Council Review Draft

ENVIRONMENTAL ASSESSMENT/INITIAL REGULATORY FLEXIBILITY ANALYSIS

for the Harvest Specifications for the Years 2005-2006 Alaska Groundfish Fisheries Implemented Under the Authority of the BSAI and GOA Groundfish Fishery Management Plans

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Abstract: This document contains an Environmental Assessment (EA) and an Initial Regulatory Flexibility Analysis (IRFA) that analyze the potential impacts of the 2005-2006 harvest specifications for the groundfish fisheries of the Bering Sea and Aleutian Islands and Gulf of Alaska management areas. The analyses in this document address the requirements of the National Environmental Policy Act (NEPA) and the Regulatory Flexibility Act (RFA).

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List of Acronyms

ABC	Allowable Biological Catch
ADCED	Alaska Department of Community and Economic Development
ADF&G	Alaska Department of Fish and Game
AFA	American Fisheries Act
AFSC	Alaska Fisheries Science Center
AKFIN	Alaska Fisheries Information Network
AP	Advisory Panel
APA	Administrative Procedures Act
B	Biomass
BiOp	Biological Opinion
BS	Bering Sea
AI	Aleutian Islands
BSAI	Bering Sea and Aleutian Islands
CDQ	Community Development Quota
CEQ	Council of Environmental Quality
CEY	Constant Exploitation Yield
CFEC	Alaska Commercial Fisheries Entry Commission
CFR	Code of Federal Regulations
CP	catcher-processor
CV	catcher vessel
DFA	Directed Fishing Allowance
DFL	Directed Fishing Level
EA	Environmental Assessment
EIS	Environmental Impact Statement
EEZ	Exclusive Economic Zone
EFH	Essential Fish Habitat
ESA	Endangered Species Act
F	Fishing mortality rate
FMP	Fishery Management Plan
FONSI	Finding of No Significant Impact
FR	*Federal Register*
FRFA	Final Regulatory Flexibility Analysis
GOA	Gulf of Alaska
FRFA	Final Regulatory Flexibility Analysis
HAPC	Habitat Area of Particular Concern
IFQ	Individual Fisherman's Quota
ITAC	Initial Total Allowable Catch
IRFA	Initial Regulatory Flexibility Analysis
MMPA	Marine Mammal Protection Act
MSST	Minimum Stock Size Threshold
MSY	Maximum Sustainable Yield
mt	metric ton
NEPA	National Environmental Policy Act

nm	nautical mile
NMFS	National Marine Fishery Service
NOA	Notice of Availability
NOAA	National Oceanographic and Atmospheric Administration
OFL	Overfishing Level
OY	Optimum Yield
PBR	Potential Biological Removal
PSC	Prohibited Species Catch
PSQ	Prohibited Species Quota
PSEIS	Programmatic Supplemental Environmental Impact Statement
RFA	Regulatory Flexibility Act
RIR	Regulatory Impact Review
SAFE	Stock Assessment and Fishery Evaluation Report
SBREFA	Small Business Regulatory Enforcement Fairness Act
SEIS	Supplemental Environmental Impact Statement
SSC	Scientific and Statistical Committee
TAC	Total Allowable Catch
USFWS	United States Fish and Wildlife Service

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Executive Summary

The actions evaluated in this document

This document provides National Environmental Policy Act (NEPA) and Regulatory Flexibility Act (RFA) small entity impact analyses for these actions:

- publication of proposed specifications for the Bering Sea and Aleutian Islands (BSAI)
- publication of proposed specifications for the Gulf of Alaska (GOA)

This document also provide the NEPA analysis for the 2005 interim harvest specifications for the GOA and the BSAI.

Purpose and Need

The implementation of the 2005 and 2006 harvest specifications is necessary for the management of the groundfish fisheries and the conservation of marine resources, as required by the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act).

The specifications provide the limits, seasonal apportionments and fishing sector allocations for target species and prohibited species. NMFS uses the specifications to control fishing activities in the exclusive economic zone off Alaska. The specifications are renewed annually or biennially, based on the latest stock assessment information, ensuring the fisheries are managed on the best available scientific information.

Environmental Assessment

An Environmental Assessment (EA) was prepared for the 2005 and 2006 harvest specifications, and the 2005 interim harvest specifications to address the statutory requirements of the NEPA. The purpose of the EA is to predict whether the impacts to the human environment resulting from setting the 2005 and 2006 harvest specifications and the 2005 interim harvest specifications will be "significant", as that term is defined under NEPA. If the predicted impacts from the preferred alternatives are found not to be significant, and those alternatives are chosen, no further analysis is necessary to comply with the requirements of NEPA.

2005 and 2006 Harvest Specifications Alternatives

TAC specifications define upper retained harvest limits, or fishery removals, for the subject fishing year.

These specifications are made for each managed species or species group, and in some cases, by species and sub-area. Sub-allocations of TAC are made for biological and socio-economic reasons according to percentage formulas established through FMP amendments.

Each of the five 2005 and 2006 specifications and 2005 interim specifications alternatives represents alternative amounts of total allowable catch that could be set for managed species and species groups for the fishing years 2005 and 2006 and for the first part of 2005. The alternatives have been selected to display a wide range of ABCs and TACs and their impacts to the environment. Fishing mortality (retained and discarded) is indicated as *F*. TAC specifications are harvest quotas that include both retained catch and discarded catch. The five alternatives are:

Alternative 1: Set TACs to produce fishing mortality rates, *F*, that are equal to $maxF_{ABC}$, "$maxF_{ABC}$" refers to the maximum permissible value of F_{ABC} under Amendment 56. Historically, TAC has been constrained by ABC, so this alternative provides a likely upper limit for setting TAC within the limits established by the fishery management plan.

Alternative 2: Set TACs that fall within the range of ABCs recommended by the Plan Team's and TACs recommended by the Council. (Preferred alternative). Under this scenario, *F* is set equal to a constant fraction of $maxF_{ABC.}$ The recommended fractions of $maxF_{ABC}$ may vary among species or stocks, based on other considerations unique to individual species or stocks.

Alternative 3: For Tiers 1, 2, and 3, set TAC to produce *F* equal to 50% of $maxF_{ABC}$. For Tiers 4, 5, and 6, set TAC equal to 50% of TAC associated with $maxF_{ABC}$. This alternative provides a likely lower bound on F_{ABC} that still allows future harvest rates to be adjusted downward should stocks fall below reference levels.

Alternative 4: For Tiers 1, 2, and 3, set TAC to produce *F* equal to the most recent five year average actual *F*. For Tiers 4, 5, and 6, set TAC equal to the most recent five year average actual catch. This alternative recognizes that for some stocks, TAC may be set well below ABC, and recent average *F* may provide a better indicator of F_{TAC} than F_{ABC}.

Alternative 5: Set TAC equal to zero. This alternative recognizes that, in extreme cases, TAC may be set at a level close to zero. This is the no action alternative.

Environmental Analysis

The EA evaluated the specifications alternatives with respect to the following classes of effects:

- effects on target species
- effects on incidental catch of non-specified species
- effects on forage fish species
- effects on prohibited species
- effects on marine mammals and ESA listed marine mammals
- effects on seabirds
- effects on marine benthic habitat and essential fish habitat
- effects on the ecosystem
- effects on State of Alaska managed state waters' seasons and parallel fisheries for groundfish
- social and economic effects

NEPA significance is determined by considering the context in which the action will occur and the intensity of the action. The context in which the action will occur includes the specific resources, ecosystem, and the human environment affected. The intensity of the action includes the type of impact (beneficial versus adverse) and duration of impact.

The intent of TAC setting deliberations is to balance the harvest of fish during the fishing year consistent with established total optimum yield amounts and ecosystem needs. The effect of the alternatives must be evaluated for all resources, species, and issues that may directly or indirectly

interact with the groundfish fisheries within the action area, as a result of specified TAC levels. The impacts of alternative TAC levels are assessed in section 4 of this EA. The summary of the impacts on the human environment is in section 6.0 of this EA and portions are provided in this Executive Summary.

Adverse or beneficial impact determinations for marine resources, including sustainability of target and nontarget species, damage to ocean or coastal habitat or essential fish habitat, effects on biodiversity and ecosystems, and marine mammals

Alternative 1

Alternative 1 had significant adverse impacts identified for marine mammals, marine benthic habitat, and the ecosystem. Some significant beneficial socioeconomic effects may result from Alternative 1.

Alternative 2

No significant adverse impacts were identified for the preferred alternative (Alternative 2) for the harvest specification. The interim specifications under Alternative 2 had unknown effects on the temporal concentration of fishing in relation to marine mammals. Because this unknown effect is potentially mitigated by the capability to use emergency rulemaking to adjust harvest levels to appropriate amounts, it is unlikely that this effect would be significantly adverse.

Alternative 2 also has unknown incidental take effects on seabirds because it is not possible to determine the population trend that may result from the fishing activities. Because of the seabird avoidance measures recently adopted in the groundfish fisheries, the likely incidental take will be lower than in past groundfish fisheries, making it less likely that the unknown effects for incidental take would be significantly adverse, especially in comparison to past years incidental take amounts. Additional research is currently being conducted to improve seabird avoidance measures which if implemented will likely result in further reductions in incidental take within the time span of the 2005 and 2006 harvest specifications. The effects of trawling on piscivorous bird species' benthic habitat are unknown but not likely to be significantly adverse. No consistent or widespread population declines have been experienced by these species and there is no indication that fishing has affected the benthic habitat to cause the carrying capacity of the environment to change.

Unknown effects were also identified for the ecosystem under Alternative 2. The population status for many top predator seabird, marine mammals and sharks is unknown so that it is not possible to determine the impacts of fishing under Alternative 2 on these population trends. Unknown effects on HAPC biota were also identified based on the unknown abundance levels needed of the structural HAPC species for a functional HAPC biota guild. It is likely that the mitigation measures in place and the application of the ecosystems management policy adopted with Amendments 81 and 74 to the groundfish FMP will reduce the potential for significantly adverse effects on the top predator populations and on HAPC biota. Also, this action of annual and interim harvest specifications is for a short duration at a similar level of harvest experienced in the groundfish fisheries in the past, reducing the potential for adverse population trend effects for top predator species and adverse effects on HAPC biota.

Alternatives 3 and 4

The effects of alternatives 3 and 4 for the environmental components were nearly identical. All effects were either unknown or insignificant. Unknown effects were similar to Alternative 2 with a few exceptions.

The table below provides a summary of the impacts of the 2005 and 2006 proposed harvest specifications and the 2005 interim harvest specifications alternatives on the human environment.

Summary of significant determinations with respect to direct and indirect impacts.

Coding: I = Insignificant, S = Significant, + = beneficial, - = adverse, U = Unknown					
Issue	**Alt. 1**	**Alt. 2**	**Alt. 3**	**Alt. 4**	**Alt. 5**
Target Fish Species (Section 4.2)					
Fishing mortality	I	I	I	I	I
Spatial temporal concentration of catch	I	I	I	I	S+
Change in prey availability	I	I	I	I	S+
Habitat suitability: change in suitability of spawning, nursery, or settlement habitat, etc.	I	I	I	I	S+
Other and non-specified species (Section 4.3)					
Incidental catch of other species and non-specified species	U	I	U	U	S+
Forage species (Section 4.4)					
Incidental catch of other species and non-specified species	U	I	U	U	S+
Prohibited Species Management (Section 4.5)					
Incidental Catch of prohibited species	I	I	I	I	I
Harvest levels in directed fisheries targeting prohibited species	I	I	I	I	I
Bycatch levels of prohibited species in directed groundfish fisheries	I	I	I	I	S+

Incidental take/entanglement in marine debris	U	I	I	I	I
Spatial/temporal concentration of fishery	I	I	I	I	S+
Spatial/temporal concentration of fishery for interim specs.	U	U	U	U	S+
Global Harvest of prey species	I	I	I	I	I
Disturbance	S-	I	I	I	S+
Northern Fulmar (Section 4.7)					
Incidental take–BSAI	U	U	U	U	I
Incidental take–GOA	U	U	I	U	I
Prey availability	I	I	U	U	I
Benthic habitat	I	I	I	I	I
Proc. waste & offal	U	I	U	U	U
Short-tailed Albatross (Section 4.7)					
Incidental take	U	U	U	U	I
Prey Availability	I	I	U	U	I
Benthic Habitat	I	I	I	I	I
Proc. Waste & Offal	I	I	I	I	U
Other Albatrosses & Shearwaters (Section 4.7)					
Incidental Take	U	U	I	U	I
Prey Availability	I	I	U	U	I
Benthic Habitat	I	I	I	I	I

Coding: I = Insignificant, S = Significant, + = beneficial, - = adverse, U = Unknown					
Issue	**Alt. 1**	**Alt. 2**	**Alt. 3**	**Alt. 4**	**Alt. 5**
Proc. Waste & Offal	I	I	I	I	U
Piscivorous Seabirds (Also Breeding in Alaska) (Section 4.7)					
Incidental Take	U	U	I	I	I
Prey Availability	U	U	U	U	I
Benthic Habitat	U	U	U	U	I
Proc. Waste & Offal	I	I	I	I	I
Eiders (Spectacled and Stellers) (Section 4.7)					
Incidental Take	U	U	I	I	I
Prey Availability	I	I	U	U	U
Benthic Habitat	I	I	I	I	I
Proc. Waste & Offal	I	I	I	I	I
Other Seabird Species (Section 4.7)					
Incidental Take	U	U	I	I	I
Prey Availability	I	I	U	U	I
Benthic Habitat	I	I	I	I	I
Proc. Waste & Offal	I	I	I	I	I
Marine Benthic Habitat (Section 4.8)					
Level of mortality and damage to living habitat	S-	I	I	I	S+
Modification of Benthic Community Structure	U	I	I	I	U
Changes in Distribution of Fishing Effort	I	I	I	I	S+

Coding: I = Insignificant, S = Significant, + = beneficial, - = adverse, U = Unknown					
Issue	**Alt. 1**	**Alt. 2**	**Alt. 3**	**Alt. 4**	**Alt. 5**
Ecosystem Considerations					
Pelagic forage availability	I	I	I	I	S+
Spatial and temporal concentration of fishery impact on forage	U	I	I	I	S+
Removal of top predators					
Trophic level of catch	U	I	I	I	I
Sensitive Top predator bycatch	S-	I	I	I	S+
Population Status of Top Predator	U	U	U	U	U
Introduction of nonnative species	S-	I	I	I	S+
Energy redirection					
Trends in offal and discard production levels	I	I	I	I	I
Scavenger population trends related to offal and discards	I	I	I	I	I
Bottom gear effort	S-	I	I	I	S+
Energy removal	I	I	I	I	I
Species diversity					
Population levels of target and nontarget relative to MSST or ESA listing thresholds linked to fishing removals	U	I	U	U	S+
Bycatch amounts of sensitive species lacking population estimates	S-	I	I	I	S+
Number of ESA listed marine species	I	I	I	I	I
Area closures	I	I	I	I	S+

Coding: I = Insignificant, S = Significant, + = beneficial, - = adverse, U = Unknown					
Issue	**Alt. 1**	**Alt. 2**	**Alt. 3**	**Alt. 4**	**Alt. 5**
Functional (trophic, structural habitat) diversity					
Guild diversity or size diversity changes linked to fishing	U	I	I	I	I
Bottom gear effort	S-	I	I	I	S+
HAPC biota bycatch	U	U	U	U	S+
Genetic diversity					
Degree of fishing on spawning aggregations or larger fish	U	I	U	U	U
Older age group abundances of target groundfish stocks	U	I	U	U	U
State waters seasons					
Harvest levels of groundfish in state waters seasons and parallel seasons	I	I	I	I	S-

Economic Indicators	Year	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5
First wholesale gross revenues	2005	S+	I	I	S-	S-
	2006	I	I	S-	S-	S-
Operating cost impacts	2005	S-	I	I	S+	S+
	2006	I	I	S+	S+	S+
Net returns to industry	2005	S+	I	I	S-	S-
	2006	I	I	S-	S-	S-
Safety and health impacts	2005	U	I	U	U	U
	2006	U	I	U	U	U
Impacts on related fisheries	2005	U	I	U	U	S-
	2006	U	I	U	U	S-
Consumer effects	2005	S+	I	I	I	S-
	2006	S+	I	I	I	S-
Management and enforcement costs	2005	S-	I	I	I	S+
	2006	S-	I	I	I	S+
Excess capacity	2005	S+	I	I	I	S-

Economic Indicators	Year	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5
	2006	S+	I	I	I	S-
Bycatch and discards	2005	I	I	I	I	S+
	2006	I	I	I	I	S+
Non-consumptive use values	2005	U	U	U	U	U
	2006	U	U	U	U	U
Subsistence	2005	U	I	U	U	U
	2006	U	I	U	U	U
Recreation	2005	U	I	I	U	U
	2006	U	I	I	U	U
Communities	2005	S+	I	I	S-	S-
	2006	I	I	S-	S-	S-

Cumulatively significant effects, including those on target and nontarget species
Cumulatively impacts are analyzed in Section 5.0 of this EA. Beyond the cumulative impacts analysis documented in the PSEIS and the SSL Protection Measures SEIS, no additional past, present, or reasonably foreseeable cumulative impact issues have been identified that would accrue from the 2005-2006 harvest specifications and the 2005 interim specifications. The 2005-2006 harvest specifications and 2005 interim specifications are therefore determined to have no new significant cumulative impacts over and above impacts evaluated in the most recent environmental impact statements prepared for these fisheries.

The specifications were determined following a process that has been fully analyzed in the 1998 SEIS and in the Final PSEIS. Moreover, this action in and of itself is of short duration, and its effects will be measurable only on a very fine scale. At the population level, the effects of a single year's specifications may be impossible to detect. The agency will attempt to more fully assess cumulative effects in future editions of the PSEIS when sufficient time has passed for analysts to be able to evaluate more clearly the cumulative environmental consequences of the annual BSAI and GOA specifications.

Comparison of Alternatives and Selection of a Preferred Alternative

Alternative 1 would set TACs in the BSAI above the upper limit of 2,000,000 mt for OY and has more potential for significantly adverse effects on a number of environmental components compared to Alternatives 2-5. Alternative 5 has the most significantly beneficial impact on environmental components but setting TACs to zero in both the BSAI and GOA would result in severe socioeconomic impacts. Neither Alternative 3 nor 4 uses the best and most recent scientific information on status of groundfish stocks nor takes into account socioeconomic benefits to the nation.

Alternative 2 is the preferred alternative because: 1) it takes into account the best and most recent information available regarding the status of the groundfish stocks, public testimony, and socio-economic concerns; 2) it sets all TACs at levels equal to or below ABC levels; 3) it falls within the specified range of OY for both the BSAI and GOA, and 4) it is consistent with the Endangered Species Act and the National Standards and other requirements of the Magunson Stevens Fishery Conservation and Management Act. Unknown effects on the environment are

not likely to be significant effects. The unknown impacts identified under the socioeconomic effects are not likely to affect the ability to determine that the implementation of Alternative 2 is not likely to cause significant impacts on the human environment. Council of Environmental Quality regulations at 40 CFR 1508.14 described the human environment as including socioeconomic concerns but those social or economic effects along are not intended to trigger the need for an EIS.

Initial Regulatory Flexibility Analysis

An Initial Regulatory Flexibility Analysis (IRFA) was prepared for these specification alternatives (see Chapter 7) to address the statutory requirements of the Regulatory Flexibility Act of 1980, as amended by the Small Business Regulatory Fairness Act of 1996.

The 2005-2006 specifications establish harvest limits for the groundfish species and species groups in the BSAI and GOA. This action is necessary to allow groundfish fishing in 2005 and 2006. About 844 small catcher vessels, 33 small catcher-processors, and six small private non-profit CDQ groups may be directly regulated by these specifications.

Estimated first wholesale revenues by species group were used to evaluate potential adverse impacts on regulated small entities. In general, in the BSAI, the preferred alternative (Alternative 2) will be associated with small overall increases in species gross revenues in 2005, and small decreases in 2006. Overall the preferred alternative appears to have little net adverse or beneficial impact. Revenues from most species appear to rise somewhat. The main exception to this is the sablefish fishery. The gross revenue model projects that sablefish revenues will drop by about 15% from 2004 to 2005. The gross revenue projections are believed to have large confidence intervals. Nevertheless, the preferred alternative appears to be associated with adverse impacts on sablefish fishermen in the BSAI.

Gross revenues for the six BSAI CDQ groups do not appear to change significantly from 2004 to 2005 and and 2006. The model suggests a slight increase in 2005 and a slight decrease in 2006. The small changes suggest that the preferred alternative will have little net impact, adverse or beneficial, on this class of small entities.

Gross revenues in the GOA appear to decline. The model suggests a $16 million decline in 2005 and a $32 million decline in 2006. Revenues from most species change little under the preferred alternative. However, there is a significant decline in first wholesale revenues for sablefish fishermen. Declines in sablefish revenues are the chief source of the decline in overall GOA revenues. Many small entities operate in the sablefish fishery and would be adversely affected by these specifications.

The analysis examined one alternative (Alternative 1) that would have a smaller adverse impact on small entities. However, this alternative was associated with harvests above biologically acceptable levels and therefore is inconsistent with statutory requirements.

The action does not impose new recordkeeping or reporting requirements on small entities. The analysis did not reveal any Federal rules that duplicate, overlap or conflict with the proposed action.

1.0 Purpose and Need

1.1 Introduction

Each year the North Pacific Fishery Management Council (Council) recommends, and the Secretary of Commerce (Secretary) publishes, harvest specifications for the Bering Sea and Aleutian Islands (BSAI) and the Gulf of Alaska (GOA) groundfish fisheries. Harvest specifications establish specific limits on the commercial harvest of groundfish and are used to manage the groundfish fisheries. Harvest specifications include the setting of overfishing levels (OFLs), acceptable biological catches (ABCs), total allowable catches (TACs), and prohibited species catches (PSC). Specifications also include the setting of seasonal apportionments and allocations for TACs and PSCs. The purpose of this action is to establish the 2005-06 harvest specifications for the groundfish fisheries in the BSAI and GOA.

This document contains an Environmental Assessment and an Initial Regulatory Flexibility analysis (EA/IRFA) for the proposed specifications for 2005-2006 and an EA for interim specifications for 2005.[1] This EA/IRFA addresses the statutory requirements of the National Environmental Policy Act (NEPA) and the Regulatory Flexibility Act (RFA). The purpose of the environmental assessment (EA) is to predict whether the 2005-06 final harvest specifications, and the 2005 interim specifications, will have significant impacts on the human environment. If the predicted impacts from the preferred alternatives are not significant, and those alternatives are chosen, no further analysis is necessary to comply with the requirements of NEPA.[2]

The 2005-06 harvest specifications are necessary for the management of the groundfish fisheries and the conservation of marine resources, as required by the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) and as described in the management policy, goals, and objectives in the groundfish Fishery Management Plans.

1.2 The Harvest Specifications Process

Fishing areas and the fishing year

TAC specifications define upper retained harvest limits, or fishery removals, for a fishing year. These specifications are made for each managed species or species group, and in some cases, by species and sub-area.

Sub-allocations of TAC are often made for biological and socio-economic reasons according to percentage formulas established through fishery management plan (FMP) amendments. For particular target fisheries, TAC specifications are further allocated within management areas (Eastern, Central, Western Aleutian Islands; Bering Sea; Western, Central, and Eastern Gulf of Alaska), among management programs (open access or community development quota program), processing components (inshore or offshore), specific gear types (trawl, non-trawl, hook-and-line, pot, jig), and seasons, according to regulations at 50 CFR 679.20, 679.23, and 679.30. TAC can be further allocated to the various gear groups, management areas, and seasons according to pre-

[1] Specifications are exempt from RIR requirements per OMB guidance on EO 12291 and 12886, so long as the specifications are statements of annual quota only, and do not include other management measures. Interim specifications are exempt from the requirements of the RFA because they do not require public comment.

[2] See chapter 7.0 for the purpose and need of the IRFA.

determined regulatory actions and by regulatory announcements by NMFS management authorities, opening and closing fisheries accordingly. No foreign fisheries are conducted in the exclusive economic zone (EEZ) off Alaska and therefore, the entire TAC amount is available to the domestic fishery. The gear authorized in the Federally managed groundfish fisheries off Alaska includes trawl, fixed gear, longline gear, pot gear, and nontrawl gear (50 CFR 679.2).

Fishing areas correspond to the defined regulatory areas within the fishery management units. The BSAI is divided into nineteen reporting areas, some of which are combined for TAC specifications purposes. The GOA is divided into eight reporting areas. The Western Gulf is Area 610, the Central Gulf includes Areas 620 and 630, and the Eastern Gulf includes Areas 640 and 650. State waters in Prince William Sound is Area 649. State waters in Southeast Alaska is Area 659. The Aleutian Islands group comprises regulatory Areas 541, 542, and 543, representing the Eastern Aleutian Islands, Central Aleutian Islands, and Western Aleutian Islands, respectively. The BSAI and GOA regions, with most management areas, are shown in Figures 1-1 and 1-2 at the end of this chapter.

Figure 1.2-1 Management areas in the Bering Sea and Aleutian Islands

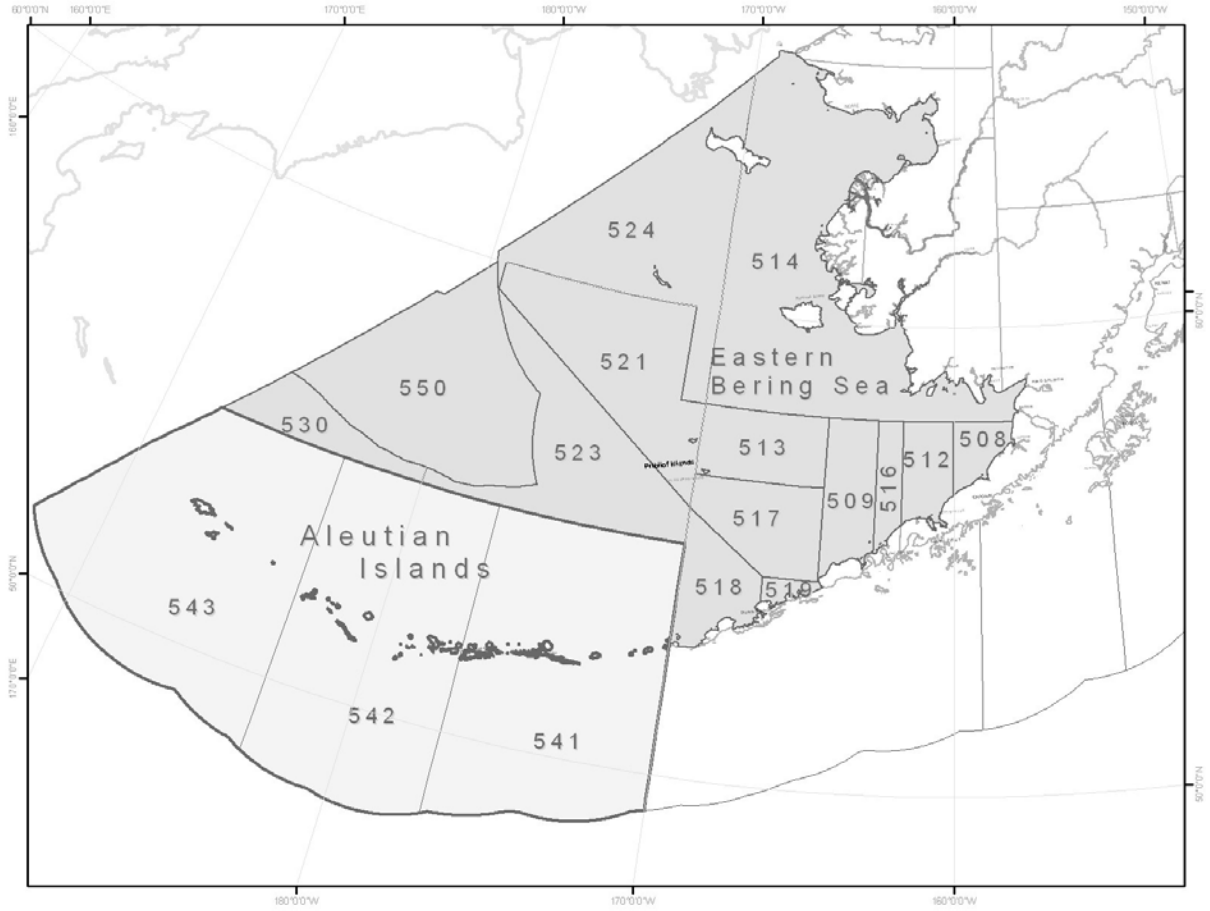
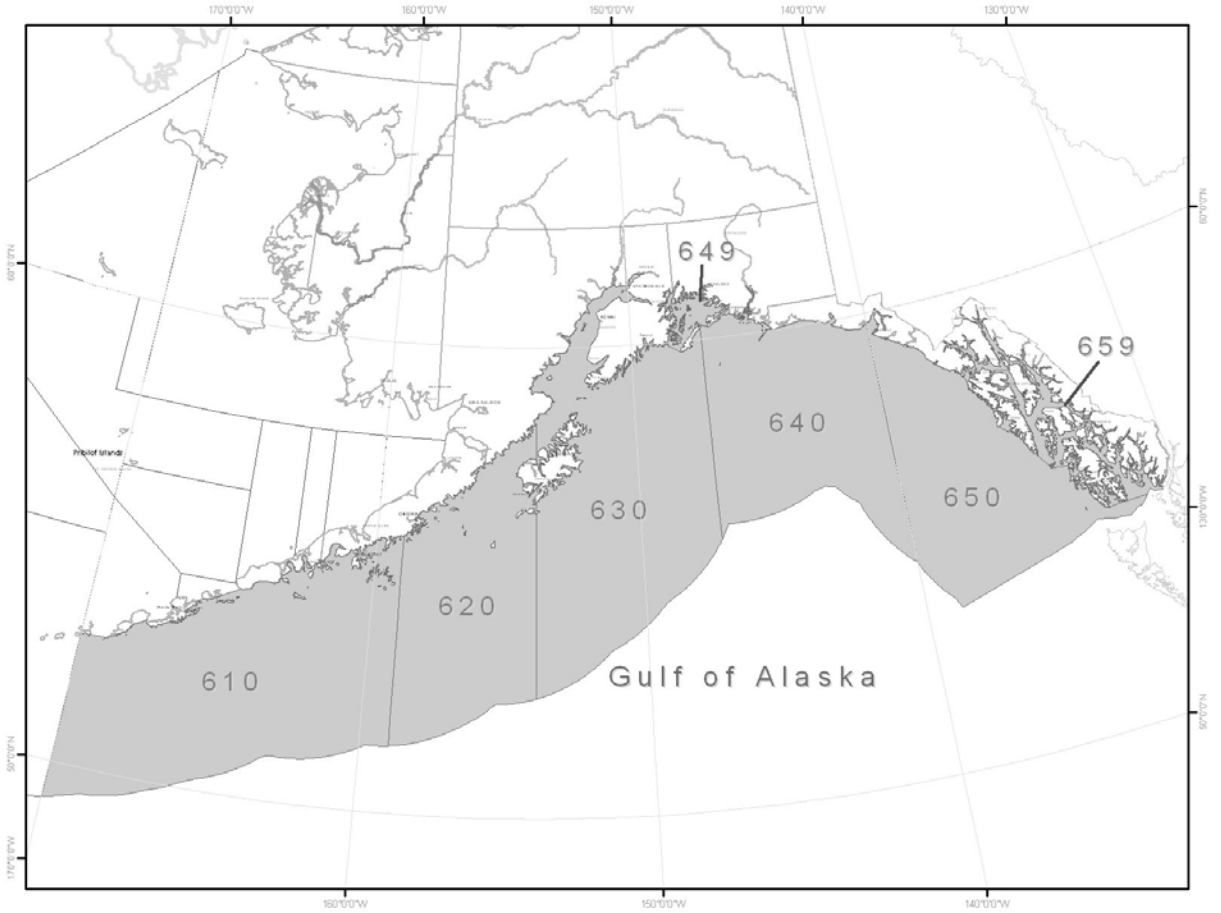


Figure 1.2-2 Management areas in the Gulf of Alaska



The fishing year coincides with the calendar year, January 1 through December 31 (§ 679.2 and 679.23). Depending on the target species' temporal allocation, additional specifications are made to particular seasons within the fishing year. TACs not harvested during a fishing year are not rolled over from that year to the next. Fisheries are opened and closed by regulatory announcement. Closures are made when inseason information indicates the apportioned TAC or available prohibited species catch (PSC) limit has been or will soon be reached, or at the end of the specified season, if the particular TAC has not been taken.

Harvest specifications for the federal groundfish fisheries are set each year. This process may change to biennial for some species if Amendments 48/48 are approved (See Section 1.4 for more detail). The process includes review of the annual Stock Assessment and Fishery Evaluation (SAFE) reports , including the Ecosystem and Economic reports (Appendices A, B, C, and D) by the North Pacific Fishery Management Council (Council), its Advisory Panel (AP), and Scientific and Statistical Committee (SSC). Using the information from the SAFE reports and the advice from Council committees, the Council makes harvest specification recommendations for the next year. NMFS reviews and makes a determination whether to approve the recommendations.

Plan teams and SAFE documents

Establishing harvest specifications involves the gathering and analysis of fisheries data. The groups responsible for analyzing and packaging the data for Council consideration are the Council's Groundfish Plan Teams (Plan Teams). These teams include NMFS scientists and managers, Alaska, Oregon, and Washington fisheries management agencies scientists, and university faculty.

Using stock assessments prepared annually by NMFS and by the Alaska Department of Fish and Game (ADF&G), Plan Teams calculate biomass, ABC, and OFL for each species or species group, as appropriate, for specified management areas of the EEZ off Alaska. Plan Team meetings are held in September to review potential model changes and are used for developing proposed ABC recommendations. In November, the Plan Teams' rationale, models, and resulting ABC and OFL calculations are documented in annual SAFE reports. The SAFE reports incorporate biological survey work recently completed, any new methodologies applied to obtain these data, and ABC and OFL determinations based on the most recent stock assessments. Periodically, an independent expert panel reviews the assumptions used in the stock assessments for a selected species or species group and provides recommendations on improving the assessment.

At its December meetings, the Council, its AP, its SSC, and interested members of the public, review the SAFE reports and make recommendations on harvest specifications based on the information about the condition of groundfish stocks in the BSAI and GOA fishing areas. The harvest specifications recommended by the Council for the upcoming year's harvest quotas, therefore, are based on scientific information, including projected biomass trends, information on assumed distribution of stock biomass, and revised technical methods used to calculate stock biomass. SAFE reports are part of the permanent record on the fisheries.

Proposed, interim, and final specifications

The specification of the upcoming year's harvest levels is currently a three-step process. In the first step, proposed harvest specifications including ABCs, TACs, and PSC limits[3] are recommended by the Council at its October meeting and published in November or December in the *Federal Register* for public review and comment. The proposed BSAI specifications for 2004 were published on December 2, 2003 (68 *FR* 67642), while the proposed GOA specifications for 2004 were published on December 5, 2003 (68 *FR* 68002).

In October, most current year stock assessments are not yet available. Proposed harvest specifications for a number of target species are based on projections from the current SAFE reports; the proposed specifications for other species, for which little stock assessment information is available, are based on rollovers of the current year's harvest specifications.

For most BSAI target species, the initial TAC (ITAC) is calculated as 85 percent of the proposed TACs (50 CFR § 679.20(b)). The remaining 15 percent is split evenly between the Western Alaska Community Development Quota (CDQ) program reserve and a non-specified groundfish reserve. Pollock is handled somewhat differently; 10% of the TAC is allocated to a CDQ reserve,

[3]BSAI crab, halibut, salmon, and herring limits are established in regulations and the Council recommends target fishery and seasonal apportionments of these PSC limits. The Council recommends the GOA halibut PSC limits, fishery, and seasonal apportionments.

and the remainder is allocated to a pollock ITAC. There is no pollock reserve. Sablefish is also handled differently; 20% of the sablefish hook-and-line and pot gear allocations are placed in the CDQ reserve.

In the GOA, ITACs equal the full TAC, except for pollock, Pacific cod, flatfish, and "other" species. The ITACs for these four species or species groups equal 80 percent of the TACs. The remaining 20 percent of the TACs are established as a species specific reserve.

The Council's recommended proposed OFL, ABC, and TAC levels do not become available until the end of its October meetings. It is difficult for NMFS to publish proposed specifications before late November or early December, and making it unlikely that final specifications can be published before January 1 of the new fishing year. In fact, final specifications have typically been published in February or March of the new year. NMFS uses interim specifications to allow the fishery to open in January and operate until the final specifications are published.

In the second step, therefore, NMFS publishes interim specifications to manage the fisheries from January 1 until they are superceded by the final specifications. As specified in 50 CFR § 679.20(c)(2), interim specifications are one-fourth of each proposed ITAC in the BSAI and proposed TAC in the GOA and apportionment thereof, one-fourth of each proposed PSC allowance, and the first seasonal allowance of GOA and BSAI pollock, Pacific cod, and BSAI Atka mackerel. These interim specifications are in effect on January 1 and remain in effect until superceded by final specifications.

The interim PSC limits are one quarter of the annual limit and PSC reserves. 7.5 percent of the PSC limits are set aside to establish the prohibited species quota (PSQ) for the CDQ program (50 CFR § 679.21(e)(1)(i)). For interim specifications, PSQ reserves are subtracted from the previous year's PSC limit, and 25 percent of the remaining amounts is established as an interim value until final specifications are adopted.

NMFS publishes the interim specifications in the *Federal Register* as soon as practicable after the October Council meeting. The 2004 interim specifications for the BSAI were published on December 8, 2003 (68 *FR* 68265), and for the GOA on December 5, 2003 (68 *FR* 67964).

Retention of sablefish in the BSAI with fixed gear is not currently authorized under interim specifications. Further, existing regulations do not provide for an interim specification for the CDQ non-trawl sablefish reserve or for an interim specification for sablefish managed under the IFQ program. This means that retention of sablefish in the BSAI taken with hook-and-line or pot gear is prohibited prior to the effective date of the final harvest specifications.

In the third step, final TAC and PSC specifications are recommended by the Council at its December meeting following completion of analysis of any new stock status information. These TAC specifications and PSC limits, and apportionments thereof, are recommended to the Secretary for implementation in the upcoming fishing year. With the final specifications, most of the non-CDQ reserves are released and the final TAC is increased by the amount of reserves released. Currently, the final specifications are typically implemented in February or March and replace the interim specifications as soon as they are in effect.

