will be greater than the number of animals encountered by fishing vessels outside of protection areas. Table 4.4-5 shows that more than 100 animals may be present at 13 Steller sea lions sites within the study areas during the time of the study. The potential for encountering sea lions is lessened by limiting the amount of fishing that may take place inside the 3 nm closure around the haulouts,

excluding fishing within 3 nm of rookeries, limiting participation to no more than three vessels, and limiting the duration of the study.

The current annual PBR for the western distinct population segment of Steller sea lions is 231 animals (Angliss and Outlaw 2005). Approximately 2.72 animals are taken in the entire BSAI pollock fishery each year. It is unlikely that take of Steller sea lions during the study combined with take in the groundfish fisheries would exceed the PBR, therefore, the potential effects on incidental take of Steller sea lions by the EFP activities are insignificant.

#### Harvest of Prey Species:

The Steller sea lion protection measures for pollock harvest include the overall harvest control and temporal and spatial dispersion of harvest. The harvest of pollock under the EFP will be within the TAC and therefore within the harvest control established under 50 CFR 670.20(d)(4). Temporal dispersion will be met by applying the EFP harvest to the TAC which is temporally dispersed and by restricting harvest to no more than one vessel over 60 feet LOA per 1 degree block. Spatial dispersion of harvest may be a concern because of the exemption to the fishing closures near the Steller sea lion haulouts and rookeries in the study areas. However, spatial dispersion will be achieved by limiting the amount harvested in one degree blocks of longitude to no more than 1,000 mt, as described in section 2.0.

In both the Kanaga Sound and Atka Island portions of the study area, past pollock fishing efforts have been concentrated in the 100 to 500 fathom isobaths. The proportion of the area harvest of pollock taken in these sites during the 1990s varied. For Kanaga Sound, the harvest of pollock in the 1990s made up at least 81 percent of area 541 harvests (Table 4.4-6). Catch data include directed fishery harvest and incidental take in the Pacific cod fishery.

In the Atka Island site, the harvest of pollock in the 1990s varied from 7 percent to 78 percent of Area 541 harvests (Table 4.4-7). The majority of the Aleutian Islands pollock harvests shifted after 1995 from Area 541 to Area 542. Much of the harvest in this time period was part of a large 1978 year class (Steve Barbeaux, personal communication, December 29, 2005). In 1998, only 1,837 mt of pollock was harvested in Area 541 with 78 percent of this harvest coming from the Atka Island area. Catch data include directed fishery harvest and incidental take in the Pacific cod fishery.

**Table 4.4-6 Recent catch data for the Kanaga Sound area.**

<b>Year</b>	<b>Observed Catch (mt)*</b>	<b>% Pollock **</b>	<b>541 + 542 A-season Sub-Total Catch (mt) ***</b>	<b>541 District Annual catch (mt)</b>	<b>542 District Annual Catch (mt)</b>	<b>543 District Annual Catch (mt)</b>	<b>Aleutian Island Annual Catch (mt)</b>	<b>(541 + 542) A-season % of AI Total</b>	<b>Area % of AI Total</b>	<b>Area % of District Annual</b>
1993	2,493	99.49%	23,001	54,512	2,536	83	57,131	40%	4%	98%
1995	35,935	99.58%	63,988	28,109	36,714	102	64,925	99%	55%	98%
1996	20,884	99.52%	27,760	9,226	19,574	216	29,016	96%	72%	107%
1997	14,868	99.58%	23,001	8,110	16,799	1,031	25,940	89%	57%	89%
1998	3,114	99.28%	5,120	1,837	3,858	18,127	23,822	21%	13%	81%

\* Observed official total catch for Jan-Apr (includes bycatch)

\*\* Percent pollock in the observed species composition samples for the area

\*\*\* Total catch in NMFS Areas 541 and 542 for Jan-Apr

Source: Steve Barbeaux, NMFS, AFSC, 12/05

**Table 4.4-7 Recent catch data for the Atka Island area.**

<b>Year</b>	<b>Observed Catch (mt)*</b>	<b>% Pollock **</b>	<b>541 + 542 A-season Sub-Total Catch (mt) ***</b>	<b>541 District Annual catch (mt)</b>	<b>542 District Annual Catch (mt)</b>	<b>543 District Annual Catch (mt)</b>	<b>Aleutian Island Annual Catch (mt)</b>	<b>(541 + 542) A-season % of AI Total</b>	<b>Area % of AI Total</b>	<b>Area % of District Annual</b>
1992	6,247	98.50%	38,315	52,140	206	6	52,352	73%	12%	12%
1993	14,011	99.29%	23,001	54,512	2,536	83	57,131	40%	25%	26%
1994	4,219	99.64%	47,045	58,091	554	15	58,660	80%	7%	7%
1995	16,869	98.96%	63,988	28,109	36,714	102	64,925	99%	26%	60%
1996	1,894	99.83%	27,760	9,226	19,574	216	29,016	96%	7%	21%
1997	3,822	98.56%	23,001	8,110	16,799	1,031	25,940	89%	15%	47%
1998	1,428	98.76%	5,120	1,837	3,858	18,127	23,822	21%	6%	78%

\* Observed official total catch for Jan-Apr (includes bycatch)

\*\* Percent pollock in the observed species composition samples for the area

\*\*\* Total catch in NMFS Areas 541 and 542 for Jan-Apr

Source: Steve Barbeaux, NMFS, AFSC, 12/05

Pollock is an important prey species for Steller sea lions in the Aleutian Islands. The frequency of occurrence of pollock in winter scat samples collected in the Central and Western Aleutian Islands between 1999 and 2005 is 12 percent (NMFS 2006c). Pollock may be important in specific local areas (e.g., Kanaga Sound, Atka Island, eastern Aleutian Islands). Scat collected at nearby Silak Island had a pollock frequency of occurrence of 46 percent in April of 2002 (NMFS 2006c). In Table 4.4-8, pollock appears to have more importance in the diet of the western and central Aleutian Islands Steller sea lions than in the summer.

**Table 4.4-8 Ranking of prey items in scat collected from 1999 to 2005. Data based on Table 3.21 in the draft FMP biological opinion. For the western DPS overall, both Federal and non-Federal directed fisheries are shaded.**

Rank	Central & Western Aleutians		Eastern Aleutians		Western Gulf		Central Gulf		Eastern Gulf	Western DPS		
	Summer	Winter	Summer	Winter	Summer	Winter	Summer	Winter	Summer	Summer	Winter	ALL
1	A. mackerel	A. mackerel	Pollock	Pollock	Sand lance	Pollock	Salmon	Pollock	Salmon	A. mackerel	Pollock	A. mackerel
2	Salmon	Pacific cod	Salmon	A. mackerel	Salmon	Pacific cod	Pollock	Pacific cod	Sand lance	Salmon	A. mackerel	Pollock
3	Ceph.	Irish Lord	Herring	Pacific cod	Pollock	Salmon	Arrowtooth	Sand lance	Herring	Pollock	Pacific cod	Salmon
4		Ceph.	Sand lance	Irish Lord	Pacific cod	Sand lance	Sand lance	Arrowtooth	Capelin	Sand lance	Irish Lord	Pacific cod
5		Snailfish	A. mackerel	Sand lance	A. mackerel		Capelin	Salmon		Pacific cod	Sand lance	Sand lance
6		Pollock	Rock sole	Salmon	Arrowtooth		Herring	Irish Lord		Herring	Salmon	Irish Lord
7			Pacific cod	Arrowtooth	Irish Lord			Sand fish			Arrowtooth	Arrowtooth
8			Sand fish	Snailfish				Halibut			Snailfish	
9			Poacher	Rock sole				Herring			Rock sole	
10			Irish Lord	Sand fish							Sand fish	
11				Halibut								

The EFP is designed to develop a method of basing the verification and compensatory fishery on the in-season survey estimates, but that capability is not possible until enough data are gathered through several years of study (S. Barbeaux, personal communication November 7, 2006). It is not possible at this time to determine an acceptable level of harvest in critical habitat. The AFSC has reserved time on the R/V Oscar Dyson in 2008 in the Central Aleutians to conduct a localized depletion study. The 2007 and 2008 EFP study is intended to develop a baseline for abundance and possible movement inside the area, i.e. whether NMFS is surveying the applicable population, and to determine possible boundaries for the 2008 localized depletion study. Information obtained from the EFP studies in 2007 and 2008 would support setting quotas based on inseason abundance estimates.

Up to 3,000 mt groundfish could be taken from between 173-179 degrees west longitude where fishing is most likely to occur under the EFP. The amount of groundfish harvest within 3 nm of a haulout will be limited to 10 mt per tow and tows limited to only as many needed to verify the acoustic data. It is likely that the majority of the groundfish caught during the EFP fishing will be pollock (Steve Barbeaux, personal communication, December 30, 2005). Based on a 2002 winter pollock survey in the study area, the amount of harvest under this EFP is expected to be less than 9.4 percent of the biomass expected to occur in the study area (Nishimura et al. 2002). This amount of overall harvest in relation to biomass is well within the harvest control rule for pollock under the Steller sea lion protection measures (50 CFR 679.20(d)(4)). From February 21 through March 1, 2002, the R/V Kaiyo Maru conducted an echo integration-trawl survey (EIT) in the Aleutian Islands area that partially covered the proposed study area (Appendix A). The estimates produced by this survey are considered conservative because the survey was limited to

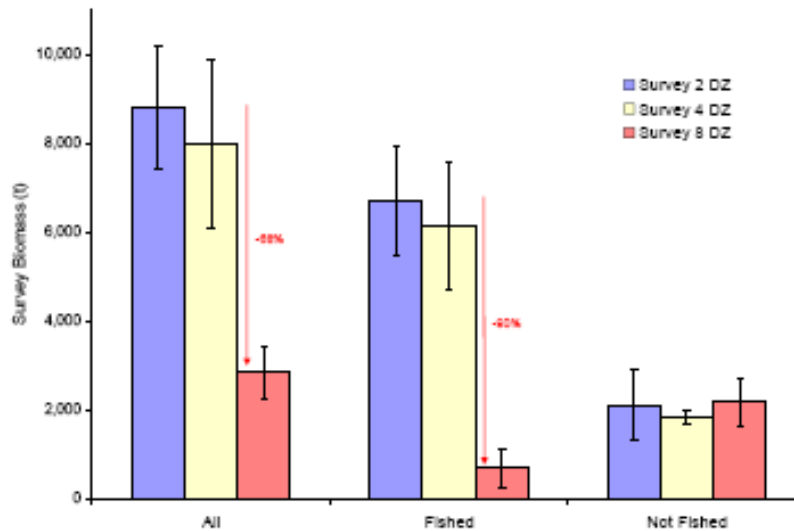


waters deeper than 100 m and did not go inland of Bobrof Island or west of 178° E longitude. The 2002 EIT survey estimated 32,000 mt in the portion of the study area between 173° W and 178° W longitude. For the entire survey region from 170° W to 178° W longitude, the 2002 EIT survey estimated the pollock biomass at 123,000 mt. Given the conservative estimates provided by the 2002 EIT survey, this study would be expected to take less than 9.4 percent of the pollock biomass in the study area surveyed in 2002, and less than 2.5 percent of the pollock biomass for the region between 170° W to 178° W longitude.

In 2006, the AFSC completed a bottom trawl survey in the Aleutian Islands. Data from the survey are used for the Aleutian Islands pollock stock assessment for 2007 pollock acceptable biological catch (ABC) development. If the North Pacific Fishery Management Council's Scientific and Statistical Committee determines that the stock remain at Tier 5, the 2007 ABC for pollock will be 21,370 mt, compared to 29,400 mt ABC for 2006.

Localized depletion of pollock may be a concern for foraging Steller sea lions. Removing 1,000 mt in a 3-week period from Atka Island/North Cape would be similar to the overall amount of pollock harvested in the 2006 study and the 1998 fishery when 78% of area 541 pollock harvest was taken from the Atka Island area (Table 4.4-7). We do not know the pollock biomass in this area in 1998. It is possible that this method of harvest may result in localized depletion of pollock prey. Any impacts on prey would be limited to the animals using the haulouts in the study area or animals foraging as they pass through the area. Kanaga Sound fishing is also a possible concern because a large portion of the historical catch for the districts has come from this area (Table 4.4-6) and recent use by Steller sea lions has increased. Of particular concern is the Kanaga Island Ship Rock rookery which may be an important site for reproduction in the Central Aleutian Islands.

The results of the 2006 EFP for this study showed that a small commercial fishing vessel could be used for acoustic survey of pollock in the Aleutian Islands. Post fishing surveys of the fished and unfished areas showed different biomass declines (Figure 4.4-1). Compared to the biomass determined in the early part of the study, the biomass of the unfished area declined 68 percent, and the biomass of the fished area declined 90 percent. The biomass decline in the fished area was 4,000 mt compared to the 935 mt removed by the fishery during the EFP. Possible reasons for the biomass decline beyond the direct harvests may include avoidance, pollock may move out of the fished area due to disturbance caused by fishing, and pre-spawning migration, pollock may use the surveyed area as a staging location and moved to another location to spawn. Given the observed changes in maturity at the end of the survey and behavior observed in pre-spawning pollock in the Bering Sea the second scenario may be more likely.



**Figure 4.4-1 Fished and unfished biomass before and after fishing under the 2006 EFP (AI pollock; from Barbeaux survey results June 27, 2006, presentation to the Steller Sea Lion Mitigation Committee).**

The EFP formula for allowable harvest in 2007 uses the lowest large survey density estimate from the 2006 Aleutian Islands Cooperative Acoustic Survey Study (15.8 mt/nm<sup>2</sup>) and extrapolates this out over the proposed 2007 survey area (Appendix A). The density estimate for the low 2006 survey is actually lower than the densities observed in the low density areas or “non-fished areas” of the 2006 surveys (19.5, 16.9, and 20.1 mt/nm<sup>2</sup> for surveys 2, 4, and 8 respectively). The tonnage allowed under the proposed formula, with an mortality (M) of 0.3, would be 4,382 mt for the surveyed area between 173 and 179 degrees W longitude (1,695 nm<sup>2</sup>). Areas of higher density likely exist throughout the survey area, in particular the area inside Bobrof Island, north of Atka Island (at times), and near Seguam Pass. Using an average density of the three large area surveys from 2006 (38.4 mt/nm<sup>2</sup>) in the formula the allowable removals (AR) would be 10,362 mt and using the density from Survey 2(48.9 mt/nm<sup>2</sup>) would have resulted in an AR of 13,569 mt. Based on the AR formula and the 3,000 mt limit in the EFP, the overall harvest under the EFP is very conservative.

Impacts on prey species are not likely to cause a population level effect on western distinct population segment of Steller sea lions because

- fishing activity is limited to 3,000 mt. Harvest is also limited to 1,000 mt for any one degree block of longitude and is conservative,
- fishing is limited to one vessel less than 60 feet LOA at a time within the one degree blocks,
- fishing is limited within the selected area,
- each tow inside 3 nm is limited to 10 mt,
- removals are expected to be less than 2.5 percent of the total biomass for the central Aleutian Region surveyed in 2002 (between 170° W and 178° W longitude) and less than 9.4 percent of the biomass for the region between 173° W and 178° W longitude,
- one to four vessels are used, and
- the project is of a short duration (two to three weeks of fishing in one or two years).

The impact of the action on prey resources for Steller sea lions is therefore insignificant. Even though the effects on prey resources are not likely to result in population level effects for the western DPS of Steller sea lions, the proposed action may adversely affect the portion of designated critical habitat in the action area by reducing available prey resources. Because of the potential for adverse impacts on Steller sea lions in the study areas, an ESA section 7 formal consultation is necessary.

### Disturbance

Issuing the EFP would result in one to four vessels harvesting pollock inside the study area for approximately three weeks between February and April for up to two years if the EFP is modified for an extension. Fishing inside critical habitat would increase the possibility of encountering Steller sea lions during fishing operations. The potential for encounters within 3 nm of haulouts is reduced by the limitations on fishing in this area. A NMFS scientist will specify the amount of fishing necessary only to verify the acoustic data within the 0 to 3 nm waters of haulouts. Considering the size of the study area (Figure 1) and the relatively small number of animals likely to be using the haulouts (fewer than 250 animals), disturbance by the one to four vessels used in this project is possible, but of minor intensity and short duration (at the most three weeks in up to two consecutive years). The acoustic equipment is out of the range of Steller sea lion hearing and therefore will have no effect on the Steller sea lions (Kastalein, et al. 2005). Any disturbance that may occur is unlikely to cause population effects, and is therefore insignificant.

Even though the impacts of this action are deemed insignificant for the western DPS of Steller sea lions, this proposed project may adversely affect some Steller sea lions by increasing the potential for incidental take, disrupting pollock aggregations or reducing available pollock for foraging Steller sea lions, and by disturbing animals in waters where more Steller sea lions may occur (0 to 3 nm). For these reasons, an Endangered Species Act Section 7 consultation should be completed before issuing the EFP. The Assistant Regional Administrator for Sustainable Fisheries will request initiation of formal consultation from the Protected Resources Division to determine if the proposed action is likely to result in jeopardy of extinction or adverse modification or destruction of designated critical habitat for the western DPS of Steller sea lions.