Rulemaking process and publication of the specifications rule

The current process used by the Alaska Region to publish most rules involves the Sustainable Fisheries Division drafting the rule package, with review by the Regional Enforcement Division,

Protected Resources Division, Habitat Conservation Division, Restricted Access Management Division, and the Regional General Counsel. After Regional review is completed, the rule is forwarded to NMFS Headquarters, the Office of Sustainable Fisheries in Silver Spring, Maryland, where it undergoes reviews within NMFS before being forwarded to NOAA General Counsel. After clearing NOAA, the rule is reviewed by Department of Commerce (DOC) and usually the Office of Management and Budget. OMB review has been waived for harvest specifications in the past on the basis that the harvest specifications process was part of a framework process. After the rule has cleared NOAA, DOC, and OMB, the rule is forwarded to the Office of the Federal Register. This Headquarter's review process normally takes at least 30 days for a proposed rule, but can take much longer depending on the complexity of the rule, degree of controversy, or other workload priorities within different review tiers. The review process is repeated for the final rule and may or may not include additional OMB review, depending on the nature of the action.

Public involvement may occur at a number of stages during harvest specifications development. Table 1.2-1 provides an overview of the points of decision making and the opportunity for public comment. Public comments are welcomed and encouraged throughout the Council process. Comments received before and during the December Council meeting are considered in developing the final specification. When the Council makes a recommendation, the Secretary is required by the Administrative Procedure Act (APA) and the Magnuson-Stevens Act to provide opportunity for public review and comment on the proposed action that the Secretary will take, based on the Council's recommendations. NMFS is the final decision maker for approval and implementation of fishery specifications.

Table 1.2- 1 Current Groundfish Harvest Specifications Setting Process

Time	Activity	Opportunity for public involvement	Decision points
January to August (of year prior to fishing year)	Plan and conduct stock assessment surveys	Casual (staff and public may interact directly with stock assessment authors)	Cruise Plans finalized. Scientific Research Permits issued. Finalize lists of groundfish biomass and prediction models to be run. Staff assignments and deadlines set
August-September	Preparation of proposed specifications recommendations. Groundfish Plan Teams meeting	Open Public Meetings. *Federal Register* Notice of Plan Team's meeting	Stock assessment teams fully scope out work necessary to complete SAFE reports, models to run, emerging ecosystem issues
September	Staff start drafting proposed and interim harvest specifications notices and EA/IRFA based on current year's specifications or current report projections	None	Proposed specifications initially based on current year's specs. or projections. Interim specifications are formula driven based on proposed harvest specifications
October 1-7 or so	October Council Meeting Presentation of proposed specifications, highlights of differences seen in recent surveys and ecosystem from past years. Council recommends proposed and interim specifications.	Open Public Meeting. *Federal Register* Notice of initial action on next year's harvest specifications as an agenda item	Council recommends proposed harvest specifications
November	NMFS reviews interim and proposed specifications	None	NMFS publishes proposed and interim specs
November	November Plan Team Meetings. Staff start drafting EA/IRFA for final specs. Finalize SAFE Reports. Initiation of informal Section 7 Consultation on final specs if needed	Open Public Meetings. *Federal Register* Notice of Plan Teams' Meetings	Plan Teams make their ABC recommendations. Determination of whether Section 7 Consultation is needed and if it has to be formal or informal
November- December	File proposed and interim specification rules with *Federal Register.* Interim specs. EA	Written comments accepted on for 30 days comment period for proposed rule. Comments welcome on EA/IRFA for proposed specs. Some specifications announced in the proposed rule **are not** the same as the final specifications that will be in the final rule	Interim specifications effective on Jan. 1 or date of publication if after Jan. 1. Not realistic documents for which to invite public comments; however, by regulation, comments are accepted and are responded to in preamble to the final rule
December 10-17	December Council Meeting. Release and present Draft EA/IRFA containing Final SAFE Reports, Ecosystem information, Economic SAFE report	Open Public Meeting *Federal Register* notice. Agenda includes next year's harvest specifications. Last meaningful opportunity for comments on the next year's quotas	Determine amount to nearest mt of next year's TAC and PSC quotas.
Late December-January	NMFS staff draft final harvest specifications rule. Harvest specifications	Comments related to information released prior to and during December Council	ESA Section 7 and EFH consultation concluded on final specifications. FONSI

Time	Activity	Opportunity for public involvement	Decision points
	EA/FRFA finalized	meeting may still be trickling in. Those comments are given consideration in final edits of the EA/FRFA. No public comment period for EA/FRFA	determination.
February of **subject fishing year**	Submit final rule to Secretary for filing with Office of Federal Register	None	Secretarial determination whether to approve Council recommendation.
February or March of **subject fishing year**	*Federal Register* publication of Final Rule	None. Administrative Procedure Act sets up 30 day cooling off period that may be waived for good cause.	Final harvest specifications replace interim specifications on date of effectiveness.

1.3 Amendments 48/48 and the Transition to a New Specifications Process

Amendments 48/48 were unanimously recommended by the Council in October 2003. A notice of availability (NOA) for the FMP amendments was published on July 14, 2004 (69 *FR* 42128), and a proposed rule was published on July 27, 2004 (69 *FR* 44634). The comment period for the NOA ended on September 13, 2004, while the comment period on the proposed rule ended on September 10, 2004. After the end of the comment period on the NOA, the Secretary has 30 days in which to reach a decision on the amendments. Pending Secretarial approval, a final rule could be published in November 2004.

If approved by NMFS, these amendments would revise the administrative process used to establish harvest specifications for the groundfish fisheries of the BSAI and GOA. Amendments 48/48 provide a process that allows for adequate prior public review and comment on the annual harvest specifications and supporting information and allows the groundfish fisheries to be managed based on the best available scientific information.

Each year in October, in consideration of the current stock assessment survey schedules, regulatory procedures, and quality of stock assessment information for the GOA and BSAI target species, the proposed harvest specifications process would authorize specifications that would be effective for up to 2 years. NMFS would review the recommendations and publish proposed harvest specifications in November or early December, including detailed descriptions of what the final harvest specifications are likely to be and the new information anticipated to support them. In November, the new SAFE reports would be forwarded to the Council by the Council's Groundfish Plan Teams. The Council would consider the new SAFE reports, public comments on the proposed harvest specifications, and public testimony and then develop recommendations for the final harvest specifications in December. NMFS would review those recommendations and public comment on the proposed harvest specifications, and specifically determine if the final harvest specifications are a logical outgrowth of the proposed harvest specifications. If the final harvest specifications recommendations are consistent with applicable law and are a logical outgrowth of the proposed harvest specifications, the final harvest specifications may be published without additional public review and comment.

If the final harvest specifications recommendations are not a logical outgrowth of the proposed harvest specifications, an additional publication of proposed harvest specifications may be needed to provide an additional opportunity for prior public review and comment under the APA. In May or June of the following year, the final harvest specifications would be published based on the additional proposed harvest specifications and after consideration of public comment. Alternatively, depending on the

circumstances, NMFS may find "good cause" to waive the additional publication of proposed harvest specifications for prior public review and comment. In this case, the final harvest specifications likely would become effective in March.

To provide opportunity for an additional public comment period after the Council's final harvest specifications recommendation in December, the groundfish fisheries in the new fishing year would be managed on the specifications that had been published previously. Each year the harvest specifications would be superseded by the new annual harvest specifications. This proposed specification process would eliminate the need for the interim harvest specifications. Having harvest specifications effective in the second fishing year would allow time for NMFS to complete an additional public review and comment period, if needed, while preventing disruption of the fisheries.

To provide consistency between the groundfish FMPs for the harvest specifications process and to provide flexibility during the harvest specifications process, Amendments 48/48 allow specifications to be effective for up to 2 fishing years. The stock assessment models used for determining the harvest specifications would use 2- year projections for biomass and acceptable biological catch. The frequency of fishery resource surveys also affects whether specifications should be done on a more or less frequent basis. Allowing specifications to be effective for up to 2 years would fit well with the frequency of stock projections that must be used for the harvest specifications, and would provide the Council and NMFS the flexibility to adjust the specifications time periods in response to potential changes in the frequency of stock assessment surveys or other stock assessment data or administrative issues.

The Council recommended that harvest specifications for the hook-and-line gear and pot gear sablefish individual fishing quota (IFQ) fisheries be limited to the succeeding fishing year to ensure those fisheries are conducted concurrent with the halibut IFQ fishery. Having the sablefish IFQ fisheries concurrent with the halibut IFQ fishery would reduce the potential for discards of halibut and sablefish in these fisheries. The sablefish IFQ fisheries would remain closed at the beginning of each fishing year, until the final harvest specifications for the sablefish IFQ fisheries are in effect. The trawl sablefish fishery would be managed using harvest specifications for to 2 years with the remaining target species in the BSAI and with GOA pollock, Pacific cod, and the "other species" complex

The years 2005-2006 are a transitional period in the introduction of Amendments 48/48. Until a two-year sequence of specifications is in place, it is necessary to continue to use interim specifications for one more year. To implement harvest specifications in the time period between January 2005, and the effective date of the final 2005 harvest specifications, the 2004 harvest specifications process will have to include an interim rule provision for 2005. The harvest specifications would apply in 2005 and 2006, with harvest specifications for most species being superceded in 2006 by the 2005 harvest specifications process setting specifications for 2006 and 2007. The interim specifications will be used to manage the fishery until the final specifications are in place in approximately March 2005. This would be the only time interim specifications would be permitted for implementing harvest specifications.

A year from now, in October and December 2005, the Council would make recommendations for proposed and final rulemaking for 2006, and the first half of 2007, for most species and for all of 2007 and 2008 for certain GOA species. No interim specifications would be needed because specifications would be in place from final specifications for 2005 and 2006. Development of harvest specifications for GOA species on a biennial schedule will not be required in 2006 and the following even years. See Table 1.3-1 for Amendments 48/48.

Under this approach, the IFQ sablefish specifications developed in 2004 would apply to 2005 only. In the following years, the harvest specifications for most species will be implemented for up to two years and the harvest specifications for IFQ sablefish will be needed for only the first year, as separate rulemaking would be used to ensure the IFQ specifications are in place by the beginning of the fishery in March, if necessary. For example, harvest specifications recommended for the groundfish fisheries, except IFQ sablefish, in 2005 would be implemented for 2006 and 2007, with 2007 specifications superceded by the new 2007 specification. IFQ sablefish harvest specifications developed in 2005 would only need to cover 2006.

Table 1.3-1 Amendment 48/48 Implementation Schedule

Council Recommendation Year	Council Recommends	Annual Harvest Specifications process, except IFQ sablefish	Biennial Harvest Specifications process.	IFQ Sablefish Specifications
2004 (initial year)	proposed , interim and final harvest specs.	2005 and 2006	2005 and 2006	2005
2005	proposed and final harvest specs.	2006 and 2007	2007 and 2008	2006
2006	proposed and final harvest specs.	2007 and 2008		2007
2007	proposed and final harvest specs.	2008 and 2009	2009 and 2010	2008
2008	proposed and final harvest specs.	2009 and 2010		2009

1.4 Required analyses

Compliance with the Magnuson-Stevens Act, NEPA, the Endangered Species Act (ESA), and the Regulatory Flexibility Act (RFA) requires the development of detailed analyses of the potential impacts of the harvest specifications. This process usually involves the development of the SAFE, NEPA, and RFA documents first, with consultations on ESA listed species and essential fish habitat (EFH) based on the preliminary preferred alternative in the NEPA document. These analyses are drafted to inform decision makers within the Council and NMFS.

An EA is normally written each year for the harvest specifications. The draft ESA and EFH consultations may be included in the draft EA as appendices to provide opportunity for public review and comment, and for the decision makers to consider ESA and EFH concerns before making a final decision. The RFA documents provide analysis of the potential impacts of the action on small entities.

Four versions of the 2004 harvest specification EA (along with associated Initial Regulatory Flexibility Analysis (IRFA) and Final Regulatory Flexibility Analysis (FRFA) required by the RFA) will be prepared. Each version reflects updated information on fish stocks and TACs, and each is addressed to the public and decision makers at a different point in the decision making process. Table 1.4-1 summarizes the four versions.

Table 1.4-1 2005-06 EA/IRFA/FRFA Versions

Version	New information on ABCs and TACs	Decision-making audience
September EA/IRFA	$_{Max}F_{ABC}$ and TACs for different F rates updated by rerunning models based on projected 2004 and 2005 harvests, or by rolling over 2004 ABCs and TACs for species for which this was not possible.	October AP, SSC, and Council deliberations on recommendations for proposed harvest specifications. (Proposed specifications are used for interim specifications.)
October EA/IRFA	Recommendations from the Council on ABCs and TACs.	Secretarial decision-making on interim specifications.
November EA/IRFA	SAFE reports finalized; November Plan Team recommendations.	December AP, SSC, and Council deliberations on recommended specifications.
January EA/FRFA	Council December recommendations. Public comment on proposed specifications and IRFA.	Secretarial decision-making on final specifications.

The current document is the September version. This, and subsequent, versions of the EA/IRFA may be found on the National Marine Fisheries Service, Alaska Region, analyses web page: http://www.fakr.noaa.gov/analyses/ .

1.5 The Groundfish Programmatic Supplemental Environmental Impact Statement (PSEIS) and the Harvest Specifications EA

The implementation of the 2005-06 harvest specifications is a project level action within the fishery management programs under the groundfish FMPs. In September 2004, NMFS completed an SEIS that analyzed the impacts of the groundfish fisheries program on the human environment. The following provides background information on this PSEIS and the relationship between this EA/RIR and the PSEIS.

The EISs for the GOA and BSAI Groundfish FMPs were prepared in 1978 and 1981, respectively. NEPA requires preparation of an EIS or SEIS when significant environmental changes have occurred. Significant changes have occurred in the GOA and BSAI groundfish fisheries and the GOA and the BSAI environment since the original EISs for the GOA and BSAI FMPs were published approximately 25 years ago. These changes include (but are not limited to) the following: the fisheries have shifted from primarily foreign fisheries to completely domestic fisheries; the FMPs governing the fisheries have been amended numerous times; new information is available about the ecosystem; the science of fisheries management has progressed substantially; public opinion about the management of these fisheries has changed; and several bird and marine mammal species have been listed as threatened or endangered under the Endangered Species Act.

While EAs and several EISs have been prepared for BSAI and GOA FMP amendments over the ensuing years, none has comprehensively examined the groundfish FMPs at a programmatic level. In 1999, U.S. District Court Judge Thomas S. Zilly issued a ruling in *Greenpeace v. National Marine Fisheries Service*, 55 F.Supp.2d 1248 (W.D.Wash.1999) that a 1998 SEIS prepared for BSAI and GOA FMPs was legally inadequate and remanded the document to NOAA for additional analyses, directing NOAA Fisheries to produce a "programmatic" SEIS.

The Alaska Groundfish Fisheries PSEIS has multiple purposes. First, it serves as the central environmental document supporting the management of the BSAI and GOA groundfish fisheries. The historical and scientific information and analytical discussions contained therein are intended to provide a broad, comprehensive analysis of the general environmental consequences of fisheries management in the Exclusive Economic Zone (EEZ) off Alaska. The document also provides agency decision-makers and the public with an analytical reference document necessary for making informed policy decisions in managing the groundfish fisheries and sets the stage for future management actions. In addition, it describes and analyzes current knowledge about the physical, biological, and human environment in order to assess impacts resulting from past and present fishery activities. The PSEIS is intended to bring both the decision-maker and the public up to date on the current state of the environment, while describing the potential environmental consequences of alternative policy approaches and their corresponding management regimes for management of the groundfish fisheries off Alaska. In doing so, it serves as the overarching analytical framework that will be used to define future management policy with a range of potential management actions.

The Council on Environmental Quality (CEQ) regulations encourages agencies preparing NEPA documents to "tier their environmental impact statements to eliminate repetitive discussions of the same issues and to focus on the actual issues ripe for decision at each level of environmental review":

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

In 40 CFR 1508.28, the CEQ regulations further define tiering as

> the coverage of general matter in broader environmental impact statements …with subsequent narrower statements of environmental analyses….incorporating by reference the general discussion and concentrating solely on the issues specific to the statement subsequently prepared.

This section of the CEQ regulations further notes that

> "tiering is appropriate when the sequence of statements or analysis is
>
> (a) From a program, plan, or policy environmental impact statement to a program, plan, or policy statement or analysis of lesser scope or to a site-specific statement or analysis…" (40 CFR 1508.28)

This EA thus tiers off of the PSEIS incorporating by reference information on the status of the environment and impacts of groundfish fisheries on the human environment. The 2005-06 harvest specifications would implement a portion of the goals and objectives of the preferred alternative in the PSEIS. The preferred alternative was implemented as Amendments 81 and 74 to the BSAI and GOA FMPs, respectively (69 FR 31091, June 2, 2004, approved August 26,

2004). See Appendix G for the complete amendments. The specific goals (italicized) and numbered objectives of Amendments 81and 74 that are related to this proposed action are:

Prevent Overfishing:

1. Adopt conservative harvest levels for multi-species and single species fisheries and specify optimum yield.
2. Continue to use the existing optimum yield cap for the BSAI (as stated in current law) groundfish fisheries.
3. Continue to improve the management of species through species categories.

Promote Sustainable Fisheries and Communities:

6. Promote conservation while providing for optimum yield in terms of providing the greatest overall benefit to the nation with particular reference to food production, and sustainable opportunities for recreational, subsistence, and commercial fishing participants and fishing communities.
7. Promote management measures that, while meeting conservation objectives, are also designed to avoid significant disruption of existing social and economic structures.
8. Promote fair and equitable allocation of identified available resources in a manner such that no particular sector, group or entity acquires an excessive share of the privileges.

Preserve Food Web:

13. Incorporate ecosystem-based considerations into fishery management decisions, as appropriate.

Manage Incidental Catch and Reduce Bycatch and Waste:

14. Continue and improve current incidental catch and bycatch management program.
16. Continue to manage incidental catch and bycatch through seasonal distribution of TAC and geographical gear restrictions.
19. Continue to account for bycatch mortality in TAC accounting and improve the accuracy of mortality assessments for target, PSC bycatch, and non-commercial species.
20. Control the bycatch of prohibited species through PSC limits or other appropriate measures.

Avoid Impacts to Seabirds and Marine Mammals:

22. Continue to cooperate with USFWS to protect ESA-listed seabird species, and if appropriate and practicable, other seabird species.
23. Maintain or adjust current protection measures as appropriate to avoid jeopardy of extinction or adverse modification to critical habitat for ESA-listed Steller sea lions.
25. Continue to cooperate with NMFS and USFWS to protect ESA-listed marine mammal species, and if appropriate and practicable, other marine mammal species.

Promote Equitable and Efficient Use of Fishery Resources:

31. Provide economic and community stability to harvesting and processing sectors through fair allocation of fishery resources.

33. Develop management measures that, when practicable, consider the efficient use of fishery resources taking into account the interest of harvesters, processors, and communities.

Improve Data Quality, Monitoring and Enforcement:

45. Continue to cooperate and coordinate management and enforcement programs with the Alaska Board of Fish, Department of Fish and Game, and Alaska Fish and Wildlife Protection, the U.S. Coast Guard, NMFS Enforcement, IPHC, Federal agencies, and other organizations to meet conservation requirements; promote economically healthy and sustainable fisheries and fishing communities; and maximize efficiencies in management and enforcement programs through continued consultation, coordination, and cooperation.

This EA/RIR tiers from the PSEIS for two reasons: (1) the 2005-06 harvest specifications would implement a portion of the program analyzed in the PSEIS and (2) except for the no-action alternative (Alternative 5), the alternatives in this EA/RIR are within the scope of the preferred alternative in the PSEIS. The PSEIS analysis covers the groundfish fisheries program up to January 2002, including the Steller sea lion protection measures as currently implemented. Because this document is tiered from the PSEIS, detailed discussions that are provided in the PSEIS that are applicable to this analysis are referenced and, as necessary, summarized in this EA/RIR. The Affected Environment Section (Chapter 3) of this document adopts by reference much of the affected environment discussion in the PSEIS. Additional detailed information is provided if new information became available after January 2002, or if the PSEIS did not cover the topic in sufficient detail to support this analysis. For instance, the Stock Assessment and Fishery Evaluation (SAFE) reports are not part of the PSEIS but are crucial analyses developed each year for the harvest specifications process. The most recent SAFE reports (2003) are appended to this EA/RIR for the harvest specifications (Appendices A and B). Later versions of this EA will be revised to append the new 2004 SAFE reports in place of the 2003 reports.

2.0 Description of Alternatives

2.1 Introduction

This chapter is organized in five sections:

2.1 Introduction and description of the five alternatives
2.2 Bering Sea and Aleutian Islands management area (BSAI) specifications for each of the five alternatives (with separate sub-sections for the years 2005 and 2006)
2.3 Gulf of Alaska (GOA) specifications for each of the five alternatives (with sub-sections for 2005 and 2006)
2.4 Interim 2005 total allowable catch amounts (TACs) for the BSAI and GOA for each of the five alternatives.
2.5 Plan team OFL and ABC recommendations

Harvest specifications are management measures used to control groundfish fishing. Overfishing levels (OFLs) and acceptable biological catches (ABCs) are published with the harvest specifications and provide guidance to the Council and NMFS on the development of TACs. These values are scientifically developed based on the management schemes specified in the FMPs. The activities of the regulated community are controlled by the enforcement of TAC and prohibited species catch (PSC) limits, and the seasonal and area apportionments, and allocations, of those limits. TAC seasonal apportionments and allocations are specified in the regulations at 50 CFR part 679.

PSC limits are mostly set in regulation or in specifications recommended by the Council. The Council has discretion about how the PSC is apportioned and allocated, but these decisions are primarily driven by the amounts of groundfish TAC allocated to different fishing sectors. For instance, the Council will recommend allocating enough halibut PSC to the Pacific cod hook-and-line sector to allow it to fully harvest its Pacific cod TAC allocation, and avoid a fishery closure from reaching its halibut PSC limit.

Because the harvest specifications are driven by the available TAC amounts, and because the Council must decide on the TAC amounts to recommend to NMFS, the alternatives in this analysis are based on a range of TACs. Each of the five proposed and interim harvest specifications alternatives represents alternative amounts of TAC that could be set for managed species and species groups for the fishing years 2005 and 2006. The alternatives have been selected to display a wide range of TACs, and their impacts on the environment. TAC specifications are harvest quotas that include both retained catch and discarded catch. "F" stands for the fishing mortality for a stock (a ratio between fishing mortality and biomass size). Fishing mortality includes both retained and discarded catch mortality. The five alternatives are:

Alternative 1: Set TACs to produce fishing mortality rates, *F*, that are equal to $maxF_{ABC}$, "$maxF_{ABC}$" refers to the maximum permissible value of F_{ABC} under Amendment 56 to the groundfish fishery management plans (FMPs). Historically, TAC has been set at or below ABC, so this alternative provides a likely upper limit for setting TAC within the limits of ABC.

Alternative 2: Set TACs that fall within the range of ABCs recommended by the Plan Teams and TACs recommended by the Council. (Preferred alternative).

Under this scenario, F is set equal to a constant fraction of $maxF_{ABC.}$ The recommended fractions of $maxF_{ABC}$ may vary among species or stocks, based on other considerations unique to each.

Alternative 3: **For Tiers 1, 2, and 3, set TAC to produce F equal to 50% of $maxF_{ABC}$. For Tiers 4, 5, and 6, set TAC equal to 50% of TAC associated with $maxF_{ABC}$.** This alternative provides a likely lower bound on F_{ABC} that still allows future harvest rates to be adjusted downward should stocks fall below reference levels.

Alternative 4: **For Tiers 1, 2, and 3, set TAC to produce F equal to the most recent five year average actual F. For Tiers 4, 5, and 6, set TAC equal to the most recent five year average actual catch.** This alternative recognizes that for some stocks, TAC may be set well below ABC, and recent average F may provide a better indicator of F_{TAC} than F_{ABC}.

Alternative 5: **Set TAC equal to zero**. This alternative recognizes that, in extreme cases, TAC may be set at a very low level, perhaps zero. This is the no action alternative.

Except for Alternative 5, the alternatives analyzed in this EA/RIR are within the scope of the Preferred Alternative in the PSEIS. See Table 4.2-2 in the PSEIS for the Preferred Alternative bookends. This action is the TAC setting process within the FMP framework. The alternatives are based on setting TAC at various levels. The bookends for the action of setting TAC under the Preferred Alternative in the PSEIS are (1) setting the sum of the TACs to be within optimum yield range and (2) setting TAC less than or equal to ABC for all target and other species categories. Alternatives 2, 3, and 4 would establish TAC within the optimum yield range, and therefore, meet the first bookend described. Alternative 1 would set TAC at the ABC level, meeting the upper threshold defined by the second bookend of the PSEIS Preferred Alternative. Alternative 5 would set TAC at zero for target species and is considered the no action alternative, as required by NEPA for environmental analysis.

At its October meetings, the Council makes recommendations to the Secretary for proposed specifications. The Secretary normally publishes these in the *Federal Register* in late November or early December. The Plan Teams receive and review species analysts' SAFE reports at the November plan team meetings and make ABC recommendations to the Council at the December Council meetings. The Council makes its final specifications recommendations in December, and these are normally published in the *Federal Register* in late February or March of the following year. The final specifications become effective on publication.

So that fishing may begin January 1, interim TAC specifications are set based upon the proposed specifications. The interim specification authorize the release of one-fourth of each proposed TAC and apportionment thereof, one-fourth of each PSC and apportionment thereof, and the first seasonal allowance of pollock, Atka mackerel, and Pacific cod. Interim specifications are published in the *Federal Register* typically in December and are superseded by the final specifications. The interim TACs for fishing year 2005 associated with each of the TAC alternatives, are detailed in Section 2.4 of this document. The Council's October 2004 motion on the proposed specifications will provide the proposed specifications from which the interim specifications will be derived pursuant to 50 CFR 679.20(c)(2).

2.2 BSAI Alternatives

2.2.1 2005 and 2006 BSAI ABCs

"ABC" stands for acceptable biological catch. Goodman *et al.* explain the calculation of ABC as follows, "…As a starting point, scientists set ABC equal to F_{MSY} applied to the exploitable biomass, and if necessary, decreased to incorporate "safety factors and risk assessment due to uncertainty". This starting maxABC may be subsequently modified by the Plan Team, by the SSC, or by the Council." (Goodman, *et al.*, page 12). The fishing mortality rate associated with the maxABC is called "$_{max}F_{ABC}$." The "$_{max}F_{ABC}$" as subsequently modified by the plan team, the SSC or the Council, is called the ABC. The "F" referred to is a fishing mortality rate.

Table 2.2.1-1 summarizes estimates of the "$_{max}F_{ABC}$" and the modifications of these ABCs that constitute the Plan Teams' recommended ABCs, for 2005 and 2006.

The 2005 $_{max}F_{ABC}$ levels for species in Tiers 1, 2, and 3, were projected on the basis of estimates of 2004 harvests up to May 22, 2004, and of projected 2004 harvests through the remainder of the year. The details of these projections may be found in Appendix E. The estimated 2004 harvests were used in the Alaska Fisheries Science Center (AFSC) population dynamics models to project 2005 $_{max}F_{ABC}$ level.[4] The 2005 $_{max}F_{ABC}$ levels for species in other tiers were carried over from the final 2004 estimates. The 2005 $_{max}F_{ABC}$ levels were treated as estimates of 2005 mortality, and input into the AFSC population models to estimate 2006 $_{max}F_{ABC}$.

The Plan Team recommended ABCs were calculated in a similar way. The 2004 harvests were estimated as described in Appendix E, and used as inputs into the AFSC age structured dynamic population models. These models were calibrated to produce harvest rates corresponding to the 2003 assessment authors' recommendations for 2004 F rates. The results of these models were adopted as the ABCs for 2005. ABCs for species for which these models were not available were estimated by carrying over the 2004 ABCs. The 2005 ABCs were modified, as described in Section 2.2.2, to produce a set of 2005 species TACs falling within the BSAI OY level of two million metric tons. For Tier 1, 2, and 3 species, this new set of TACs was adopted as estimated fishing mortality for 2005, and reentered into the AFSC models to produce ABC estimates for these species for 2006. For species for which this approach was not possible, ABCs for 2006 were set equal to estimated 2005 ABCs.

As Table 2.2.1-1 shows, the 2006 $_{max}F_{ABC}$ for EBS pollock is less than the BSAI Plan Team recommended ABC in that year. This is a result of the different approaches to estimating these values. In 2005, these values are the same. However, the $_{max}F_{ABC}$ calculations assume that 2005 fishing mortality will equal $_{max}F_{ABC}$, while the Plan Team recommendations assume that 2005 fishing mortality will be constrained so that total fishing mortality falls within the two million metric ton BSAI OY. The lower 2005 fishing mortality under the projected Plan Team recommendations lead to a larger biomass and higher ABC in 2006.

[4] This was done for pollock, Pacific cod, Alaska plaice, Arrowtooth flounder, rock sole, flathead sole, Greenland turbot, yellowfin sole, Pacific ocean perch, northern rockfish, sablefish and Atka mackerel.

Table 2.2.1-1 2005-06 BSAI ABCs (in metric tons)

Species	Area	$_{Max}F_{ABC}$ ABCs		BSAI Plan Team recommended ABCs	
		2005	2006	2005	2006
Pollock	EBS	2,363,000	1,699,600	2,363,000	2,087,800
	Aleutian Islands	67,400	67,400	39,400	39,400
	Bogoslof District	29,700	29,700	2,570	2,570
Pacific cod	BSAI	299,400	270,500	225,500	220,500
Sablefish	BS	2,821	2,548	2,418	2,244
	AI	3,255	2,940	2,790	2,589
Atka mackerel	Total	49,470	44,180	49,470	44,180
	WAI	18,057	16,126	18,057	16,126
	EAI/BS	8,360	7,466	8,360	7,466
	CAI	23,053	20,588	23,053	20,588
Yellowfin sole	BSAI	109,300	103,570	109,300	105,250
Rock sole	BSAI	128,370	102,690	128,370	114,060
Greenland turbot	Total	14,630	11,160	11,230	10,430
	BS	9,802	7,477	7,524	6,988
	AI	4,828	3,683	3,706	3,442
Arrowtooth flounder	BSAI	117,420	95,500	96,140	96,300
Flathead sole	BSAI	56,860	45,540	56,860	53,380
Alaska plaice	BSAI	200,760	131,980	159,040	159,230
Other flatfish	BSAI	13,500	13,500	13,500	13,500
Pacific ocean perch	BSAI	13,320	13,370	12,020	12,170
	BS	2,131	2,139	1,923	1,947
	AI total	11,189	11,231	10,097	10,223
	WAI	5,158	5,177	4,655	4,713
	CAI	2,943	2,954	2,655	2,689
	EAI	3,088	3,100	2,787	2,821
Nothern rockfish	BSAI	6,680	6,450	6,030	5,850
Shortraker	BSAI	526	526	526	526
Rougheye	BSAI	195	195	195	195
Other rockfish	BS	960	960	960	960
	AI	634	634	634	634
Squid	BSAI	1,970	1,970	1,970	1,970
Other species	BSAI	63,200	63,200	46,810	46,810
Total		3,543,371	2,708,113	3,328,733	3,020,548

Note: The maxFABC ABCs for 2006 are based on the assumption that 2005 fishing mortality equals the 2005 maxFABC levels. The Plan Team recommended ABCs are based on the assumption that fishing mortality is at Alt 2 projected TAC levels. These are constrained by the BSAI OY, and by past Council specifications patterns. If fishing mortality under maxFABC ABCs is sufficiently higher than fishing mortality under Plan Team recommended ABCs in 2005, the 2006 Plan Team recommended ABC may be greater than the maxFABC ABCs.
Source: G:\FMGROUP\05specs\Sept EA-IRFA\Chapter 2\ Sept ABC and TAC worksheets.xls

2.2.2 2005 TACs

Table 2.2.2-1 summarizes the TACs for each of the five alternatives. The 2005 BSAI interim TACs are summarized in Table 2.4-1 in Section 2.4. The 2005 TACs were projected in different ways for Alternative 2, and for Alternatives 1, 3, 4, and 5.

The Alternative 2 TACs were projected in a two-step process. In the first step, preliminary TACs were prepared by taking the lesser of (a) the 2004 TAC, or (b) the 2005 ABC.[5] In other words, in the first step, the 2004 TACs were carried over to 2005, unless they were greater than the 2005 ABC, in which case TACs were set equal to ABC. This process produced TACs that summed to less than the 2 million mt OY. Given the current demand for fishing opportunities in the BSAI,

[5] ABCs are projected Plan Team recommended ABCs, determined as described in Section 2.2.1.

and the healthy status of the groundfish stocks, it is unlikely that the Council would not recommend allocating the entire OY among the different species TACs.

There are many ways this could be done. In the second step in this analysis, a mechanical approach, allocating among species with ABCs greater than their TACs in proportion to their TACs (with the exception of pollock) was adopted. While it is unlikely that the Council will adopt exactly this approach, it may adopt an approach that is not too far removed. The difference between the volumes of fish allocated by species under this approach, and the volumes that would be allocated under the Council's approach are unlikely to be so different that they would affect the outcome of the NEPA analysis.

Therefore, in the second step, the residual, 14,882 mt, was allocated among selected species whose 2005 TACs were less than their 2005 ABCs. This allocation was made in proportion to the preliminary 2005 TAC estimates. There were three main exceptions to this approach in step 2: (1) the northern rockfish TAC was set equal to ABC, (2) the Pacific cod TAC was increased by less than the proportionality rule would have allowed, since it would otherwise have exceeded the ABC, and (3) the pollock proportion was based on the amount of pollock transferred from the EBS to the AI, rather than on the pollock TAC. While the Council may well choose to allocate a larger amount to the EBS pollock fishery, this approach was used on the assumption that: (a) the EBS pollock harvest is approaching the highest levels the Council is likely to allow it given the needs of other fisheries, (b) the Council's recommendation to allocate the AI pollock fishery from the EBS pollock fishery, which implicitly assumed a given EBS pollock harvest, and (c) the amount was small compared to the large size of the EBS pollock TAC, and was unlikely to affect the results of the NEPA analysis.

In Alternatives 1, 3, and 4, the 2005 ABCs for species in Tiers 1, 2, and 3 were projected on the basis of estimated 2004 harvests using AFSC population dynamics models, so as to produce the F rates associated with those alternatives. These ABCs were treated as 2005 TACs and mortality estimates. These estimates were input into the AFSC population models to estimate ABCs for 2006. The 2006 ABCs were used as estimates of 2006 TACs and species mortality. The 2005 and 2006 ABCs for species in other tiers were rolled over from 2004. No effort was made to constrain the resulting sum of TACs to lie within the regional groundfish OY. Only the TACs for Alternative 1 (select TACs to produce $_{max}F_{ABC}$) exceeded the OY. A NEPA alternative need not be possible under current laws to be a legitimate alternative. For Alternative 5, all TACs were set to zero. Alternative 5 is the no action alternative.

Table 2.2.2-1 2005 BSAI TACs for Alternatives 1 through 5 (in metric tons)

Species	Area	Alt 1.	Alt 2.	Alt 3.	Alt 4.	Alt 5.
Pollock	EBS	2,345,000	1,475,399	1,277,100	1,133,000	0
	Aleutian Islands	19,000	19,000	19,000	900	0
	Bogoslof District	29,700	50	14,850	30	0
Pacific cod	BSAI	299,400	225,500	158,700	161,300	0
Sablefish	BS	2,821	2,418	1,443	1,846	0
	AI	3,255	2,790	1,665	2,130	0
Atka mackerel	Total	49,470	49,470	26,710	45,440	0
	WAI	18,057	18,057	9,749	16,586	0
	EAI/BS	8,360	8,360	4,514	7,679	0
	CAI	23,053	23,053	12,447	21,175	0
Yellowfin sole	BSAI	109,300	87,965	56,040	70,550	0
Rock sole	BSAI	128,370	41,910	66,710	28,600	0
Greenland turbot	Total	14,630	3,578	7,660	4,210	0
	BS	9,802	2,752	5,132	2,821	0
	AI	4,828	826	2,528	1,389	0
Arrowtooth flounder	BSAI	117,420	12,262	62,250	6,940	0
Flathead sole	BSAI	56,860	19,000	29,850	12,380	0
Alaska plaice	BSAI	200,760	3,067	112,160	13,060	0
Other flatfish	BSAI	13,500	10,222	6,800	11,902	0
Pacific ocean perch	BSAI	13,320	12,020	6,730	10,420	0
	BS	2,131	1,408	1,077	1,667	0
	AI total	11,189	10,097	5,653	8,753	0
	WAI	5,158	4,655	2,606	4,035	0
	CAI	2,943	2,655	1,487	2,302	0
	EAI	3,088	2,787	1,560	2,416	0
Nothern rockfish	BSAI	6,680	6,030	3,390	4,310	0
Shortraker	BSAI	526	526	263	479	0
Rougheye	BSAI	195	195	98	178	0
Other rockfish	BS	960	460	480	250	0
	AI	634	634	317	534	0
Squid	BSAI	1,970	1,275	985	699	0
Other species	BSAI	63,200	27,205	31,600	25,614	0
Total		3,476,971	2,000,000	1,884,801	1,534,772	0

Notes: Alternative 5 is the no action alternative.
Source: G:\FMGROUP\05specs\Sept EA-IRFA\Chapter 2\ Sept ABC and TAC worksheets.xls

2.2.3 2006 TACs

Table 2.2.3-1 summarizes the 2006 BSAI TACs for each of the five alternatives.

The procedures used to project the 2006 TACs for the five alternatives were similar to those used to project the 2005 TACs. Different approaches were used for Alternative 2, and for the other Alternatives. The 2005 TACs for Alternative 2 were used as estimates of 2005 fishing mortality by species for that alternative, and model runs were updated. Where models were unavailable, 2004 ABCs and TACs were used. ABCs were compared to 2004 TACs rather than the projected 2005 TACs in order to constrain total fishing mortality below the two million metric ton OY under Alternative 2. This kept TAC projections tied more closely to past Council decision-making. A reallocation process similar to that used for 2005 was used to bring 2006 TACs up to OY. Sums of TACs for other alternatives were allowed to exceed or fall below OY.

Table 2.2.3-1 2006 BSAI TACs for Alternatives 1 through 5 (in metric tons)

Species	Area	Alt 1.	Alt 2.	Alt 3.	Alt 4.	Alt 5.
Pollock	EBS	1,681,600	1,475,509	1,168,000	1,062,000	0
	Aleutian Islands	19,000	19,000	19,000	900	0
	Bogoslof District	29,700	50	14,850	30	0
Pacific cod	BSAI	270,500	220,500	163,000	165,400	0
Sablefish	BS	2,548	2,244	1,443	1,820	0
	AI	2,940	2,589	1,665	2,100	0
Atka mackerel	Total	44,180	44,180	29,200	43,040	0
	WAI	16,126	16,126	10,658	15,710	0
	EAI/BS	7,466	7,466	4,935	7,274	0
	CAI	20,588	20,588	13,607	20,057	0
Yellowfin sole	BSAI	103,570	93,289	55,740	69,270	0
Rock sole	BSAI	102,690	44,436	57,640	25,850	0
Greenland turbot	Total	11,160	3,793	6,970	3,990	0
	BS	7,477	2,897	4,670	2,673	0
	AI	3,683	897	2,300	1,317	0
Arrowtooth flounder	BSAI	95,500	13,006	56,790	7,030	0
Flathead sole	BSAI	45,540	19,000	26,310	11,570	0
Alaska plaice	BSAI	131,980	3,251	90,650	12,840	0
Other flatfish	BSAI	13,500	10,838	6,800	11,902	0
Pacific ocean perch	BSAI	13,370	12,170	7,060	10,590	0
	BS	2,139	1,408	1,130	1,694	0
	AI total	11,231	10,223	5,930	8,896	0
	WAI	5,177	4,713	2,734	4,101	0
	CAI	2,954	2,689	1,560	2,340	0
	EAI	3,100	2,821	1,637	2,455	0
Nothern rockfish	BSAI	6,450	5,850	3,360	4,240	0
Shortraker	BSAI	526	526	263	479	0
Rougheye	BSAI	195	195	98	178	0
Other rockfish	BS	960	460	480	250	0
	AI	634	634	317	534	0
Squid	BSAI	1,970	1,275	985	699	0
Other species	BSAI	63,200	27,205	31,600	25,614	0
Total		2,641,713	2,000,000	1,742,221	1,460,326	0
Notes: Alternative 5 is the no action alternative. Source: G:\FMGROUP\05specs\Sept EA-IRFA\Chapter 2\ Sept ABC and TAC worksheets.xls						

2.3 GOA Alternatives

2.3.1 2005 and 2006 GOA ABCs

The 2005 $_{max}F_{ABC}$ and ABC levels for species in Tiers 1, 2, and 3, were projected on the basis of estimates of 2004 harvests up to May 22, 2004, and of projected 2004 harvests through the remainder of the year. The details of these projections may be found in Appendix E. The estimated 2004 harvests were used as estimates of fishing mortality in the AFSC population dynamics models to project 2005 $_{max}F_{ABC}$ level, and the fishing mortality needed to produce the F rates recommended by assessment authors.[6] These estimates based on assessment author recommended F rates formed the basis for the GOA Plan Team recommended ABCs.

2005 TAC estimates were were made for the alternatives by examining the relationship between 2004 ABCs and Council recommended TACs. If these were equal, 2005 TACs were set equal to the ABC projection. If TAC was less, the 2005 TAC was set equal to the 2004 TAC. For tiers 1, 2, and 3, these 2005 TAC estimates were used as proxies for fishery mortality and input into the

[6] This was done for pollock, Pacific cod, sablefish, Arrowtooth flounder, flathead sole, and Pacific ocean perch .

AFSC population models to estimate 2006 ABCs. The 2006 TAC estimates were then projected, using the process just described.

At its September meeting, the GOA Plan Team substituted a rollover of the 2004 pollock ABC levels for the 2005 and 2006 projections of pollock ABC.

The 2005 and 2006 ABC levels for species in other tiers were carried forward from the final 2004 estimates found in the published specifications (69 FR 9263) or in the final 2004 Specifications EA/FRFA.

Table 2.3.1-1 2005 GOA ABCs (in metric tons)

Species	Area	$_{Max}F_{ABC}$ ABCs		GOA Plan Team recommended ABCs	
		2005	2006	2005	2006
Pollock	610	29,890	32,192	22,930	22,930
	620	34,533	37,193	26,480	26,480
	630	18,306	19,716	14,040	14,040
	640	1,671	1,800	1,280	1,280
	Subtotal	84,400	90,900	64,740	64,740
	650	6,520	6,520	6,520	6,520
	Total	90,920	97,420	71,260	71,260
Pacific cod	W	24,048	24,048	21,204	17,406
	C	38,076	38,076	33,573	27,560
	E	4,676	4,676	4,123	3,385
	Total	66,800	66,800	58,900	48,350
Flatfish (deep water)	W	310	310	310	310
	C	2,970	2,970	2,970	2,970
	WYK	1,880	1,880	1,880	1,880
	SEO	910	910	910	910
	Total	6,070	6,070	6,070	6,070
Rex sole	W	1,680	1,680	1,680	1,680
	C	7,340	7,340	7,340	7,340
	WYK	1,340	1,340	1,340	1,340
	SEO	2,290	2,290	2,290	2,290
	Total	12,650	12,650	12,650	12,650
Flathead sole	W	11,694	11,694	11,694	11,111
	C	30,025	30,025	30,025	28,527
	WYK	2,992	2,992	2,992	3,843
	SEO	390	390	390	370
	Total	45,100	45,100	45,100	42,850
Flatfish (shallow water)	W	21,580	21,580	21,580	21,580
	C	27,250	27,250	27,250	27,250
	WYK	2,030	2,030	2,030	2,030
	SEO	1,210	1,210	1,210	1,210
	Total	52,070	52,070	52,070	52,070
Arrowtooth flounder	W	26,249	26,249	26,249	27,924
	C	168,953	168,953	168,953	179,734
	WYK	11,787	11,787	11,787	12,539
	SEO	9,911	9,911	9,911	10,543
	Total	216,900	216,900	216,900	230,740
Sablefish	W	2,812	2,540	2,411	2,237
	C	6,875	6,209	5,892	5,468
	WYK	2,187	1,976	1,875	1,740
	SEO	3,750	3,387	3,214	2,983
	E subtotal	5,937	5,363	5,089	4,723
	Total	15,624	14,112	13,392	12,428
Pacifc ocean perch	W	2,489	2,489	2,489	2,419
	C	8,253	8,253	8,253	8,020
	WYK	802	802	802	779
	SEO	1,556	1,556	1,556	1,512
	E subtotal	2,358	2,358	2,358	2,291
	Total	13,100	13,100	13,100	12,730
Shortraker/rougheye	W	388	388	254	254
	C	1,014	1,014	656	656
	E	638	638	408	408
	Total	2,040	2,040	1,318	1,318
Other rockfish	W	40	40	40	40
	C	300	300	300	300
	WYK	130	130	130	130
	SEO	3,430	3,430	3,430	3,430
	Total	3,900	3,900	3,900	3,900
Northern rockfish	W	730	730	730	678
	C	3,869	3,869	3,869	3,591
	E	NA	NA	NA	NA

Species	Area	$_{Max}F_{ABC}$ ABCs		GOA Plan Team recommended ABCs	
		2005	2006	2005	2006
	Total	4,600	4,600	4,600	4,270
Pelagic shelf rockfish	W	370	370	370	370
	C	3,010	3,010	3,010	3,010
	WYK	210	210	210	210
	SEO	880	880	880	880
	Total	4,470	4,470	4,470	4,470
Thornyhead rockfish	W	592	592	410	410
	C	1,465	1,465	1,010	1,010
	E	761	761	520	520
	Total	2,818	2,818	1,940	1,940
Demersal shelf rockfish	SEO	560	560	450	450
Atka mackerel	GW	4,700	4,700	600	600
Skates	C Big+longnose	4,435	4,435	4,435	4,435
	W/C/E Other	3,709	3,709	3,709	3,709
	Total	8,144	8,144	8,144	8,144
Other species	Gulf wide	n.a.	n.a.	n.a.	n.a.
Total		550,466	555,454	514,864	514,240

Note: The maxFABC ABCs for 2006 are based on the assumption that 2005 fishing mortality equals the 2005 maxFABC levels. The Plan Team recommended ABCs are based on the assumption that fishing mortality is at Alt 2 projected TAC levels. These are constrained by the BSAI OY, and by past Council specifications patterns. If fishing mortality under maxFABC ABCs is sufficiently higher than fishing mortality under Plan Team recommended ABCs in 2005, the 2006 Plan Team recommended ABC may be greater than the maxFABC ABCs.
Source: G:\FMGROUP\05specs\Sept EA-IRFA\Chapter 2\ Sept ABC and TAC worksheets.xls

2.3.2 2005

Table 2.3.1-2 summarizes estimated 2005 GOA TACs for each of the five alternatives. The GOA 2005 Interim TACs are summarized in Section 2.4.

The 2005 TACs for all species in all tiers were in different ways for Alternative 2, and for Alternatives 1, 3, 4, and 5.

The process used to project the Alternative 2 TACs differed from that used in the BSAI (see Section 2.2.1) since the upper bound of the GOA OY was not binding, as it had been in the BSAI. In the GOA, two classes of species were identified: (1) those for which the TAC was equal to the ABC in 2004, and (2) those for which the TAC was less than the ABC in 2004. The 2005 TACs for each of these classes were projected in different ways. (1) For species for which TACs had been set equal to ABC in 2004, TACs were projected to be equal to the 2005 ABCs. (2) For species for which TACs had been smaller than the ABC in 2004, the 2005 TACs were set equal to the 2004 TACs.

Pacific cod projections were reduced to take account of State of Alaska GHLs for those species. In 2004, Skates were separated from the other species category for the first time. Moreover, 2004 is the first year for which skate harvest data has been collected for individual skate species. Skates are a Tier 5 species.

In Alternatives 1, 3, and 4, the ABCs for species in Tiers 1, 2, and 3 were projected on the basis of estimated 2004 harvests using AFSC population dynamics models, so as to produce the F rates associated with those alternatives. The TACs for other species were rolled over from 2004. All TACs were consistent with the ABC ~~$_{max}F_{ABC}$~~ levels. For Alternative 5, all TACs were set to zero. Alternative 5 is the no action alternative.

Table 2.3.2-1 2005 GOA TACs for Alternatives 1 through 5 (in metric tons)

Species	Area	Alt 1.	Alt 2.	Alt 3.	Alt 4.	Alt 5.
Pollock	610	29,890	22,930	15,441	34,565	0
	620	34,533	26,490	17,839	39,934	0
	630	18,306	14,040	9,457	21,169	0
	640	1,671	1,280	863	1,932	0
	Subtotal	84,400	64,740	43,600	97,600	0
	650	6,520	6,520	3,260	4	0
	Total	90,920	71,260	46,860	97,604	0
Pacific cod	W	18,036	16,957	9,504	12,177	0
	C	28,843	27,116	15,198	19,473	0
	E	4,208	3,960	2,218	2,841	0
	Total	51,087	48,033	26,920	34,491	0
Flatfish (deep water)	W	310	310	155	71	0
	C	2,970	2,970	1,485	677	0
	WYK	1,880	1,880	940	429	0
	SEO	910	910	455	207	0
	Total	6,070	6,070	3,035	1,384	0
Rex sole	W	1,680	1,680	840	406	0
	C	7,340	7,340	3,670	1,772	0
	WYK	1,340	1,340	670	324	0
	SEO	2,290	2,290	1,145	553	0
	Total	12,650	12,650	6,325	3,055	0
Flathead sole	W	11,694	2,000	6,379	467	0
	C	30,025	5,000	16,377	1,198	0
	WYK	2,992	2,992	1,632	119	0
	SEO	390	390	213	16	0
	Total	45,101	10,382	24,600	1,800	0
Flatfish (shallow water)	W	21,580	4,500	10,790	2,192	0
	C	27,250	13,000	13,625	2,768	0
	WYK	2,030	2,030	1,015	207	0
	SEO	1,210	1,210	605	123	0
	Total	52,070	20,740	26,035	5,290	0
Arrowtooth flounder	W	26,249	8,000	13,482	2,009	0
	C	168,953	25,000	86,775	12,930	0
	WYK	11,787	2,500	6,054	902	0
	SEO	9,911	2,500	5,090	758	0
	Total	216,900	38,000	111,400	16,600	0
Sablefish	W	2,812	2,411	1,439	1,840	0
	C	6,875	5,892	3,516	4,499	0
	WYK	2,187	1,875	1,119	1,431	0
	SEO	3,750	3,214	1,918	2,454	0
	E subtotal	5,937	5,089	3,037	3,885	0
	Total	15,624	13,392	7,992	10,224	0
Pacifc ocean perch	W	2,489	2,489	1,254	2,014	0
	C	8,253	8,253	4,158	6,678	0
	WYK	802	802	404	649	0
	SEO	1,556	1,556	784	1,259	0
	E subtotal	2,358	2,358	1,188	1,908	0
	Total	13,100	13,100	6,600	10,600	0
Shortraker/rougheye	W	388	254	193	347	0
	C	1,014	656	504	908	0
	E	638	408	317	570	0
	Total	2,040	1,318	1,014	1,825	0
Other rockfish	W	40	40	21	9	0
	C	300	300	156	68	0
	WYK	130	130	66	29	0
	SEO	3,430	200	1,764	769	0
	Total	3,900	670	2,007	875	0
Northern rockfish	W	730	730	365	381	0
	C	3,869	3,869	1,934	2,018	0
	E	1	0	1	1	0
	Total	4,600	4,599	2,300	2,400	0

Species	Area	Alt 1.	Alt 2.	Alt 3.	Alt 4.	Alt 5.
Pelagic shelf rockfish	W	370	370	188	296	0
	C	3,010	3,010	1,524	2,397	0
	WYK	210	210	309	487	0
	SEO	880	880	243	382	0
	Total	4,470	4,470	2,264	3,562	0
Thornyhead rockfish	W	592	410	301	285	0
	C	1,465	1,010	744	707	0
	E	761	520	386	367	0
	Total	2,818	1,940	1,431	1,359	0
Demersal shelf rockfish	SEO	560	450	280	450	0
Atka mackerel	GW	4,700	600	2,350	232	0
Skates	C Big+longnose	4,435	3,284	2,218	n.a.	0
	W/C/E Other	3,709	3,709	1,855	n.a.	0
	Total	8,144	6,993	4,072	2,332	0
Other species	Gulf wide	26,689	12,903	13,726	9,656	0
Total		561,491	267,399	289,260	203,788	0
Notes: Alternative 5 is the no action alternative. Source: G:\FMGROUP\05specs\Sept EA-IRFA\Chapter 2\ Sept ABC and TAC worksheets.xls						

2.3.3 2006

Table 2.3.3-1 summarizes the 2006 GOA TACs for each of the five alternatives.

The 2006 TACs for species in Tiers 1, 2, and 3, were projected on the basis of estimates of 2005 harvests. The 2005 TACs, shown in Table 2.3.2-1, were used as estimates of the 2005 harvests for this purpose. These projections were made using the AFSC population dynamics models to project 2006 TACs that would achieve the target F rates identified in the descriptions of the alternatives. The 2006 TAC levels for species in other tiers were carried over from the 2005 estimates summarized in Table 2.3.1-2.

Harvest specifications for most long-lived target species and complexes in the GOA would be set on a biennial basis. The target species considered for biennial specifications are limited to species on a biennial survey schedule in the GOA and for which annual stock assessments are not reasonable. In the GOA, these species include: deep water flatfish, rex sole, shallow water flatfish, flathead sole, arrowtooth flounder, "other" slope rockfish, northern rockfish, Pacific ocean perch, shortraker/rougheye rockfish, pelagic shelf rockfish, thornyhead rockfish, demersal shelf rockfish, skates, and Atka mackerel.

Stocks recommended for biennial specifications are, in general, longer-lived species (such as the rockfish and flatfish stocks) which are surveyed biennially in the GOA trawl survey. Rulemaking would set specifications for two years, based on projected OFLs, ABCs, and TACs, for years 1 and 2. For these stocks, the projected specifications for year 2 do not vary appreciably from those established for year 1 (where the ABC was established by incorporating recent survey results into the assessment).

The following GOA stocks are not recommended for biennial specifications: pollock, Pacific cod, sablefish, and the "other species" complex. For these stocks, annual specifications should continue.

Table 2.3.3-1 2006 GOA TACs for Alternatives 1 through 5 (in metric tons)

Species	Area	Alt 1.	Alt 2.	Alt 3.	Alt 4.	Alt 5.
Pollock	610	32,192	22,930	18,734	35,379	0
	620	37,193	26,490	21,645	40,875	0
	630	19,716	14,040	11,474	21,668	0
	640	1,800	1,280	1,047	1,978	0
	subtotal	90,900	64,740	52,900	99,900	0
	650	6,520	6,520	3,260	4	0
	Total	97,420	71,260	56,160	99,904	0
Pacific cod	W	18,036	13,055	9,504	12,177	0
	C	28,843	20,876	15,198	19,473	0
	E	4,208	3,046	2,218	2,841	0
	Total	51,087	36,977	26,920	34,491	0
Flatfish (deep water)	W	310	310	155	71	0
	C	2,970	2,970	1,485	677	0
	WYK	1,880	1,880	940	429	0
	SEO	910	910	455	207	0
	Total	6,070	6,070	3,035	1,384	0
Rex sole	W	1,680	1,680	840	406	0
	C	7,340	7,340	3,670	1,772	0
	WYK	1,340	1,340	670	324	0
	SEO	2,290	2,290	1,145	553	0
	Total	12,650	12,650	6,325	3,055	0
Flathead sole	W	11,694	2,000	6,379	467	0
	C	30,025	5,000	16,377	1,198	0
	WYK	2,992	2,843	1,632	119	0
	SEO	390	370	213	16	0
	Total	45,100	10,213	24,600	1,800	0
Flatfish (shallow water)	W	21,580	4,500	10,790	2,192	0
	C	27,250	13,000	13,625	2,768	0
	WYK	2,030	2,030	1,015	207	0
	SEO	1,210	1,210	605	123	0
	Total	52,070	20,740	26,035	5,290	0
Arrowtooth flounder	W	26,249	8,000	13,482	2,009	0
	C	168,953	25,000	86,775	12,930	0
	WYK	11,787	2,500	6,054	902	0
	SEO	9,911	2,500	5,090	758	0
	Total	216,900	38,000	111,400	16,600	0
Sablefish	W	2,540	2,237	1,439	1,814	0
	C	6,209	5,468	3,516	4,435	0
	WYK	1,976	1,740	1,119	1,411	0
	SEO	3,387	2,983	1,918	2,419	0
	E subtotal	5,363	4,723	3,037	3,830	0
	Total	14,112	12,428	7,992	10,079	0
Pacific ocean perch	W	2,489	2,419	1,254	2,014	0
	C	8,253	8,020	4,158	6,678	0
	WYK	802	779	404	649	0
	SEO	1,556	1,512	784	1,259	0
	E subtotal	2,358	2,291	1,188	1,908	0
	Total	13,100	12,730	6,600	10,600	0
Shortraker/rougheye	W	388	254	193	347	0
	C	1,014	656	504	908	0
	E	638	408	317	570	0
	Total	2,040	1,318	1,014	1,825	0
Other rockfish	W	40	40	21	9	0
	C	300	300	156	68	0
	WYK	130	130	66	29	0
	SEO	3,430	200	1,764	769	0
	Total	3,898	670	2,007	875	0
Northern rockfish	W	730	678	365	381	0
	C	3,869	3,591	1,934	2,018	0
	E	0	0	0	0	0
	Total	4,599	4,269	2,299	2,399	0
Pelagic shelf rockfish	W	370	370	188	296	0
	C	3,010	3,010	1,524	2,397	0

Species	Area	Alt 1.	Alt 2.	Alt 3.	Alt 4.	Alt 5.
	WYK	210	210	309	487	0
	SEO	880	880	243	382	0
	Total	4,470	4,470	2,264	3,562	0
Thornyhead rockfish	W	592	410	301	285	0
	C	1,465	1,010	744	707	0
	E	761	520	386	367	0
	Total	2,818	1,940	1,431	1,359	0
Demersal shelf rockfish	SEO	560	450	280	450	0
Atka mackerel	GW	4,700	600	2,350	232	0
Skates	C Big+longnose	4,435	3,264	2,218	n.a.	0
	W/C/E Other	3,709	3,709	1,855	n.a.	0
	Total	8,144	6,993	4,072	2,332	0
Other species	Gulf wide	26,987	12,089	14,239	9,812	0
Total		566,727	253,866	299,024	206,050	0
Notes: Alternative 5 is the no action alternative. Source: G:\FMGROUP\05specs\Sept EA-IRFA\Chapter 2\ Sept ABC and TAC worksheets.xls						

2.4 Interim specifications

The interim TACs for the BSAI and the GOA are summarized in Tables 2.4-1 and 2.4-2.

Each year, normally in October, proposed groundfish harvest specifications for the BSAI and GOA are published in the Federal Register. These proposed specifications are based on TAC, ABC, and PSC amounts, and apportionments thereof, which have been recommended by the Council for the current year. Based on public comment on the proposed specifications and information made available at the December Council meeting, final specifications are published in the Federal Register during February or early March.

So that fishing may begin January 1, regulations authorize the release of one-fourth of each proposed TAC and apportionment thereof, one-fourth of each PSC and apportionment thereof and the first seasonal allowance of pollock and Atka mackerel. These interim specifications are based upon the proposed specifications and published in the Federal Register in December and are superceded by the final specifications.

This is the last year in which interim TACs will be published. As described in Section 1.3 of this EA, 2005 is a transitional year for the implementation of BSAI and GOA FMP Amendments 48/48. Under these amendments, the specifications process will produce approximately 14 to 18 month specifications for most of the fisheries in the BSAI, and 24 month specifications for most of the fisheries in the GOA. These longer specification periods will eliminate the need for interim specifications. For example, in the BSAI, the 2005-06 specifications will be implemented from January 2005 up to June 2006. However, sometime in early 2006, likely well before June, the 2005-06 specifications will be superceded by the 2006-07 specifications, which themselves will be implemented period January 2006 up to June 2007. Once the changeover has been made to the new specifications process, there will be no more need for the interim specifications.

In the BSAI ITACs are specified each year in the proposed specifications for the BSAI. Initial TACs are set at 85% of the proposed annual TAC (7.5% is apportioned to CDQ fisheries and 7.5% to nonspecified reserves) for all targets except pollock, Pacific cod, Atka Mackerel, and sablefish. Interim TACs are established by a final rule based on a percentage of the proposed annual and proposed initial TACS to start the fisheries January 1 of each year and are effective until superceded by the final harvest specifications for the year. Interim TACs are based on 25% of the proposed ITACs for all targets except pollock, Pacific cod, Atka mackerel, and sablefish.

In the accompanying table neither CDQ nor gear apportionments of TAC are presented. For pollock the ITAC is based on 90% of the proposed annual TAC and the interim TAC is based on 40% of the proposed annual TAC.

For Pacific cod the ITAC is based on 85% of the proposed annual TAC and the interim TAC is based on 60% of the proposed annual TAC, except for the annual amount allocated to trawl catcher/processors (50%) and trawl catcher vessels (70%).

For Akta mackerel 85% of the proposed annual TAC is the basis for the ITAC. The interim TAC is based on 50% of the ITAC, except for the jig gear apportionment which is 100% of the ITAC.

For sablefish the ITAC is based upon the amount of sablefish allocated to trawl gear only and the interim TAC is 25% of that amount. The use of hook-and- line and pot gear are not authorized to open under the interim specifications

In the GOA, the estimations of proposed TACs under Alternative 2 for 2005 will be based largely on the Council's recommendations for the 2004 final TACs at its December 2004 meeting. For pollock, deep water flatfish, rex sole, sablefish, northern rockfish, Pacific Ocean perch, Shortraker and rougheye rockfish, pelagic shelf rockfish, demersal shelf rockfish, Atka mackerel, and thornyhead rockfish along with shallow water flatfish, flathead sole, in the Eastern GOA and other slope rockfish in the Central and Western GOA the Council has recommended recently that TACs be set at ABC levels. Where the Council has recommended that TACs be set at levels lower than the ABCs for the proposed 2004 specifications, the Council's final 2004 TAC recommendations are rolled over. These include Pacific cod, shallow water flatfish and flathead sole in the Central and Western GOA, and arrowtooth flounder. The Pacific cod TACs are reduced from ABC levels by the anticipated levels of the GHLs in the state managed Pacific cod fisheries of 10%, 23% and 25% in the Eastern, Central, and Western GOA, respectively. For the other species assembly, the proposed TAC is 5% of the sum of all other TACs in the GOA. Initial TACs for groundfish are not established in the proposed specifications for the GOA.

In the GOA, interim TACs are established by a final rule based on a percentage of the proposed annual TACs to start the fisheries January 1 of each year and are effective until superceded by the final harvest specifications for the year. Interim TACs are based on 25% of the proposed annual TACs for all targets except pollock, Pacific cod, and sablefish.

For pollock the interim TAC is based upon the first seasonal apportionment of annual TAC (which just happens to be 25% at this time).

For Pacific cod the interim TAC is set at 60% of the proposed annual TAC in the Western and Central GOA and 25% in the Eastern GOA.

For sablefish the interim TAC is based upon 25% of the proposed annual TAC. However only the interim amount allocated for trawl gear may be harvest after January 20 until the final specifications are published. The use of hook-and- line gear is not authorized to open under the interim specifications.

Table 2.4-1 2005 BSAI Interim TACs for Alternatives 1 through 5 (in metric tons)

Species	Area	Alt 1.	Alt 2.	Alt 3.	Alt 4.	Alt 5.
Pollock	EBS	947,849	595,952	516,204	457,959	0
	Aleutian Islands	19,000	15,760	14,400	360	0
	Bogoslof District	50	50	50	50	0
Pacific cod	BSAI	179,520	135,259	95,249	96,807	0
Sablefish	BS	1,305	1,118	667	854	0
	AI	753	645	385	493	0
Atka mackerel	Total	24,771	24,771	13,374	22,753	0
	WAI	9,028	9,028	4,875	8,293	0
	EAI/BS	4,216	4,216	2,276	3,872	0
	CAI	11,527	11,527	6,223	10,588	0
Yellowfin sole	BSAI	25,276	20,347	12,959	16,315	0
Rock sole	BSAI	29,686	9,692	15,427	6,614	0
Greenland turbot	Total	3,383	827	1,771	974	0
	BS	2,267	636	1,187	652	0
	AI	1,116	191	585	321	0
Arrowtooth flounder	BSAI	27,153	2,837	14,395	1,605	0
Flathead sole	BSAI	13,149	4,394	6,903	2,863	0
Alaska plaice	BSAI	46,426	709	25,937	3,020	0
Other flatfish	BSAI	3,122	2,364	1,573	2,752	0
Pacific ocean perch	BSAI	3,080	2,780	1,556	2,410	0
	BS	493	326	249	386	0
	AI total	2,587	2,335	1,307	2,024	0
	WAI	1,193	1,076	603	933	0
	CAI	680	614	344	532	0
	EAI	714	644	361	559	0
Nothern rockfish	BSAI	1,545	1,394	784	997	0
Shortraker	BSAI	122	122	61	111	0
Rougheye	BSAI	45	45	23	41	0
Other rockfish	BS	222	106	111	58	0
	AI	147	147	73	123	0
Squid	BSAI	419	271	209	149	0
Other species	BSAI	14,615	6,291	7,308	5,923	0
Total		1,341,635	825,880	729,419	623,229	0

Notes: Alternative 5 is the no action alternative.
Source: G:\FMGROUP\05specs\Sept EA-IRFA\Chapter 2\ Sept ABC and TAC worksheets.xls

Table 2.4-2 2005 GOA Interim TACs for Alternatives 1 through 5 (in metric tons)

Species	Area	Alt 1.	Alt 2.	Alt 3.	Alt 4.	Alt 5.
Pollock	610	7,473	6,384	3,860	8,641	0
	620	8,633	7,375	4,460	9,984	0
	630	4,577	3,910	2,364	5,292	0
	640	418	357	216	483	0
	subtotal	21,100	18,025	10,900	24,400	0
	650	1,630	1,630	815	1	0
	Total	22,730	19,655	11,715	24,401	0
Pacific cod	W	10,822	10,174	5,702	7,306	0
	C	17,306	16,270	9,119	11,684	0
	E	2,525	2,376	1,331	1,705	0
	Total	30,652	28,820	16,152	20,695	0
Flatfish (deep water)	W	78	78	39	18	0
	C	743	743	371	169	0
	WYK	470	470	235	107	0
	SEO	228	228	114	52	0
	Total	1,518	1,518	759	346	0
Rex sole	W	420	420	210	102	0
	C	1,835	1,835	918	443	0
	WYK	335	335	168	81	0
	SEO	573	573	286	138	0
	Total	3,163	3,163	1,581	764	0
Flathead sole	W	2,924	500	1,595	117	0
	C	7,506	1,250	4,094	300	0
	WYK	748	748	408	30	0
	SEO	97	97	53	4	0
	Total	11,275	2,595	6,150	450	0
Flatfish (shallow water)	W	5,395	1,125	2,698	548	0
	C	6,813	3,250	3,406	692	0
	WYK	508	508	254	52	0
	SEO	303	303	151	31	0
	Total	13,018	5,185	6,509	1,323	0
Arrowtooth flounder	W	6,562	2,000	3,370	502	0
	C	42,238	6,250	21,694	3,233	0
	WYK	2,947	625	1,513	226	0
	SEO	2,478	625	1,273	190	0
	Total	54,225	9,500	27,850	4,150	0
Sablefish	W	703	603	360	460	0
	C	1,719	1,473	879	1,125	0
	WYK	547	469	280	358	0
	SEO	938	804	480	614	0
	E subtotal	1,484	1,272	759	971	0
	Total	3,906	3,348	1,998	2,556	0
Pacifc ocean perch	W	622	622	314	504	0
	C	2,063	2,063	1,040	1,670	0
	WYK	200	200	101	162	0
	SEO	389	389	196	315	0
	E subtotal	590	590	297	477	0
	Total	3,275	3,275	1,650	2,650	0
Shortraker/rougheye	W	97	64	48	87	0
	C	254	164	126	227	0
	E	160	102	79	143	0
	Total	510	330	254	456	0
Other rockfish	W	10	10	5	2	0
	C	75	75	39	17	0
	WYK	33	33	17	7	0
	SEO	858	50	441	192	0
	Total	975	168	502	219	0
Northern rockfish	W	183	183	91	95	0
	C	967	967	484	505	0
	E	0	0	0	0	0
	Total	1,150	1,150	575	600	0
Pelagic shelf rockfish	W	93	93	47	74	0
	C	753	753	381	599	0

Species	Area	Alt 1.	Alt 2.	Alt 3.	Alt 4.	Alt 5.
	WYK	53	53	77	122	0
	SEO	220	220	61	96	0
	Total	1,118	1,118	566	891	0
Thornyhead rockfish	W	148	103	75	71	0
	C	366	253	186	177	0
	E	190	130	97	92	0
	Total	705	485	358	340	0
Demersal shelf rockfish	SEO	140	113	70	113	0
Atka mackerel	GW	1,175	150	588	58	0
Skates	C Big+longnose	1,109	821	554	n.a.	0
	W/C/E Other	927	927	464	n.a.	0
	Total	2,036	1,748	1,018	583	0
Other species	Gulf wide	7,578	4,024	3,915	3,030	0
Total		159,147	84,502	82,208	63,623	0

Notes: Alternative 5 is the no action alternative.
Source: G:\FMGROUP\05specs\Sept EA-IRFA\Chapter 2\ Sept ABC and TAC worksheets.xls

2.5 2004 September Plan Team meeting recommendations

The BSAI and GOA Groundfish Plan Teams (Plan Teams) are responsible for reviewing stock assessments, recommending OFLs and ABCs, and preparing the SAFE reports for Council consideration. These teams include NMFS scientists and managers, Alaska, Oregon, and Washington fisheries management agencies scientists, university faculty, and Council staff.

The Plan Teams use stock assessments prepared annually by NMFS and by the Alaska Department of Fish and Game (ADF&G), as the basis for recommendations of OFLs and ABCs for each species or species group, as appropriate, for specified management areas of the EEZ off Alaska that are open to harvest of groundfish.

A Plan Team meeting is held in September to review potential model changes, ecosystem considerations, and other related management issues, and to make proposed OFL and ABC recommendations. The Plan Team recommendations are reviewed by the Council and its Science and Statistical Committee (SSC) and Advisory Panel (AP) at the October Council meeting. Proposed ABCs, TACs, and PSC limits[1] are recommended by the Council at this meeting and published by early December in the *Federal Register* for public review and comment. Interim specifications, based on the proposed specifications, are published at about the same time.

When the Plan Teams meet in September, most current stock assessments are not yet available. Prior to 2002, the Teams' proposed specifications were set equal to the current year's specifications. In 2002, the proposed 2003 harvest specifications for a number of target species were based on projections from the 2001 SAFE reports, rather than rollovers of the 2002 harvest specifications. This provided for a more scientifically based proposed harvest level for those species with enough information available to allow for projections. The Plan Teams continued to use this approach in September 2003, for the 2004 proposed ABC recommendations. The same approach is used for this year as well. The Teams' recommendations are summarized in Tables 2.5-1 and 2.5-2. The proposed OFL and ABC recommendations were prepared as described below.

[1]BSAI crab, halibut, salmon, and herring limits are established in regulations and the Council recommends target fishery and seasonal apportionments of these PSC limits. The Council recommends the GOA halibut PSC limits, seasonal apportionments, and fishery allocations.

In May 2004, total 2004 catches for species in Tiers 1, 2, and 3 were estimated as described in detail in Appendix E. These projections were then input into AFSC age-structured population models and used to estimate the fishing mortality levels that would produce OFL and Alternative 2 (preferred alternative) fishing mortality rates (F) in 2005. These fishing mortality levels were interpreted as the 2005 OFL and ABC levels for these species. In the BSAI, these species included pollock, Pacific cod, Alaska plaice, arrowtooth flounder, rock sole, flathead sole, Greenland turbot, yellowfin sole, Pacific ocean perch, northern rockfish, Atka mackerel, and sablefish. In the GOA, these species included pollock, Pacific cod, arrowtooth flounder, flathead sole, Pacific ocean perch, northern rockfish, and sablefish.

The 2005 ABC projections obtained in this manner were adjusted to project 2005 TACs. The adjustments drew on past Council specifications recommendations to derive relationships between ABCs and TACs, and applied these to the 2005 ABCs to project the TACs. In the BSAI, the TACs were constrained to fall within the OY. These 2005 TAC projections were treated as 2005 fishing mortality levels, and used in a subsequent run of the age-structured models to project 2006 OFLS and ABCs for these species.

The 2005 and 2006 OFL and ABC projections for species for which the age-structured population models were unavailable were made by setting them equal to the 2004 OFL and ABC levels for these species.

Table 2.5-1 BSAI Plan Team OFL and ABC Recommendations (metric tons)

Species	Area	2004			2005		2006	
		OFL	ABC	TAC	OFL	ABC	OFL	ABC
Pollock	EBS	2,740,000	2,560,000	1,492,000	2,909,800	2,363,000	2,542,900	2,087,800
	Aleutian Islands	52,600	39,400	1,000	52,600	39,400	52,600	39,400
	Bogoslof District	39,600	2,570	50	39,600	2,570	39,600	2,570
Pacific cod	BSAI	350,000	223,000	215,500	352,500	225,500	344,700	220,500
Sablefish	BS	4,020	3,000	2,900	3,432	2,418	3,184	2,244
	AI	4,620	3,450	3,100	3,960	2,790	3,674	2,589
Atka mackerel	Total	78,500	66,700	63,000	57,730	49,470	51,830	44,180
	WAI	—	24,360	20,660	—	18,057	—	16,126
	EAI/BS	—	11,240	11,240	—	8,360	—	7,466
	CAI	—	31,100	31,100	—	23,053	—	20,588
Yellowfin sole	BSAI	135,000	114,000	86,075	129,710	109,300	124,900	105,250
Rock sole	BSAI	166,000	139,000	41,000	153,290	128,370	136,240	114,060
Greenland turbot	Total	19,300	4,740	3,500	17,740	11,230	16,490	10,430
	BS	—	3,162	2,700	—	7,524	—	6,988
	AI	—	1,578	800	—	3,706	—	3,442
Arrowtooth flounder	BSAI	142,000	115,000	12,000	144,990	96,140	145,180	96,300
Flathead sole	BSAI	75,200	61,900	19,000	69,100	56,860	64,870	53,380
Alaska plaice	BSAI	258,000	203,000	10,000	254,970	159,040	255,220	159,230
Other flatfish	BSAI	18,100	13,500	3,000	18,100	13,500	18,100	13,500
Pacific ocean perch	BSAI	15,800	13,300	12,580	15,790	12,020	15,990	12,170
	BS	—	2,128	1,408	—	1,923	—	1,947
	AI total	—	11,172	11,172	—	10,097	—	10,223
	WAI	—	5,187	5,187	—	4,655	—	4,713
	CAI	—	2,926	2,926	—	2,655	—	2,689
	EAI	—	3,059	3,059	—	2,787	—	2,821
Northern rockfish	BSAI	8,140	6,880	5,000	7,900	6,030	7,670	5,850
Shortraker	BSAI	701	526	526	701	526	701	526
Rougheye	BSAI	259	195	195	259	195	259	195
Other rockfish	BS	1,280	960	460	1,280	960	1,280	960
	AI	846	634	634	846	634	846	634
Squid	BSAI	2,620	1,970	1,275	2,620	1,970	2,620	1,970
Other species	BSAI	81,150	46,810	27,205	81,150	46,810	81,150	46,810
Total		4,193,736	3,620,535	2,000,000	4,318,068	3,328,733	3,910,004	3,020,548

Source: 2004 OFL, ABC, and TAC from 69 FR 9244 (2-27-04); 2005, 2006 OFLs and ABCs from G:\FMGROUP\05specs\Sept EA-IRFA\Chap 2\Sept ABC and TAC worksheets.xls

Table 2.5-2 GOA Plan Team OFL and ABC Recommendations (in metric tons)

		2004			2005		2006	
Species	**Area**	**OFL**	**ABC**	**TAC**	**OFL**	**ABC**	**OFL**	**ABC**
Pollock	610	—	22,930	22,930	—	22,930	—	22,930
	620	—	26,490	26,490	—	26,490	—	26,490
	630	—	14,040	14,040	—	14,040	—	14,040
	640	—	1,280	1,280	—	1,280	—	1,280
	subtotal	91,060	64,740	64,740	91,060	64,740	91,060	64,740
	650	8,690	6,520	6,520	8,690	6,520	8,690	6,520
	Total	99,750	71,260	71,260	107,090	71,260	118,550	71,260
Pacific cod	W	—	22,610	16,957	—	21,204	—	17,406
	C	—	35,800	27,116	—	33,573	—	27,560
	E	—	4,400	3,960	—	4,123	—	3,385
	Total	102,000	62,810	48,033	78,400	58,900	63,950	48,350
Flatfish (deep water)	W	—	310	310	—	310	—	310
	C	—	2,970	2,970	—	2,970	—	2,970
	WYK	—	1,880	1,880	—	1,880	—	1,880
	SEO	—	910	910	—	910	—	910
	Total	8,010	6,070	6,070	8,010	6,070	8,010	6,070
Rex sole	W	—	1,680	1,680	—	1,680	—	1,680
	C	—	7,340	7,340	—	7,340	—	7,340
	WYK	—	1,340	1,340	—	1,340	—	1,340
	SEO	—	2,290	2,290	—	2,290	—	2,290
	Total	16,480	12,650	12,650	16,480	12,650	16,480	12,650
Flathead sole	W	—	13,410	2,000	—	11,694	—	11,111
	C	—	34,430	5,000	—	30,025	—	28,527
	WYK	—	3,430	3,430	—	2,992	—	3,843
	SEO	—	450	450	—	390	—	370
	Total	64,750	51,270	10,880	56,500	45,100	53,800	42,850
Flatfish (shallow water)	W	—	21,580	4,500	—	21,580	—	21,580
	C	—	27,250	13,000	—	27,250	—	27,250
	WYK	—	2,030	2,030	—	2,030	—	2,030
	SEO	—	1,210	1,210	—	1,210	—	1,210
	Total	63,840	52,070	20,740	63,840	52,070	63,840	52,070
Arrowtooth flounder	W	—	23,590	8,000	—	26,249	—	27,924
	C	—	151,840	25,000	—	168,953	—	179,734
	WYK	—	10,590	2,500	—	11,787	—	12,539
	SEO	—	8,910	2,500	—	9,911	—	10,543
	Total	228,130	194,930	38,000	253,900	216,900	270,050	230,740
Sablefish	W	—	2,930	2,930	3,421	2,411	3,174	2,237
	C	—	7,300	7,300	8,364	5,892	7,758	5,468
	WYK	—	2,550	2,550	2,661	1,875	2,469	1,740
	SEO	—	3,770	3,770	4,562	3,214	4,232	2,983
	E subtotal	—	6,320	6,320	7,223	5,089	6,701	4,723
	Total	22,160	16,550	16,550	19,008	13,392	17,633	12,428

Table 2.5-2 (cont'd) GOA Plan Team OFL and ABC Recommendations (in metric tons)

		2004			2005		2006	
Species	**Area**	**OFL**	**ABC**	**TAC**	**OFL**	**ABC**	**OFL**	**ABC**
Pacific ocean perch	W	2,990	2,520	2,520	2,964	2,489	2,873	2,419
	C	9,960	8,390	8,390	9,828	8,253	9,526	8,020
	WYK	—	830	830	—	802	—	779
	SEO	—	1,600	1,600	—	1,556	—	1,512
	E subtotal	2,890			2,808	2,358	2,722	2,291
	Total	15,840	13,340	13,340	15,600	13,100	15,120	12,730
Shortraker/rougheye	W	—	254	254	—	254	—	254
	C	—	656	656	—	656	—	656
	E	—	408	408	—	408	—	408
	Total	2,510	1,318	1,318	2,510	1,318	2,510	1,318
Other rockfish	W	—	40	40	—	40	—	40
	C	—	300	300	—	300	—	300
	WYK	—	130	130	—	130	—	130
	SEO	—	3,430	200	—	3,430	—	3,430
	Total	5,150	3,900	670	5,150	3,900	5,150	3,900
Northern rockfish	W	—	770	770	—	730	—	678
	C	—	4,100	4,100	—	3,869	—	3,591
	E	—	NA	NA	—	NA	—	NA
	Total	5,790	4,870	4,870	5,400	4,600	5,070	4,270
Pelagic shelf rockfish	W	—	370	370	—	370	—	370
	C	—	3,010	3,010	—	3,010	—	3,010
	WYK	—	210	210	—	210	—	210
	SEO	—	880	880	—	880	—	880
	Total	5,570	4,470	4,470	5,570	4,470	5,570	4,470
Thornyhead rockfish	W	—	410	410	—	410	—	410
	C	—	1,010	1,010	—	1,010	—	1,010
	E	—	520	520	—	520	—	520
	Total	2,590	1,940	1,940	2,590	1,940	2,590	1,940
Demersal shelf rockfish	SEO	690	450	450	690	450	690	450
Atka mackerel	GW	6,200	600	600	6,200	600	6,200	600
Skates	C Big+longnose	NA	NA	NA	—	4,435	—	4,435
	W/C/E Other				—	3,709	—	3,709
	Total				10,859	8,144	10,859	8,144
Other species	Gulf wide			12,592	NA	NA	NA	NA
Total		649,460	498,948	264,433	650,457	514,864	647,272	514,240

Source: 2004 OFL, ABC, and TAC from 69 FR 9261; 2005, 2006 OFLs and ABCs from G:\FMGROUP\05specs\Sept EA-IRFA\Chap 2\Sept ABC and TAC worksheets.xls

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 TAC setting process. Rather than duplicate an affected environment description here, readers are referred to those documents, which are incorporated by reference into this document.