### Conclusions

The proposed action is not likely to compete for prey with any of the marine mammals occurring in the action area, except Steller sea lions. Any prey competition that might occur between marine mammals and the groundfish fisheries is not known to result in population effects (NMFS 2006b). Disturbance of marine mammals that may occur in the action area during the study is possible. Because the action area is limited, the study is expected to last for only 2-3 weeks in up to two years, and only up to four vessels would be involved harvesting a limited amount of pollock, it is unlikely that any disturbance would result in population level effects for any marine mammals. Therefore, disturbance of marine mammals under Alternative 2 is likely insignificant. Even if the EFP is modified for an additional year of activity, the level of impact would be similar and insignificant.

For the proposed action, in many cases the marine mammals are not likely to occur in the action area at the time of the study, are not taken in the pollock fishery, or are known not to compete with the pollock fishery and therefore, no impacts are expected. Table 4.4-9 summarizes the effects of the proposed action on marine mammals that may occur in the action area.

**Table 4.4-9 Summary of Impacts on Marine Mammals**

Marine Mammal	Incidental Takes	Competition	Disturbance
Steller Sea Lions	insignificant	insignificant	insignificant
Harbor seal (GOA)	insignificant	insignificant	Insignificant
Ribbon seal	insignificant	No impact	Insignificant
Killer whale Eastern North Pacific AK resident	insignificant	Insignificant	Insignificant
Killer whale Eastern North Pacific Northern resident	insignificant	insignificant	Insignificant
Killer whale GOA, BSAI transient	insignificant	No impact	Insignificant
Pacific white-sided dolphin	No impacts	No impacts	No impacts
Harbor porpoise BSAI	No impacts	No impact	Insignificant
Dall's porpoise	insignificant	No impact	Insignificant
**Humpback whale Western North Pacific	No impact	No impact	No impact
Beaked whale	No impact	No impact	No impact
Minke whale Alaska	insignificant	No impact	insignificant
**Sperm whale North Pacific	No impact	No impact	Insignificant
**Fin whale Northeast Pacific	No impact	No impact	No impact
**Sea otter Southwest Alaska	No impact	No impact	insignificant

\* Does not include research mortality. Other human-caused mortality is predominantly subsistence harvests for seals, sea lions, otters, bowhead whales, and walrus.  
 \*\* ESA-listed stock.

#### 4.4.2 Effects on Prohibited Species

The only prohibited species likely to be taken during the EFP activities are Pacific halibut and Pacific salmon. Under Alternative 2, the EFP would require salmon and halibut to be treated in the same manner as Alternative 1, as required by the PSC regulations at 50 CFR 679.21. With the increased take of pollock in the Aleutian Islands under the EFP, the amounts of halibut and salmon incidental take in the Aleutian Islands are also expected to increase compared to the status quo.

Table 3.7-1 of the Amendment 82 EA shows rates of bycatch in the pollock fishery of the AI (NMFS 2005). Between 1993 and 1998, the average annual bycatch rates in Areas 541 and 542 were 0.0222 kg/mt for halibut, 0.019 fish/mt for Chinook salmon, and 0.037 fish/mt for other salmon species. Using these average bycatch rates, approximately 22.2 kg halibut, 19 individual Chinook salmon, and 37 other salmon would be incidentally caught for each 1,000 mt of pollock harvested during EFP activities. This is consistent with the results of the 2006 EFP fishery during which 44 salmon were taken (table 6 of Barbeaux 2006) It is unlikely that any of the salmon taken would be from ESA-listed stocks. Coded-wire tag recoveries of salmon incidentally taken in the groundfish fisheries have shown that ESA-listed salmon are more likely to occur in the Bering Sea and in the Gulf of Alaska than the proposed study areas (Myers et al. 2005). The harvest under the EFP is not expected to result in significant impacts on PSC species because of

the relatively small amount of potential bycatch and because no exemptions will be given for the PSC measures in the regulations.

#### 4.4.3 Social and Economic Effects

Economic and social impacts differ in important ways from the impacts on other resource components examined in this EA. Significance findings for social and economic impacts would not affect a FONSI; see 40 CFR 1508.14. In light of 40 CFR 1508.14, significance determinations are not made for these impacts.

##### *Increased Aleut Corporation pollock revenues in 2006*

The Aleut Corporation's AI pollock harvest is limited to 19,000 mt by regulation. The social and economic impacts of harvests up to this level were fully analyzed in the EA/RIR/IRFA for BSAI FMP Amendment 82, which allocates the directed pollock fishery in the Aleutian Islands to the Aleut Corporation (NMFS 2005). However, Alternative 2 may increase the likelihood that an additional 3,000 mt of the Aleut Corporation's pollock allocation will be harvested by the Corporation's affiliates (within the 19,000 mt limitation) compared to harvests in 2005.

Pollock harvested under the EFP would be processed shoreside at Adak. If the 3,000 mt of pollock were not harvested under the EFP, or by other Aleut Corporation affiliates, it would roll over to the eastern Bering Sea pollock fishery (subject to pollock ABC exceeding TAC in the BS) where it would be split between catcher processors, and catcher vessels and shoreside processors (Table 3, 2006 harvest specifications 71 FR 10894, March 3, 2006). This is unlikely to happen based on the proposed pollock TACs for the eastern Bering Sea being set at the proposed ABCs for 2007 and 2008 (NMFS 2006b).

For each 1,000 mt of pollock harvested in the Aleutian Islands, the Aleut Corporation and its affiliates would receive approximately \$849,000 in first wholesale gross revenues<sup>6</sup>. If the 1,000 mt of pollock were rolled over to the eastern Bering Sea, the participants in the Bering Sea fishery would receive approximately \$966,000 in first wholesale gross revenues<sup>78</sup>. Fishing, processing, and transportation costs in the two sectors are unknown, but are believed to be higher in the relatively remote Aleutian Islands, than in the eastern Bering Sea.

##### *New Information and improved utilization of the Aleutian Island Pollock Resource*

The results of the study under the EFP may provide a better understanding of pollock aggregations, biomass, and distribution in the Aleutian Islands. The results also may provide another method for the AFSC to gather additional stock assessment information for Aleutian

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<sup>6</sup> Based on 2004 "A" season BSAI first wholesale value per metric ton, round weight, for shoreside deliveries (\$849/metric tone).

<sup>7</sup> Based on a weighted average of the catcher-processor and shoreside processing "A" season prices per metric ton for pollock in the "A" season BSAI fishery in 2004 (\$1,082 and \$849 per metric ton respectively).

<sup>8</sup> Values per metric ton round weight were based on weekly production reports and Commercial Operators Annual Reports (COAR), and provided by Terry Hiatt, National Marine Fisheries Service, P.O. Box 15700, Seattle, WA 98115-0070, on January 9, 2006. BSAI prices represent eastern Bering Sea prices. Not enough AI information is available for a specialized AI first wholesale price.

Islands pollock. Additional information about the stock may result in increased confidence in the data and the ability to manage the stock at a higher tier level than is currently used.

Under the current level of knowledge and the current fishery restrictions, the pollock resource may not be fully harvested. The lack of information regarding the stock leads to more cautious setting of harvest levels. The type of information collected during the EFP study may result in more confidence in setting harvest levels providing for higher harvest amounts based on the additional information. Harvesting pollock under the current Steller sea lion protection measures has been difficult, as seen in the 2005 and 2006 fisheries in which only 1.2 percent and 16 percent, respectively, of the initial annual TAC were harvested.

If the study shows that the amount of pollock biomass in a discrete area can be predicted and a harvest quota may be set based on this biomass, then future management of the AI pollock TAC harvest may improve over the current pollock harvest management. Note that improved long-term utilization of the AI pollock TAC implies a commensurate reduction in pollock harvests by the AFA fleets in the eastern Bering Sea in those years when the BS pollock ABC exceeds the TAC.

### *Economic Development*

The intent of establishing the Aleut Corporation pollock allocation was to encourage economic development in Adak. Additional revenue in 2007 (and 2008 if the EFP is modified for a year extension) should contribute to this objective. Moreover, economic development depends on the ability to harvest the pollock allocation. The results of the study may improve the ability to more fully harvest Aleutian Islands pollock, which may result in more economic activity in Adak with the processing of pollock shoreside. At sea processing of pollock would likewise result in more revenues for the Aleut Corporation to reinvest in the Adak community.