Additionally, the Ecosystem Considerations section of the 2004 SAFE reports is included as Appendix C to this EA. It contains summaries and pointers to recent studies and information applicable to understanding and interpreting the criteria used to evaluate significance of impacts that will result from setting harvest quotas at levels contemplated under these five alternatives.

3.1 Related NEPA Documents

Detailed descriptions of the fishery may be found in the following reports. All of these are public documents and are readily available in printed form or over the Internet at links given in the references.

TAC-Setting EIS The original EISs for the BSAI and GOA FMPs were completed in 1981 and 1979, respectively. The TAC setting process was not revisited in an EIS until 1998, when an SEIS on the process of TAC setting was completed 1998 (NMFS1998). In that document the impacts of groundfish fishing over a range of TAC levels was analyzed. The five alternatives were very similar to the alternatives considered in this 2004-2005 TAC specifications EA. The Record of Decision in that action was affirmation of the status quo alternative for TAC-setting which contained regulations and fishery management plans as they stood in 1997. Impacts to the human environment from the federal groundfish fisheries were displayed in that EIS. Setting TAC under the status quo procedures was not found to be having significant impacts on the issues evaluated.

Annual TAC-Specification EAs In addition to the TAC-setting EIS analysis, environmental assessments have been written to accompany each new year's TAC specifications since 1991. One exception was the 2001 harvest specifications, which were promulgated by an emergency rule published in January 2001 without an accompanying NEPA analysis. That was done because the TAC specifications were set by Congressional action at the 2000 levels (Public Law 106-554). An EA was prepared on the 2001 TAC specifications in July 2001 (NMFS 2001a). The 2003 TAC specifications were analyzed in an EA and a FONSI determination was made prior to publication of the rule (NMFS 2003a).

Steller Sea Lion Protection Measures SEIS A supplemental environmental impact statement was completed in 2001 (NMFS 2001b) to evaluate modifications of fishery management measures being made to mitigate impacts on Steller sea lions. The purpose of that SEIS was to provide information on potential environmental impacts that could occur from implementing a suite of fisheries management measures such that the western population of Steller sea lions existence is not jeopardized nor its critical habitat adversely modified by the groundfish fisheries in the GOA and the BSAI. Fisheries management measures considered were designed to allow commercial groundfish fishing in the North Pacific while assuring that the fisheries would neither jeopardize the continued existence of both western and eastern Steller sea lion stocks, nor adversely affect their critical habitat. Alternative 4, the area and fishery specific approach, was selected in the Record of Decision. Revision of fishery management measures in accordance with that decision

has been promulgated through proposed and final rulemakings in accordance with Magnuson-Stevens Act procedures.

American Fisheries Act Amendments 61/61/13/8 EIS This EIS (NMFS 2002a) was prepared to evaluate sweeping changes to the conservation and management program for the pollock fishery of the Bering Sea and Aleutian Islands (BSAI) and to a lesser extent, the management programs for the other groundfish fisheries of the BSAI and Gulf of Alaska, the king and Tanner crab fisheries of the BSAI, and the scallop fishery off Alaska. Under the Magnuson Act, the Council prepared Amendments 61/61/13/8 to implement the provisions of the AFA in the groundfish, crab and scallop fisheries. Amendments 61/61/13/8 incorporated the relevant provisions of the AFA into the FMPs and established a comprehensive management program to implement the AFA. The EIS analysis provided an evaluation of the environmental and economic effects of the management program that was implemented under these Amendments, as well as developed scenarios of alternative management programs for comparative use.

Groundfish PSEIS A final programmatic SEIS (PSEIS) has been prepared to evaluate the fishery management policies embedded in the BSAI and GOA groundfish FMPs against policy level alternatives. NOAA Fisheries issued a Record of Decision on August 26, 2004, and with the simultaneous approval of Amendments 74 and 81 to the GOA and BSAI Groundfish FMPs, respectively, this decision implements a new management policy that is ecosystem-based and is more precautionary when faced with scientific uncertainty. While effecting the public decision-making process prescribed by the National Environmental Policy Act, the PSEIS also serves as a primary environmental document for subsequent analyses of environmental impacts on the groundfish fisheries. For more information see the http://www.fakr.noaa.gov/sustainablefisheries/seis/default.htm website.

3.2 Affected Environment

As discussed in Chapter 1, this EA tiers off of the analyses and information provided in the PSEIS, as recommended by the Council for Environmental Quality regulations (see Section 1.5 above). Chapter 3 of the PSEIS establishes an environmental baseline, a description of existing conditions that serves as the starting point for the document's analyses. That description of baseline environmental conditions was developed using the best available scientific information, which at the time that the PSEIS was drafted incorporated data up to 2002. In tiering off of the PSEIS, this EA uses the PSEIS baseline as a starting point for the present evaluation of environmental effects and, therefore, incorporates the PSEIS baseline by reference into this document.

The PSEIS provides a recent, complete description of the environment that may be affected by groundfish fishing activities in the following sections:

Features of the physical environment, Section 3.3.
Threatened and endangered species, Section 3.4
Groundfish resources, Section 3.5,
Prohibited species, Section 3.5.2
Other species, Section 3.5.3
Habitat, Section 3.6.
Seabirds, Section 3.7
Marine mammals, Section 3.8.
Socioeconomic Conditions, Section 3.9

Ecosystem, Section 3.10.

But two years have passed since the period described in that baseline. At the time of this EA's initial composition (September 2004), the most up-to-date scientific information comes from the most current SAFE reports, which themselves date from November, 2003, and present much of the same data on BSAI and GOA groundfish fisheries as the PSEIS. Although the timeframe of the PSEIS's baseline reaches to 2002 only, the models used in developing the data for that baseline allowed fisheries biologists to make projections of ABCs, OFLs, and TACs for 2003 and 2004, and these projections for the GOA and BSAI target fisheries are given in PSEIS Tables 3.5-2 and 3.5-28, respectively. The current SAFE reports, while they incorporate new information such as from the 2004 trawl and longline surveys, present projected ABCs and OFLs that derive from many of the same modeling efforts and correspond closely (and, in most cases, exactly) to the data published in the PSEIS baseline tables.

Up-to-date information on groundfish harvests may be found in the annual catch statistics from the NMFS/Alaska Region's catch accounting system and published on the NMFS/Alaska Region website at http://www.fakr.noaa.gov/sustainablefisheries/catchstats.htm. Until the publication of the 2004 SAFE reports, these statistics allow us to infer whether the target fisheries at present are having any impacts that may differ from those described in the PSEIS baseline. The catch statistics are categorized by individual species, and those discreet statistics may be viewed at NMFS/Alaska Region website. For brevity's sake, we here present the statistics for total harvests and quotas only; the complete catch statistics tables may be found at:

http://www.fakr.noaa.gov/2004/car110_bsai.pdf
http://www.fakr.noaa.gov/2004/car110_goa.pdf
http://www.fakr.noaa.gov/2003/car110_bsai.pdf
http://www.fakr.noaa.gov/2003/car110_goa.pdf
http://www.fakr.noaa.gov/2002/bsa02b.txt
http://www.fakr.noaa.gov/2002/goa02b.txt

In 2002, in the GOA groundfish fisheries, catch of all target and other species totaled 165,664 mt, which constituted 70% of the quota (for all species) of 237,123 mt.

In the following year, the GOA groundfish fisheries caught a total of 176, 433 mt of all target and other species, constituting 75% of the total quota of 236,440 mt.

As of September 4 of the present year, 2004, catch of all target and other species in the GOA groundfish fisheries totals 137,227 mt, slightly more than 50% of the total quota of 271,776, with four months left to fish.

The total quotas and harvests from these years show relatively small incremental changes and suggest that overall harvests are in line with or below the amounts anticipated in the PSEIS.

In the BSAI groundfish fisheries, in 2002, catch of all target and other species totaled 1,761,866 mt, or 98% of the total quota of 1,793,115 mt.

In 2003, the BSAI groundfish fisheries harvested a total of 1,792,123 mt of all target and other species, or 99% of the total quota of 1,806,915 mt.

And as of September 4 of the present year, catch of all target and other species in the BSAI groundfish fisheries totals 1,557,391 mt, or 86% of the total quota of 1,800, 808 mt, with time remaining to fish in the latter seasons of the respective target fisheries.

As in the catch statistics for the GOA, the total BSAI harvests and quotas for target and other species from these years do not suggest significant differences in the overall fisheries or, consequently, in their environmental impacts from the baseline previously analyzed in the PSEIS. The data presented in the GOA and BSAI catch statistics suggest that the fisheries are being prosecuted in the same spatial and temporal patterns as in the past.

These inferences, however, are preliminary, at best, and the upcoming publication of the 2004 SAFE reports should allow a clearer determination of any environmental impacts of the target fisheries subsequent to and different than those identified in the PSEIS baseline.

A number of final rules have been implemented by NMFS since January 2002, which is the baseline for analysis in the PSEIS. Each action was analyzed under NEPA for their impacts on the human environment. Copies of all final rules and the associated analyses are available on the NMFS Alaska Region website at www.fakr.noaa.gov. Two important actions were finalized after January 2002 but implemented by emergency rule in 2001 and 2002: the Steller sea lion protection measures (68 FR 204, January 2, 2003) and the American Fisheries Act program (67 FR 79692, December 30, 2002). Because these were implemented by emergency rule in 2001 and 2002, their impacts were included in the PSEIS analysis and are part of the baseline for the PSEIS. Many of the final rules since January 2002 implement administrative changes, observer program changes, recordkeeping and reporting changes, or corrections and have no effect on the harvest specifications. A few of these actions have affected the harvest specification or other management aspects of the groundfish fisheries in ways that were not analyzed in the PSEIS and may need to be considered in this EA.

In December 2003, NMFS issued a final rule (68 FR 69974, December 16, 2003) to modify the management of the ‘‘other species’’ Community Development Quota (CDQ) reserve by eliminating specific allocations of ‘‘other species’’ CDQ to individual CDQ managing organizations (CDQ groups) and, instead, allowing NMFS to manage the ‘‘other species’’ CDQ reserve with the general limitations used to manage the catch of non-CDQ groundfish in the BSAI. This action also eliminated the CDQ non-specific reserve and made other changes to improve the clarity and consistency of CDQ Program regulations. This action was necessary to improve NMFS’s ability to effectively administer the CDQ Program, allowing for more complete harvest of target species that had been constrained by individual allocations of “other species” quota. This action affects the harvest specifications only by facilitating the full harvest of the target species quota in the CDQ program that may have been previously constrained and by changing the way the “other species” TAC as a whole (CDQ plus non-CDQ catch) is managed in the annual harvest specifications. The impacts from the alternatives in this analysis are based on the assumption of fully harvesting the quotas, and, therefore, the CDQ “other species” final rule action is not likely to have any additional effects that need to be considered in this EA.

One significant change in the GOA fisheries since the PSEIS was the development of a directed fishery for certain skate species in 2003. In May 2004, NMFS issued a final rule implementing Amendment 63 to the GOA FMP, which moved skates from the ‘‘other species’’ list to the ‘‘target species’’ category in the FMP (69 FR 26313, May 12, 2004). This change has affected not only the skate fishery management but also the “other species” management in the harvest specification. The “other species” category has fewer species groups listed but a higher amount

of TAC that is available to harvest "other species." These changes need to be considered in this analysis and are discussed in the GOA SAFE report. The current GOA SAFE report presents all available information on skates pertinent to management, including suggestions for incorporating additional survey information for skate stock assessment in the future.

On February 12, 2004, NMFS published a final rule revising regulations requiring seabird avoidance measures in the hook-and-line fisheries off Alaska to further mitigate interactions with the Short-tailed albatross. (69 FR 1930, January 13, 2004; effective February 12, 2004.) These seabird avoidance measures can reduce the impact of the hook-and-line fisheries on seabirds and will likely reduce the take of seabirds in the groundfish fisheries as managed under the harvest specifications.

Also, on August 10, 2004, NMFS published a final List of Fisheries (LOF) for 2004, as required by the Marine Mammal Protection Act (MMPA), reflecting new information on interactions between commercial fisheries and marine mammals (69 FR 48407, effective September 9, 2004). In this LOF, NMFS categorizes each commercial fishery into one of three categories under the MMPA based upon the level of serious injury and mortality of marine mammals that occurs incidental to each fishery. The categorization of a fishery in the LOF determines whether participants in that fishery are subject to certain provisions of the MMPA, such as registration, observer coverage, and take-reduction plan requirements.

The listing of the Alaska groundfish fisheries was changes in 2004 to be specific to a target species rather than combining all fisheries in one gear type in an area. All groundfish fisheries are Category III fisheries based on the annual marine mammal mortality in each fishery, which mortality is expected to be less than or equal to one percent of the potential biological removal level for each marine mammal species.

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4.0 Environmental Impacts

4.1 Significance analysis

An EA must consider whether an environmental impact is significant. Significance is determined by considering the contexts (geographic, temporal, societal) in which the action will occur, and the intensity of the action. The evaluation of intensity should include consideration of the magnitude of the impact, the degree of certainty in the evaluation, the cumulative impact when the action is related to other actions, the degree of controversy, and violations of other laws.

This section describes the criteria by which the impacts of the proposed action are analyzed for each of the following resource categories:

- target species and fisheries
- Incidental catch of other and non-specified species
- Incidental catch of forage fish species
- Incidental catch of prohibited species
- Marine mammals and ESA listed marine mammals
- Seabirds and ESA listed seabirds
- Habitat
- Ecosystem
- State managed and parallel fisheries
- Social and economic effects

The above categories are used in the annual specifications EA documents and are relevant potential receptors in the proposed action. Because the interim specifications are a subset of the annual specifications and they exist for a short duration in the beginning of the fishing year, interim specifications alternatives impacts on the environment are limited. Interim specifications are likely to be a concern only for those environmental components that are affected by fishing activities in the early part of the fishing year. Steller sea lion protection measures require control of fishing in the early part of the fishing year and therefore may be affected by interim specifications. The level of interim specifications may also have an impact on economic aspects of the resources and should also be analyzed.

Each of the environmental categories is associated with significance criteria that have previously been developed and used to evaluate alternative quotas in the annual specifications document. Use of these provides consistency with the significance criteria used in these related documents.

Five significance assignments are made in this EA. These are:

Significantly adverse (S-): Significant adverse effect in relation to the reference point and based on ample information and data and the professional judgment of the analysts who addressed the topic.

Insignificant impact (I): Insignificant effect in relation to the reference point; this determination is based on information and data, along with the professional judgment of the analysts, that suggest that the effects will not cause a significant change to the reference point condition.

Significant beneficial (S+): Significant beneficial effect in relation to the reference point and based on ample information and data and the professional judgment of the analysts who addressed the topic.

Unknown (U): Unknown effect in relation to the reference point; this determination is characterized by the absence of information and data sufficient to adequately assess the significance of the impacts, either because the impact is impossible to predict, or because insufficient information is available to determine a reference point for the resource, species, or issue.

No effect (NE): No known impact

The "reference point condition", where used, may be considered the state of the environmental component being analyzed where it is believed to be in healthy condition, in equilibrium with its physical or biological environment, or is in a condition judged to be not threatened adversely at the present time. For example, a "reference point condition" for a fish species would be the state of that species such that it is in healthy condition, able to sustain itself, successfully reproducing, and not threatened with an adverse population-level decline.

Table 4.1-1 Reference points for significance determinations

Reference Point	Application
Current population trajectory or harvest rate of subject species	(1) Marine mammals (2) Target commercial fish species (3) Incidental catch of non-specified species (4) Forage species (5) Prohibited species bycatch (6) ESA list Pacific salmon (7) Seabirds
Global harvest of prey species. Temporal dispersion of harvest of prey species.	Steller sea lions
Current size and quality of marine benthic habitat and other essential fish habitat	Marine benthic habitat and other essential fish habitat
Application of principles of ecosystem management	Ecosystem
Current management and enforcement activities	(1) State of Alaska managed fisheries (2) Management complexity and enforcement
Current rates of fishing accidents	Human safety and private property (vessels)

Effects on Target Species

The FMP describes the target fisheries as, "those species which are commercially important and for which a sufficient data base exists that allows each to be managed on its own biological merits. Accordingly, a specific TAC is established annually for each target species. Catch of each species must be recorded and reported. This category includes pollock, Pacific cod, yellowfin sole, Greenland turbot, arrowtooth flounder, rock sole, "other flatfish," sablefish, Pacific ocean perch, "other rockfish," Atka mackerel, and squid." (BSAI FMP, page 286). A fishing operation can affect its own target, but it can also affect other target species (for example, through incidental catches).

Alternatives are evaluated with respect to four potential impacts:

1. How much effect does the alternative have on fishing mortality?
2. How much effect does the alternative have on spatial or temporal concentration of the species (as manifested by changes in genetic structure of the population or changes in reproductive success)?
3. How much effect does the alternative have on the availability of prey for the target species?
4. How much effect does the alternative have on the target species' habitat?

The reference point against which each question is assessed is the current population trajectory or harvest rate of the subject target fish species (Table 4.1-1).

The ratings utilize a minimum stock size threshold (MSST) as a basis for positive or negative impacts of each alternative. Any stock that is below its MSST is defined to be overfished. Any stock that is expected to fall below its MSST in the next two years is defined to be approaching an overfished condition. A thorough description of the rationale for the MSST can be found in the National Standard Guidelines 50 CFR Part 600 (Federal Register Vol. 63, No. 84, 24212 - 24237). It is currently impossible to evaluate the status of stocks in Tiers 4 through 6 with respect to their MSSTs because stocks qualify for management under these tiers only if reference stock levels (such as MSST) cannot be estimated reliably.

Table 4.1-2 Criteria used to estimate the significance of effects on targeted groundfish stocks in the Bering Sea, Aleutian Islands, and Gulf of Alaska

Intensity of the Effects				
Direct Effects	Significant Adverse	Unknown	Insignificant Impact	Significant Beneficial
Fishing mortality	Reasonably expected to jeopardize the capacity of the stock to produce MSY on a continuing basis	Unknown fishing mortality rate	Reasonably *not* expected to jeopardize the capacity of the stock to produce MSY on a continuing basis	Action allows the stock to return to its unfished biomass

Spatial and temporal distribution of catch	Leads to change in genetic structure of population	Evidence of genetic sub-population structure and evidence that the distribution of harvest leads to a detectable reduction in genetic diversity such that it jeopardizes the ability of the stock to sustain itself at or above the MSST	MSST and genetic structure is unknown, therefore no information to evaluate whether distribution of the catch changes the genetic structure of the population such that it jeopardizes *or* enhances the ability of the stock to sustain itself at or above the MSST	Evidence that the distribution of harvest is *not* sufficient to alter the genetic sub-population structure such that it jeopardizes the ability of the stock to sustain itself at or above the MSST	Evidence of genetic sub-population structure and evidence that the distribution of harvest leads to a detectable increase in genetic diversity such that it enhances the ability of the stock to sustain itself at or above the MSST
	Change in reproductive success	Evidence that the distribution of harvest leads to a detectable decrease in reproductive success such that it jeopardizes the ability of the stock to sustain itself at or above MSST	MSST is unknown therefore no information regarding the potential impact of the distribution of the catch on reproductive success such that it jeopardizes *or* enhances the ability of the stock to sustain itself at or above the MSST	Evidence that the distribution of harvest will *not* change reproductive success such that it jeopardizes the ability of the stock to sustain itself at or above the MSST	Evidence that the distribution of harvest leads to a detectable increase in reproductive success such that it enhances the ability of the stock to sustain itself at or above MSST
Change in prey availability		Evidence that current harvest levels and distribution of harvest lead to a change prey availability such that it jeopardizes the ability of the stock to sustain itself at or above the MSST	MSST is unknown therefore no information that current harvest levels and distribution of harvest lead to a change in prey availability such that it enhances *or* jeopardizes the ability of the stock to sustain itself at or above the MSST	Evidence that current harvest levels and distribution of harvest do *not* lead to a change in prey availability such that it jeopardizes the ability of the stock to sustain itself at or above the MSST	Evidence that current harvest levels and distribution of harvest lead to a change in prey availability such that it enhances the ability of the stock to sustain itself at or above the MSST

Habitat: Change in suitability of spawning, nursery, or settlement habitat, etc. due to fishing	Evidence that current levels of habitat disturbance are sufficient to lead to a decrease in spawning or rearing success such that it jeopardizes the ability of the stock to sustain itself at or above the MSST	MSST is unknown therefore no information that current levels of habitat disturbance are sufficient to lead to a detectable change in spawning or rearing success such that it enhances *or* jeopardizes the ability of the stock to sustain itself at or above the MSST	Evidence that current levels of habitat disturbance are not sufficient to lead to a detectable change in spawning or rearing success such that it jeopardizes the ability of the stock to sustain itself at or above the MSST	Evidence that current levels of habitat disturbance are sufficient to lead to an increase in spawning or rearing success such that it enhances the ability of the stock to sustain itself at or above the MSST

Effects on Incidental Catch of Non-specified Species

The non-specified species category contains a huge diversity of species, including invertebrates, that are not defined in the FMP as target, other, forage, or prohibited species, except for animals protected under the MMPA or the ESA. Jellyfish and grenadiers, a group of deep-sea species related to hakes and cods, appear to have dominated non-specified catches in recent years. (Grenadier biology and management are discusses in Section 3.5.5.1 of the PSEIS (NMFS 2004d)). Other non-specified species caught in recent years include prowfish, smooth lumpsucker, eels, sea cucumbers, Pacific lamprey, greenling, and Pacific hagfish.

There is currently no active management and limited monitoring for the species in this category, and the retention of any non-specified species is permitted. No reporting is required for non-specified species, and there are no catch limitations or stock assessments. Most of these animals are not currently considered commercially important and are not targeted or retained in groundfish fisheries.

The criteria applied to target species are arguably relevant for non-specified, however the information available for non-specified species is much more limited than that available for target fish species. Estimates of biomass, seasonal distribution of biomass, and natural mortality are unavailable for most non-specified species. Management concerns, data limitations, research in progress, and planned research to address these concerns are discussed in Section 5.1.2.6 of the PSEIS (NMFS 2004d).

Predictions of impacts from different levels of harvest are therefore qualitatively described. Direct effects include the removal of non-specified species from the environment as incidental catch in the groundfish fisheries. The reference point against which significance was assessed was the current population trajectory or harvest rate of the non-specified species. For analytical purposes, this is assumed to be the trajectory or rate in a recent year. The current trajectory or rate significance criterion had been used in the Steller Sea Lion Protection Measures SEIS (Table 4.0-1 of NMFS 2001b). The criterion for evaluating significance was whether a substantial difference in harvest of non-specified species would occur (+>50% = adverse or - > 50%=beneficial). Indirect effects include habitat disturbance by fishing gear and disruption of food web interactions by disproportionate removal of one or more trophic levels. No attempt was made to evaluate the significance of indirect effects.

Table 4.1-3 Criteria used to estimate the significance of effects on incidental catch of other species and non-specified species in the Aleutian Islands

Effect	Significant Adverse	Insignificant	Significant Beneficial	Unknown
Incidental catch of other species and non-specified species	Reasonably expected to increase harvest levels by >50%.	Reasonably expected to not increase or decrease harvest levels by >50%.	Reasonably expected to decrease harvest levels by >50%.	Insufficient information available to predict harvest change.

Effects on Forage Fish Species

Forage fish are fish eaten by larger predatory fish, seabirds, or marine mammals, usually swimming in large schools. In this analysis the species referred to as forage fish species are limited to those species included in FMP Amendments 36 in the BSAI and 39 in the GOA. Listings of GOA forage fish species may be found in Section 3.1 of the FMP while listings of BSAI forage fish species may be found in regulations in Table 2 to 50 CFR §679. The forage fish species categories include (but are not limited to) eulachon, capelin, smelts, lanternfishes, Pacific sand lance, Pacific sand fish, gunnels, pricklebacks, krill, and Pacific herring. A great many other species occupy similar trophic levels in the food chain to forage fish as species preyed upon by higher trophic levels at some period during their life history, such as juvenile pollock and Pacific cod.

Management concerns, data limitations, research in progress, and planned research to address these concerns are discussed in Section 5.1.2.5 of the Draft PSEIS (NMFS 2003b) and the Ecosystems Considerations for 2004 (NMFS 2003a, Appendix C). Bottom trawl surveys of groundfish conducted by NMFS are not designed to assess the biomass of forage fish species. Estimates of biomass and seasonal distribution of biomass are poor for forage fish species, therefore the effects of different levels of target species harvest on forage fish species are not quantitatively described.

Direct effects include the removal of forage fish species from the environment as incidental catch in the groundfish fisheries. Indirect effects include competition between groundfish (particularly juveniles) and forage fish for available prey. In the Steller Sea Lion Protection Measures SEIS (NMFS 2001b) the reference point against which forage fish effects are assessed is the current population trajectory or harvest rate of the subject target fish species (Table 4.1-1). For analysis purposes, this is assumed to be rates in 2003. The criterion for evaluating significance was a substantial change in incidental catch amount (+>50% = adverse or -> 50%= beneficial). Indirect effects include habitat disturbance by fishing gear and disruption of food web interactions by disproportionate removal of one or more trophic levels. Insufficient information is available to estimate the indirect effects of changes in the incidental catch of forage species.

Table 4.1-4 Criteria used to estimate the significance of effects on incidental catch of forage fish species in the Aleutian Islands

Effect	Significant Adverse	Insignificant	Significant Beneficial	Unknown
Incidental catch of other species and non-specified species	Reasonably expected to increase harvest levels by >50%.	Reasonably expected to not increase or decrease harvest levels.	Reasonably expected to decrease harvest levels by >50%.	Insufficient information available to predict change in harvest levels.

Effects on Prohibited Species

Prohibited species in the groundfish fisheries include: Pacific salmon (chinook, coho, sockeye, chum, and pink and ESA listed salmon), steelhead trout, Pacific halibut, Pacific herring, and Alaska king, Tanner, and snow crab.

This analysis focuses on the effects of the specifications alternatives on three aspects of prohibited species management measures: 1) effects on the stocks of prohibited species; 2) effects on harvest levels in the directed fisheries for salmon, halibut, herring, and crab managed by the state; and 3) effects on recent levels of incidental catch of prohibited species in the groundfish fisheries. The significance criteria are summarized in Tables 4.1-5.

Table 4.1-5 Criteria used to estimate the significance of effects on stocks of prohibited species in the BSAI and GOA

Effect	Significant Adverse	Insignificant	Significant Beneficial	Unknown
Incidental catch of prohibited species	Reasonably expected to jeopardize the capacity of the stock to maintain benchmark population levels	Reasonably not expected to jeopardize the capacity of the stock to maintain benchmark population levels	Reasonably expected to increase harvest levels in directed fisheries targeting prohibited species without jeopardizing capacity of stock to maintain benchmark population levels.	Insufficient information available

Effect	Significant Adverse	Insignificant	Significant Beneficial	Unknown
Harvest levels in directed fisheries targeting catch of prohibited species	Substantial decrease in harvest levels in directed fisheries targeting prohibited species (>20%)	No substantial increase or decrease (<20%) in harvest levels in directed fisheries targeting prohibited species	Substantial increase in harvest levels in directed fisheries targeting prohibited species (>20%)	Insufficient information available
Harvest levels of prohibited species in directed fisheries targeting groundfish species	Substantial increase in harvest levels of prohibited species in directed fisheries targeting groundfish species (>50%)	No substantial increase or decrease (<50%) in harvest levels of prohibited species in directed fisheries targeting groundfish species	Substantial decrease in harvest levels of prohibited species in directed fisheries targeting groundfish species (>50%)	Insufficient information available

Benchmarks: Salmon - minimum escapement goals, Pacific halibut - estimated long term CEY level, Pacific herring - minimum spawning biomass threshold, crab - minimum stock size threshold. NA: not applicable.

Effects on 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 foraging and commercial fishing activities. Impacts of the various proposed 2005 and 2006 harvest levels are analyzed by addressing four core questions modified from Lowry (1982):

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 that could compromise foraging success of marine mammals (harvest of prey species)?
3. Do the proposed harvest levels result in temporal or spatial concentration of fishing effort in areas used for foraging by marine mammals (spatial and temporal concentration of removals with some likelihood of localized depletion)?
4. Do the proposed harvest levels modify marine mammal foraging behavior to the extent that population level impacts could occur (disturbance)?

The reference point for determining significant impact to marine mammals is predicting whether the proposed harvest levels will impact the current population trajectory of any marine mammal species or if the impact is likely to be different from the impact in 2004. Significance ratings for each question are summarized in Table 4.1-6.

Table 4.1-6 Criteria for determining significance of effects to marine mammals.

Effects	Significance Criteria			
	Significant Adverse	**Insignificant**	**Significant Beneficial**	**Unknown**
Incidental take/ entanglement in marine debris	Take rate increases downward change in population trajectory by >10%	Level of take below that which would have an effect on population trajectories by > 10%	Not Applicable	Insufficient information available on take rates
Spatial/ temporal concentration of fishery	More temporal and spatial concentration in key areas than 2004 protection measures	Temporal and spatial concentration of fishery same as 2004 protection measures.	Much less temporal and spatial concentration of fishery in all key areas than 2004 protection measures	Insufficient information as to what constitutes a key area or important time of year
Global harvest of prey species*	Harvest level exceeds harvest allowed by the harvest control rule	Harvest level at or below harvest control rule	Not applicable	Insufficient information to determine level of harvest in relation to available prey biomass
Disturbance	More disturbance (closed areas reopened) than 2004 protection measures	Similar level of disturbance as that which was occurring in 2004	Much less disturbance by groundfish fishery	Insufficient information as to what constitutes disturbance

* applies to western DPS of Steller sea lions

ESA listed Steller sea lions have significance criteria based on the Steller sea lion protection measures. These measures require the overall harvest of pollock, Pacific cod and Atka mackerel to fall within the harvest control rule specified in regulations at 50 CFR 679.20(d)(4). Seasonal apportionment of harvest also is specified for these prey species at 50 CFR 679.20(a)(5), (a)(7), and (a)(8). Closure areas providing spatial dispersion of these fisheries and closures for protection of other marine mammals are at 50 CFR 679.22. The effect of the interim and final harvest specifications on Steller sea lions may be considered significant if specifications do not fall within the Steller sea lion protection measures, and ESA formal consultation would be required.

Effects on Seabirds

Seabird Groups and Effects to Consider: For reasons explained in the Steller Sea Lion Protection Measures SEIS (NMFS 2001b), the following species or species groups are considered: northern fulmar, short-tailed albatross, spectacled and Steller's eiders, albatrosses and shearwaters, piscivorous seabird species, and all other seabird species not already listed.

The fishery effects that may impact seabirds are direct effects of incidental take (in gear and vessel strikes), and indirect effects on prey (forage fish) abundance and availability, benthic habitat, processing waste and offal. ESA listed seabirds are under the jurisdiction of the USFWS, which has completed an FMP level (USFWS 2003a) and project level BiOp (USFWS 2003b) for the groundfish fisheries and the setting of annual harvest specifications. Both BiOps concluded that the groundfish fisheries and the annual setting of harvest specifications were unlikely to cause the jeopardy of extinction or adverse modification or destruction of critical habitat for ESA listed birds.

Incidental take The effects of incidental take of seabirds (from fishing gear and vessel strikes) are described in Section 3.7.1 of the PSEIS (NMFS 2004d). Birds are taken incidentally in longline (hook and line), trawl, and pot gear. Estimation of seabird incidental take from longline and pot vessels is very straightforward. On trawlers, however, the estimation procedure is confounded by sample size issues (Appendix C). This unfortunately creates the need to provide two estimates of total seabird takes for trawl fisheries, depending on the sample size for hauls where seabirds were not recorded. Further, while

observers are able to see all gear-related mortalities from longline and pot vessels, on trawl vessels there is anecdotal evidence that seabird mortalities occur from collisions with the trawl sonar cable and main net cables. The degree of that mortality is currently unknown, as observers are fully tasked with sampling the catch. Note that the amount of mortality contributed by the pot fleet is very minimal, accounting for less than one half percent annually. The trawl fleet contributes from 10.6% to 44.9% of the overall mortality, depending on which estimation methodology is used, with the actual amount likely being somewhere between these two bounds. Longline operations contribute the remainder. Due to its minimal contribution to overall seabird mortality, the pot fleet will not be considered in this analysis.

As noted in Section 3.7.1 of the PSEIS (NMFS 2004d), several factors are likely to affect the risk of seabird incidental catch. It is reasonable to assume that risk goes up or down, partly as a consequence of fishing effort (measured as total number of hooks in the longline fleet, and total haul time in the trawl fleet) each year (NMFS 2004d). In the longline fleet, if seabird avoidance measures used to prevent birds from accessing baited hooks are effective, then effort levels would probably be less of a critical factor in the probability of a bird getting hooked. Seabird bycatch avoidance measures are outlined on pages 3.7-7 through 3.7-10 of the PSEIS (NMFS 2004d). New regulations will become effective in February 2004. However, a sizeable portion of the longline fleet began, in January 2002, to use the seabird avoidance measures recommended by Washington Sea Grant (Melvin, et al., 2001) and approved by the North Pacific Fisheries Management Council at their December 2001 meeting. While the incidental take of seabirds has exhibited some large inter-annual variations, it is worth noting that the overall take of seabirds was reduced by about 60% from 2001 to 2002. Continued collection of seabird incidental take data by groundfish observers will provide the data necessary to evaluate whether the rates continue to decrease.

In the trawl fleet, improved instructions to observers will help refine the estimates, which will in turn allow a better assessment of whether the numbers taken pose a conservation concern. At the same time, the trawl industry, the NMFS, Washington Sea Grant, and the University of Washington are collaborating on a project to reduce or eliminate mortality associated with sonar transducer and net cables.

Prey (forage fish) abundance and availability A description of the effects of prey abundance and availability on seabirds is in Section 3.7.1 of the PSEIS (NMFS 2004d). Detailed conclusions or predictions cannot be made regarding the effects of forage fish bycatch on seabird populations or colonies. However, the present understanding is that fisheries management measures affecting abundance and availability of forage fish or other prey species could affect seabird populations (NMFS 2004d; NMFS 2001b), although commercial fisheries do not compete directly with seabirds. There is no directed commercial fishery for those species which compose the forage fish management group and seabirds typically target juvenile stages rather than adults for those target species where there is an overlap between seabirds and commercial fisheries.

Benthic habitat The fishery effects on benthic habitat are described in Section 3.6.4 of the PSEIS (NMFS 2004d). The indirect fishery effects on benthic habitat as utilized by seabirds are described in the seabird summaries provided in each alternative (Sections 4.5.7, 4.6.7, etc. to the PSEIS) (NMFS 2004d). The seabird species most likely to be impacted by any indirect gear effects on the benthos would be diving sea ducks such as eiders and scoters as well as cormorants and guillemots (NMFS 2001b). Bottom trawl gear has the greatest potential to indirectly affect seabirds via their habitat. Thus, the remainder of this analysis will be limited to the impacts of bottom trawl gear on benthic foraging habitat.