### *State Pollock Harvest Effects on Revenues for EFP Participants*

Because the State has authorized a pollock fishery in the Aleutian Islands and the limit in the EFP is no more than 3,000 mt of the combined EFP and State of Alaska pollock harvest, the revenues to the EFP participants may be decreased by any amount of fishing that may occur in the State fishery. If the participants in the EFP also are the participants in the State fishery, no effect on income is expected. If participants in the State fishery are not participants in the EFP, the EFP participants would experience a reduction in potential harvest by the amount of the harvest in the State fishery. It is likely that the participants in the EFP will be the same participants in the State fishery because of the limited interest in the pollock fishery in the Aleutian Islands and the limited participation in the Aleut Corporation's directed pollock fishery.

## 5.0 Cumulative Effects

Analysis of the potential cumulative effects of a proposed action and its alternatives is a requirement of the NEPA. An EA or EIS 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 Groundfish Harvest Specifications DEIS (NMFS 2006b) and are adopted here by reference. The Harvest Specifications EIS is a very recent and broad examination of potential cumulative effects for fisheries throughout Alaskan waters. The findings can therefore be applied to this small portion of the Aleutian Islands pollock fishery. That EIS 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. The DEIS 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).

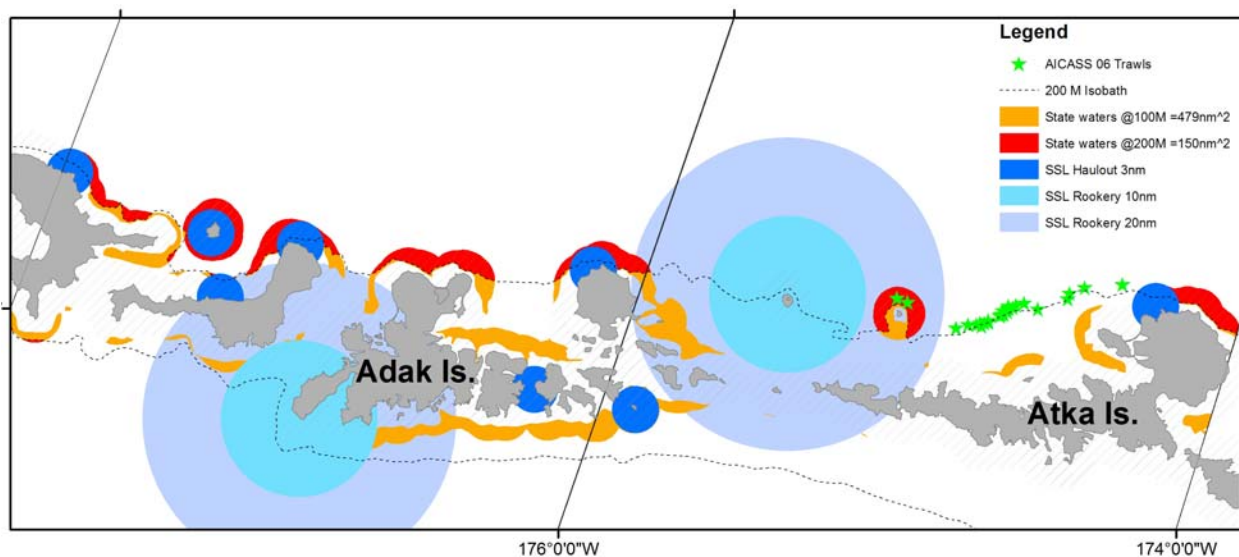
One foreseeable future action not previously analyzed is the new State of Alaska pollock fishery in the Aleutian Islands. This fishery was established by unanimous vote at the October 2006 Board of Fisheries meeting and is not included in the cumulative effects of the DEIS. This fishery has the following features:

- Located in state waters (0-3 nm) in the Adak area between 174° and 178°W longitude.
- The areas 20 miles around Steller sea lion rookeries and 3 miles around SSL haulouts will remain closed, with the exception of the Adak rookery closure area that extends into the bay on the northwest side of Kanaga Island.
- The pollock fishery is open to trawl vessels 58 feet LOA or less.
- The season will open January 20 and run through June 10 or until the guideline harvest level (GHL) is taken.
- No cod-end transfers will be allowed; vessels must deliver catch to a plant with observer coverage.
- The harvest limit will be 3,000 mt, which may be a combination of the state waters fishery and any federally-authorized pollock fishing inside AI critical habitat.
- Vessels must register and report daily catch to the department.

- The state waters fishery will sunset on December 31, 2008.

The intent is no more than 3,000 mt of pollock would be taken from the Federal and State waters in the area, regardless of whether it was harvested under an EFP or state waters fishing. The State fishery would open January 20, concurrent with the Federal pollock fisheries unless emergency action is taken to close it. A news release would announce the GHL. Unfortunately, the GHL set in this manner does not take into account the potential that the available pollock biomass may not support a harvest amount of 3,000 mt of pollock. Potential Federal harvest and survey information would not be available until late February or early March after the initial surveys under the EFP. The amount of Federal harvest would not be known until after fishing is completed under the EFP, in the first part of April.

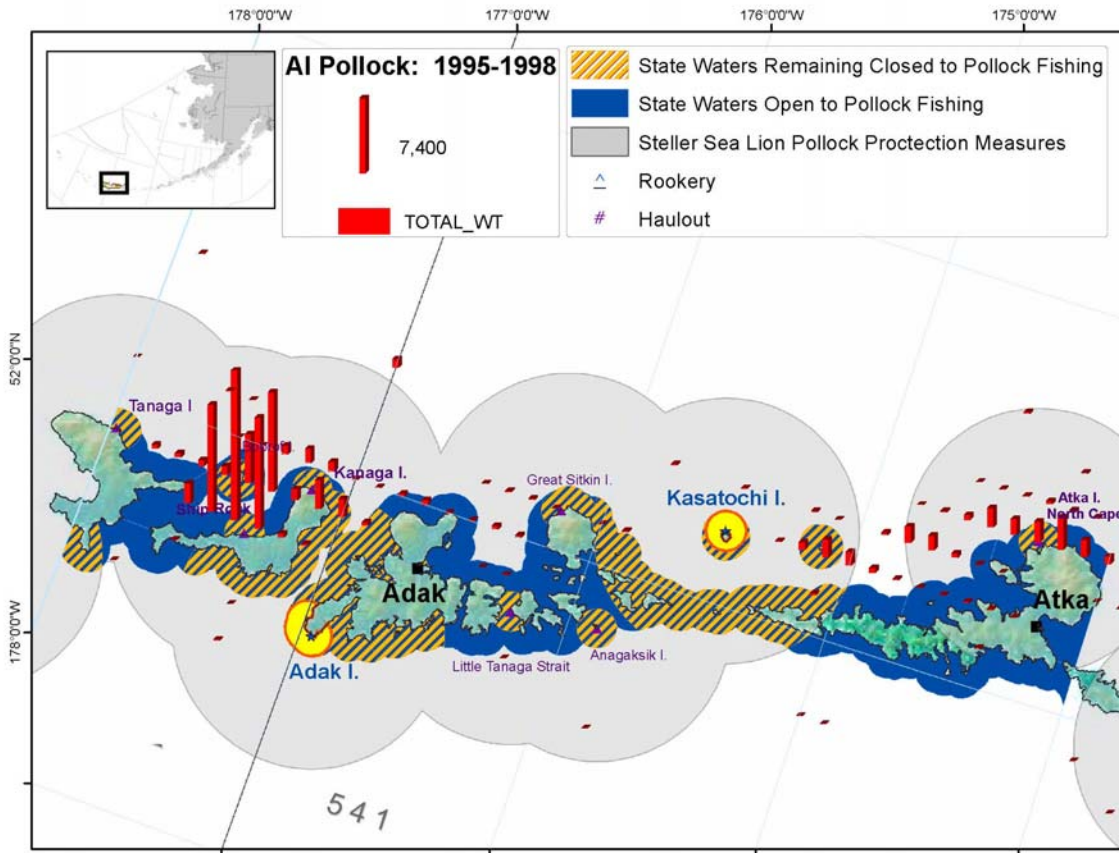
Figure 5.0-1 shows the state waters that are likely to provide habitat suitable for pollock harvests in the State waters pollock fishery areas. Based on the 2006 pollock survey under the EFP, pollock are expected to be most highly aggregated deeper than 150 m during spawning.



**Figure 5.0-1 Pollock habitat within State waters, and outside closed Steller sea lion areas, as described by depth.** Red areas are waters deeper than 200 m, gold areas are deeper than 100 m (Steve Lewis, October 27, 2006, NMFS Alaska Region Analytical Team).