Processing waste and offal The volume of offal and processing wastes probably changes approximately in proportion to the total catch in the fishery. Whereas some bird populations may benefit from the food supply provided by offal and processing waste, the material also acts as an attractant that may lead to

increased incidental take of some seabird species (NMFS 2001b). For example, there seems to be little interaction between trawl sonar cables and seabirds in the shoreside delivery fleet, which has minimal discards and offal, while the interactions are higher near catcher/processor vessels (McElderry, et al, in prep). These conclusions are drawn on very limited samples and should be used with caution. It is also worth noting the apparent reduction in seabird incidental take for the longline fleet described earlier. Should the use of seabird avoidance gear prove effective over time, the negative aspects of seabird attraction to vessels will be reduced. TAC level under various alternatives could reduce the amount of processing waste and offal that is available to scavenging seabirds, particularly in some areas near major breeding colonies. This impact would need to be considered in the balance of the beneficial and detrimental impacts of the disposal actions.

Criteria used to determine significance of effects on seabirds Significance of impacts is determined by considering the context in which the action will occur and the intensity of the action. When complete information is not available to reach a strong conclusion regarding impacts, the rating of 'unknown' is used. Table 4.1-7 outlines the qualitative significance criteria or thresholds that are used for determining if an effect has the potential to create a significant impact on seabirds.

Table 4.1-7 Criteria used to determine significance of effects on seabirds.

Effects	Rating		
	Significant	**Insignificant**	**Unknown**
Incidental take	Take number and/or rate increases or decreases substantially and causes impacts at the population or colony level.	Take number and/or rate is the same.	Take number and/or rate is not known.
Prey (forage fish) availability	Prey availability is substantially reduced or increased and causes impacts at the population or colony level.	Prey availability is the same.	Changes to prey availability are not known.
Benthic habitat	Impact to benthic habitat is substantially increased or decreased and causes impacts at the population or colony level within critical habitat.	Impact to benthic habitat is the same.	Impact to benthic habitat is not known.
Processing waste and offal	Availability of processing wastes is substantially decreased or increased and causes impacts at the population or colony level.	Availability of processing wastes is the same.	Changes in availability of processing wastes is not known.

Effects on Marine Benthic Habitat and Essential Fish Habitat Assessment

The PSEIS uses the following criteria to determine significance for habitat:

1. Level of mortality and damage to living habitat;
2. Benthic community diversity;

3. Geographic diversity of impacts.

The reference point, or baseline for purpose of this EA/RIR/IRFA, against which the criteria are applied is the current size and quality of marine benthic habitat and other essential fish habitat.

Table 4.1-8 Significance Criteria for Habitat

Effect	S-	I	S+	U
Level of mortality and damage to living habitat	Likely to increase substantially from baseline; continued long-term irreversible impacts to long-lived slow growing species	Likely to be similar to baseline	Likely to decrease substantially from baseline	Insufficient information available on baseline habitat data
Changes to Benthic Community Structure	Likely to decrease substantially from baseline	Likely to be similar to baseline	Likely to increase from baseline	Insufficient information available on baseline habitat data
Changes in Distribution of Fishing Effort Geographic Diversity of Management Measures	Likely to decrease substantially from baseline	Likely to be similar to baseline	Likely to increase from baseline	Not applicable

Effects on the Ecosystem

Ecosystem effects evaluated include (1) predator-prey relationships, (2) energy flow and balance, and (3) Diversity.

Table 4.1-9 Significance thresholds for fishery induced effects on ecosystem attributes.

Issue	Effect	Significance threshold	Indicators
Predator-prey relationships	Pelagic forage availability	Fishery induced changes outside the natural level of abundance or variability for a prey species relative to predator demands	• Population trends in pelagic forage biomass (quantitative – pollock, Atka Mackerel, catch/bycatch trends of forage species, squid and herring)
	Spatial and temporal concentration of fishery impact on forage	Fishery concentration levels high enough to impair the long term viability of ecologically important, non-resource species such as marine mammals and birds	• Degree of spatial/temporal concentration of fishery on pollock, Atka mackerel, herring, squid and forage species (qualitative)
	Removal of top predators	Catch levels high enough to cause the biomass of one or more top level predator species to fall below minimum biologically acceptable limits.	• Trophic level of the catch • Sensitive top predator bycatch levels (quantitative: sharks, birds; qualitative: pinnipeds) • Population status of top predator species (whales, pinnipeds, seabirds) relative to minimum biologically acceptable limits.
	Introduction of nonnative species	Fishery vessel ballast water and hull fouling organism exchange levels high enough to cause viable introduction of one or more nonnative species, invasive species	• Total catch levels
Energy flow and balance	Energy redirection	Long-term changes in system biomass, respiration, production or energy cycling that are outside the range of natural variability due to fishery discarding and offal production practices	• Trends in discard and offal production levels (quantitative for discards) • Scavenger population trends relative to discard and offal production levels (qualitative) • Bottom gear effort (qualitative measure of unobserved gear mortality particularly on bottom organisms)
	Energy removal	Long-term changes in system-level biomass, respiration, production or energy cycling that are outside the range of natural variability due to fishery removals of energy	• Trends in total retained catch levels (quantitative)
Diversity	Species diversity	Catch removals high enough to cause the biomass of one or more species (target, nontarget) to fall below or to be kept from recovering from levels below minimum biologically acceptable limits	• Population levels of target, nontarget species relative to MSST or ESA listing thresholds, linked to fishing removals (qualitative) • Bycatch amounts of sensitive (low potential population turnover rates) species that lack population estimates (quantitative: sharks, birds, HAPC biota) • Number of ESA listed marine species • Area closures
	Functional (trophic,	Catch removals high enough to cause a change in functional	• Guild diversity or size diversity

Issue	Effect	Significance threshold	Indicators
	structural habitat) diversity	diversity outside the range of natural variability observed for the system	changes linked to fishing removals (qualitative) • Bottom gear effort (measure of benthic guild disturbance) • HAPC biota bycatch
	Genetic diversity	Catch removals high enough to cause a loss or change in one or more genetic components of a stock that would cause the stock biomass to fall below minimum biologically acceptable limits	• Degree of fishing on spawning aggregations or larger fish (qualitative) • Older age group abundances of target groundfish stocks

Effects on State of Alaska Managed State Waters Seasons and Parallel Fisheries for Groundfish Fisheries

The State of Alaska manages state water seasons for several species of groundfish in internal waters: sablefish in Statistical Areas 649 (Prince William Sound) and 659 (Southeast Inside District), pollock in Area 649 (Prince William Sound), and Pacific cod in Areas 610 (South Peninsula District), 620, 630 (Chignik, Kodiak, and Cook Inlet Districts), and 649 (Prince William Sound).

The state also manages groundfish fisheries for which federal TACs are established within state waters. Unless otherwise specified by the state, open and closed seasons for directed fishing within state waters are concurrent with federal seasons. These fisheries have been referred to as parallel fisheries or parallel seasons in state waters. Harvests of groundfish in these fisheries accrue towards their respective federal TACs.

The criteria used in estimating the effects are outlined below in Table 4.1-10. If an alternative was deemed by NMFS as likely to result in a decrease in harvest levels in these fisheries of more than 50%, it was rated significantly adverse. If the alternative was deemed to likely result in an increase in harvest levels of more than 50%, it was rated significantly beneficial. If the alternative was deemed likely to neither decrease nor increase harvest levels by more 50%, it was rated insignificant. Where insufficient information was available to make such determinations, the effect was rated as unknown. The level of a 50% change in harvest levels is more a qualitative than quantitative assessment. A change of 50% or more in either direction was clearly a significant change and a change of less than 50% in either direction is likely insignificant as stocks of groundfish may change over the short term within this range. Individual fishing operations with greater reliance upon participation in these state fisheries may experience adverse or beneficial effects at lower percent changes in harvest levels but information is not available to determine the significance difference between 50 % and lesser values. Harvest levels in a recent year are used as the benchmark for comparison.

Table 4.1- 10 Criteria used to estimate the significance of effects on harvest levels in state managed groundfish fisheries in the BSAI and GOA.

Effect	Significant Adverse	Insignificant	Significant Beneficial	Unknown
Harvest levels of groundfish in state waters seasons and parallel seasons	Substantial decrease in harvest levels (>50%)	No substantial decrease or increase in harvest levels (<>50%)	Substantial increase in harvest levels (>50%)	Insufficient information available

Social and Economic Effects

The significance criteria used to evaluate effects of the proposed action include a quantitative and qualitative assessment of gross revenues, operating costs, net returns, safety and health, related fisheries, consumer effects, management and enforcement, excess capacity, bycatch and discards, subsistence use, impacts on benefits from marine ecosystems, and community impacts. These significance criteria are provided in Table 4.1-11.

Table 4.1-11 Economic and socio-economic significance criteria

Issue	Indicators	Significance threshold
Gross revenues	Changes in estimated gross revenues to relevant fishing and fish processing operations.	With exceptions noted below, The term "significant" for an expected change in a quantitative indicator means a 20 percent or greater change (either plus or minus) relative to the comparative baseline. If the expected change is less than 20 percent, the change is not considered to be significant. Roughly, the same threshold is used to assess changes in qualitative indicators (e.g. fishing vessel safety). However, whereas changes in quantitative indicators are based on model projections, predicted changes in qualitative indicators are based on the judgment of the economic analysts. (PSEIS, 4.1-10)
Operating costs	Cost information is generally unavailable for North Pacific fishing and/or processing operations. Only a qualitative discussion of operating costs will generally be possible.	
Net returns	Measured net returns (gross revenues net of variable and/or fixed costs as appropriate). Operating cost information is generally unavailable for North Pacific fisheries or fish processors. Only a qualitative analysis of net returns will generally be possible, based on inferences from knowledge of changes to gross revenues and of the characteristics of fishery management regime.	
Safety and health	Changes in risk of death, injury, or morbidity for the relevant population. In general, models making it possible to project changes in the risk of death, injury, or morbidity associated with changes in fishery management regulations are not available. It may only be possible to make informed conjectures about the direction of likely impacts. Only qualitative analyses will be possible.	

Issue	Indicators	Significance threshold
Related fisheries	Changes in fishing activity in one groundfish fishery can have impacts on other groundfish fisheries, (and on non-groundfish fisheries, such as those for crab, salmon, herring, and halibut). Behavioral models that would make quantitative projections of impacts possible are not, in general, available. A qualitative analysis will often be necessary.	
Consumer effects	Alternatives that change the quantity or quality of fish harvested, or that change the cost of harvesting fish, may affect product form, availability, and the prices faced by consumers and, thus, the size of the consumers' surplus they receive from the fisheries. In the absence of information on consumers' demand curves and demand elasticities, this analysis must necessarily be qualitative.	
Management and enforcement	The Council, NMFS, NOAA Enforcement, and the U.S. Coast Guard incur costs for the management of North Pacific fisheries, and for the enforcement of fisheries regulations. The U.S. Coast Guard also incurs costs to provide emergency services to the fishing industry. (Private sector costs associated with safety are considered under the "safety" impact category.) The private sector may also incur costs associated with observer, catch accounting and reporting, or VMS requirements. Analysis of this impact will be quantitative and qualitative.	
Excess capacity	Actions may impact fishery overcapacity. Impacts in the directed regulated fishery should be considered, as well as impacts in related fisheries (for example, will restrictions or rationalization in one fishery lead to increased capacity in a second fishery). In the absence of behavioral models, this discussion will generally be qualitative.	
Bycatch and discards	The impacts of the alternatives on the bycatch and discard of the target species, of other groundfish and non-groundfish species that support fishing activities by other sectors, and of PSC, may have economic impacts.	The significance criteria for PSC species, and for bycatch and discards of other species, which are targeted by other fishing sectors, are adopted here.

Issue	Indicators	Significance threshold
Subsistence use	The mechanisms relating changes in the harvest of groundfish prey to changes in populations of animals used for subsistence purposes, and the mechanisms relating changes in populations of animals to changes in subsistence use, are poorly understood. In addition, as noted earlier in this section, prohibited species bycatch is limited by bycatch caps and area closures. This issue will require a qualitative analysis.	The 20% utilization criterion above is adopted here.
Impacts on benefits from marine ecosystems	Groundfish fishing rules may directly impact marine ecosystem benefits through effects on groundfish populations, or indirectly through impacts on predators, prey, or habitat. Other than those benefits related to commercial or subsistence groundfish fisheries (addressed above, these may include non-market (existence value and option value, etc.), and other uses of the ecosystem such as recreational fishing or tourism.	Any action that places a species listed as endangered under the ESA in jeopardy or creates adverse modification to the species' habitat. will be significant, by definition. The 20% utilization criteria will be used for actions affecting recreational fishing or tourism.
Community impacts	Income, employment, and other impacts to onshore communities associated with actions. Simple quantitative models may be employed in some cases, although qualitative analysis will often be necessary.	The 20% utilization criterion above is adopted here

4.2 Effects on Target Species

In the BSAI, groundfish target species includes pollock, Pacific cod, sablefish, yellowfin sole, Greenland turbot, arrowtooth flounder, rock sole, flathead sole, Alaska plaice, "other flatfish", Pacific ocean perch, northern rockfish, shortraker rockfish, rougheye rockfish, "other rockfish", Atka mackerel, and squid. (Council, 2004, page 9) In the GOA, groundfish target species includes walleye pollock, Pacific cod, sablefish, shallow and deep water flatfish, rex sole, flathead sole, arrowtooth flounder, Pacific ocean perch, shortraker/rougheye rockfish, northern rockfish, "other slope" rockfish, pelagic shelf rockfish, demersal shelf rockfish, thornyhead rockfish, Atka mackerel, and skates. (Council, 2004, page 9)

"Other species" are also included in this part of the analysis. "Other species" are those species or species groups that currently are of slight economic value and not generally targeted upon. This category, however, contains species with economic potential or which are important ecosystem components, but insufficient data exist to allow separate management. Accordingly, a single TAC applies to this category as a whole. Catch of this category as a whole must be recorded and reported. In this BSAI this category includes sculpins, sharks, skates, and octopus, and in the GOA it includes squid, sculpins, sharks, and octopus.

The general impacts of fishing mortality within FMP Amendment 56/56 ABC/OFL definitions are discussed in Section 4.1.3 of the PSEIS (NMFS 2003b), and apply to all fish species for which a TAC is specified. Since 2002, a modified harvest control rule applies to the directed fisheries for pollock, Pacific cod, and Atka mackerel. This rule closes directed fishing when the spawning biomass is estimated to be

less than 20% of the projected unfished spawning biomass. This harvest control rule was evaluated in the Steller Sea Lion Protection Measures SEIS (NMFS 2001b).

Detailed analyses are prepared for each stock, species or species group in the Bering Sea and Aleutian Islands and the Gulf of Alaska and are contained in the stock assessment and fishery evaluation reports (Appendices A and B). The criteria used to estimate the significance of direct and indirect impacts of TAC setting Alternatives 1 through 5 on the BSAI and GOA stocks of target species are summarized in Section 4.1 and in Table 4.1-2. The significance ratings for the target species criteria are summarized in Table 6.0-1. The criteria utilize a minimum stock size threshold (MSST) as a basis for positive or negative impacts of each alternative. A thorough description of the rationale for the MSST can be found in the National Standard Guidelines 50 CFR Part 600 (Federal Register Vol. 63, No. 84, 24212 - 24237).

Under all alternatives, the spawning stock biomass of all target species that have calculated spawning stock biomasses are expected to be above their MSST. The probability that overfishing would occur is low for all of the stocks. The target species stocks that have calculated MSSTs are currently above their MSSTs and the expected changes that would result from harvest at the levels proposed are not substantial enough to expect that the genetic diversity of reproductive success of these stocks would change. None of the alternatives would allow overfishing of the spawning stock. Therefore the genetic integrity and reproductive potential of the stocks should be preserved.

For these reasons, impacts to the target species stock, species or species group, are predicted to be insignificant for all target fish evaluated under Alternatives 1, 2, 3 and 4. This action is not expected to: (1) jeopardize the capacity of the stock to produce maximum sustainable yield on a continuing basis; (2) alter the genetic sub-population structure such that it jeopardizes the ability of the stock to sustain itself at or above the minimum stock size threshold; (3) decrease reproductive success in a way that jeopardizes the ability of the stock to sustain itself at or above the minimum stock size threshold; (4) alter harvest levels or distribution of harvest such that prey availability would jeopardize the ability of the stock to sustain itself at or above the minimum stock size threshold; and (5) disturb habitat at a level that would alter spawning or rearing success such that it would jeopardize the ability of the stock to sustain itself at or above the minimum stock size threshold. See the individual species and species group stock assessments in the SAFE reports (Appendices A and B) for additional information and documentation of this year's assessment process.

Alternative 5 would not allow fishing in 2005 and 2006. The impact of this action on fishing mortality is insignificant because the cessation of fishing for two years is not likely to result in stocks returning to their unfished biomass, especially for long-lived species. No fishing in 2005 and 2006 is likely to allow for increases in genetic diversity, reproductive success, increased prey availability and a reduction on impacts on habitat that may enhance reproductive success. The effects of Alternative 5 on these measurements of target species health are expected to be positively significant.

4.3 Effects on Incidental Catch of Non-specified Species

"Non-specified species" are those species and species groups of no current economic value taken by the groundfish fishery only as an incidental catch in the target fisheries. Virtually no data exist which would allow population assessments. No record of catch is required. The allowable catch for this category is the amount, which is taken incidentally while fishing for target and other species, whether retained or discarded. (BSAI FMP, page 9)

The non-specified species category contains a huge diversity of species, including invertebrates, that are not defined in the FMP as target, other, forage, or prohibited species, except for animals protected under

the MMPA or the ESA. Jellyfish and grenadiers, a group of deep-sea species related to hakes and cods, appear to have dominated non-specified catches in recent years. (Grenadier biology and management are discussed in Section 3.5.5.1 of the Final PSEIS (NMFS 2004d)). Other non-specified species caught in recent years include prowfish, smooth lumpsucker, eels, sea cucumbers, Pacific lamprey, greenling, and Pacific hagfish.

Currently no active management and limited monitoring is used for these species, and the retention of any non-specified species is permitted. No reporting is required for non-specified species, and there are no catch limitations or stock assessments. Most of these animals are not currently considered commercially important and are not targeted or retained in groundfish fisheries.

The information available for non-specified species is much more limited than that available for target fish species. Estimates of biomass, seasonal distribution of biomass, and natural mortality are unavailable for most non-specified species. Management concerns, data limitations, research in progress, and planned research to address these concerns are discussed in Section 5.1.2.6 of the PSEIS (NMFS 2004d).

Predictions of impacts from different levels of harvest are qualitatively described. Direct effects include the removal of other and non-specified species from the environment as incidental catch in the groundfish fisheries. The reference point against which significance was assessed was the current harvest rate of non-specified species. For analytical purposes, this is assumed to be catch in 2004. The criterion for evaluating significance was whether a substantial difference in incidental catch would occur (+>50% = adverse or - > 50%=beneficial).

Indirect effects include habitat disturbance by fishing gear and disruption of food web interactions by disproportionate removal of one or more trophic levels. No attempt was made to evaluate the significance of indirect effects. Insufficient information exists to estimate the indirect effects of changes in the incidental catch of non-specified species. Indicators of ecosystem function relating to non-specified species are summarized in a table at the start of Appendix C to this EA, on “Ecosystems Considerations for 2005.”

Qualitative estimates of the direction of change in non-specified species harvests are made assuming that non-specified harvests are roughly proportional to target species harvests. Alternatives that constrain target harvests relative to those in 2004 are assumed to reduce non-specified species harvests relative to 2004, those that allow larger harvests are assumed to permit larger harvests of non-specified species. Alternative 1 allows larger harvests of target species and could thus be associated with larger harvests of non-specified species. Alternative 2 is associated with target harvests that are, in general similar to those in 2004. Alternatives 3 and 4 are associated with lower harvests than in 2004, and Alternative 5 is associated with no harvests. Because of the lack of information on the relationship between changes in target harvests and changes in non-specified species harvests, Alternatives 1, 3 and 4 have been given an “unknown” rating. Alternative 2 has been rated “insignificant” due to the relatively minor harvest changes likely to be associated with it. The positively significant rating for Alternative 5 is due to its impact on non-specified catches, since the significance criterion is defined in terms of increasing or decreasing catches by 50 percent. The elimination of fishing would reduce the bycatch of non-specified species by more than 50 percent. Alternative 5, which does not permit target harvests is assumed to end non-specified harvests as well, and has been given a “positively significant” rating. However, it is not clear that the elimination of incidental forage fish catches would have a significant impact on non-specified fish populations.

4.4 Effects on Forage Fish Species

Forage fish are fish eaten by larger predatory fish, seabirds, or marine mammals, usually swimming in large schools. In this analysis the species referred to as forage fish species are limited to those species included in FMP Amendments 36 in the BSAI and 39 in the GOA. Listings of GOA forage fish species may be found in Section 3.1 of the FMP while listings of BSAI forage fish species may be found in regulations in Table 2 to 50 CFR §679. The forage fish species categories include, but are not limited to, eulachon, capelin, smelts, lanternfishes, Pacific sand lance, Pacific sand fish, gunnels, pricklebacks, and krill. A great many other species occupy similar trophic levels in the food chain to forage fish as species preyed upon by higher trophic levels at some period during their life history, such as juvenile pollock and Pacific cod. Other species forage on Pacific herring, however these are considered under the prohibited species category in the next section (Section 4.4).

Management concerns, data limitations, research in progress, and planned research to address these concerns are discussed in Section 5.1.2.5 of the PSEIS (NMFS 2004d) and the Ecosystems Considerations for 2004 (NMFS 2003a, Appendix C). Bottom trawl surveys of groundfish conducted by NMFS are not designed to assess the biomass of forage fish species. Estimates of biomass and seasonal distribution of biomass are poor for forage fish species, therefore the effects of different levels of target species harvest on forage fish species are not quantitatively described.

Direct effects include the removal of forage fish species from the environment as incidental catch in the groundfish fisheries. Indirect effects include competition between groundfish (particularly juveniles) and forage fish for available prey. For analysis purposes, the incidental catch is compared to incidental catch that would occur in 2004. The criterion for evaluating significance was a substantial change in incidental catch amount (+>50% = adverse or -> 50%= beneficial).

Indirect effects include habitat disturbance by fishing gear and disruption of food web interactions by disproportionate removal of one or more trophic levels. Insufficient information is available to estimate the indirect effects of changes in the incidental catch of forage species. Even though the amount of biomass and seasonal distribution is unknown for the individual forage fish groups, the small amount of average incidental catch in the BSAI of 33 mt and in the GOA of 148[2] mt (2000 to 2002) is not likely to affect stocks (abundance) of forage fish species by more than 50%. In both the BSAI and the GOA more than 90% of the incidental catch by weight of all forage fish species are smelt which are taken in pollock fisheries. Indicators of ecosystem function relating to forage fish species are summarized in Table 1 of Appendix C to this EA, on "Ecosystems Considerations for 2004."

Qualitative estimates of the direction of change in forage fish species harvests are made assuming that forage fish harvests are roughly proportional to target species harvests. Alternatives which constrain target harvests relative to those in 2004 are assumed to reduce forage fish harvests relative to 2004, those that allow larger harvests are assumed to allow larger harvests of forage fish. Direct and indirect forage fish impacts are assumed to be correlated with forage fish catches, and thus with target species catches. Alternative 1 allows larger harvests of target species, and could thus be associated with larger harvests of forage fish. Alternative 2 is associated with target harvests that are, in general similar to those in 2004. Alternatives 3 and 4 are associated with lower harvests than in 2004, and Alternative 5 is associated with no harvests. Because of the lack of information on the relationship between changes in target harvests and changes in forage fish harvests, Alternatives 1, 3 and 4 have been given an "unknown" rating.

[2]The GOA harvest varied considerably around the mean, ranging from zero metric tons in 2000 to 351 mt in 2001.

Alternative 2 has been rated "insignificant" due to the relatively minor harvest changes likely to be associated with it. Alternative 5, which does not permit groundfish harvest is assumed to end forage fish harvests as well, and has been given a "positively significant" rating. The positively significant rating for Alternative 5 is due to its impact on catches, since the significance criterion is defined in terms of reducing catches by more than 50 percent compared to 2004. However, it is not clear that the elimination of incidental forage fish catches would have a significant impact on forage fish populations.

4.5 Effects on Prohibited Species

Prohibited species in the groundfish fisheries include: Pacific salmon (chinook, coho, sockeye, chum, and pink and ESA listed salmon in Table 6.0-2), steelhead trout, Pacific halibut, Pacific herring, and Alaska king crab, Tanner crab, and snow crab.

The effects of the groundfish fisheries in the BSAI and GOA on prohibited species are primarily managed by conservation measures developed and recommended by the Council over the entire history of the FMPs for the BSAI and GOA and implemented by federal regulation. These measures can be found at 50 CFR part 679.21 and include prohibited species catch (PSC) limitations on a year round and seasonal basis, year round and seasonal area closures, gear restrictions, and an incentive plan to reduce the incidental catch of prohibited species by individual fishing vessels. These management measures are discussed in the draft EIS for Essential Fish Habitat dated January, 2004 (NMFS), Section 3.5 of the PSEIS dated June, 2004 (NMFS), the Final EIS for Bering Sea and Aleutian Islands Crab Fisheries dated August, 2004 (NMFS), and in a review paper by Witherell and Pautzke (1997). The most recent review of the status for the prohibited species and the effects of the groundfish fisheries on the stocks can be found in Section 3.5 of the PSEIS (NMFS 2004d) and for crab in the EIS for Bering Sea and Aleutian Islands Crab Fisheries (NMFS 2004b).

This analysis focuses on the effects of the alternatives on three aspects of prohibited species management measures; 1) effects of PSC limitations and other management measures in the groundfish fisheries on the stocks of prohibited species; 2) effects of PSC limitations and other management measures in the groundfish fisheries on harvest levels in the directed fisheries for salmon, halibut, herring, and crab managed by the state; and 3) effects of PSC limitations and other management measures on recent levels of incidental catch of prohibited species in the groundfish fisheries.

The three criteria used to evaluate the environmental significance of the groundfish specifications alternatives on PSC are summarized in Section 4.1 and in Table 4.1-5. The following three subsections provide more detail on how those three criteria area applied. The significance analysis in this section is summarized in Table 6.0-1. The comparison year for total catches of PSC in the groundfish fisheries is 2003 and these catch amounts by fishery are is displayed in Table 4.5-1. The 2003 fishing year is used for this version of the EA because total catch for the 2003 fishing year is available at the time of this analysis. PSC limits and catch data for 2004 are included up to September 11, 2004 and these amounts are similar to amounts in 2003.

1) Criteria used to estimate effects of Alternatives 1 through 5 on stocks of prohibited species in the BSAI and GOA.

Pacific salmon Pacific salmon are managed by the State of Alaska on a sustained yield principal. Predetermined escapement goals for each salmon stock are monitored on an inseason basis to insure long term sustainable yields. When escapement levels are low, commercial fishing activities are curtailed. If escapement levels exceed goals, commercial fishing activities are enhanced by longer open seasons. In

instances where minimum escapement goals are not met, sport and subsistence fishing activities may also be curtailed.

The effect of the groundfish fisheries on Pacific Northwest salmon and ESA listed salmon is limited to incidental take during groundfish harvest. Designated critical habitat for ESA listed salmon does not occur in the EEZ. The potential impacts of implementation of Steller sea lion protection measures on ESA listed salmon was determined to be insignificant in the Steller sea lion protection measures SEIS (Section 4.6.4, NMFS 2001b). Additional information is available on the effects of the groundfish fisheries on Pacific Northwest and listed salmon can be found in Section 3.4 of the PSEIS (NMFS 2004d). The ESA incidental take statement for listed salmon is 55,000 chinook salmon in the BSAI and 40,000 chinook salmon in the GOA. Chinook salmon incidental catch through September 11, 2004 in the BSAI was 29,474 fish. Chinook salmon incidental catch in the GOA fisheries through September 11, 2004 was 12,778 fish. Incidental catch in both areas are well below the amounts stated in the incidental take statement. Regulations at 50 CFR part 679 authorize the incidental catch of no more than 29,000 chinook salmon annually in the BSAI by trawl vessels targeting pollock for 2004 and future years. The incidental catch of chinook salmon in the BSAI pollock trawl fishery exceeded the 29,000 fish limit and the Chinook Salmon Savings Area was closed to pollock trawling September 5, 2004. On September 14, 2004, the Chum Salmon Savings Area was also closed due to the trawl fishery reaching the 42,000 non-Chinook salmon limit in the Catcher Vessel Operating Area. Similar rates of incidental take of salmon during the 2004 groundfish fisheries are expected for the 2005 and 2006 groundfish fisheries.

Informal consultation for ESA listed salmon was completed on November 26, 2002 for the 2003 groundfish fisheries with a finding of not likely to adversely affect ESA listed salmon species. No consultation is initiated with the preferred alternative fall within the scope of previously analyzed actions and no additional adverse effects are expected.

The benchmark used to determine the significance of effects under each alternative on salmon stocks was whether or not salmon minimum escapement needs would be reasonably expected to be met. If the alternative was reasonably not expected to jeopardize the capacity of the salmon stocks to produce long term sustainable yields it was deemed insignificant; if the alternative was reasonably expected to jeopardize the capacity of the salmon stocks to produce long term sustainable yields it was deemed significantly adverse; the alternative is rated unknown where insufficient information exists to reach conclusions about the alternative's effects.

Halibut The International Pacific Halibut Commission (IPHC) is responsible for the conservation of the Pacific halibut resource. The IPHC uses a policy of harvest management based on constant exploitation rates. The constant exploitation rate is applied annually to the estimated exploitable biomass to determine a constant exploitation yield (CEY). The CEY is adjusted for removals that occur outside the commercial directed hook-and-line harvest (incidental catch in the groundfish fisheries, wastage in halibut fisheries, sport harvest, and subsistence use) to determine the commercial directed hook-and-line quota.

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

The most recent halibut stock assessment was conducted by the IPHC in December 2003. The halibut resource is considered to be healthy, with total catch near record levels. For 2004 the exploitable halibut biomass in Alaska is estimated to be 215,912 mt. Additional information on the life history of halibut and management measures in the groundfish fisheries to conserve halibut stocks can be found in Section 3.5 of the PSEIS (NMFS 2004d). Through September 11, 2004 in the BSAI 3,247 mt of halibut mortality in the groundfish fisheries has accrued towards an annual halibut PSC limit of 4,575 mt and in the GOA 2,385 mt of halibut mortality has exceeded an annual limit of 2,290 mt. Similar levels of halibut bycatch during the 2004 groundfish fisheries are expected for the 2005 and 2006 groundfish fisheries.

The benchmark used to determine the significance of effects under each alternative on the halibut stock was whether or not incidental catch of halibut in the groundfish fisheries would be reasonably expected to lower the total CEY of the halibut stock below the long term estimated yield of 80 million pounds. If the alternative was reasonably not expected to decrease the total CEY of the halibut stock below the long term estimated yield of 80 million pounds it was rated insignificant; if the alternative was reasonably expected to lower the total CEY of the halibut stock below the long term estimated yield of 80 million pounds it was rated significantly adverse; where insufficient information exists to reach conclusions, the alternative's effects are rated unknown.

Pacific herring Pacific herring are managed by the State of Alaska on a sustained yield principal. Pacific herring are surveyed each year and the Guideline Harvest Levels (GHLs) are based on an exploitation rate of 20% of the projected spawning biomass, these GHLs may be adjusted in-season based on additional survey information to insure long term sustainable yields. The ADF&G has established minimum spawning biomass thresholds for herring stocks that must be met before a commercial fishery may occur.

The most recent herring stock assessment for the EBS stock was conducted by the ADF&G in December 2003. For 2004, the herring biomass in the EBS Alaska is estimated to be 187,600 mt. Additional information on the life history of herring and management measures in the groundfish fisheries to conserve herring stocks can be found in Section 3.5 of the PSEIS (NMFS 2004d). In the BSAI the herring PSC limit for the groundfish trawl fisheries are set at one percent (1,876 mt) of the estimated herring biomass. Through September 11, 2004 in the BSAI 1,110 mt of herring bycatch in the groundfish trawl fisheries has occurred. Similar levels of herring bycatch during the 2004 groundfish trawl fisheries are expected for the 2005 and 2006 groundfish trawl fisheries.

The benchmark used to determine the significance of effects under each alternative on herring stocks was whether the minimum spawning biomass threshold levels would be reasonably expected to be met. If the alternative was reasonably not expected to jeopardize the capacity of the herring stocks to reach minimum spawning biomass threshold levels, it was deemed insignificant; if the alternative was reasonably expected to jeopardize the capacity of the herring stocks to reach minimum spawning biomass threshold levels, it was rated significantly adverse; where insufficient information exists to reach conclusions, the alternative's effects are rated unknown.

Crab Alaska king, Tanner, and snow crab stocks in the BSAI and GOA herring are managed by the State of Alaska (with federal oversight in the BSAI) on a sustained yield principal. The crab stocks are surveyed each year, by NMFS in the BSAI and by ADF&G in the GOA and Guideline Harvest Levels (GHLs) are established for each stock based on an exploitation rate that varies with the abundance of legal sized male crab in each stock. These GHLs may be adjusted in-season basis based on additional harvest information to insure long term sustainable yields.

The most recent stock assessment for eastern Bering Sea crab stocks was conducted by NMFS in November 2003. Additional information on the life history of crab and management measures in the

groundfish fisheries to conserve crab stocks can be found in Section 3.5 of the PSEIS (NMFS 2004d) and in the EIS for Bering Sea and Aleutian Islands Crab Fisheries (NMFS 2004b). Four stocks of crab; Saint Matthew Island blue king crab, Pribilof Islands blue king crab, Bering Sea Tanner crab (C. bairdi) and Bering Sea snow crab (C. opilio), are presently being managed under rebuilding plans approved by the NPFMC. As in 2003, the 2004 directed Saint Matthew Island blue king and Pribilof Islands red and blue king crab fisheries remained closed due to low abundance. GHLs for the 2004 Bristol Bay red king crab and 2005 Bering Sea snow crab directed fisheries will be announced later in September 2004, by ADF&G. In addition to area closures for trawl gear in both the BSAI and GOA, in the BSAI PSC limits have been established for the trawl groundfish fisheries in several areas. These PSC limits and areas are described in 50 CFR 679.21.

For 2004 in the C. opilio bycatch limitation zone (COBLZ), the 2004 PSC limit was set at 4,350,000 animals. Through September 11, 2004, 1,697,273 animals have been caught. In Zone 1 of the Bering Sea the 2004 PSC limit for Bairdi Tanner crab was set at 980,000 animals, with 208,926 animals have been caught since September 11, 2004. In Zone 2 of the Bering Sea the 2004 PSC limit for Bairdi Tanner crab was set at 2,970,000 animals with 369,582 animals have been caught since September 11, 2004. In Zone 1 of the Bering Sea the 2004 PSC limit for red king crab was set at 197,000 animals with 70,216 animals caught since September 11, 2004. Similar levels of crab bycatch during the groundfish trawl fisheries are expected for the 2005 and 2006 groundfish fisheries.

The benchmark used to determine the significance of effects under each alternative on crab stocks was whether MSST levels would be reasonably expected to occur. If the alternative was reasonably not expected to jeopardize the capacity of the crab stocks to maintain MSST levels it was rated insignificant; if the alternative was reasonably expected to jeopardize the capacity of the crab stocks to reach or maintain MSST levels, it was rated significantly negative; where insufficient information exists to reach conclusions the alternative's effects are rated unknown. These criteria are summarized in Table 4.1-5.

2) Criteria used to estimate effects of Alternatives 1 through 5 on harvest levels of prohibited species in their respective state managed directed fisheries in the BSAI and GOA.

For all prohibited species, if under the alternative considered the catch in the directed fisheries for those species was expected to increase or decrease by more than 20% from 2003levels the effect was rated significantly beneficial or adverse respectively. 2003 was chosen as the benchmark year for purpose of comparison as it is the most recent year for which total catch amounts are available and because management measures in 2003 are similar to those for 2005 and 2006.

Table 4.5-1 presents the total catch of groundfish by target, area, and gear and the prohibited species catch that was incidental to those groundfish fishing activities in 2003. Tables 4.5-1a through 4.5-1d do not include the groundfish catch and associated prohibited species incidental catch in the Community Development Quota (CDQ) fisheries in the BSAI, except for pollock that are part of the incidental catch allowance of pollock and squid which are exempted from CDQ allocations. CDQ allocations are based on 10 % of the annual pollock TAC and 7.5 % of other target species TACs in the BSAI. A proportionate share of the PSC limits is also allocated to the CDQ fisheries in the BSAI. In 2003 for all groundfish targets in the BSAI the total allocation of groundfish to the CDQ program was187,696 mt and the total groundfish catch by all gear types was 136,633 mt as of September 18, 2004. The PSC allocation of red king crab in Zone 1 was 14,775 animals of which 89 were taken as of September 18, 2004. The PSC allocation of bairdi Tanner crab in Zone 1 was 73,500 animals of which 657 were taken as of September 18, 2004. The PSC allocation of bairdi Tanner king crab in Zone 2 was 222,751 animals of which 1,820 were taken as of September 18, 2004. The PSC allocation of opilio Tanner crab was 326,251 animals of which 4,084 were taken as of September 18, 2004. The PSC allocation of halibut was 343 mt of which 95

mt were taken as of September 18, 2004. The PSC allocation of chinook salmon was 2,177 animals of which 1,895 were taken as of September 18, 2004. The PSC allocation of non-chinook salmon was 3,151 animals of which 916 were taken as of September 18, 2004.

If under the alternative considered, the catch in the directed fisheries for those species was not expected to increase or decrease by more than 20 % from 2003 levels (Tables 4.5-1d and h), the effect was rated insignificant as harvest levels based on stock conditions often vary over this range from year to year. If under the alternative considered, insufficient information exists to estimate changes in harvest levels, the effect was rated as unknown. The authors acknowledge that individual fishing operations with substantial reliance upon participation in these state fisheries may experience adverse or beneficial effects at changes in harvest levels below the 20% level. These criteria are summarized in Table 4.1-5.

3) Criteria used to estimate effects of Alternatives 1 through 5 on bycatch levels of prohibited species in the directed groundfish fisheries in the BSAI and GOA.

The establishment by the Council of annual halibut PSC limits in the directed fisheries of the GOA and the annual and seasonal apportionments thereof of all PSC limits to gear types and targets in the BSAI and GOA is of critical importance each year in both minimizing the incidental catch of prohibited species and in maximizing the optimum yield from the groundfish resources to the fishing industry. In this analysis, 2003 prohibited species incidental catch and directed groundfish catch is presented for comparison to the groundfish TAC alternatives in Table 4.5-1.

Under the Magnuson-Stevens Act, National Standard 9 directs that when a regional council prepares an FMP they shall to the extent practicable minimize bycatch and to the extent bycatch cannot be avoided, minimize the mortality of such bycatch. Over the years since the enactment of the Magnuson-Stevens Act in 1976, over 30 FMP amendments designed to help minimize the incidental catch and mortality of prohibited species have been implemented. Levels of incidental catch of prohibited species in each fishery in 2003 (Table 4.5-1) were used to estimate the effects TAC levels set for each fishery on incidental catch levels of prohibited species under each alternative. It was assumed for each fishery that an increase or decrease in TAC would result in a proportional increase or decrease in incidental catch. Increases were not assumed to exceed PSC limitations where applicable.

For all prohibited species if under the alternative considered the incidental catch of prohibited species in the directed fisheries for groundfish was expected to increase or decrease by more than 50% from 2003 levels, chosen as the benchmark year for purpose of comparison (Tables 4.5-1d and h) the effect was rated significantly beneficial or adverse respectively. If under the alternative considered the incidental catch in the directed fisheries for groundfish was not expected to increase or decrease by more than 50% from 2003 levels the effect was rated insignificant as incidental catch of prohibited species in the directed groundfish fisheries often vary over this range from year to year. If under the alternative considered insufficient information exists to estimate changes in harvest levels the effect was rated as unknown.

Effects of Alternative 1 on Prohibited Species and Directed Fisheries

Under Alternative 1 catch quotas would be set at the $maxF_{abc}$ level. In the GOA this would amount to 542,322 mt for 2005 and 555,454 mt in 2006, which falls within the optimum yield range of 116,000 mt to 800,000. However in the BSAI this would amount to 3,476,971 mt in 2005 and 2,641,713 mt in 2006, which would be constrained by the upper limit established for optimum yield of 2,000,000 mt for the BSAI (50 CFR § 679.20(a)).

Alternative 1 sets catch quotas at the highest levels considered. Even so, PSC limits established for the

BSAI by regulation and halibut PSC limitations recommended by the Council for the GOA in 2005 and 2006 along with other factors such as market demand for the different groundfish targets will likely constrain the harvest of groundfish in both the BSAI and the GOA as in previous years. In the worst case the entire PSC limit for each prohibited species would be reached in both the BSAI and GOA, and that in the GOA for prohibited species without PSC limits, incidental catch rates would be similar to those in 2003 (Tables 4.5-1d and h) and BSAI CDQ fisheries.

Stocks For Pacific salmon these PSC numerical limits are very low compared to recent average returns and would not be expected to prevent salmon returns from reaching escapement goals. In recent years there have been concerns for several chinook and chum stocks in the Yukon and Kuskokwim Rivers, tributaries to the Bering Sea. However for 2004 ADF&G has estimated that minimum escapement goals for these stocks will be met and that subsistence and some limited commercial harvests will be permitted. In an analysis on the effects on salmon returns in the EA prepared for BSAI FMP Amendment 21b to reduce chinook salmon bycatch it was estimated that with the elimination of all incidental catch in the groundfish fisheries chinook salmon returns on average would increase by 4.4% in the Nushagak and by 1.7% in the Yukon Rivers, similar estimates of increases in chum salmon runs are not available. For these reasons the effect of Alternative 1 on salmon stocks is rated insignificant.

Because incidental catch of halibut in the groundfish fisheries, as well as all other removals, is accounted for in setting the directed hook-and-line fishery CEY for halibut and the total CEY for the fishery is above the estimated long term CEY of 80 million pounds, the effect of incidental catch of halibut on the halibut stock under Alternative 1 is rated insignificant.

The PSC limitation for herring of 1% current biomass estimates in the BSAI and the low volume of herring bycatch in the GOA (1997 through 1999 average 15 mt (NMFS 2001b)) would not be expected to reduce herring stocks below minimum spawning biomass thresholds under Alternative 1 and the effects are rated insignificant.

In the BSAI PSC limits for crab are set at a proportion of the estimated number of animals with upper limits approximately 0.5% for red king crab, 1.2% for Tanner crab, and 0.1 % for snow crab. Given these low levels, even if crab PSC limits were reached it is unlikely that any effects on crab stocks could be detected. Incidental catch of crab in the GOA is very low. In 2003, a total of 88 red king crab and 146,876 bairdi Tanner crab were taken (Table 4.5-1e and f). Because incidental catch is small relative to other sources of mortality, time and area closures for trawl gear in the BSAI and GOA are thought to be more effective in reducing effects on crab stocks (Witherell and Harrington 1996) and the effect of Alternative 1 on all crab stocks in the BSAI and GOA is rated insignificant.

Directed PSC fisheries Due to the low numbers of salmon incidental take in the GOA and salmon PSC limitations for chum and Chinook salmon in the BSAI, present levels of salmon incidental catch are not likely to affect escapement totals. For those western stocks of Chinook salmon of concern in the EA prepared for Amendment 21b to the BSAI FMP, a reduction in incidental catch of 40,000 Chinook was estimated to increase commercial catches on average by 2,700 Chinook in the Nushagak and 2,200 Chinook in the Yukon Rivers. This amount represents 2.5% of the average commercial catch of 194,000 Chinook in these drainages. Similar estimates on effects on chum salmon are not available. As an increase or decrease of less than 20% to the commercial salmon fisheries would not be expected given the reduced Chinook PSC cap of 29,000 fish for 2004 and future years in the BSAI, the current PSC limit of 42,000 chum in the BSAI, and current incidental catch rates in the GOA the effect of incidental catch on the commercial catch of salmon under Alternative 1 is rated insignificant.

In the IPHC 2003 assessment of Pacific halibut for the 2004 fishing year, the total CEY for Alaska was 37,029 mt. The combined halibut PSC limit for 2005 and 2006 is expected to be similar to the amount in 2003 and 2004. If the combined halibut PSC limits in Alaska totaling 6,865 mt for 2004 were reached this would represent a reduction in the amount of the total CEY available to the directed fishery of about 19% and as such Alternative 1 is rated insignificant. However it is worth noting that the reductions in CEY amounts for the directed commercial fishery are not proportional over all halibut management areas. The halibut PSC limits are fixed, rather than floating with the condition of halibut stocks. Indirect effects of a downstream reduction in the potential yield of the halibut stock (1.7 pounds on average for each 1 pound of mortality) coupled with projected declines in the exploitable biomass in the halibut stock suggest that at some future time the effect of incidental catch of halibut in the groundfish fisheries could have an adverse effect on the directed halibut fishery in the future.

Due to the herring PSC limit of 1% of estimated biomass in the BSAI and the present low volume of incidental catch in the GOA and increase or decrease in the commercial catches herring would not be likely to increase or decrease by more than 20% under Alternative 1 and the effect on the commercial herring fisheries is rated insignificant.

For these same reasons, floating PSC limits based on stock abundance in the BSAI and the present low numbers of animals taken in the GOA, the effect of incidental catch in the groundfish fisheries along with seasonal and area closures to trawl gear on all crab stocks the effect on commercial crab fisheries is rated insignificant.

Directed groundfish fisheries The apportionment of annual and seasonal PSC limits to the groundfish targets by gear type is of critical importance in order to optimize the harvest of groundfish within PSC limitations. Although average incidental catch of prohibited species by gear type, season, and target are extremely useful in anticipating incidental catch needs to support the harvest of the different groundfish targets, the complex interactions between the distribution of fishing effort and variation in incidental catch rates of prohibited species invariably result in grounding fishing closures due to reaching PSC limits each year. Where PSC limits can be expected to constrain the groundfish fisheries, apportionments are based primarily on socioeconomic concerns. One such example is in the trawl fisheries in the GOA. During the first quarter of the year when incidental catch of halibut in the Pacific cod fishery is at its lowest a greater proportion of the annual halibut allowance is apportioned to the shallow water targets (which include Pacific cod) than at other times of the year and during the summer months when the incidental catch of halibut in the rockfish fisheries is at its lowest a greater proportion of the annual halibut allowance is apportioned to the deep water targets (which include rockfish). With such apportionments the intent is to maximize, up to TAC levels, the harvest of the most valuable species.

Assuming incidental catch rates of prohibited species in 2005 and 2006 are similar to 2003 levels in the BSAI and GOA (Tables 4.5-1a and h) TAC levels under Alternative 1 in combination with seasonal and fishery specific PSC apportionments, and PSC limit closure areas, the total incidental catch of each prohibited species group would not be expected to increase or decrease by more than 50%. The effect of Alternative 1 on levels of incidental catch of prohibited species in the groundfish fisheries is therefore rated insignificant in the BSAI and GOA.

Effects of Alternative 2 on Prohibited Species and Directed Fisheries

Stocks Under Alternative 2 catch quotas (TACs) for the 2005 and 2006 proposed and 2005 interim specifications would be set at levels recommended by the Council at its October 2004 meeting. In the BSAI this would amount to 2,000,000 mt and in the GOA 270,969 mt. For the reasons discussed under Alternative 1, the effect of Alternative 2 on stocks of prohibited species is rated insignificant (Table 6.0-

1) because PSC limits, even if reached, would not have a significant impact on stocks of prohibited species.

Directed PSC fisheries Additionally for the reasons discussed under Alternative 1 the effects of Alternative 2 on the directed fisheries for prohibited species is rated insignificant (Table 6.0-1) because PSC limits, even if reached, would not significantly reduce the amount harvested by the directed fisheries which are permitted to target prohibited species.

Directed groundfish fisheries In section 4.5.1.4 the Steller sea lion Protection Measures SEIS (NMFS 2001b) the effects of the preferred alternative on the incidental catch levels of prohibited species were estimated to result in an increase of herring and other salmon incidental catch in the pollock fisheries of 16% and 7% respectively while the incidental catch of Chinook salmon was estimated to result in a reduction of 9%. In the Pacific cod fisheries reductions of incidental catch of halibut (11%), Tanner crab (30%), Chinook (25%) and other salmon (8%) were expected. Assuming incidental catch rates of prohibited species in 2005 and 2006 are similar to 2003 levels in the BSAI (Table 4.5-1d) TAC levels under Alternative 2, in combination with seasonal and fishery specific PSC apportionments and management measures, the total incidental catch of each prohibited species group would not be expected to increase or decrease by more than 50%. The effect of Alternative 2 on levels of incidental catch of prohibited species in the groundfish fisheries is therefore rated insignificant in the BSAI (Table 6.0-1).

In section 4.5.2.4 the Steller sea lion Protection Measures SEIS (NMFS 2001b) the effects of the preferred alternative on the incidental catch levels of prohibited species in the GOA were estimated to range from an increase of up 15% (Tanner crab in the pollock fishery) to a decease of 11% (other salmon in the pollock fishery) for TACs set at 2000 levels. Assuming incidental catch rates of prohibited species in 2005 and 2006 are similar to 2003 levels in the GOA (Table 4.5-1h) TAC levels under Alternative 2, in combination with seasonal and fishery specific PSC apportionments, the total incidental catch of each prohibited species group would not be expected to increase or decrease by more than 50%. The effect of Alternative 2 on levels of incidental catch of prohibited species in the groundfish fisheries is therefore rated insignificant in the GOA (Table 6.0-1).

Effects of Alternative 3 on Prohibited Species and Directed Fisheries

Stocks Under Alternative 3 catch quotas would set TACs to produce *F* equal to 50% of the $maxF_{abc}$ level for stocks at or above Tier 3 and set TACs equal to 50% of TACs associated with the $maxF_{abc}$ level for stocks at or below the Tier 4 level. In the BSAI this would amount to 1,884,801 mt and in the GOA 288,238 mt for 2005 and similar values in 2006. For the reasons discussed under Alternative 1, the effect of Alternative 3 on stocks of prohibited species is rated insignificant (Table 6.0-1) because PSC limits, even if reached, would not have a significant impact on stocks of prohibited species.

Directed PSC fisheries Additionally for the reasons discussed under Alternative 1 the effects of Alternative 3 on the directed fisheries for prohibited species is rated insignificant (Table 6.0-1) because PSC limits, even if reached, would not significantly reduce the amount harvested by the directed fisheries which are permitted to target prohibited species.

Directed groundfish fisheries Assuming incidental catch rates of prohibited species in 2005 and 2006 are similar to 2003 levels in the BSAI (Table 4.5-1d), TAC levels under Alternative 3 in combination with seasonal and fishery specific PSC apportionments, the total incidental catch of each prohibited species group would not be expected to increase or decrease by more than 50%.
In combination with TAC recommendations, annual halibut PSC limits and seasonal and fishery specific PSC apportionments, and incidental catch rates in the different fisheries unchanged from 2003 (Table 4.5-

1h), the total incidental catch of each prohibited species group would not be expected to increase or decrease by more than 50%. The effect of Alternative 3 on incidental catch levels of prohibited species in the groundfish fisheries is therefore rated insignificant in the BSAI and GOA (Table 6.0-1).

Effects of Alternative 4 on Prohibited Species and Directed Fisheries

Stocks Under Alternative 4 catch quotas would be set at levels equal the most recent 5 year average actual *F* for stocks at a Tier 3 level and above and at the recent 5 year average actual catch for stocks at a Tier 4 level and below. In the BSAI this would amount to 1,534,772 mt and in the GOA 202,766 mt. Alternative 4 sets TAC at levels that fall within the range of 1,400,000 to 2,000,000 mt in the BSAI and 116,000 mt to 800,000 mt in the GOA established for optimum yield. For the reasons discussed under Alternative 1 the effect of Alternative 4 on stocks of prohibited species is rated insignificant (Table 6.0-1) because PSC limits, even if reached, would not have a significant impact on stocks of prohibited species.

Directed PSC fisheries Additionally for the reasons discussed under Alternative 1 the effects of Alternative 4 on the directed fisheries for prohibited species is rated insignificant (Table 6.0-1) because PSC limits, even if reached, would not significantly reduce the amount harvested by the directed fisheries which are permitted to target prohibited species.

Directed groundfish fisheries In combination with TAC recommendations and seasonal and fishery specific PSC apportionments and incidental catch rates in the different fisheries unchanged from 2003 (Table 4.5-1), the total incidental catch of each prohibited species group would not be expected to increase or decrease by more than 50%. The effect of the Alternative 4 on levels of incidental catch of prohibited species in the groundfish fisheries is therefore rated insignificant (Table 6.0-1) in the BSAI and GOA.

Effects of Alternative 5 on Prohibited Species and Directed Fisheries

Under Alternative 5 catch quotas would be set at zero, and if adopted the effect of this alternative would be to close directed fishing for groundfish for the 2005 and 2006 fishing years. The adoption of this alternative is considered unlikely as harvest levels would be set at levels below the lower limits established for optimum yield in the BSAI of 1,400,000 mt and in the GOA of 116,000 mt. Another effect of Alternative 5 would be to reduce incidental catch of prohibited species in the groundfish fisheries to zero. However for the reasons discussed under Alternative 1, even if incidental catch were reduced to zero, the effect on stocks of prohibited species and harvest levels in the directed fisheries for these prohibited species would be insignificant (Table 6.0-1). A 100% reduction in harvest levels of groundfish (to zero) would reduce the incidental catch level of prohibited species in the groundfish fisheries also to zero (>50%) and is rated significantly positive (Table 6.0-1).

Table 4.5-1 Catch of Groundfish and Prohibited Species in the Groundfish Fisheries in the BSAI and GOA in 2003 by Target, Area, and Gear Type

Table 4.5-1a Groundfish and Prohibited Species Catch by Trawl Gear in the BSAI

Target	Total Catch[1] (mt)	Halibut Mortality (mt)	Numbers[2] of Bairdi Crab	Numbers of Red King Crab	Numbers of Chinook Salmon	Numbers of Other Salmon[3]
Atka mackerel	57,427	74	6	416	781	346
Pacific cod	93,598	1,234	181.947	9,666	4,221	990
Other flatfish	872	21	518	0	165	0
Flathead sole	18,678	150	320,771	0	57	174
Rock sole	35,821	890	239,355	53,434	579	0
Greenland turbot	708	8	2,788	0	0	0
Arrowtooth	2,379	46	5,141	0	1,648	9
Yellowfin sole	103,678	704	229,221	26,615	271	520
Rockfish	13,005	66	297	1,730	0	0
Sablefish	0	0	0	0	0	0
Other species	350	8	3,251	0	8	19
Pollock (bottom)	15,280	2	9	0	967	1,745
Pollock (midwater)	1,303,014	75	743	54	43,739	185,578
Total	1,644,810	3,278	984,047	91,915	52,436	189,362

Target	Total Catch[1] (mt)	Numbers of Snow crab[2]	Herring (mt)
Rock sole, flathead sole, and other flatfish	64,090	271,093	4
Pacific cod	93,598	80,566	14
Pollock, Atka mackerel, and other species	1,347,309	2,112	1,047
Yellowfin sole	103,678	342,051	33
Rockfish	13,005	0	0
Greenland turbot, sablefish, and arrowtooth	3,087	2,340	0
Total	1,644,810	698,152	1,099

Table 4.5-1b Groundfish and Prohibited Species Catch by Hook-and-Line Gear in the BSAI

Target	Total Catch[1] (mt)	Halibut Mortality (mt)	Numbers[2] of Bairdi Crab	Numbers of Red King Crab	Numbers of Chinook Salmon	Numbers of Other Salmon[3]
Pacific cod	118,653	490	11,550	13,454	0	13
Greenland turbot	2,198	20	69	0	10	19
Sablefish	1,624	27	0	0	0	15

Target	Total Catch[1] (mt)	Halibut Mortality (mt)	Numbers[2] of Bairdi Crab	Numbers of Red King Crab	Numbers of Chinook Salmon	Numbers of Other Salmon[3]
Rockfish	10	0	0	0	0	0
Other species	44	1	0	0	0	0
Arrowtooth	2	0	0	0	0	0
Non-retained groundfish	0	0	0	0	0	0
Total	122,531	538	11,619	13,454	10	47

Table 4.5-1c Groundfish and Prohibited Species Catch by Pot Gear in the BSAI.

Target	Total Catch[1] (mt)	Halibut Mortality (mt)	Numbers[2] of Bairdi Crab	Numbers of Red King Crab	Numbers of Chinook Salmon	Numbers of Other Salmon[3]
Pacific cod	22,691	2	87,548	58	0	0
Sablefish	700	3	175	32	0	0
Total	23,391	5	87,723	90	0	0

Table 4.5-1d Total Groundfish and Prohibited Species Catch by All Gear Types in the BSAI.

Target	Total Catch[1] (mt)	Halibut Mortality (mt)	Numbers[2] of Bairdi Crab	Numbers of Red King Crab	Numbers of Chinook Salmon	Numbers of Other Salmon[3]
All	1,790,888	3,821	1,083,389	105,458	52,447	189,410

Table 4.5-1e Groundfish and Prohibited Species Catch by Trawl Gear in the GOA.

Target	Total Catch[1] (mt)	Halibut Mortality (mt)	Numbers[2] of Bairdi Crab	Numbers of Red King Crab	Numbers of Chinook Salmon	Numbers of Other Salmon[3]
Pacific cod	15,986	453	2,518	0	3,165	0
Deep water flatfish	825	21	0	0	0	0
Rex sole	10,359	240	28,784	0	2,900	523
Flathead sole	3,883	118	17,331	0	661	19
Shallow water flatfish	8,495	539	55,598	0	116	0
Arrowtooth	119,065	413	28,338	0	3,508	908
Rockfish	25,355	262	183	59	928	2,529
Other species	2,366	24	15	0	0	0
Sablefish	26	0	0	0	0	0
Pollock (bottom)	3,820	0	1	0	912	46
Pollock (midwater)	45,827	10	8	0	3,666	6,307
Total	136,547	2,080	136,776	59	15,797	10,332

Table 4.5-1f Groundfish and Prohibited Species Catch by Hook-and-Line Gear in the GOA.

Target	Total Catch[1] (mt)	Halibut Mortality (mt)	Numbers[2] of Bairdi Crab	Numbers of Red King Crab	Numbers of Chinook Salmon	Numbers of Other Salmon[3]
Pacific cod	9,846	191	0	0	0	0
Rockfish	350	0	0	0	0	0
Other species	1,506	103	0	0	0	0
Sablefish	13,456	405	22	29	0	162
Arrowtooth	3	2	0	0	0	0
Deep water flatfish	1	0	0	0	0	0
Total[4]	25,162	701	22	29	0	162

Table 4.5-1g Groundfish and Prohibited Species Catch by Pot Gear in the GOA.

Target	Total Catch[1] (mt)	Halibut Mortality (mt)	Numbers[2] of Bairdi Crab	Numbers of Red King Crab	Numbers of Chinook Salmon	Numbers of Other Salmon[3]
Pacific cod	13,127	14	10,071	0	0	0
Total	13,127	14	10,071	0	0	0

Table 4.5-1h Total Groundfish and Prohibited Species Catch by All Gear Types in the GOA.

Target	Total Catch[1] (mt)	Halibut Mortality (mt)	Numbers[2] of Bairdi Crab	Numbers of Red King Crab	Numbers of Chinook Salmon	Numbers of Other Salmon[3]
All	174,056	2,793	146,876	88	15,812	10,545

Source: NMFS 2003 catch accounting system
Notes:
1 Total catch includes all groundfish harvested, the targeted species as well as incidental catch of all other groundfish except for the CDQ groundfish fisheries in the BSAI.
2 Numbers are estimates of individual animals and include estimates (in the case of crab) all animals, male and female, juvenile and adult, and should not be interpreted as an estimate of legal sized males that are targeted in directed crab fisheries.
3 other salmon numbers include pink, chum, coho, and red salmon.
4 The halibut mortality estimates includes those from the pot and hook-and-line sablefish fisheries which are exempt from halibut PSC limits.

4.6 Effects on Marine Mammals and ESA Listed Marine Mammals

Marine mammals were considered in two groups: (1) ESA listed Steller sea lions and (2) ESA listed great whales, other cetaceans, northern fur seals, harbor seals, other pinnipeds, and sea otters. The western distinct population segment (DPS) of Steller sea lions and its critical habitat has been determined to be likely to be adversely affected by the groundfish fisheries (FMP BiOp, NMFS 2000a and NMFS 2001). Implementation of the groundfish fisheries must be done in compliance with the Steller sea lion protection measures (68 FR 204, January 2, 2003) to avoid the likelihood of jeopardy of extinction or adverse modification or destruction of Steller sea lion critical habitat. For this reason, particular attention is warranted for Steller sea lions. No other ESA listed marine mammal has been determined to be likely to be adversely affected by the groundfish fisheries, hence the separate consideration of Steller sea lions from other marine mammals.

The information contained in this analysis, including the SAFE reports (Appendices A and B), comprises the biological assessment the action agency is required to present to the consulting agency under section 7 of the Endangered Species Act. NMFS is both the action and the consulting agency for ESA listed species under NMFS' jurisdiction, including Steller sea lions. As noted in Section 3.2, the groundfish fisheries have recently been evaluated under the Marine Mammal Protection Act (MMPA) and are included in the List of Fisheries published in the Federal Register on August 10, 2004 (69 FR 48407). All groundfish fisheries listed as are Category III fisheries in 2004 based on the criterion that the annual

marine mammal mortality in each fishery is expected to be less than or equal to one percent of each marine mammal species potential biological removal (PBR) level.[7]

The causes of impacts on marine mammals are difficult to identify and can be controversial. Changes detected in populations may result from impacts by groundfish fisheries or from other causes. Springer et al. (2003) discuss a possible mechanism that could explain the decline over recent decades in some north Pacific marine mammal species, including seals, sea lions, and sea otters. Their thesis is that industrial whaling in the mid 20th Century may have removed the primary prey (great whales, particularly fin, sei, and sperm) important to killer whales, thus causing killer whales to shift to feeding on smaller marine mammal prey in a sequential fashion causing a one-by-one collapse in population size of harbor seals, fur seals, sea lions, and most recently sea otters. The scientific community is not unified in acceptance of this hypothesis, but it is a potential factor that may have influenced marine mammal populations in the north Pacific, with the consequence of either absolving fishery activities as possible causes or reducing marine mammal populations sizes to such a low level that they are more susceptible to effects from smaller perturbations. Most scientists and managers likely agree that there is great uncertainty about the ways these various factors interweave and affect the population dynamics of the various species of marine mammals in this region.

The reference point for determining significant impact to marine mammals is whether the proposed harvest levels will impact the current population trajectory of any marine mammal species or result in impacts different from impacts in 2004. Criteria for determining significance are contained in Table 4.1-6. Significance ratings for each question are summarized in Table 6.0-1. The impacts of the preferred alternative in the PSEIS on marine mammals are analyzed in detail in section 4.9.8 of the PSEIS. In Table 4.9-5, the direct and indirect effects of the preferred alternative in the PSEIS on marine mammals were determined to be insignificant. Cumulative effects were either significantly adverse, insignificant, or conditionally significantly adverse for the preferred alternative in the PSEIS. The cumulative effects of the alternatives for this action are presented in section 5 of this document. Alternatives 1-4 of this EA are within the scope of the Preferred Alternative in the PSEIS.

The 2005-2006 harvest specifications include provisions for the opening of the directed pollock fishery in the Aleutian Islands subarea. This fishery has been closed since 1999 but was considered and included in the Steller sea lion protection measures SEIS (NMFS 2001a) and in the EA for the Aleutian Island Pollock fishery FMP and regulatory amendments recommended by the Council in June 2004 (NMFS 2004c). Because the potential approval of Amendment 82 to the BSAI FMP and 2005-2006 harvest specifications would implement the AI pollock fishery after being closed for six years and harvest levels are proposed, detailed discussions regarding the impacts of various TAC alternatives for the Aleutian Islands directed pollock fishery on marine mammals is warranted and found in Section 4.12 of this EA.

Incidental Take/Entanglement in Marine Debris

Annual levels of incidental mortality are estimated by comparing the ratio of observed incidental take of dead animals to observed groundfish catch (stratified by area and gear type). Incidental bycatch frequencies also reflect locations where fishing effort is highest. In the Aleutian Islands and GOA, incidental takes are often within Steller sea lion critical habitat. In the Bering Sea, takes are farther off shore and along the continental shelf. Otherwise there seems to be no apparent "hot spot" of incidental

[7] The MMPA (16 U.S.C. 1362 (20)) defines the PBR level as the maximum number of animals, not including natural mortalities, that may be removed from a marine mammal stock while allowing that stock to reach or maintain its optimum sustainable population.

catch disproportionate with fishing effort. Therefore, estimated incidental take and entanglement based on estimated TAC are appropriate.

TACs under Alternatives 2-5 are similar or less than past harvest amounts and are unlikely to result in mortality beyond those seen previously. Under Alternative 5, the no fishing alternative, incidental take will not occur, but marine debris may still be present posing an entanglement risk for Steller sea lions and for other marine mammals even with the fisheries not operating. Because mortality amounts are likely to be the same or less than those experienced in 2004, TACs established under Alternatives 2-5 are not likely to change the population trajectories by more than 10% and are therefore insignificant.

Alternative 1 would provide for significantly higher amounts of TAC than in 2004. This increase in TACs raises concerns that the amount of incidental take and entanglement may also be higher than the other alternatives. To determine the possible effects on population trajectory the stock assessment reports for marine mammals can be used. Stock assessment reports are completed by the National Marine Mammal Laboratory (NMML) every few years for marine mammals occurring in Alaskan waters (Angliss and Lodge 2004). The reports are available at the NMFS NMML website at http://www.nmfs.noaa.gov/prot_res/PR2/Stock_Assessment_Program/individual_sars.html. These reports provide population estimates, population trends, and potential biological removal amounts. The reports also identify potential causes of mortality and whether the stock is considered a strategic stock under the MMPA. A number of marine mammal stocks have unknown population trends. Two examples of marine mammals that may be taken in the groundfish fisheries are the Eastern North Pacific stock of Killer Whales and the Western North Pacific stock of humpback whales. Both of these species have been observed taken in the BSAI groundfish trawl fishery and are likely to experience more incidental take with increased fishing effort. These species have very low PBRs, (0.7 for humpback whales and 7.2 for killer whales). Any additional take of these species may be a concern because the current estimated mortality and serious injury due to all commercial fisheries exceed 10 percent of the PBR for each of these species and is considered significant in terms of the stock assessment. Because the population trend is unknown for these species, they are likely to be taken in the groundfish fishery, and a similar level of information is available for the other marine mammals, the impact of Alternative 1 on the population trajectory through the incidental take and entanglement of other marine mammals is also unknown, but likely to be adverse.

Because of the potential change in Northern sea otter status it is being mentioned individually. Northern sea otters in the Aleutian Islands (from Unimak Pass to Attu Island) were designated by the US Fish and Wildlife Service (USFWS) as candidate species under the ESA on August 22, 2000 (65 FR 67343). On August 21, 2001, the USFWS was petitioned under the Marine Mammal Protection Act (MMPA) for the Alaska stock of sea otters to be listed as depleted. On November 2, 2001 (66 FR 55693), the USFWS determined that the current population of sea otters throughout Alaska exceeds the optimum sustainable population of 60,000 animals and, therefore, does not meet the criteria to be listed as depleted under the MMPA. On February 11, 2004, the USFWS proposed to list the southwestern stock of sea otters as threatened under the ESA based on a 56-68 percent population decline since the 1980s (69 FR 6600). The USFWS is continuing to evaluate the sea otter under both the ESA and MMPA.

Northern Sea otters are not likely to interact with groundfish fisheries in the Alaska EEZ because the areas of fishing and the types of prey do not overlap. Otters feed in the near shore areas primarily on invertebrates while groundfish fisheries are conducted further offshore on groundfish species (Funk 2003). As far as interaction with the groundfish fisheries, NMFS observers monitored incidental take in the 1990–1995 groundfish trawl, longline, and pot fisheries**.** No mortality or serious injuries to sea otters were observed. One sea otter mortality in the trawl fishery of the BSAI has been reported in 1997, but no other sea otter mortality in the groundfish fisheries in the Alaska EEZ has been reported (Funk 2003).

Alternatives 1-5 would have insignificant impacts on northern sea otter because the risk of entanglement is very unlikely and would not affect the population trajectory by more than 10 percent. Alternative 5 would be more beneficial than Alternative 1-4 by eliminating the fishing activities and any potential interaction with sea otters.

Spatial and Temporal Concentration of Fishery

Spatial and temporal concentration effects on all marine mammals by the groundfish fisheries have been analyzed in the PSEIS, and groundfish fisheries management has been modified to comply with ESA considerations for Steller sea lions (NMFS 2001b). The criteria for insignificant effect determination are based on the assumptions of the Steller sea lion protection measures analysis and section 7 biological opinion that the groundfish fisheries modified by Steller sea lion protection measures reduce the impacts and prevents the likelihood of jeopardy of extinction or adverse modification or destruction of critical habitat. The criterion in this EA also is that other protection areas (Pribilof Habitat conservation area and Walrus protection area) that may benefit marine mammals that were in place in 2004 remain unchanged. This determination applies to all ESA listed marine mammal species in the affected management areas because this action falls within the scope of the effects analyzed in the 2000 FMP BiOp. The BiOp found that only Steller sea lions were likely to be at risk of jeopardy and adverse modification of critical habitat. The spatial and temporal management of the groundfish fisheries in 2005 and 2006 would be the same as in 2004 under Alternatives 1-4. Because the spatial and temporal management proposed for the 2005 and 2006 groundfish fisheries under Alternatives 1-4 are the same as 2004, the impacts of Alternatives 1-4 on the spatial and temporal concentration of the groundfish fisheries are insignificant. Under Alternative 5, TACs would be set equal to zero. This would remove the potential for temporal and spatial concentration of fishing, therefore, Alternative 5 would have significantly beneficial impacts.

Under each alternative, the interim specifications include the first seasonal apportionment of pollock, P. cod, and Atka mackerel (25-60 %), as required by the Steller sea lion protection measures and 50 CFR 679.20. Setting the interim TAC at a level higher than is appropriate for the biomass may result in greater harvest than is intended by the Steller sea lion protection measures. Under current procedures, the interim TAC is calculated starting with the proposed TAC for each specified groundfish species or species group. If a large change in the biomass is discovered during the November Plan Team meeting, this cannot be reflected in the interim TAC. Because of this, the interim TAC may be higher or lower than appropriate. If a final TAC is less than a proposed TAC, the interim TAC would be based on the higher proposed TAC and the level of harvest in the first season could exceed the seasonal apportionment that is specified in final specifications. It is possible that the excessive interim TAC could be adjusted downward by either an inseason action or an emergency rule.

It is unlikely that an inseason adjustment can be used based on the November SAFE because the interim TACs are usually not published until mid December. It is possible that emergency action may be taken to adjust seasonal harvest if the Council sets a TAC that is substantially lower resulting in a lower seasonal TAC. Whether the drop in seasonal TAC could justify an emergency action will have to be determined at the time final specifications are recommended. Because such actions may require up to two months to complete, it is unlikely that the inseason or emergency action could be completed before the start of the fishery in January.

It is not possible to determine the significance of the effects on the interim specifications at this time because the final TACs must be available to do the comparison. Due to the lack of information to determine if an adverse effect is possible and the capability of using emergency rulemaking to adjust harvest amounts, the potential effects from Alternatives 1-4 for the interim specifications on the temporal

dispersion of harvest of prey species is unknown. The effect of Alternative 5 would be significantly beneficial due to no fishing leading to no need for temporal dispersion of prey removal.

Harvest Control of Prey Species

Steller sea lion protection measures require the control of overall harvest of pollock, Pacific cod, and Atka mackerel, which are considered key Steller sea lion prey species (50 CFR 679.20(d)(4)). If the spawning biomass of a prey species is predicted to fall below 20 percent of its unfished spawning biomass, directed fishing for that species would be prohibited. The harvest control rule is analyzed in the Steller sea lion protection measures SEIS (NMFS 2001b). The global harvest of pollock, Pacific cod, and Atka mackerel would be controlled by the harvest control rule for Alternatives 1-4, and the global harvest would be below the harvest control rule for Alternative 5. Based on the significance criteria, impacts from Alternative 1-5 on the global harvest of prey species are insignificant.

Gulf of Alaska Pollock The GOA pollock fishery impacts on Steller sea lions may be of concern due to the magnitude of change in the pollock population in the GOA. The estimated female spawning biomass has steadily decreased in the GOA from 385,000 mt in 1994 to **142,000 mt in 2002** (Appendix B). The model estimate of the spawning biomass of the stock in **2003 was 28** percent of the unfished spawning biomass, fairly close to the 20 percent limit specified in the harvest control rule at 50 CFR 679.20(d)(4). Draft results of the 2003 winter echo integration trawl survey of pollock were provided to the GOA Plan Team at its September 2003 meeting (Guttormsen, Wilson, and Stienessen 2003). Surveys were conducted in the Shumagin Islands, Sanak Trough, Shelikof Strait, and in the shelf breaks near Chirikof Island and Middleton Island in February and March 2003. Overall, the total GOA biomass was estimated to be similar to that in 2002, with mixed results found at the various survey locations. (Provided text to Martin Dorn for updates 9/17/04)

Disturbance Effects

Vessel traffic, nets moving through the water column, or underwater sound production may all represent perturbations that could affect marine mammal behavior. Foraging could potentially be affected not only by interactions between vessel and species, but also by changes in fish schooling behavior, distributions, or densities in response to harvesting activities. In other words, disturbance to the prey base may be as relevant a consideration as disturbance to the predator itself. For the purposes of this analysis, some level of prey disturbance may occur as a fisheries effect. The impact on marine mammals using those schools for prey is a function of both the amount of fishing activity and its concentration in space and time, neither of which may be extreme enough under any alternative to represent population level concerns. To the extent that fishery management measures do impose limits on fishing activities inside critical habitat, some protection may be provided from these disturbance effects.

The criterion set for insignificant impacts is a similar level of disturbance as that which was occurring in 2004. The level of disturbance is based on the locations of fishing activities and whether closed areas have been opened. Alternatives 1-4 would not open additional areas where disturbance may increase at particular locations compared to 2004. Alternative 1 allows for more fishing effort than 2004, which in turn may result in more disturbance by increasing the amount of time vessels may be in contact with marine mammals. Thus, the effect under Alternatives 2-4 is insignificant and the effect of Alternative 1 is significantly adverse according to the criteria set for significance (Table 4.1-6). Effects on all marine mammals under Alternative 5 is likely to be significantly beneficial because there would be no interaction between marine mammals and the groundfish fisheries.

The significance determinations for analysis performed in this EA are summarized in Table 6.0-1.

4.7 Effects on Seabirds

Impacts of fishery management on seabirds are difficult to predict due to the lack of information on many aspects of seabird ecology. A summary of known information, both general and species-specific, was presented in the PSEIS, (Section 3.7) and was followed by a description of the comparative baseline to be used for analysis (Sections 3.7.1 and 4.4). An analysis of the effects of each PSEIS alternative on seabirds is provided in sections 4.5 through 4.8, followed by an analysis of the effects of the preliminary preferred alternative in Section 4.9.7 (NMFS 2004d).

The criteria used to evaluate the environmental significance of the alternatives' seabird impacts are described in Section 4.1, and summarized in Table 4.1-7. A summary of the significance ratings for the criteria may be found in Table 6.0-1. Significance of impacts is determined by considering the context in which the action will occur and the intensity of the action. When complete information is not available to reach a strong conclusion regarding impacts, the rating of 'unknown' is used. Table 4.1-7 outlines the qualitative significance criteria or thresholds that are used for determining if an effect has the potential to create a significant impact on seabirds.

Seabird Groups and Effects to Consider

For reasons explained in the Steller Sea Lion Protection Measures SEIS (NMFS 2001b), the following species or species groups are considered: (1) northern fulmar, (2) short-tailed albatross, (3) spectacled and Steller's eiders, (4) other albatrosses and shearwaters, (5) piscivorous seabird species, and (6) all other seabird species not already listed.

Given the sparse information, fishery effects on most individual bird species may not be discernable. The fishery effects that may impact seabirds are (a) direct effects of incidental take (in gear and vessel strikes), and indirect effects on (b) prey (forage fish) abundance and availability, (c) benthic habitat, (d) processing waste and offal. See Table 4.1-7 in Section 4.1 for a list of the impacts. These are discussed at greater length below.

ESA listed seabirds are under the jurisdiction of the USFWS which has completed an FMP level (USFWS 2003a) and project level BiOp (USFWS 2003b) for the groundfish fisheries and the setting of annual harvest specifications. Both BiOps concluded that the groundfish fisheries and the annual setting of harvest specifications were unlikely to cause the jeopardy of extinction or adverse modification or destruction of critical habitat for ESA listed birds.