Historical harvests of pollock in State waters have shown concentrations of harvest primarily in the Kanaga Island/Bobrof Island areas and Atka Island (Figures 5.0-2 through 5.0-4).





**Figure 5.0-2 Pollock harvests in the Aleutian Islands between 1995 and 1998 and the State waters pollock fishery.** (Steve Lewis, October 27, 2006, NMFS Alaska Region Analytical Team).

The State Aleutian Islands pollock fishery is a concern because it is located within 0-3 nm, the area where Steller sea lions are most likely to be encountered, increasing the potential for disturbance and incidental take. The larger concern is the harvest amount of 3,000 mt is not limited by any biomass information and is concentrated in very limited areas. Localized depletion is more likely to occur with this State managed fishery compared to the EFP because the number of vessels is not limited, the harvest amount is not based on biomass information for discrete location, and harvest is concentrated in the 0-3 nm waters between closer longitudes than under the EFP. Because of the limited number of Steller sea lions impacted, the effect of this action in combination with the EFP is not likely to result in population level effects for the western DPS of Steller sea lions, and is therefore insignificant. Regardless, the potential cumulative effect on Steller sea lions is likely adverse and may need to be addressed in an ESA section 7 consultation for this action and for the BSAI groundfish fisheries.

Because of the nature of the State fishery, the potential effects under Alternative 1 may be more adverse for Steller sea lions than under Alternative 2. If the EFP allows for 3,000 mt of harvest, the State pollock fishery would not open. If the EFP harvest amount is reduced due to required mitigation from a biological opinion, the State is authorized to harvest the difference up to 3,000

mt which would likely need to be offset in some manner in the Federal groundfish fisheries. In any case, less fishing under the State pollock fishery, means less potential for impacts on Steller sea lions and their critical habitat.

In summary, the cumulative effects analysis of the Groundfish Harvest Specifications EIS and in this EA shows 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 this EA, including PSC species and marine mammals. 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, except for the State of Alaska Aleutian Islands pollock fishery. The State pollock fishery is likely to adversely affect Steller sea lions and their critical habitat but is not likely to result in population level effects for the western DPS of Steller sea lions. The State pollock fishery is likely to occur under Alternative 1 and may harvest up to 3,000 mt in combination with the EFP harvest under Alternative 2. Thus, the cumulative effects added to the direct and indirect effects of either Alternative 1 or Alternative 2 are not likely to significantly impact the human environment.

## 6.0 Environmental Analysis Conclusions

Alternative 1 maintains the status quo. No EFP would be issued, and therefore, no additional effects would occur beyond those already identified and analyzed in the Groundfish Harvest Specifications EA and EIS (NMFS 2006a and 2006b), except for the State of Alaska pollock fishery in the Aleutian Islands. Alternative 2 would allow 3,000 mt of groundfish harvest (mostly pollock) under an EFP that would provide survey information on pollock abundance and distribution in a portion of the Aleutian Islands. In addition to the significance analysis in the 2006 and 2007 harvest specifications EA (NMFS 2006a), 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 pollock fishery of the Aleutian Islands. The effects of the issuance of an EFP on society, within this area, are on individuals directly and indirectly participating in the Aleutian Island pollock fishery and on those who use the ocean resources. Because this action may improve the use of the Aleutian Islands directed pollock fishery allocation, 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 NMFS Instruction 30-124-1 dated July 22, 2005, Guidelines for Preparation of a FONSI. The preferred alternative is Alternative 2 and the focus of the responses to the questions.

1. Can the proposed action be reasonably expected to jeopardize the sustainability of any target species that may be affected by the action? *No. No significant adverse impacts were identified for Alternative 2. All catches of pollock and other groundfish will be accounted for and will be*

*applied against the 2007 or 2008 TACs (EA Section 4.0). The effects are not expected to cause population level effects for the western DPS of Steller sea lions.*

2. Can the proposed action be reasonably expected to jeopardize the sustainability of any non-target species or prohibited species? *No. Potential effects of Alternative 2 on non-target/prohibited species were limited to Pacific halibut and salmon, and those effects were determined to be not significant (EA Section 4.4.2).*

3. Can the proposed action be reasonably expected to cause substantial damage to the ocean and coastal habitats and/or essential fish habitat as defined under the Magnuson-Stevens Act and identified in FMPs? *No. No significant adverse impacts were identified for Alternative 2. No effects were expected on ocean or coastal habitat or EFH. All fishing will be by pelagic trawl gear and will not occur within designated Habitat Areas of Particular Concern (EA Section 4.0).*

4. Can the proposed action be reasonably expected to have a substantial adverse impact on public health or safety? *No. Public health and safety will not be affected in any way not evaluated under previous actions or disproportionately as a result of the EFP study. The EFP will not change fishing methods (including gear types), timing of fishing or quota assignments to gear groups, which are based on previously established seasons and allocation formulas in regulations.*

5. Can the proposed action be reasonably expected to adversely affect endangered or threatened species, marine mammals, or critical habitat of these species? *The only ESA-listed animal that may be impacted by the action is the western DPS of Steller sea lions. The study would allow for limited fishing within critical habitat. The potential impacts are incidental take, competition for prey species, and disturbance. Because the amount of harvest is limited, activities are for a short time period, and only up to four vessels will be used, it is not likely that these effects would cause a population level effect for Steller sea lions. Therefore, for this NEPA analysis, the impacts on Steller sea lions are likely not significant. For purposes of ESA, an adverse effect on one or more Steller sea lions is likely and requires a formal consultation under section 7 of the ESA. Formal consultation will be completed before issuance of the EFP (EA Section 4.4.1 and 4.4.2).*

6. Can the proposed action be expected to have a substantial impact on biodiversity and ecosystem function within the affected area (e.g., benthic productivity, predator-prey relationships, etc.)? *No significant adverse impacts were identified for Alternative 2. No effects were expected on biodiversity, the ecosystem or seabirds (EA Section 4.0).*

7. Are social or economic impacts interrelated with natural or physical environmental effects? *Risks to the human environment by the Aleutian Islands pollock fishery are described in detail in the 2006 and 2007 harvest specifications EA and the draft Groundfish Harvest Specifications EIS (NMFS 2006a and 2006b). This action is limited in scope to a study that would last up to two years and with limited amounts of pollock harvest within a limited portion of the Steller sea lion protection areas. The effect on the human environment from this activity in critical habitat is insignificant in term of this analysis. Socioeconomic effects are possible in the future depending on the success of the project and the development of management measures. It is not possible to*

*predict the outcome of the project or future levels of pollock harvest in relation to the Aleutian Islands directed pollock fishery allocation. If the study results in improved utilization of pollock resources in the Aleutian Islands and for Adak, the socioeconomic impacts would likely be beneficial for those participants in the fishery and for residents in Adak (EA Section 4.5).*

8. Are the effects on the quality of the human environment likely to be highly controversial? *This action involves the permitting of a project to improve use of an underharvested fishery. The Aleut Corporation, Alaska Fisheries Science Center, and the Council support this action. Fishing inside critical habitat may be controversial but the limited vessel use, timing, discrete areas, and harvest amounts reduce the potential for this action being controversial. In addition, the potential for improved management of harvest inside Steller sea lion protection areas may outweigh concerns of potential impacts of the study. The experimental design of the project is supported by the Alaska Fisheries Science Center and by the Science and Statistical Committee of the North Pacific Fishery Management Council (EA Section 1.0).*

9. Can the proposed action be reasonably expected to result in substantial impacts to unique areas, such as historic or cultural resources, park land, prime farmlands, wetlands, wild and scenic rivers, essential fish habitat, or ecologically critical areas? *No. This action takes place in the geographic area of the Aleutian Islands, generally from 0 nautical miles (nm) to 20 nm offshore and between 173° and 179° W longitude. The land adjacent to this marine area may contain archeological sites of Aleut villages. This action would occur in adjacent marine waters and processing is limited to one location in Adak, Alaska so no impacts on these cultural sites are expected. The marine waters where the fisheries occur contain ecologically critical areas. Effects on the unique characteristics of these areas are not anticipated to occur with this action because of the small amount of fish removed by fewer than four vessels using pelagic trawl gear that is not as likely to impact ecologically critical areas.*

10. Are the effects on the human environment likely to be highly uncertain or involve unique or unknown risks? *The potential effects of the action are well understood because of the fish species and harvest method involved and the limited duration, harvest amounts, and area of the activity. For the Steller sea lions, enough research has been conducted to know about the animals' abundance, distribution, and feeding behavior to determine that this action is not likely to result in population effects (EA Section 4.4.1). The potential impacts of pollock harvest on other components of the environment also are well understood as described in a previous NEPA analysis (EA Section 3.0).*