Incidental take

The effects of incidental take of seabirds (from fishing gear and vessel strikes) are described in Section 3.7.1 of the PSEIS (NMFS 2004d). Birds are taken incidentally in longline (hook and line), trawl, and pot gear. Estimation of seabird incidental take from longline and pot vessels is very straightforward. On trawlers, however, sample size issues confound the estimation procedure. This unfortunately creates the need to provide two estimates of total seabird takes for trawl fisheries, depending on the sample size for hauls where seabirds were not recorded. Further, while observers are able to see all gear-related mortalities from longline and pot vessels, on trawl vessels there is anecdotal evidence that seabird mortalities occur from collisions with the trawl sonar cable and main net cables. The extent of that mortality is currently unknown, as observers are fully tasked with sampling the catch. Mortality contributed by the pot fleet is small, accounting for less than one half percent annually. The trawl fleet contributes from 10.6% to 44.9% of the overall mortality, depending on which estimation methodology is

used, with the actual amount likely being somewhere between these two bounds. Longline operations contribute the remainder. Due to its minimal contribution to overall seabird mortality, the pot fleet will not be considered in this analysis.

As noted in Section 3.7.1 of the PSEIS (NMFS 2004d), several factors are likely to affect the risk of seabird incidental catch. It is reasonable to assume that risk goes up or down, partly as a consequence of fishing effort (measured as total number of hooks in the longline fleet, and total haul time in the trawl fleet) each year (NMFS 2004d). In the longline fleet, if seabird avoidance measures used to prevent birds from accessing baited hooks are effective, then effort levels would probably be less of a critical factor in the probability of a bird getting hooked. Seabird bycatch avoidance measures are outlined on pages 3.7-7 through 3.7-10 of the PSEIS (NMFS 2004d). New bycatch avoidance measures have been required in the hook-and-line groundfish fisheries of the BSAI and GOA since February 12, 2004 (69 *FR* 1930). These regulations required all hook-and-line vessels over 55 feet to use paired streamer lines. Seabird incidental take in 2003 was reduced by 43% from 2001, when many freezer longliners had not yet begun voluntarily using paired streamer lines. Although the incidental take of seabirds has exhibited some large inter-annual variations, it is worth noting that this is the second year of substantive reductions in seabird incidental take when compared to earlier years. Continued collection of seabird incidental take data by groundfish observers will provide the data necessary to evaluate further changes in the rates.

In the trawl fleet, improved instructions to observers should help refine the estimates, which will in turn allow a better assessment of whether the numbers taken pose a conservation concern. At the same time, the trawl industry, the NMFS, Washington Sea Grant, and the University of Washington are collaborating on a project to reduce or eliminate mortality associated with sonar transducer and net cables.

Prey (forage fish) abundance and availability

A description of the effects of prey abundance and availability on seabirds is in Section 3.7.1 of the PSEIS (NMFS 2004d). Detailed conclusions or predictions cannot be made regarding the effects of forage fish bycatch on seabird populations or colonies. However, the present understanding is that fisheries management measures affecting abundance and availability of forage fish or other prey species could affect seabird populations (NMFS 2004d; NMFS 2001b), although commercial fisheries do not compete directly with seabirds. There is no directed commercial fishery for those species which compose the forage fish management group and seabirds typically target juvenile stages rather than adults for those target species where there is an overlap between seabirds and commercial fisheries.

Benthic habitat

The fishery effects on benthic habitat are described in Section 3.6.4 of the PSEIS (NMFS 2004d). The indirect fishery effects on benthic habitat as utilized by seabirds are described in the seabird summaries provided in each alternative (Sections 4.9.7) (NMFS 2004d).

Cormorants and alcids have diverse diets that include small schooling fishes (capelin and sand lance) and demersal fish species and crustaceans. These birds are capable of diving from 40 m to over 100 m deep and are thus able to reach the ocean floor in many areas. Some species, such as cormorants and guillemots, usually forage in coastal waters during the breeding season, but other species forage well away from land. Bottom trawl gear has the greatest potential to indirectly affect these diving seabirds via physical changes to benthic habitat but pelagic trawls (to various extents), pot gear, and longline gear also contact the ocean floor. Trawling (and to a lesser extent other fishing gear disturbance) can reduce habitat complexity and productivity. (NMFS 2004d, page 4.9-241 to 4.9-242) Gear impacts on benthic habitat

would primarily be from bottom trawl gear although pelagic trawls and pot gear also make contact with the bottom and contribute to benthic disturbance. (NMFS 2004d, page 4.9-248)

Processing waste and offal

The volume of offal and processing wastes probably changes approximately in proportion to the total catch in the fishery. Whereas some bird populations may benefit from the food supply provided by offal and processing waste, the material also acts as an attractant that may lead to increased incidental take of some seabird species (NMFS 2001b). For example, there seems to be little interaction between trawl sonar cables and seabirds in the shoreside delivery fleet, which has minimal discards and offal, while the interactions are higher near catcher/processor vessels (McElderry, et al, in prep). These conclusions are based on very limited samples and should be used with caution. It is also worth noting the apparent reduction in seabird incidental take for the longline fleet described earlier. Should the use of seabird avoidance gear prove effective over time, the negative aspects of seabird attraction to vessels will be reduced. TAC levels under various alternatives could reduce the amount of processing waste and offal that is available to scavenging seabirds, particularly in some areas near major breeding colonies. This impact would need to be considered in the balance of the beneficial and detrimental impacts of the disposal actions.

Effects of Alternative 1 on Seabirds

Incidental take In as much as Alternative 1 could increase fishing effort by setting the TAC to produce a fishing rate equal to $max F_{ABC}$, it has the potential to increase interactions with those seabird species prone to incidental bycatch. The PSEIS (NMFS 2004d) noted that the data suggest that northern fulmars were the only species showing a positive linear relationship between fishing effort and numbers of birds hooked. This relationship did not exist for other bird groups. The short-tailed albatross, because of its small population and endangered species status, and the black-footed albatross, because of concerns of a population decline and high incidental take in the GOA, might also be affected by greater fishing effort (NMFS 2001b). These three species, the northern fulmar, short-tailed albatross, and black-footed albatross, may demonstrate significant adverse effects from incidental take resulting from this alternative. However, because there is insufficient information to document a link between colonies or population trends and incidental take of these species and other seabird species, the effect of Alternative 1 on the incidental take of all seabirds was rated 'unknown'. The overall effectiveness of seabird avoidance measures has not yet been evaluated, but these measures do appear to substantially reduce seabird incidental take in the longline fishery. If implemented fleet-wide, either through voluntary action or regulation, these may substantially reduce incidental take.

The Steller Sea Lion Protection Measures SEIS (NMFS 2001b) examines the population trends and potential for effects of groundfish fisheries on these potentially affected species. Effort should be made to gather data and conduct the analysis and modeling necessary to make a determination in future EA on TAC alternatives on these three species.

Prey (forage fish) abundance and availability The PSEIS concluded that fishery influences on the abundance and availability of forage fish was considered insignificant for populations of northern fulmars and most other seabird groups (NMFS 2004d). The prey base for some piscivorous seabirds, however, could be affected by localized increases in TAC level (NMFS 2001b). The effect at the population level of high TAC for these seabird species remains unknown.

Benthic habitat Specific effects of trawling on piscivorous seabird prey species in the BSAI/GOA (through habitat change rather than by direct take) are poorly known. However, none of the species in this

group appear to have experienced consistent or widespread population declines so there is no indication that the carrying capacity of the environment has been decreased through changes to benthic habitat (or any other mechanism) (NMFS 2004d). The impact on piscivorous seabirds has been rated unknown.

Based on an analysis of the Observer Program data, there is currently no overlap occurred between spectacled eider critical habitat and the groundfish fishery under the baseline conditions. (NMFS, 2004, page 4.9-248) Since Steller's eiders forage almost exclusively in shallow waters inshore of the groundfish fisheries, their preferred winter habitats are not subject to groundfish fishing effort. During the breeding season, the overlap of bottom trawl fisheries and Steller's eider critical habitat is also very limited, involving only a few vessels in a limited area of Kuskokwim Bay. The effects of this small bottom trawl fishery on Steller's eider critical habitat have not been investigated but considering the limited fishing effort and large area of critical habitat that is not fished, it is unlikely that the changes in benthic habitat resulting from this fishery would affect Steller's eiders on a population level. The small amount of fishing in this area is limited by logistical considerations and lack of interest by the fleet. During Section 7 consultations with NOAA, USFWS concluded that the fisheries were not likely to adversely affect Steller's eider critical habitat or their food supply through bottom-contact fishing gear (USFWS 2003a; NMFS, 2004, page 4.9-248). The impact on eiders and on other seabirds not dependent on benthic habitat has been rated insignificant.

Processing waste and offal It could be that the northern fulmar, a species known to benefit from fishery discards in the North Atlantic, experiences a benefit from North Pacific fisheries. Given the unknown effect of incidental take on northern fulmars in the BSAI and on the Pribilof Island colonies in particular, any benefit from a supplemental feeding source could be reduced by the bycatch effects associated with the fishery. Based on this information, the availability of fishery processing wastes could have a significant beneficial effect on northern fulmars under Alternative 1. It is not possible at this time to determine if this effect is significant, and thus the effect is unknown.

Effects of Alternative 2 on Seabirds

Incidental take TAC levels under Alternative 2 are less than those under Alternative 1 in the BSAI. In the GOA, TAC levels under Alternative 2 are lower than those of Alternative 1 for most species, with the exceptions of Pacific ocean perch. The promulgation of Alternative 2 is thus seen as similar in effect on seabirds as those in Alternative 1. Because the primary fisheries potentially affecting seabirds in the GOA would have lower effort, it is possible that lower incidental take could occur for species such as fulmars, albatrosses and shearwaters. The population level differences are not likely to be different than those determined under Alternative 1.

Prey (forage fish) abundance and availability The effects on seabird prey from TAC levels under Alternative 2 are not likely different than those under Alternative 1, at the population level. It is possible that in the GOA, localized impacts on the seabird prey could be reduced, but the effect at the population level is considered insignificant, or for piscivorous birds, unknown.

Benthic habitat For the reasons discussed under Alternative 1, the Alternative 2 habitat impact on piscivorous seabirds has been rated unknown, while the impacts on other species have been rated insignificant.

Processing waste and offal TAC levels under Alternative 2 could have effects similar to those described under Alternative 1. In the GOA, processing waste and offal that is available to scavenging seabirds might be reduced. This indirect effect potentially has both beneficial and detrimental impacts and overall

could be considered insignificant at the population level for all seabird species with high interaction levels with the fisheries, such as fulmars, albatrosses, shearwaters, and gulls.

Effects of Alternative 3 on Seabirds

Incidental take Potentially, the overlap between longline vessels and fulmars foraging near colonies would be reduced under TAC levels of Alternative 3, and could result in reduced levels of interaction and incidental take of fulmars. Given the current levels of incidental take, the existing measures in place to reduce incidental take of seabirds, and all of the above considerations (see also NMFS 2001b), Alternative 3 is considered to have an unknown effect on fulmars at the BSAI colonies. Black-footed albatrosses could be affected in the GOA by lower encounter rates under a $F_{50\%}$., thus the effect of this alternative on incidental take for albatrosses is considered unknown. Other seabird species are not likely to be affected significantly by this amount of change in fishing effort.

Prey (forage fish) abundance and availability For the reasons noted in the PSEIS and summarized in NMFS 2001b, the potential indirect fishery effects on prey abundance and availability of Alternative 3 are considered unknown for all seabirds. For most piscivorous seabirds, the effects of fishing effort under this alternative would not likely be different than under current TAC levels. Those seabirds that feed closer to shore or include benthic prey in their diets, such as guillemots, cormorants, eiders and other seaducks, might benefit from lower fishing effort under this alternative. However, the potential for effects at the population or colony level are unknown, and thus effects for these groups of birds is considered unknown.

Benthic habitat For the reasons discussed under Alternative 1, the Alternative 3 habitat impact on piscivorous seabirds has been rated unknown, while the impacts on other species have been rated insignificant.

Processing waste and offal The availability of fishery processing wastes could decline under Alternative 3, which could reduce supplemental food available to fulmars, which are closely associated with fishing vessels. However, the change in fishing effort is not likely to be sufficiently different from current TAC levels to affect population-level changes in fulmars. Furthermore, reduced fishing could also have the effect of reducing interactions subjecting the birds to incidental take, thus the effects are considered unknown for fulmars.

Effects of Alternative 4 on Seabirds

Incidental take Under Alternative 4, fishing effort varies among target species and regions, with respect to effort under Alternatives 1-3. It is thus difficult to make a determination about the potential effects of this alternative on seabirds. In general, using the 5-year average to set TAC levels is lower than other alternatives (with the exception of Alternative 5, no take). However, important exceptions are the pollock and Pacific cod fisheries in the GOA, which under Alternative 4 are equivalent to those of Alternative 1, the $max F_{ABC}$. Given the current levels of incidental take, the existing measures in place to reduce incidental take of seabirds, and all of the above considerations, Alternative 4 is considered to have an unknown effect on fulmars, albatrosses and shearwaters. See NMFS 2001b for the analysis of the effect of incidental take on these species.

Prey (forage fish) abundance and availability For the reasons noted in the PSEIS and summarized in NMFS 2001b, the potential indirect fishery effects on prey abundance and availability resulting from Alternative 4 are considered unknown at the population level for all seabirds.

Benthic habitat For the reasons discussed under Alternative 1, the Alternative 4 habitat impact on piscivorous seabirds has been rated unknown, while the impacts on other species have been rated insignificant.

Processing waste and offal This alternative has the potential of increasing offal in the GOA, and thus could affect fulmars in particular. However, the population or colony effects of TAC levels under Alternative 4 are unknown for fulmars, and are likely to be insignificant for other seabirds.

Effects of Alternative 5 on Seabirds

Incidental take The effects of Alternative 5 with respect to incidental take are expected to benefit seabirds subject to incidental take in groundfish fisheries, since it eliminates or greatly reduces fishing effort. Thus, this alternative could have a significant positive effect on populations of fulmars, albatrosses, shearwaters, and gulls. Northern fulmars have considerable overlap between longline fisheries and colony location and distribution at sea (NMFS 2003a, Appendix C). Fulmars also demonstrate a direct link between fishing effort and incidental take rates (NMFS 2004d). For these reasons, a complete absence of fishing has a high potential to have a significant beneficial effect on specific colonies. Similarly, short-tailed albatrosses and black-footed albatrosses may derive significant benefits by reduced incidental take. However, as noted under Alternative 1, there is insufficient information to document a link between colonies or population trends and incidental take of these species. For the reasons discussed in Alternative 4 of the PSEIS, the effect of the no fishing alternative for this EA must also be rated as insignificant for these species. Other species, though incidental catch rates would be reduced, are also not likely to be affected at the population or colony level. Should the seabird new mitigation measures prove effective over time, there will be a less likely benefit to seabirds from reduced incidental take under the no fishing alternative. Differences due to trawl fishing need to be evaluated in light of refined estimates resulting from changes in observer data recording proposed for 2004.

Prey (forage fish) abundance and availability For the reasons noted in the PSEIS and summarized in NMFS 2001b, the potential indirect fishery effects on prey abundance and availability of Alternative 5 are considered insignificant at the population level for most seabirds, and unknown for eiders and other seaducks.

Benthic habitat Under Alternative 5, all TACs would be set equal to zero. This alternative has therefore been given an insignificant rating for this impact.

Processing waste and offal Based on the assumptions noted in NMFS 2001b, the availability of fishery processing wastes could have a significant beneficial effect on northern fulmars, thus, a complete reduction of fishing could reduce offal availability to fulmars. Similar effects might occur for albatrosses, shearwaters, and gulls. The degree to which these populations are dependent on offal are not known, and thus the effect is considered unknown for fulmars, albatrosses, shearwaters, and gulls, and is insignificant for other seabird species.

4.8 Effects on Marine Benthic Habitat and Essential Fish Habitat

The effects of fishing on benthic habitat and essential fish habitat important to federally managed FMP species and their prey are analyzed in this section under alternative levels of total allowable catch. A complete evaluation of effects would require detailed information on the distribution and abundance of habitat types, the life history of living habitat, habitat recovery rates, and natural disturbance regimes. Although more habitat data becomes available from various NOAA and ADF&G research projects each fishing year, much is still unknown about marine benthic habitat and essential fish habitat in the EEZ.

Specific effects for alternate TAC levels and the magnitude of the differences between them are very difficult to predict, given the limitations of current data.

Both the Final PSEIS (NMFS 2004d) and the Draft EFH EIS (NMFS 2004a) discuss effects of fishing on habitat. Section 3.6 of the PSEIS discusses the role of particularly sensitive or vulnerable areas and types of EFH, referred to as Habitat Areas of Particular Concern (HAPCs) and outlines the history of fisheries management in protecting EFH. It also includes a discussion of the effects of different gear types on EFH and on different types of substrate, and has information on the patterns of trawling in the North Pacific and on the past and present effects of fishing on EFH. A habitat impacts model is presented in Section 4.1.6, and Appendix A contains tables summarizing the effects of each alternative on habitat. The Draft EFH EIS (NMFS 2003) contains different alternatives for identifying and mitigating effects on EFH and alternative approaches for identifying HAPC. It contains an analysis of the expected effects of each of these alternatives on EFH as well as other environmental quality factors.

Table 4.1-8 provides significance criteria for effects on habitat. These effects include direct and indirect effects on living habitat through direct mortality of benthic organisms, changes to benthic community structure, and geographic diversity of management and fishing effort. The reference points from which the significance of effects are determined are the current size and quality of marine benthic habitat and other essential fish habitat and the change from the current management of the groundfish fisheries.

Total Allowable Catch Specifications Alternatives 1, 2, 3, and 4

Alternatives 1, 2, 3, and 4 are variations on current management, and are considered to fall within the scope of the PSEIS preferred alternative. The following discussion is based on effects described in the PSEIS for the preferred alternative and the additional effects that Alternatives 1-4 may have beyond those already occurring in the current groundfish fisheries and how these effects relate to the significance criteria.

Changes to Living Habitat – Direct Mortality of Benthic Organisms: The direct mortality on benthic organisms from groundfish fisheries is likely to be affected by the amount of harvest that is permitted. The more harvest permitted, the more activity that is likely to happen in those areas where groundfishing takes place which may result in additional mortality for benthic organisms in these locations. Alternatives 2, 3, and 4 would implement harvest levels that are near or below the current management regime and would likely have impacts on the direct mortality of benthic organisms that is the same or less than impacts currently experienced in the groundfish fisheries, therefore have insignificant effects. Alternative 1 would allow for larger amounts of harvest and may result in increased fishing effort that may cause additional mortality of benthic organisms beyond those currently experienced. Therefore, Alternative 1 impacts on the mortality of benthic organisms are considered significantly adverse.

Changes to Benthic Community Structure – Benthic Community Diversity and Geographic Diversity of Management: Alternative 2, 3, and 4 would allow harvest levels near or below the current management regime. Locations of management measures for the groundfish fisheries under each of these alternative are the same as the current management regime. Because the levels of harvest are similar or less than current management, and the locations of fishing management are not changed under these alternatives, the impacts on benthic community structures and the geographic diversity of management measures and fishing effort are insignificant.

Alternative 1 would allow for an increase in the amount of harvest. This increase in harvest may result in additional removal of organisms from the benthic community that may result in changes to the community structure depending on the type of organisms removed and the potential rate of recovery.

Information on how the additional harvest may change the community structure is not available at this time. Therefore, Alternative 1 has potentially adverse but unknown effects on benthic community diversity. The geographic management of the groundfish fishery would not change under Alternative 1, and therefore, the impacts of Alternative 1 on the geographic diversity of management measures and fishing effort are insignificant.

Total Allowable Catch Specifications Alternative 5

Alternative 5 sets the TACs to zero. No groundfish fisheries would have an allocation, and therefore no fishing would occur.

Changes to Living Habitat – Direct Mortality of Benthic OrganismsThe level of mortality under a no fishing regime would be much less than the level of mortality currently experienced in the groundfish fisheries. Abundance increases for short-lived biota with fast recovery rates may occur relatively quickly if no fishing occurred during the 2005 and 2006 fishing years. For other species of living substrates such as long-lived corals and perhaps some sponges that have been permanently eradicated from some areas, increases over baseline levels during 2005 and 2006 may not occur or would occur very slowly. Even though the ability of the biota to recover from the impacts of the current fishing practices vary, the effects of Alternative 5 on the direct mortality of benthic organisms would be less than the current management and is therefore considered significantly beneficial.

Changes to Benthic Community Structure As discussed above for changes in living habitat, some changes in community structure may be seen in 2005 and 2006 with no fishing, but detectable, meaningful changes in community structure are expected to take longer than two years to accumulate. Shorter lived species that are capable of recolonizing damaged areas may increase the structure in some benthic communities. There is insufficient information to determine whether the cessation of fishing for two years would result in an overall change in the benthic community structure beyond what would happen under the current management regime. The effects of Alternative 5 on benthic community structure is therefore likely to be positive but unknown.

Distribution of Fishing Effort – Geographic Diversity of Management With no fishing occurring, the distribution of fishing effort to protect the geographic diversity of habitat would be unnecessary. The elimination of fishing would allow for widespread protection of the geographic diversity of benthic communities, resulting in significant beneficial impacts on the distribution of fishing effort and geographic diversity of management measures.

4.9 Effects on the Ecosystem

Ecosystems are populations (consisting of single species) and communities (consisting of two or more species) of interacting organisms and their physical environment that form a functional unit with a characteristic trophic structure (food web) and material cycles (movement of mass and energy among the groups).

The indicators of ecosystem function used to interpret and predict the effects of the BSAI and GOA groundfish fisheries on the ecosystem are listed in Table 4.1-9. The indicators were separated into categories relating to the three key ecosystem attributes of predator/prey relationships, energy flow/removal, and diversity. Background information specific to the North Pacific ecosystem is contained in Appendix C of this EA/IRFA ("Ecosystem Considerations for 2005"). The analysis of direct

and indirect ecosystem impacts under the preferred alternative in the PSEIS may be found on pages 4.9-351 to 4.9-357 (NMFS, 2004d, Volume IV)

Predator-prey relationships

Pelagic forage availability The significance of impacts on pelagic forage availability is assessed with respect to whether or not fishery induced changes are outside the natural level of abundance or variability for a prey species relative to predator demands. (Section 4.1, Table 4.1-9) Significance is assessed primarily by evaluating population trends in pelagic forage biomass for species with age-structured population models. These include walleye pollock in the GOA, Bering Sea walleye pollock, and Aleutian Islands Atka mackerel. For other forage species (herring, squid, and the forage species group), bycatch trends are used as measures of the potential impact of the BSAI and GOA groundfish fisheries on forage availability. (NMFS, 2004d, page 4.9-352)

EBS pollock biomass was at low levels in the late 1970s, but rose to over 10 million mt a year by 1993. EBS pollock biomass has fluctuated between 10 million and 15 million mt since that time. (Appendix C, page 121) Estimates prepared with age-structured population models indicate that female spawning biomass ranged between 893,000 mt and 4.4 million mt between 1977 and 2004. The 2004 estimate was 3.9 million mt. (Appendix A, page 75). The model projects declines in biomass from current levels under all alternatives. Alternatives 1 and 2 project declines to about 2.4 million mt in 2006, and then gradual increases to stable levels of 3.0 million mt from 2010 to 2016 (the end of the projection period in the SAFE). These projections overstate the decline under Alternative 2, because they assume that harvests will be at assessment author recommended fishing rates, rather than at the lower rates imposed by the Council due to OY considerations. The assessment authors point out that at a constant harvest of 1.5 million mt (slightly above current TACs) the biomass remains above 3 million mt. (Appendix A, page 55) Alternatives 3 and 4 also involve short term harvest declines and longer term increases. Biomass in these projections never go below 3 million mt. Alternative 5 involves increases in pollock biomass from current levels. (Appendix A, page 77) Biomass fluctuations under all scenarios stay within levels observed in the last 20 years.

Under Alternatives 1 to 4, the AI pollock fishery will be reopened in 2005, with a TAC of 19,000 mt. Alternative 5 would maintain the fishery as essentially an ICA fishery at about current levels. The impact of the new AI pollock fishery on marine mammal and seabird predators is reviewed in Section 4.12 of this EA. Impacts on predators were rated insignificant.

Pollock biomass in the GOA has declined more or less continuously since a peak of almost 4 million mt in the early 1980s. In recent years pollock biomass has been under 1 million mt – although it appears to have increased slightly between 2000 and 2003. In the late 1970s, pollock was the dominant GOA groundfish species; its position was replaced by arrowtooth flounder in 1986. (Appendix C, page 121) Age-structured population models suggest that the female spawning biomass has ranged between 749,000 mt and 142,000 mt over the period from 1977 to 2003. As noted, biomass sizes were declining over that period. The population models indicate that all alternatives are associated with increases in the estimated spawning biomass from current levels. (Appendix B, pages 80 and 83) Section 4.6 of this EA, which examines the impact of alternatives on marine mammals describes the GOA pollock fishery as a topic of concern due to the low levels of biomass and its potential impacts on Steller sea lions, noting that the "…model estimate of the spawning biomass of the stock in 2003 was 28 percent of the unfished spawning biomass, fairly close to the 20 percent limit specified in the harvest control rule…" for closing fishing.

Age-structured population model estimates of total biomass since 1977 indicate that AI Atka mackerel biomass has fluctuated between 260,860 mt and 771,360 mt; biomass appears to have been relatively

stable since 1997, fluctuating between 414,840 mt and 459,030 mt. Female spawning biomass fluctuated between 59,000 and 200,000 mt over the same period. In recent years (1999-2004) female spawning biomass has fluctuated between 76,000 and 100,000 mt. The age structured models suggest that female spawning biomass will drop somewhat in the shortrun under either Alternatives 1 or 2, reaching a minimum of 68,000 mt in 2006 before rising to and staying at recent levels through 2016. Biomass stays at current levels under Alternative 3 and then rises to between 110,000 and 120,000 mt from 2008 to 2016. Biomass drops somewhat under Alternative 4, but then rises again, staying between 90,000 and 100,000 mt from 2009 to 2016. Biomass rises systematically under Alternative 5, reaching about 200,000 mt in 2016. (Appendix A, page 749 and 752)

Under the preferred alternative in the PSEIS, the estimated pelagic forage biomass for the age-modeled populations declines from the baseline in the BSAI and increases over the baseline in the GOA. Twenty-year biomass projections show similar trends. Average biomass, however, remains within the bounds of estimated biomass that occurred historically before a target fishery emerged. Bycatch of other forage species increases in the BSAI and declines in the GOA. (NMFS, 2004d, page 4.9-352)

As noted in Section 4.4 of this EA (on forage fish species) Alternatives 1, 3 and 4 are rated unknown with respect to forage species, Alternative 2 is rated insignificant, and Alternative 5 is rated as beneficially significant. In Section 4.5 of this EA (on PSC species) all of the alternatives have been rated as insignificant with respect to impacts on herring populations. Estimates of forage biomass from food web models of the EBS indicate that levels of bycatch at recent harvest levels (represented by the baseline in the PSEIS) have probably been a small proportion of the total forage biomass, although because population-level assessments are lacking for some members of the forage species group, corresponding biomass estimates for these species are not available. (NMFS, 2004d, page 4.9-352)

Because average biomass projections for the age-modeled forage species remain within the estimated historical boundaries, and bycatch-based estimates for other forage species are small in relation to total forage biomass, specifications Alternatives 1 to 4 are given insignificant ratings. Alternative 5 sets all species TACs equal to zero. This alternative has been given a positively significant rating. (NMFS, 2004, page 4.9-352

Spatial and temporal The spatial and temporal concentration of fishery impacts on forage species is assessed qualitatively by considering the potential for the alternative to concentrate fishing on forage species in regions used by predators tied to land, such as pinnipeds and breeding seabirds. Additionally, the possibility for concentrated fishing effort to result in an ESA listing or in the lack of recovery of a species that is already listed is also considered. (NMFS, 2004d, page 4.9-353)

All specifications alternatives under consideration would continue the existing closures around Steller sea lion rookeries, trawl and fixed gear closures in nearshore and critical habitat areas, the ban on directed fishing for forage fish, the seabird protection measures required since February 2004 in hook-and-line fisheries, and the spatial/temporal allocation of TAC for some BSAI and GOA species. Ecosystem Appendix C to this EA provides a map of groundfish closures in Alaska's Exclusive Economic Zone and a table summarizing groundfish trawl closures implemented since 1995. BSAI pollock fisheries have shown increasing catch in northern fur seal foraging habitat, but more research is required to evaluate whether the amounts of pollock removed are having a population-level effect on fur seals. (NMFS, 2004d, page 4.9-353)

Alternatives 2 to 4 have been rated insignificant because they involve harvests similar to or less than recent harvests, and no change in spatial or temporal controls. Alternative 1 has been rated unknown, because of the large increase in BSAI pollock harvests it implies, and because of the noted potential for

increased pollock catches in northern fur seal habitat. Alternative 5 has been rated significantly beneficial because of the removal of the need for spatial and temporal controls of fishing under the no fishing regime for protection of the ecosystem.

Removal of top predators The significance criterion for removal of top level predators is whether or not catch levels are high enough to cause the biomass of one or more top level predator species to fall below minimum biologically acceptable limits. Removal of top predators, either through directed fishing or bycatch, is assessed by (1) an examination of the trophic level of the catch or bycatch, (2) the bycatch levels of sensitive top level predators, and (3) the population status of top predator species relative to acceptable limits. (Section 4.1, Table 4.1-9) The PSEIS elaborates somewhat on the ways these indicators are meant to be evaluated:

> Removal of top predators, either through directed fishing or bycatch, is assessed by evaluating the trophic level of the catch relative to the trophic level of the groundfish biomass…, bycatch levels of sensitive top predator species such as birds and sharks…, and a qualitative evaluation of the potential for catch levels to cause one or more top-level predator species to fall below biologically acceptable limits (MSST for groundfish; for other species, ESA listing or preventing recovery of an already-listed species). (NMFS, 2004d, page 4.9-353)

The PSEIS points out that trophic level of the catch in both the BSAI and GOA has been stable. (NMFS, 2004, 4.9-353). In 1999, Livingston *et al.* "found no evidence that groundfish fisheries had caused declines in tropic guild diversity for the groups studied." Observed changes in tropic guild diversity appeared to be "related primarily to recruitment rather than to fishing." (NMFS, 2004d, page 3.10-26) More recently, as noted in this year's ecological SAFE, which may be found in Appendix C, "Stability in the trophic level of the total fish and invertebrate catches in the eastern Bering Sea, Aleutian Islands, and Gulf of Alaska…are another indication that the "fishing-down" effect is not occurring in these regions. Although there has been a general increase in the amount of catch since the late 1960's in all areas, the trophic level of the catch has been high and stable over the last 25 years." The Appendix also reports on a "Fishery in Balance Index" or FIB, which declines "when catches do not increase as expected when moving down the food web, relative to an initial baseline year. In the Alaska region, the index suggests that "…catches and tropic level of the catch in the EBS, AI, and GOA have been relatively constant and suggest an ecological balance in the catch patterns." (Appendix C, page 166) This indicator is unknown for Alternative 1, which is associated with large increases in TACs, and is rated insignificant for the other alternatives, under which TACs remain at recent levels, or are reduced.

The above indicators result in no change in the evaluation of the importance of this effect relative to the baseline. The baseline determination shows that historical whaling has resulted in low present-day abundance of whale species in the North Pacific Ocean. The PSEIS preferred alternative would not further impair the recovery of these species through direct takes. Similarly, it is not expected that levels of seabird and pinniped bycatch in groundfish fisheries would lead to an ESA listing for any of those populations or prevent any of the listed species from recovery under the ESA. (NMFS, 2004d, 4.9-353)

Bycatch levels of top-level predators are assumed to vary with catch levels, and thus with the TAC levels that constrain catches. Alternative 1 is associated with large increases in TAC and catch levels in the BSAI and GOA. This alternative is assumed to have a significantly adverse impact on this indicator. Alternatives 2, 3, and 4, are associated with harvest levels similar to or less than, those in recent years. These alternatives have been rated insignificant with respect to this indicator. Under Alternative 5, all TACs and catches would be set at zero. This alternative is rated positively significant.

Section 4.6 of the EA examined the impacts of groundfish fishery incidental takes of marine mammals and found the impact of Alternative 1 to be unknown, and of Alternatives 2 to 5 to be insignificant. Section 4.7 examined the impacts on incidental takes of seabirds, and found an unknown effect for at least one species for each alternative except for Alternative 5. The effect of shark bycatch on shark populations is currently unknown, and further research focusing on population assessments and establishing reliable biomass estimates for these sensitive (late maturing, low fecundity, low natural mortality) species is needed to identify potential effects from the groundfish fisheries. (NMFS, 2004d, 4.9-354)

Unknown marine mammal impacts from Alternative 1, unknown seabird impacts from Alternatives 1 to 4, and the unknown impacts of the fishery shark bycatch on shark populations, lead to an unknown rating for all five alternatives. While TACs are set to zero under Alternative 5, in the absence of better baseline information, it is not clear that this alternative would have a significant impact.

Introduction of non-native species The introduction of non-native species through ballast water exchange and hull-fouling organism release from fishing vessels could potentially disrupt the Alaskan marine food web structure. There have been 24 non-indigenous plant and animal species documented in Alaskan marine waters, primarily in shallow-water nearshore and estuarine ecosystems, with 15 of those species recorded in PWS. It is possible that most of these introductions were from tankers or other large commercial vessels that have large volumes of ballast exchange. However, exchange via fishery vessels that take on ballast from areas where invasive species have already been established and then transit through Alaskan inshore waters has been identified as a threat in a recently developed State of Alaska Aquatic Nuisance Species Management Plan. (NMFS, 2004d, 4.9-354)

Total groundfish catch levels are used as an indicator of potential changes in the amount of these releases by groundfish fishery vessels. Catch levels in the BSAI and GOA increase substantially beyond recent levels under Alternative 1. Catch levels are similar to or less than 2004 levels under Alternatives 2, 3, and 4. Catch levels are set to zero under Alternative 5. Consequently, Alternative 1 has been rated significantly adverse, Alternatives 2, 3, and 4, have been rated insignificant, and Alternative 5 has been rated significantly beneficial. (NMFS, 2004, 4.9-354 to 4.9-355)

As noted in Section 4.12, the opening of the AI pollock fishery may increase the number of vessels operating in the AI, and the potential for the introduction of rats into islands that are currently rat-free. This could pose a threat to some bird species on those islands. That discussion indicates that the likelihood of this was small, however, and that the reopening of this fishery would have insignificant impact.

Energy flow and removal

Energy removal Fishing may alter the amount of energy in an ecosystem by removing energy through the retained harvest of fish. The indicator for energy removal is trends in total retained catch levels. (See Section 4.1, Table 4.1-9). The PSEIS notes that "The annual total catch biomass in the EBS is estimated at about one percent of the total system biomass, excluding dead organic material. There is no indication that the annual removal of this small biomass percentage alters the amount and flow of energy sufficiently to affect ecosystem stability." (NMFS, 2004d, page 3.10-24).

Total retained catch mortality is projected to increase under Alternative 1. However, given the limited potential for impacts on the ecosystem this impact has been rated insignificant. Harvests under Alternatives 2, 3, and 4 are expected to be similar to or smaller than current levels. These alternatives

have been rated insignificant. Alternative 5 sets all TACs equal to zero. However, given the limited impact of removals of retained harvest, this alternative has also been rated insignificant.

Energy re-direction Fishing may alter the direction of energy flow in an ecosystem. Energy re-direction, in the form of discards, fishery offal production, or unobserved gear-related mortality, can potentially change the natural pathways of energy flow in the ecosystem. The recipients, locations, and forms of this returned biomass may differ from those in an unfished system. Three factors: (1) trends in discard and offal production, (2) scavenger population trends, and (3) bottom gear effort, were identified as formal indicators of energy redirection in Section 4.1, Table 4.1-9). Animals damaged when passing through the meshes of trawls may later die and be consumed by scavengers. Bottom trawls can expose benthic organisms and make them more vulnerable to predation. Discards and offal production can cause local enrichment and changes in species composition or water quality if discards or offal returns are concentrated in confined areas such as estuaries, bays, and lagoons. (NMFS, 2004d, 4.9-355)

Ecosystem Appendix C shows that that biomass discards in BSAI and GOA groundfish fisheries dropped substantially in 1998, with the introduction of regulations prohibiting the discards of pollock and Pacific cod. The BSAI biomass discard rate in 2003 was under 6%, while the GOA rate was under 15%. The GOA rate had risen somewhat since the drop in 1998, but remained below the levels of the mid-1990s. (Appendix C, page 156). The PSEIS notes that:

> Queirolo *et al.* (1995), working before present stricter retention requirements for pollock and cod were mandated, estimated that the total production of discarded fish and processing wastes in the BSAI and GOA ecosystems were about one percent of the unused detritus already going to the bottom. With the new retention requirements now in effect, this estimate would be substantially smaller. These authors found no changes in scavenger populations relating to changes in discard or offal production, and found the annual consumptive capacity of scavenging birds, groundfish, and crabs in the EBS to be over 10 times larger than the total production of discards and offal in the BSAI and GOA. Pathways of energy flow within the BSAI and GOA ecosystems, therefore, are apparently not redirected in any significant way by discarded fish bycatch and processing wastes that are returned to the sea. (NMFS, 2004d, page 3.10-25)

Bottom gear effort may affect benthic habitat, and its capacity to support marine fish and invertebrates that use the habitat for protection from predators. Because of this the use of bottom gear may be an indicator of the potential for this source of energy redirection. The PSEIS notes that "Present-day trends in bottom gear effort show there has been a decline in this effort over the last ten or more years." (NMFS 2004d, page 3.10-25).

Given the limited significance of the offal production and scavenging in the ecosystem, the impacts of all alternatives have been rated insignificant with respect to the first two indicators. Alternative 1 may lead to significantly increased use of bottom trawl gear. As noted in Section 4.8, this alternative was expected to have significantly adverse impacts with respect to direct mortality of benthic organisms, and unknown impacts with respect to changes in benthic community structure. For these reasons, Alternative 1 has been given a significantly adverse rating for this issue. Alternatives 2 to 4 create impacts similar to those in recent years, and have been given an insignificant rating on this indicator. Alternative 5 sets all TACs equal to zero, and has been given a positively significant rating on this indicator.

Diversity

Species diversity Species diversity, defined as the number of different species in an ecosystem, can be altered if fishing results in removal of one or more species from the system . An impact on species

diversity is significant if catch removals are high enough to cause the biomass of one or more species (target or nontarget) to fall below or to be kept from recovering from levels below minimum biologically acceptable limits. The indicators for species diversity are: (1) population levels of target and non-target species relative to MSST or ESA listing thresholds, linked to fishing removals, (2) bycatch amounts of sensitive (low potential population turnover rates) species that lack population estimates, (3) number of ESA listed marine species, and (4) area closures. (Section 4.1, Table 4.1-9).