11. Is the proposed action related to other actions with individually insignificant, but cumulatively significant impacts? *Beyond the cumulative impact analyses in the 2006 and 2007 harvest specifications EA and the Groundfish Harvest Specifications EIS (NMFS 2006a and 2006b), the only additional past, present or future cumulative impact issues identified was on the State of Alaska Aleutian Islands pollock fishery. The combination of effects from the State of Alaska pollock fishery and this proposed action are not likely to result in population level effects for Steller sea lions and are therefore not significant. Foreseeable future impacts include socio-economic beneficial effects for this action, as described above and in Section 5.0 of the EA.*

12. Is the proposed action likely to adversely affect districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places or may cause loss or destruction of significant scientific, cultural or historical resources? *This action will have no effect on districts, sites, highways, structures, or objects listed or eligible for listing in the National Register of Historic Places, nor cause loss or destruction of significant scientific, cultural, or historical resources. Because this action is in nearshore waters to 20 nm at sea, this consideration is not applicable to this action (EA Section 1.0).*

13. Can the proposed action be reasonably expected to result in the introduction or spread of a nonindigenous species? *This action poses no effect on the introduction or spread of nonindigenous species into the Aleutian Islands beyond those previously identified because it does not change fishing, processing, or shipping practices that may lead to the introduction of nonindigenous species.*

14. Will the proposed action likely establish a precedent for future actions with significant effects or represents a decision in principle about a future consideration? *Future actions related to this action may result in impacts. As described in Section 5.0, future actions depend on the results of the study. Pursuant to NEPA for all future action, appropriate environmental analysis documents (EA or EIS) will be prepared to inform the decision makers of potential impacts to the human environment and to implement mitigation measures to avoid significant adverse impacts. Socioeconomic impacts of improved management of pollock harvest in the Aleutian Islands would likely be beneficial.*

15. Can the proposed action be reasonably expected to threaten a violation of Federal, State, or local law or requirements imposed for the protection of the environment? *This action poses no known violation of Federal, State, or local laws or requirements for the protection of the environment. Issuance of the EFP would be conducted in a manner consistent, to the maximum extent practicable, with the enforceable provisions of the Alaska Coastal Management Program within the meaning of Section 30(c)(1) of the Coastal Zone Management Act of 1972, and its implementing regulations. ESA section 7 consultation would be completed before issuance of the EFP (EA section 4.4.1 and 5.0).*

16. Can the proposed action be reasonably expected to result in adverse impacts, not otherwise identified and described above? *Beyond the analysis in the 2006 and 2007 harvest specifications EA and the draft Groundfish Harvest Specifications EIS (NMFS 2006a and 2006b), no additional direct, indirect, past or present impacts have been identified that would accrue from this action. Foreseeable future impacts are likely socioeconomic depending on the results of the experimental study. These potential benefits are described above and in Section 5.0 of the EA.*

### **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 the assessment of pollock abundance in the Central Aleutian Islands and to test the technical feasibility of setting quotas for Aleutian Islands pollock at a finer temporal and spatial resolution using near real-time acoustic surveying. In addition, Alternative 1 would result in the opening of the State of Alaska Aleutian Islands pollock fishery which is likely to have more impacts on Steller sea

lions than Alternative 2. Alternative 2 would provide for an EFP that would allow the potential gathering of additional information regarding pollock biomass and distribution and determining if finer defined quotas may be developed. The ultimate goal is to develop management measures that may improve the use of pollock resources in the Aleutian Islands. Alternative 2 had no significant impacts identified and potential beneficial socioeconomic effects for Adak. Alternative 1 had no additional environmental impacts beyond those already identified in previous analyses, but Alternative 1 would not provide for the additional information and potential for improved management and use of pollock resources in the Aleutian Islands and would allow for the State of Alaska Aleutian Islands pollock fishery. Because Alternative 2 has no significant adverse impacts identified and provides the potential for improved use of pollock in the Aleutian Islands and is likely less adverse to Steller sea lions, Alternative 2 is the preferred alternative.

## 7.0 List of Preparers and Contributors

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## Appendix A

# FINAL CRUISE INSTRUCTIONS

**F/V Muir Milach and F/V TBD**  
**Late February 2007 – April 1, 2007**  
**Chief Scientist: Steven J. Barbeaux**

## 1.0 FINAL CRUISE INSTRUCTIONS

### 1.1 Cruise Title – Aleutian Islands Pollock Acoustic Survey Study

### 1.2 Cruise Dates:

1.2.1 Departure – Depart Adak, Alaska, after the close of the federal trawl CV cod season in late February 2007.

1.2.2 Arrival – Arrive Adak, Alaska, at 1200 on April 1, 2007.

## 2.0 CRUISE OVERVIEW

Cruise Objectives – The purpose of this study is to assess Alaska pollock abundance in a portion of the Aleutian Islands and to test the feasibility of managing an Aleutian Islands pollock fishery at a finer temporal and spatial resolution using near real-time acoustic surveying. To accomplish these objectives two acoustic surveys will be conducted, surveying the area between 173°W longitude to 179°W longitude on the north side of the Aleutian Island archipelago. Verification tows will be conducted during the surveys to determine the species composition and biological attributes of the observed acoustic sign. Verification tows will be limited to less than 10t and to no more than 30 tows per survey. All verification catch will be accounted for either by direct weighing or by volumetric assessment and discarded at sea. Between the two surveys commercial fishing vessels will be allowed to remove (AR) up to a maximum of

$$AR = \left[ \sum (N_A W_{A+1}) \right] \left( \frac{A_{07}}{A_{06}} \right) (1 - M) (0.75M)$$
 of groundfish from the survey area, removals are

not to exceed 3,000 t and not to exceed 1000t from any 1 degree longitude blocks.  $N_A$  is the numbers at age from the final 2006 survey,  $W_{A+1}$  is the calculated weight-at-age from the 2006 survey,  $M$  is the natural mortality,  $A$  is the survey area. In addition only one vessel greater than 60' LOA will be allowed to fish in a 1 degree longitude block at a given time. All commercial hauls will be sampled by observers on board the vessels and all catch will be delivered to Adak Fisheries LLC. in Adak, Alaska.

2.1 **Applicability** – These instructions present complete information for this cruise.

2.2 **Operating Area** – Aleutian Islands

2.3 **Participating Organizations**

NOAA – Alaska Fisheries Science Center (AFSC)  
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2.4 **Personnel**

2.4.1 **Chief Scientist**

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3.0 OPERATIONS

3.1.1 **Data To Be Collected** – The purpose of this study is to assess Alaska pollock abundance in the Central Aleutian Islands and to evaluate the feasibility of managing

an Aleutian Islands pollock fishery at a finer temporal and spatial resolution using near real-time acoustic surveying. In the course of this study data on the reliability and stability of the echosounder will be collected as well as the specific noise characteristics of the small commercial fishing vessel/s. This will be done through SONAR self-noise testing and sphere calibrations. Two acoustic surveys of pollock aggregations will be conducted that will entail the collection of both acoustic data from ES-60 echosounders as well as biological data collected from verification trawl tows. CTD casts will be made to support both the calibration exercises and the survey effort. Commercial fishing will be conducted to support the study. Sampling of the catch will occur at sea by NMFS certified Observers for species composition, pollock length, weight, and age structures. In addition species composition and total delivery data of the commercial catch will be collected at the processing plant in Adak.

- 3.2 Staging Plan** – The majority of the equipment necessary for the cruise will be shipped to Adak prior to January, 2007. The laptop computers, CTD, and personal gear of the scientists will be carried as luggage and delivered to the boats in Adak at the time of embarkation.
- 3.3 De-staging Plan** – The data, computer hardware, and personal gear will be returned with the chief scientist at the end of the study. All other gear will remain on board the F/V Muir Milach until the ship returns to Bellingham, WA (June 2007).
- 3.4 Cruise Plan** – The study area is the region between 173°W longitude to 179°W longitude on the north side of the Aleutian Island archipelago and will be divided into six one-degree pollock fishing areas (PFA). In February the acoustic survey vessel/s will conduct SONAR self-noise tests while steaming to fishing grounds (See Below). On the first and last trip an ES-60 system calibration will be conducted on board each of the vessel/s (See Below). If more than one vessel is to be used for the acoustic surveys, an information inter-ship comparison exercise will be conducted in a location and at a time deemed appropriate by the NOAA lead scientist. In the second phase of the study, NOAA scientists (or contracted acoustic technician) will board the vessel/s and depart from Adak, Alaska, after the closing of the federal catcher vessel trawl cod A season in 2007. A 2.5 nm spacing parallel transect acoustic survey will be conducted of the study area. If a single acoustic survey vessel is to be used, then the survey will commence at 173°W longitude and work towards 179°W longitude. At the direction of the NMFS scientist a second vessel will conduct verification tows to collect biological data. If two acoustic vessels are used for the survey the vessels will start at the eastern most edge of the survey area and conduct the survey in parallel with each survey vessel surveying every other transect such that each vessel will survey transects 5 nm apart.. At least one CTD drop per PFA will be made for each acoustic survey to obtain conductivity and temperature at depth. At the direction of the NOAA scientists (or contracted acoustic technician) trawl hauls of no more than 10t will be conducted during the acoustic surveys to verify acoustic backscatter and obtain biological samples. The validation tows will be randomly sampled for species composition, the samples will not exceed 1 t. A random subsample of 150 pollock and/or other dominant species will be measured and weighed. All measured pollock will be scanned for maturity. Otolith and fin clip samples will be collected from a subsample of the measured fish. Following the acoustic survey the NMFS scientists (or contracted acoustic technician) will disembark from the survey vessels. NMFS certified observers will embark the commercial fishing vessels that are to conduct fishing operations. The observed vessels will be allowed to harvest pollock in the PFAs up to the limits identified in section 2.0 above. All commercial tows will be monitored by biological technicians and all

catch will be delivered to Adak, Alaska. All commercial tows will be sampled for species composition. A random subsample of pollock will be measured, weighed, and scanned for maturity. Otolith samples will be collected from a subsample of the measured fish. Following commercial fishing the NMFS scientists will again board the survey vessel/s and another 2.5 nm spaced parallel transect survey will be conducted following the same procedures as the first survey.

### 3.5 **Study Locations** – See Figs. 9.2

- **Study Operations** – The following are operations to be conducted on this cruise.

**3.5.1 Phase 1: SONAR Self-noise testing** – SONAR Self-noise tests will be conducted in January 2007 while the vessel/s steam to the Pacific cod fishing grounds. For this part of the study the ES-60 echosounder will record data in “passive” mode as the vessel systematically increases speed from 0 knots to maximum in 2 knot increments every three minutes. This exercise will take no more than 45 minutes. The recorded data will then be sent to the Chief Scientist for analysis to determine signal to noise ratios and speed for the optimum survey operations.

**3.5.2 Phase 1: ES-60 System Calibration** – Two ES-60 System calibrations will be conducted per survey vessel, one prior to the first parallel transect acoustic survey and one following the final acoustic survey. The calibrations will be conducted by the NOAA Scientist (or contracted acoustic technician) as per protocols described in Foote et al. (1987) for sphere calibration of a scientific echosounder.

**3.5.3 Phase 2: CTD measurement** – During each of the calibration exercise and once during each parallel transect survey in each PFA, CTD casts will be made to assess speed of sound at depth. The CTD will be allowed to acclimate 1m below the surface for one minute and then lowered via the vessel winch or crane to the bottom and retrieved. CTD cast data will be downloaded to a NOAA laptop and backed up on DVD after each cast.

**3.5.4 Phase 2: Parallel Transect Acoustic Survey** – Two 2.5 nm spaced acoustic surveys will be conducted of the area between 173°W and 179°W longitude (See figure below). The waypoints for these surveys will be determined by the Chief Scientist by February 15th, 2007. The survey will consist of parallel transects with a random start location for the beginning transect. The transects will be adaptive in that they are designed to survey 1nm inshore of the 200m isobath and 5nm offshore of the 200m isobath, but can be cut short if, in the opinion of the NMFS scientist or contracted acoustic technician, pollock acoustic sign is no longer observed. Ping rate during the survey will be one ping per two seconds and vessel speed for the survey will be determined by the Chief Scientist after analysis of the SONAR self-noise test. All acoustic data will be recorded on external 120GB IOMEGA drives and backed-up nightly onto DVDs. If a single acoustic survey vessel is to be used, then the survey will commence at 173°W longitude and work towards 179°W longitude. A second vessel will conduct verification tows to collect biological data at the direction of the NMFS scientist. If two vessels are used for the survey the vessels will start at the

eastern most edge of the survey area and conduct the survey in parallel with each survey vessel surveying every other transect such that each vessel will survey transects 5 nm apart..

- 3.5.5 Phase 2: In-formation Inter-ship Comparison** – If two vessels are to be used for the survey an in-formation inter-ship comparison will be conducted. Once a suitable location is identified near the center of the study area where there are substantial quantities of fish in layers or dispersed aggregations of varying density the vessels will collect data in formation. One vessel will lead and the other will follow about 400m astern, far enough to the side to avoid the leaders wake. The two vessels will take the lead in turns and exchange position at the end of two transects. A total of eight 3 mile transects spaced 0.5 nm apart will be run over the area.
- 3.5.6 Phase 3: Verification Trawling** – At the direction of the NOAA scientist or contracted acoustic technician, trawls hauls of no more than 10t will be conducted during the acoustic surveys to verify acoustic backscatter and obtain biological samples. If a single acoustic survey vessel is used then verification trawls will be conducted by accompanying fishing vessels and the survey vessel will not fish. If two acoustic survey vessels are employed then verification trawling will be conducted by the acoustic survey vessels. The choice of net will be up to the vessel captain/s, and will be fitted with a 3/8” knotless codend liner. Time, date, and location of each trawl will be recorded using standard observer program trawl haul forms. All validation tows will be measured for total catch and randomly sampled for species composition, the samples will not exceed 1t. A random subsample of 150 pollock and/or other dominant species will be measured and weighed. All measured pollock will be scanned for maturity. Otolith and fin clip samples will be collected from a subsample of the measured fish. Deck hands on the survey vessels will conduct the species composition samples and length measurements under the supervision of a contracted biological technician. Maturity scans, otoliths, and fin clips will be collected by the contracted biological technician/s. All data will be recorded on deck sheets and later transferred to an access database designed by the Chief Scientist. The Access database will be backed up on DVD nightly.
- 3.5.7 Phase 3: Commercial Trawling** – Following the first survey commercial fishing vessels will conduct commercial fishing in the survey area. All fishing vessels must have a NMFS approved biological technician on board. All commercial trawl locations must be outside of 3 nm from designated Steller Sea Lion (SSL) haulout and rookery sites, but otherwise will be at the discretion of the vessel captain. Time, date, and location of each trawl will be recorded using standard observer program trawl haul forms. All commercial tows will be measured for total catch and sampled for species composition. A random subsample of pollock will be measured, weighed, and scanned for maturity. Otolith samples will be collected from a subsample of the measured fish. Observers will collect species composition, length measurements, maturity scans, otoliths, and fin clips from pollock. All data will be recorded on standard observer deck sheets. All catch will be delivered to the Adak processing plant where it will be sorted and weighed. Data on total catch composition and weight will be reported to the NOAA scientist prior to embarkation on a following trip.
- 3.5.8 Phase 3: Opportunistic Acoustic Data Collection** – During all fishing operations, including searching for fishable aggregations of pollock, and when traveling to and

from port, the survey vessels will continue to collect ES-60 acoustic data. These data will be used to qualitatively assess the relative densities and assess the spatial dynamisms of fish within the study areas in between acoustic surveys. In addition these data, in conjunction with catch per unit effort data from the commercial trawl hauls, will be used to assess possible impacts of fishing activities on the pollock aggregations due to the study.

**3.6 Underway Operations** – The following are underway operations to be conducted on this cruise.

- Opportunistic Acoustic data collection

**3.7 Applicable Restrictions** – Commercial trawl tows will not be conducted within 3NM of designated Sea Lion haulout or rookery protected areas.

**3.8 Small Boat Operations** – None

## **4.0 FACILITIES**

### **4.1 Equipment and Capabilities Provided by Ships**

- Stern trawl system (winches, wire, electronics, etc.)
- 38kHz SIMRAD ES-60 echosounder with GPS feed
- Sea-water hoses and nozzles to wash nets and gear ,
- Adequate deck lighting for night-time operations,
- Navigational equipment including GPS and radar,
- Ship's crane(s) used for loading and/or deploying,
- Commercial pelagic trawl gear, appropriate to the vessel
- 3/8" cod end liner for trawls

### **4.2 Equipment and Capabilities Provided by Scientists for Each Survey Vessel**

- Sea-Bird Electronics' SBE-19 SEACAT system
- AFSC Laptop with SEASOFT software for CTD data collection and processing,
- Electronic 50kg basket scale, 2kg scale for individual fish weights,
- 120GB IOMEGA External Drives, DVD read write drive, and Backup DVDs
- Miscellaneous scientific sampling and processing equipment,
- Data forms,
- Data storage Access database

## **5.0 DISPOSITION OF DATA AND REPORTS**

**5.1** The following data products will be included in the cruise data package:

- Calibration Sheets for all ship's and scientific instruments used
- CTD Cast Information
- 120GB Iomega external drive logs of ES-60 Acoustic Data
- Nightly DVD Backup logs of ES-60 Acoustic Data
- Access database log of all fishing activity
- Trawl haul information sheets, trawl haul deck forms
- All data and preliminary analyses will be submitted as an AFSC Processed report

**5.2 Pre- and Post-cruise Meetings** – A pre-cruise meeting will be scheduled with the chief scientist, the contracted acoustic technician, contracted observers, and the vessel captains (via telephone) in February, 2007 prior to the closure of the federal catcher vessel cod trawl A season in Seattle to discuss sampling strategy and coordinate vessels. A meeting of the NOAA scientist, the vessel captain, and the vessel crew will be conducted on board the survey vessels prior to departure for the first survey to discuss operations on board the vessel and assigned duties. In April 2007, a post-cruise meeting will be held in Seattle, Washington with the chief scientist, the vessel owner, and a representative from the Aleut Enterprise Corporation to discuss preliminary results of the survey.

## **6.0 ADDITIONAL PROJECTS**

**6.1 Definition** – Ancillary and piggyback projects are secondary to the objectives of the cruise and should be treated as additional investigations. The difference between the two types of secondary projects is that an ancillary project does not have representation aboard and is accomplished by the ship's force.

**6.2 Ancillary Projects** – None

**6.3 Piggyback Projects** – During biological data collection fin clips will also be taken from pollock. In at least two separate hauls, fin clips will be collected from at least 50 randomly selected pollock. Length, weight, sex, and maturity of females will be recorded for each fish. Otolith samples will be collected from each fish and placed in a vial with a unique specimen number. The clips will be placed in separate micro-ampoules containing 95% alcohol and the specimen number recorded on the micro-ampoule. The data will be recorded in an Access database developed by the Chief Scientist. The fin clip samples and associated data will be provided to Dr. Mike Cannino of the AFSC for processing. Otoliths samples will be included in the total otolith samples from the study and processed by the Age and Growth Laboratory at the AFSC.

## **7.0 HAZARDOUS MATERIALS**

**7.1 Inventory**

<b>Chemical</b>	<b>Amount</b>	<b>Neutralizer</b>	<b>Contact</b>
Alcohol, Reagent, 95%	2 x 1-Liter	3-M Sorbent Pads	Barbeaux

**7.2 Material Safety Data Sheet (MSDS)** – Submitted separately

## **8.0 MISCELLANEOUS**

**Communications** – Specific information on how to contact the F/V Muir Milach

**8.1 Important Telephone and Facsimile Numbers and E-mail Addresses**



### 8.1.1 Alaska Fisheries Science Center (AFSC):

Resource Ecology and Fisheries Management (REFM):

- (206) 526-4211 (voice)
- (206) 526-4066 (fax)

E-Mail: Steve.Barbeaux@noaa.gov

### 8.1.2 Commercial Fishing Vessels to be determined by AEC and NMFS – Telephone and E-mail contacts

Homeport :

Cellular:

INMARSAT Mini-M:

INMARSAT B:

E-Mail:

Other:

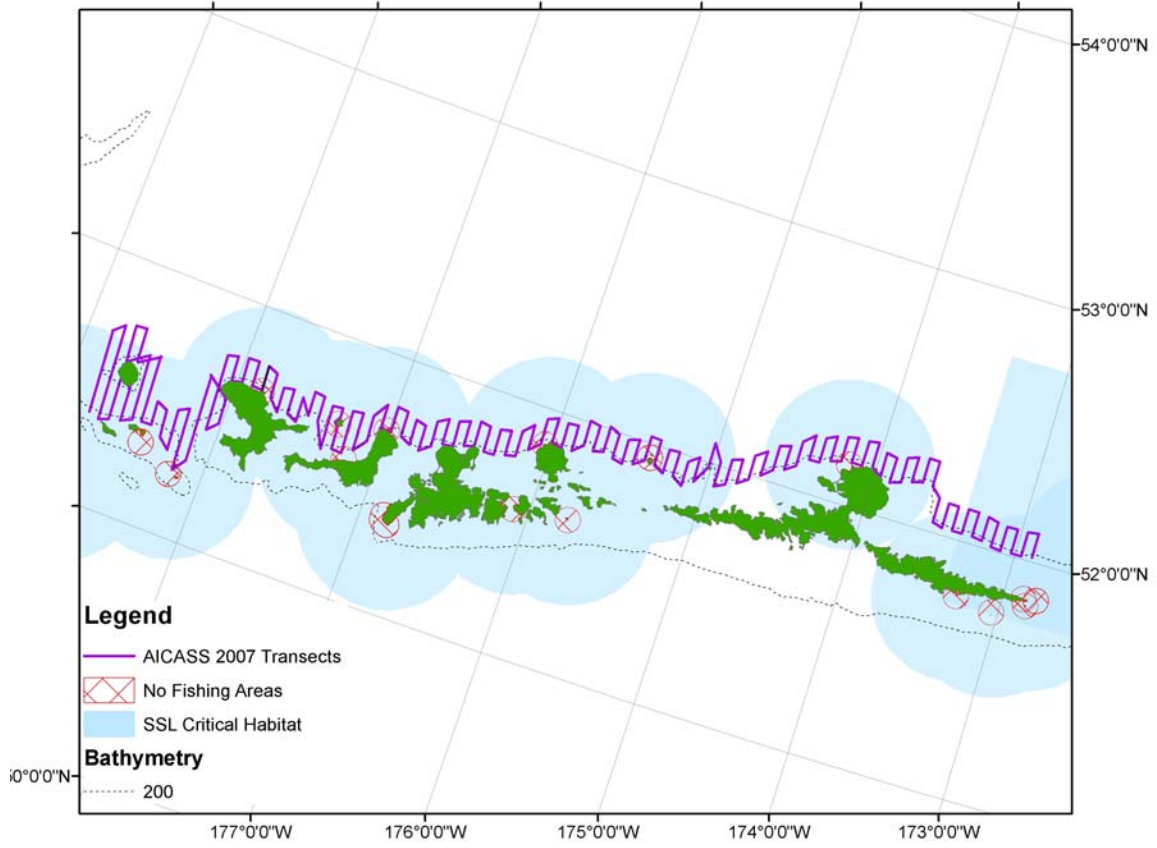
## 9.0 APPENDICES

### 9.1 Equipment Inventory

<b>Equipment</b>	<b>Quantity</b>	<b>Source</b>
<b>Acoustic Gear</b>		
Laptop Computer	2	Chief Scientist, FIT program
IOMEGA 120GB external drive	4	FIT Program
Calibration Downrigger	4	Chief Scientist
Tungsten-Carbide Calibration Sphere	2	Chief Scientist
Lead Cannonball	2	Chief Scientist
Spiderwire 100 lbs test	300 M	Chief Scientist
Calibration Tools and Parts	1	Chief Scientist
CTD and Cage	1	FIT Program
DVD Read/Write Drive	2	FIT Program
DVD backup discs	10	FIT Program
<b>Biological Sampling</b>		
Flatbed Scale 50 kg, 0.002 kg precision	2	RACE Division
Length-Frequency Board	2	Observer Program
Sampling Baskets	10	RACE Division
Otolith Vials	500	RACE Division
Species Id Manual	2	RACE Division
Handheld Deck Computer	2	FIT Program
Otolith Knife	2	FIT Program

Forceps	2	FIT Program
Scalpel	4	FIT Program
Scissors	2	FIT program
Various Zip-lock bags	30	FIT Program
Fin Clip micro-ampoules	100	Dr. Mike Canino
1 Liter 95% Alcohol	1	Dr. Mike Canino
Small Scale 1kg	1	FIT Program
Deck Sheets	100	Observer Program
<b>Safety</b>		
Immersion Suit	2	RACE Division
Life Jacket	2	RACE Division
Boots	2 pair	RACE Division
Wet Weather Gear	2 sets	RACE Division
Personal EPIRB	2	RACE Division
Hardhat	2	RACE Division
Work Gloves	6 pair	FIT Program
<b>Other</b>		
Digital Camera	1	FIT Program
Sleeping Bag	2	FIT Program

9.2 **Figures**



**Figure 9.2 Aleutian Islands Study Area**

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Mnbrown: 9/22/06, 10/11/06, 11/7/06

Sbarbeaux: 9/28/06

Jscheuer: 11/8/06

Cried: 12/13/06

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