Population levels of target, non-specified, PSC, and forage species were addressed in Sections 4.2, 4.3, 4.4, and 4.5 of this EA. The impacts on target species were rated insignificant for Alternatives 1 to 4 and beneficially significant for Alternative 5. The impacts on non-specified and forage fish species were unknown for Alternatives 1, 3, and 4, insignificant for Alternative 2, and beneficially significant for Alternative 5. The impacts for PSC were insignificant for all alternatives. Summarizing these results for this ecosystem indicator, Alternative 1 is rated unknown, Alternative 2 is rated insignificant, Alternatives 3 and 4 are rated unknown, and Alternative 5 is rated positively significant.

Although no fishing-related species removals have been documented under fisheries management policies in effect during the last 30 years, elasmobranches (sharks, skates, and rays) are particularly susceptible to removal, and benthic invertebrate species diversity could be affected by bottom trawling. (NMFS, 2004d, page 3.10-26) More comprehensive survey data and life history parameter determinations for skates, sharks, grenadiers, and other species groups may help to determine population status and establish additional protection measures that could minimize adverse impacts from fishing. (NMFS, 2004d, page 4.9-356). Alternative 1, under which there are large increases in TACs, has been rated adversely significant for this impact. Alternatives 2, 3, and 4, under which TACs remain close to what they were in 2004, or decline somewhat, have been rated insignificant. Alternative 5, under which TACs are set to zero, has been rated beneficially significant.

Table 6.0-2 identifies the ESA listed and candidate species that range into the BSAI or GOA groundfish management areas. As determined in previous ESA consultation BiOps (NMFS 2000, 2001a, and USFWS 2003), the alternatives under consideration in this EA are not expected to change the number of ESA marine species, or the status of existing ESA listed species. Species currently listed as candidates for ESA listing (northern sea otter and Kittlitz murrelet) have little overlap with groundfish fisheries (NMFS 2004d, NMFS 2004e, and 69 FR 24876, May 4, 2004). Harvest levels under Alternatives 1-4 are unlikely to increase the potential for these species to be listed. Alternative 5 also is not likely to result in the removal of any threatened or endangered species from the ESA listed because of the short duration of the action and the time period needed to recover a species. Alternatives 1 to 5 have been rated insignificant with respect to this impact.

Under all the alternatives, currently closed areas (50 CFR 679.22) would be maintained, and current no-trawl zones and fixed-gear restrictions would stay in place. Alternatives 1-4 have been rated insignificant with respect to this impact. Alternative 5 would close the entire EEZ to groundfish fishing and therefore would provide a significant beneficial impact to closure areas.

In summary, Alternative 1 is rated adversely significant, Alternatives 2 is rated insignificant, and Alternatives 3, and 4 are rated insignificant, and Alternative 5 is rated beneficially significant.

Functional (tropic, structural habitat) diversity Functional diversity can be altered with respect to trophic characteristics if removal or depletion of a trophic guild member occurs. Changes to distribution of biomass within a trophic guild may also result. From a structural habitat standpoint, functional diversity can be altered or damaged if benthic fishing methods such as bottom trawling remove or deplete organisms that provide structural habitat for other species (e.g., corals, sea anemones, sponges).

Functional (either trophic or structural habitat) diversity can be altered through fishing if selective removal of one member of a functional guild results in increases in other guild members. A functional guild is a group of species that utilize resources within the ecosystem in similar ways. (NMFS, 2004d, 4.9-355 to 4.9-356) Significance thresholds are characterized by catch removals resulting in a change in functional diversity outside the range of natural variability observed for the system. Three indicators are used with respect to functional diversity: (1) guild diversity or size diversity changes linked to fishing removals, (2) bottom gear effort, and (3) HAPC biota bycatch. (Section 4.1, Table 4.1-9)

In 1999, Livingston *et al.* "found no evidence that groundfish fisheries had caused declines in tropic guild diversity for the groups studied." Observed changes in tropic guild diversity appeared to be "related primarily to recruitment rather than to fishing." (NMFS, 2004d, page 3.10-26) More recently, as noted in this year's ecological SAFE, which may be found in Appendix C, "Stability in the trophic level of the total fish and invertebrate catches in the eastern Bering Sea, Aleutian Islands, and Gulf of Alaska…are another indication that the "fishing-down" effect is not occurring in these regions. Although there has been a general increase in the amount of catch since the late 1960's in all areas, the trophic level of the catch has been high and stable over the last 25 years." The Appendix also reports on a "Fishery in Balance Index" or FIB, which declines "when catches do not increase as expected when moving down the food web, relative to an initial baseline year. In the Alaska region, the index suggests that "…catches and tropic level of the catch in the EBS, AI, and GOA have been relatively constant and suggest an ecological balance in the catch patterns." (Appendix C, page 166) This indicator is unknown for Alternative 1, which is associated with large increases in TACs, and is rated insignificant for the other alternatives, under which TACs remain at recent levels, or are reduced.

Bottom gear effort, which is an indicator of benthic community guild disturbance, has been decreasing in recent years. (NMFS, 2004d, page 3.10-26). This indicator has been rated significant adverse for Alternative 1, which increases harvest levels a large amount. This indicator has been rated insignificant for Alternatives 2 to 4, which leave harvests at, or below, recent levels. It has been rated significantly beneficial for Alternative 5, under which TACs, and associated bottom trawling, are set at zero levels. Members of the HAPC biota guild serve important functional roles in providing fish and invertebrates with structural habitat and refuge from predation. The abundance level of these structural species necessary to provide protection is not known, and it may be important to retain populations of these organisms and maintain wide spatial distribution to enable them to fulfill their various functional roles. Some of these organisms have life-history traits that make them very sensitive to population-level impacts resulting from fishing. The long-lived nature of corals, in particular, makes them susceptible to permanent eradication in fished areas. Present and proposed Steller sea lion trawl closures are spread throughout the Aleutian Islands, but these closures may be further inshore than most of the coral. For this reason, the area closures proposed under the PSEIS preferred alternative may not be sufficient to provide additional protection for these sensitive organisms in all areas throughout the BSAI and GOA. (NMFS, 2004d, 4.9-356 to 4.9-357) Under these circumstances, this impact has been rated unknown for Alternatives 1 to 4, and positively significant for Alternative 5, under which no fishing would take place in 2005 and 2006.

Genetic diversity An impact on genetic diversity would be significant if catch removals were high enough to cause a loss or change in one or more genetic components of a stock that would cause the stock biomass to fall below minimum biologically acceptable limits. Indicators for this effect are: (1) degree of fishing on spawning aggregations or larger fish, and (2) older age group abundances of target groundfish stocks. Changes in these indicators are assessed qualitatively by inferences from changes in catch levels and in regulations protecting spawning aggregations and separate biomass concentrations.

If a fishery concentrates on certain spawning aggregations or on older (larger) age classes of a target species that tend to have greater genetic diversity (dating from an earlier period when fishing was less

intensive), then genetic diversity will tend to decline in fishing versus unfished systems. Since genetic diversity has not been systematically surveyed, there is no baseline against which changes in genetic diversity may be measured. There are examples (ie. North Sea cod) of fisheries in which heavy fishing, and selection for body length, over long periods of time has been found to have little impact on genetic diversity. There has been heavy exploitation of certain spawning aggregations in the past (e.g., Bogoslof pollock), but current spatial-temporal management of the groundfish fishery has tended to reduce fishing pressure on spawning aggregations. Groundfish stocks in general are protected by sub-division of ABCs and TACs among management areas smaller than the overall BSAI and GOA groupings. It is unknown if commercial fishing has altered the genetic diversity of stocks with distinct genetic components at finer spatial scales than the present groundfish management regions. (NMFS, 2004d, page 3.10-27).

Alternatives 2-4 would establish harvest levels similar to 2004, but would not alter spatial and temporal management controls that provide existing protection for spawning stocks and for overexploitation of subdivisions of broader regional stocks. Alternative 1 would involve heavier exploitation of fish stocks and for this reason could be expected to have an adverse impact on genetic diversity. However, it is not clear whether or not this would be significant. This impact has therefore been rated unknown. Alternative 2 provides for catch levels very similar to current levels. It has been rated insignificant. Alternatives 3, 4, and 5 are associated with smaller overall levels of harvest, and may be expected to have a beneficial impact on genetic diversity. It is unknown, however, whether this impact will be significant. These alternatives have been rated unknown on this indicator.

4.10 Effects on State of Alaska Managed State Waters Seasons and Parallel Fisheries for Groundfish Fisheries

The State of Alaska manages "state water seasons" for several species of groundfish in internal waters: sablefish in Statistical Areas 649 (Prince William Sound) and 659 (Southeast Inside District), pollock in Area 649 (Prince William Sound), and Pacific cod in Areas 610 (South Peninsula District), 620, 630 (Chignik, Kodiak, and Cook Inlet Districts), and 649 (Prince William Sound).

The state also manages groundfish fisheries for which federal TACs are established within state waters. Unless otherwise specified by the state, open and closed seasons for directed fishing within state waters are concurrent with federal seasons. These fisheries have been referred to as "parallel fisheries" or "parallel seasons in state waters." Harvests of groundfish in these fisheries accrue towards their respective federal TACs.

This analysis focuses on the effects of Alternatives 1 through 5 on harvest levels in these state managed fisheries. The criterion used in estimating the effects is described in Table 4.1-10. If an alternative was deemed by NMFS to likely result in a decrease in harvest levels in these fisheries of more than 50%, it was rated significantly adverse. If the alternative was deemed likely to result in an increase in harvest levels of more than 50%, it was rated significantly beneficial. If the alternative was deemed likely to neither decrease nor increase harvest levels by more 50%, it was rated insignificant. Where insufficient information was available to make such determinations, the effect was rated as unknown. The year 2004 was used as a benchmark for comparison. The level of a 50% change in harvest levels is more a qualitative than quantitative assessment. A change of 50% in either direction was clearly a significant change and a change of less than 50% in either direction is likely insignificant as stocks of groundfish can change over the short term within by up to this amount. Individual fishing operations with greater reliance upon participation in these state fisheries may experience adverse or beneficial effects at changes in harvest levels below the 50%. Economic effects are discussed in Section 4.11 on "Social and Economic

Consequences." The effects on other state managed fisheries (salmon, herring, and crab) are discussed in Section 4.5 on "Effects on Prohibited Species."

As noted above, guideline harvest levels for the state waters seasons for sablefish in Prince William Sound (Area 649) and the Southeast Inside District (Area 659) and for pollock in Prince William Sound (Area 649) are assessed independently from federal assessments of these stocks in EEZ waters. NMFS does not consider pollock in Prince William Sound to constitute a distinct stock separate from the western GOA, and includes this pollock in its assessment of the combined 649, 640, 630, 620, and 610 pollock stock. The annual GHL established by the state for PWS is subtracted from the ABC for the combined stock. None of the alternatives considered would have an effect on the GHLs established by the state for these fisheries; therefore the effect on these fisheries under Alternatives 1 through 5 is rated insignificant.

Guideline harvest levels for Pacific cod in the state waters seasons are based on a fraction of the federal ABC apportionments in the GOA (not to exceed 25%). These GHLs would proportionately change with the federal ABCs established for Pacific cod. Alternatives which result in an ABC reduction or increase of more than 50% are rated significant. Alternative 5 would reduce Pacific cod ABCs in the GOA (and therefore the GHLs) by more than 50% and are rated significantly adverse. Alternatives 1, 2, 3, and 4 would not reduce or increase ABCs for Pacific cod in the GOA by more than 50% and are rated insignificant.

Alternatives which result in a decrease or increase in 2004 TAC levels in the BSAI and GOA from 2004 levels are assumed to have a proportionate effect on harvest levels in the state managed parallel seasons.

Alternatives 1 through 4 do not increase or decrease TACs by more than 50% from 2004 levels in the BSAI and GOA, and therefore the effect of these alternatives on harvest levels in the parallel seasons is rated insignificant. Alternative 5 (which would set TACs at zero) would be expected to decrease harvest levels in the state managed parallel seasons by more than 50% and is rated significantly adverse. These effects are summarized in Table 6.0-1.

4.11 Social and Economic Consequences

Section 4.11 describes the social and economic consequences of the alternatives. Sub-section 4.11.1 analyses the significance of the alternative proposed TAC specifications, and Sub-section 4.11.2 evaluates the interim specifications. Appendix F provides a detailed discussion of the way the gross revenue estimates were prepared.

4.11.1 2005 and 2006 Proposed Specifications Analysis

Impacts

This EA evaluates the significance of the same economic indicators used in the SSL SEIS with the addition of an indicator for "Net Returns to Industry" and the subtraction of an indicator for "Harvest Levels and Fish Prices."[13] The SSL SEIS indicators were relatively extensive, as the SSL SEIS (NMFS 2001c, page 4-342) attempted to describe the impact of the protection measures on all stakeholders. The significance of indicator changes is evaluated through a comparison with ABCs and TACs in 2004. The indicators are:

First Wholesale Groundfish Gross Values
Operating Cost Impacts

Net Returns to Industry
Safety and Health Impacts
Impacts on Related Fisheries
Consumer Effects
Management and Enforcement
Excess Capacity
Bycatch and Discard Considerations
Subsistence use
Recreational use
Impacts on non-consumptive benefits from marine ecosystems
Community impacts

Each of these indicators was evaluated using the criteria described earlier in this EA.

First Wholesale Groundfish Gross Revenues

Information on gross revenue changes is summarized here. The approach used to estimate gross revenues for each alternative is discussed in detail in Appendix F. This section merely summarizes the impacts and discusses significance.

First wholesale gross revenues under each alternative were estimated separately for the fisheries harvesting (a) the BSAI ITAC and unspecified reserves, (b) the BSAI CDQ reserve, and (c) the GOA TACs. In addition to estimating gross revenues for the alternatives, 2002, 2003, and 2004 gross revenues were also estimated for the BSAI and GOA. The gross revenues impacts of the alternatives and their significance are defined with respect to the change between the alternative and the year 2004 estimates. The 2004 estimates were generated through the same estimation process used to produce the estimates for the alternatives - in other words the 2004 gross revenues estimates were produced, treating the 2004 ABCs and TACs in the same manner as the ABCs and TACs for the alternatives. Average 2002 prices were used for all alternatives and for 2004. These issues, and others, are discussed in more detail in Appendix F.

The method used to prepare these first wholesale gross revenue estimates is described in detail in Appendix F. The model makes a large number of simplifying assumptions. These results must be treated as a rough approximation with a large margin of error. Note that 2002-2004 revenue estimates are not historical revenue estimates, but estimates developed from the model, based on the TAC levels in those years. They are made in the same way the 2005 and 2006 estimates are made.

The impacts of the preferred alternatives on first wholesale revenues in the BSAI and the GOA are summarized in Tables 4.11-1 through 4.11-3.

Table 4.11-1 Estimated and Projected First Wholesale Gross Revenues in the BSAI, 2002-2006.

BSAI	Estimated Earned Revenue			Projected Revenue	
	2002	2003	2004	2005 Alt. 2	2006 Alt. 2
Pollock	852,470,951	856,320,005	856,457,676	856,686,818	857,323,023
Sablefish	9,530,117	12,789,094	13,088,075	11,093,399	10,294,632
Pacific cod	190,500,954	197,644,739	205,264,778	214,789,825	210,027,301
Arrowtooth	696,994	522,745	522,745	534,346	566,556
Flathead sole	5,296,251	4,237,001	4,025,151	4,025,151	4,025,151
Rock sole	8,720,059	7,105,234	6,620,786	6,767,715	7,175,662
Turbot	2,961,255	1,480,628	1,295,549	1,324,300	1,404,127
Yellowfin	30,404,383	29,608,919	30,430,898	31,106,225	32,981,256
Flats (other)	274,432	237,841	237,841	243,119	257,774
Rockfish	8,417,568	8,074,095	6,910,422	7,077,883	7,067,194
Atka	23,004,466	28,168,734	29,577,171	23,225,121	20,741,578
Other	3,832,374	4,005,792	3,328,129	3,328,129	3,328,129
Column total	1,136,109,803	1,150,194,828	1,157,759,222	1,160,202,033	1,155,192,383

Table 4.11-2 Estimated and Projected First Wholesale Gross Revenues for BSAI CDQ groups, 2002-2006.

BSAI CDQ	Estimated Earned Revenue			Projected Revenue	
	2002	2003	2004	2005 Alt. 2	2006 Alt. 2
Pollock	95,012,499	95,441,497	95,456,841	95,482,380	95,553,288
Sablefish	1,059,997	1,404,191	1,404,191	1,223,394	1,135,299
Pacific cod	14,444,041	14,985,693	15,563,454	16,285,656	15,924,555
Arrowtooth	67,718	50,788	50,788	51,915	55,045
Flathead sole	152,521	122,017	115,916	115,916	115,916
Rock sole	124,387	101,352	94,442	96,538	102,357
Turbot	90,568	45,284	39,624	40,503	42,944
Yellowfin	975,323	949,806	976,174	997,837	1,057,985
Flats (other)	15,272	13,236	13,236	13,530	14,345
Rockfish	522,805	501,472	429,198	439,599	438,935
Atka	1,818,885	2,227,206	2,338,566	1,836,331	1,639,966
Other	275,009	287,453	238,825	238,825	238,825
Column total	114,559,025	116,129,996	116,721,255	116,822,424	116,319,461

Estimated BSAI gross revenues by species group are shown in Table 4.11-1. Between 2002 and 2004, overall revenue trended upward and that trend is projected to continue into 2005. A slight increase of about $2 million is projected for 2005. However, a similar decrees is projected for 2006.

Table 4.11-2 provides similar revenue estimates for the BSAI CDQ groups over the years 2002-2006. From 2002-2004, an increasing trend in overall revenue is evident. The projected 2005 CDQ allocation of TAC will continue that trend with a slight increase. However, 2006 allocation of TAC to CDQ groups is estimated to result in a slight decline in overall revenue when compared to 2004 revenue.

Table 4.11-3 Estimated and Projected First Wholesale Gross Revenues in the GOA, 2002-2006.

GOA	Estimated Earned Revenue			Projected Revenue	
	2002	2003	2004	2005 Alt. 2	2006 Alt. 2
Pollock	32,280,964	30,119,663	39,490,841	39,490,841	39,490,841
Sablefish	65,039,559	75,541,266	83,962,925	67,941,480	63,050,830
Pacific cod	42,308,654	38,778,947	45,946,452	45,946,452	35,370,600
Arrowtooth	5,157,687	5,157,687	5,157,687	5,157,687	5,157,687
Flathead sole	936,758	1,125,523	1,098,268	1,047,954	1,030,924
Rex sole	2,075,505	2,075,505	2,772,454	2,772,454	2,772,454
Flat (deep)	522,787	522,787	650,270	650,270	650,270
Flat (shallow)	3,244,926	3,435,617	3,295,777	3,295,777	3,295,777
Rockfish	13,172,206	13,664,840	12,457,656	12,222,214	11,899,976
Atka	106,341	106,341	106,341	106,341	106,341
Skates	0	0	4,663,788	4,663,788	4,663,788
Other	864,712	859,369	961,028	971,813	922,629
Column total	165,710,099	171,387,547	200,563,488	184,267,071	168,412,117

Table 4.11-3 provides estimates of first wholesale gross revenues in the GOA, by species group, from 2002-2006. Note, that skates were first allocated a separate TAC in 2004 due to an emerging target fishery. Overall, GOA first wholesale revenues are estimated to have increased from 2002-2004. However, projected GOA TACs result in estimated overall revenue declines of approximately $16 million and $32 million in 2005 and 2006 respectively. These declines result largely from declines in 2005 and 2006 GOA TACs for sablefish, while other species groups contribute smaller declines.

Figure 4.11-1 BSAI First Wholesale Value of the ITAC and Unspecified Reserves: Difference Between Estimated 2004 First Wholesale Value and Estimated First Wholesale Value of Each Alternative for 2005 and 2006 (in millions of dollars)

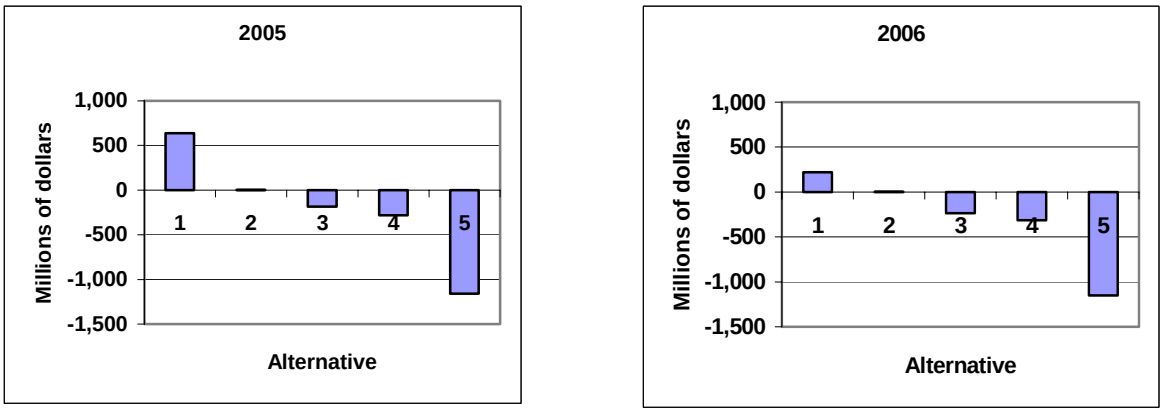
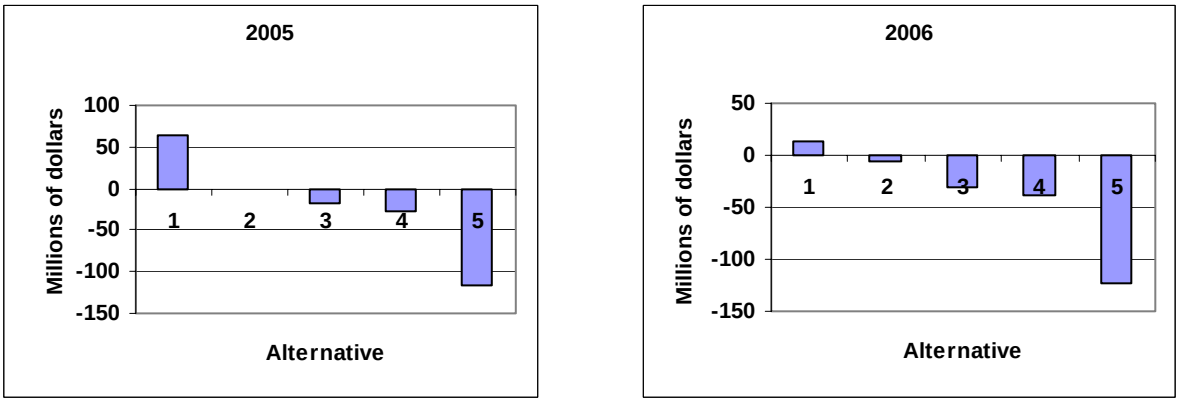
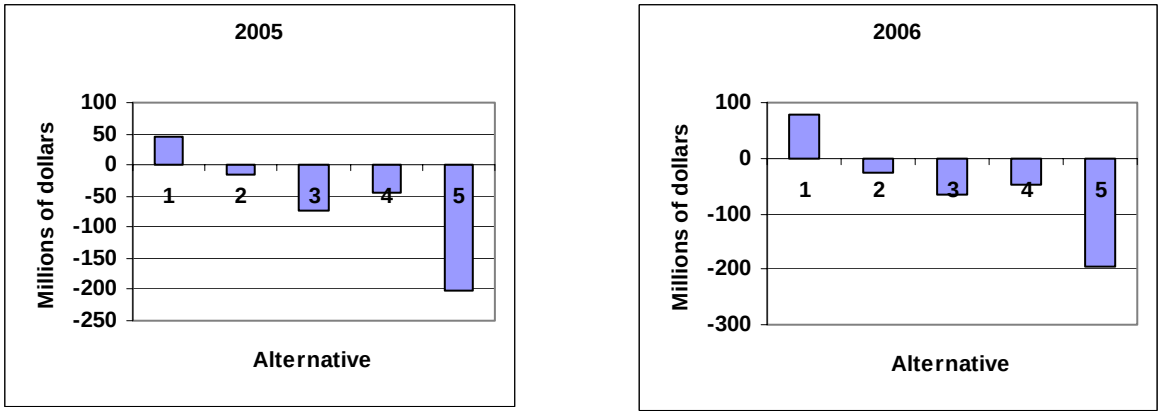


Figure 4.11-2 BSAI First Wholesale Value Estimates for CDQ reserve: Difference Between Estimated 2004 First Wholesale Value and Estimated First Wholesale Value of Each Alternative for 2005 and 2006 (in millions of dollars[14]



[14]It is important to note that this figure reports the first wholesale value of the CDQ reserve, not the receipts received by the CDQ groups. These receipts will be considerably lower than the first wholesale value since CDQ groups lease out large parts of their allotments in return for royalty payments.

Figure 4.11-3 GOA Gross Revenue Estimates: Difference Between Estimated 2004 First Wholesale Value and Estimated First Wholesale Value of Alternatives for 2005 and 2006 (millions of dollars)



The results of this analysis are summarized graphically in Figures 4.11-1, 4.1-2, and 4.1-3. Each of these figures shows the difference between 2004 first wholesale revenue estimates, and the first wholesale revenue estimates for each of the alternatives in 2005 and 2006. If the revenues associated with the alternative are greater than the 2004 estimated revenues, the appropriate bar in the figure is positive, if they are less than the 2004 estimated revenues, the bar is negative.

For this analysis of effects, a 20% threshold was adopted to determine significance. In other words, only a change in gross revenues of 20% from 2004 levels will be described as significant. Table 4.11-4 provides the projected changes in estimated gross revenue by alternative and year for the BSAI, CDQ groups, and the GOA. Estimated BSAI ITAC 2004 revenues were about $1,158 million, BSAI CDQ revenues were about $117 million, and GOA revenues were about $201 million. The corresponding significance thresholds are changes of $232 million, $23 million, and $40 million, respectively. Any changes that exceed these thresholds (in absolute value) are bolded for clarity.

Table 4.11-4 Projected Change in Revenue by Alternative (millions of dollars)

Threshold	Year	Alternative				
		Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5
BSAI	2005	**638**	2	-183	**-281**	**-1,158**
232	2006	222	5	**-236**	**-312**	**-1,150**
CDQ	2005	**65**	0	-18	**-28**	**-117**
23	2006	13	-7	**-31**	**-39**	**-123**
GOA	2005	**46**	-16	**-73**	**-45**	**-201**
40	2006	**42**	-32	**-68**	**-45**	**-201**

Alternative 1 sets TAC's to produce fishing mortality rates, *F*, that are equal to $maxF_{ABC}$ where $maxF_{ABC}$ refers to the maximum permissible value of F_{ABC} under Amendment 56. Historically, TAC has been constrained by ABC, so this alternative provides a likely upper limit for setting TAC within the limits

established by the fishery management plan. It is important to note that Alternative 1 results in total TAC that significantly exceeds the 2 million metric ton OY in the BSAI.

Table 4.11-4 shows that the total of first wholesale revenues under Alternative 1 in 2005 exceeds the threshold positively in each case. Therefore, the significance ratings for the gross revenues under alternatives 1 for 2005 are "positively significant." In contrast, the estimates of first wholesale revenues under Alternative 1 in 2006 are only "positively significant" in the GOA, while the BSAI and CDQ values are "insignificant." However, This assessment should be qualified by the observation that price declines associated with higher catches are not taken into account. The revenue projection may thus overstate the likely increase. Overall, the effect of Alternative 1 on gross revenue is positively significant in 2005 and insignificant in 2006.

Alternative 2 shows "insignificant" changes in both 2005 and 2006 in all cases. This would be expected of maintaining the status quo. In each of 2005 and 2006, Alternative 5, which sets all ABCs to zero, eliminates all revenues from the fishery. This alternative has been given a significance rating of "negatively significant" in both years and all cases.

Alternatives 3 and 4 tend to have a more negative impact on gross revenues. The gross revenue estimates in this analysis may have an upward bias (for the reasons discussed in Appendix F), and they have a large, and unknown, error. Alternative 3 triggered the threshold in both 2005 and 2006 for the GOA revenue estimates as well as in 2006 for both the BSAI and BSAI CDQ revenue estimates. Thus, Alternative 3 has been given a significance rating of "negatively significant" in these instances. However, the combined effects of alternative 3 are insignificant in 2005 and significantly negative in 2006. Alternative 4 triggered the thresholds in all cases. Thus, Alternative 4 has been given a significance rating of "negatively significant" in all cases.

Operating Cost Impacts

There is very little information on operating and capital costs in the BSAI and GOA groundfish fisheries. Models that would predict behavioral changes associated with changes in these TAC specifications and that would generate estimates of cost impacts associated with these behavioral changes are not available. It is therefore impossible to provide numerical estimates of the operating cost impacts associated with the proposed alternatives.

However, even absent empirical data, it is clear that harvesting, delivering, and processing of larger volumes of fish would increase the variable costs of fishing and fish processing. Conversely, reductions in production imposed by reduced specifications would decrease variable costs. Thus, Alternative 1, which increased TACs to theoretical upper bounds has been given a "negatively significant" rating in 2005 due to the likelihood of increased costs with significant increases in harvest and an "insignificant" rating for 2006 in keeping with the "insignificant" rating for gross revenue effects of Alternative 1 in that year. Since the Alternative 2 specifications are similar to the 2004 specifications, suggesting that there may be little change in variable costs, this alternative has been given a cost impact significance rating of "insignificant." TACs are generally smaller under Alternatives 3 and 4. Thus, variable costs are expected to be smaller. As discussed previously, these alternatives reduced gross revenues enough to exceed the 20 percent of gross revenues threshold in 2006 and in both 2005 and 2006 for Alternatives 3 and 4 respectively, Alternative 3 was consequently rated as "insignificant' in 2005 and "significantly positive" in 2006, while Alternative 4 was rated as "significantly positive" in both years.

Under Alternative 5, no groundfish fishing would be allowed during 2005 and 2006. In these circumstances, no variable costs would be incurred for active fishing operations. The same level of fixed

costs would continue to be incurred. Fishermen would experience transitional expenses as they move into their next best alternative employment. However, on balance, fishing costs would be expected to decline. For this reason, Alternative 5, again when examined in isolation, has been given a rating of "positively significant" for this indicator in both 2005 and 2006.

Net Returns to Industry

Although it has been possible to make crude estimates of gross first wholesale revenues under the alternatives, without cost information, it is not possible to make corresponding estimates of net returns to industry. NMFS has little information on the value of capital investments or the operating costs in Alaska's groundfish fisheries. Voluntary surveys have been tried, but response rates have been very poor.

In general, net returns should be larger in parts of the fishery that have been subject to rationalization. This may be the case in the BSAI pollock fisheries, where the American Fisheries Act (AFA) allowed fishing operations to rationalize through the medium of fishing cooperatives, it may be the case in the portions of BSAI fisheries conducted under the auspices of the Community Development Quotas, and it may be the case in the sablefish fisheries which operate under an IFQ program. Each of these programs would allow fishermen to operate with greater efficiency. In general, however, the groundfish fisheries in the GOA and the BSAI are conducted in an essentially open-access environment. While a limited entry program has been adopted, the numbers of permits provide little constraint on fishing effort. Theory suggests that economic costs and benefits would be closely balanced in these fisheries, and that in equilibrium net revenues would be only be large enough to cover the opportunity costs of labor and capital.

Specifications associated with gross revenues that are larger than current levels of production would relax constraints on fishermen and fish processors and would almost certainly be associated with higher levels of profits; specifications associated with lower gross revenues would increase the constraints on fishermen and would likely result in lower profits.

Alternative 1, which had positively significant impacts on gross revenue in 2005 is assumed to have positively significant impacts on net returns in that year and "insignificant" effects on net returns in 2006. Alternative 2, which had insignificant impacts on gross revenues and costs is assumed to have insignificant impacts on net returns. Alternatives 3 was rated as having insignificant impacts on revenues and costs in 2005, and have thus been given a similar "insignificant" rating for net returns in 2005 while the rating for 2006 is "significantly negative" in keeping with the similar rating for gross revenue. Alternative 4 is rates as "significantly negative" in both years also in keeping with similar ratings for gross revenues. Alternative 5 eliminates all revenues and variable costs, but fishermen would be left with fixed costs. This alternative has been rated "negatively significant" in terms of this net effects criterion for both 2005 and 2006.

Safety and Health Impacts

Groundfish fishing off Alaska is a dangerous occupation. However, little is known about the connection between fisheries management measures and accident, injury, or fatality rates. Moreover, little is known about risk aversion among fishermen, or the values they place on increases or decreases in different risks. There is no way to connect changes in the harvests expected under these alternatives with changes in different risks, and the costs or benefits of these changes to fishermen.

Increases in TACs may improve fishing profitability and lead to greater investments in fishing vessel safety and greater care by skippers. This may reduce the fatality rate (although this is conjecture).

Conversely, increases in TACs may increase the number of operations, the average crew size per operation, and the average time at sea. These may increase the potential population at risk, and the length of time individuals may be exposed to the risks. The net impact of changes in TACs on accident rates and accident severity are thus difficult to determine. Shoreside stress and related health problems are probably associated with large negative changes in production and fishery revenues. The extent of stress related health problems associated with decreases in revenues is unknown.

Alternative 1 increases TACs, thereby likely increasing fishing/processing activity and time at sea. This would be expected to affect safety and health negatively. However, if increased TACs lead to greater net returns (as argued above), then safety and health may be positively affected. Thus, it is not possible to unequivocally state what net effect Alternative 1 would be expected to have on safety and health, and this has resulted in an "unknown" ranking. Alternative 2 has essentially the same projected TACs as 2004.[5] Because of this, alternative 2 has been given an "insignificant" safety and health rating. Alternatives 3 and 4 generally involve cuts in 2004 gross revenues. In some instances, there are large percentage reductions in harvests from important stocks. Because there is no clear relation between changes in fish production and safety and health the impacts of these changes are rated "unknown."

Alternative 5 stops all fishing for groundfish. Under these conditions, there would be no groundfish vessels at sea, and fatalities, injuries, and property damage to this sector would drop to zero. However, Alternative 5, by closing the fisheries for a year, and by eliminating this source of yearly income for thousands of persons and their families, would introduce new sources of stress, and stress-related health problems, for those connected with the affected fishing, processing, and support businesses. While the fishery closure would reduce at-sea accidents, increased stress associated with income loss would have an offsetting effect of unknown magnitude. This alternative has thus been given a significance rating of "unknown."

Impacts on Related Fisheries[16]

Many of the operations active in groundfish fishing are diversified operations participating in other fisheries. Groundfish fishing may provide a way for fishermen to supplement their income from other fisheries and to reduce fishing business risk by diversifying their fishery "portfolios." Moreover, Pacific cod pot fishermen often fish for crab as well and Pacific cod harvests provide them with low cost bait. Changes in specifications and consequent changes in groundfish availability could lead to more or less activity by groundfish fishermen in other fisheries affecting competition in those other fisheries.

In general, reductions in groundfish availability would be expected to have a negative affect on related fisheries, as fishermen move out of groundfish fishing and into those activities, or crab fishermen find bait costs rising. Conversely, increases in groundfish availability should have a positive impact on those fisheries. However, little is known about how these processes would take place and what their quantitative impacts would be.

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[5]The TACs in this EA are based on ABC recommendations made by the Council Plan Teams at their September 2004 meeting. These TACs take account of fishery optimum yields, and past Council decisions - particularly those incorporated in the 2004 specifications. For more details on the methods used to make the TAC projections incorporated here see Chapter 2.

[16]The impact of groundfish fisheries on fisheries for species that are prohibited catches in groundfish fisheries is discussed under another heading in this section.

CDQ groups use revenues from their CDQ operations to invest in new fishing activities. Many of these investments take place in fisheries other than groundfish fisheries. For example, the Coastal Villages Region Fund operates seasonal halibut buying stations, and has invested in a custom salmon processing plant in Quinhagak. (ADCED 2001, page 54). The impact of a reduction in groundfish revenue is difficult to predict. CDQ groups may have smaller revenues to invest in other fishing related activities. However, they may also accelerate their diversification into other non-groundfish fishing activities in order to offset the risks associated with lower groundfish harvests.

Changes in Alaska groundfish TACs may also affect other fisheries through market impacts. Alaska groundfish products are substitutes for groundfish products produced elsewhere. For example, Pacific cod has a relatively close substitute in Atlantic cod. Reductions in Pacific cod harvests, and consequent price increases for Pacific cod, may shift demand curves for substitute species out, and lead to price increases for those species. Price increases and associated profit increases may lead to increased fishing effort in the fisheries for those species.

The projected TACs under Alternative 2 are very similar to those in place in 2004. The impact of these alternatives on related fisheries has been rated, "insignificant." Alternative 1 significantly increases the TAC for several species, while Alternatives 3 and 4 produce moderate reductions in fish harvests. Given the uncertainties associated with projecting impacts on other fisheries, these alternatives have been given a rating of "unknown".

Alternative 5 sets all TACs equal to zero. This alternative would clearly create strong incentives for fishermen to explore other fisheries (although most fisheries in the U. S. EEZ are fully subscribed and entry into many is strictly limited), would make it harder for CDQ programs to develop additional local fishery resources (even if it would increase the incentive for them to do so), and would increase prices and incentives to use more effort in fisheries that can be used as substitutes in markets. For these reasons, this alternative has been given a "negatively significant" rating.

Consumer Effects

Consumer effects of changes in production are measured by changes in the consumers' surplus. The consumers' surplus is a measure of what consumers would be willing to pay to be able to buy a given amount of a product or service at a given price. A decrease in quantity supplied and an associated increase in price will reduce consumer welfare as measured by consumers' surplus. An increase in quantity supplied and a consequent decrease in price will increase consumer welfare as measured by consumers' surplus.[17] A decrease in consumers' surplus is not a total loss to society, since some of that loss is usually transferred to industry in the form of higher prices. However, this transfer is still a loss to consumers.

The effect of changes in production of Pollock, Pacific cod, and Atka mackerel products on domestic consumers might be fairly modest because Pollock surimi and roe and Atka mackerel are principally sold overseas. Pacific cod and pollock fillets are sold into domestic markets in which there are many relatively close substitutes. Under these circumstances, consumers would be unlikely to gain or lose much from changes in supply.

[17]As a technical matter, in the standard diagram of supply and demand curves, the amount of the consumers' surplus is approximated by the area under the demand curve and above the horizontal line used to indicate the price of the good.

Alternative 1 would increase TAC's significantly for some species. As a result, this alternative would tend to decrease market prices, leading to increased consumer surplus, and has been rated "significantly positive." TACs projected under Alternative 2 are not expected to change much from those in 2004. This alternative has therefore been given a consumer impact significance rating of "insignificant." Similarly, alternatives 3 and 4 lead to some reductions in a number of TACs. However, the overall effect of alternatives 3 and 4 on United States consumers is rates as "insignificant, primarily due to the overseas market accounting for a majority of groundfish products."

Alternative 5 would close Alaska's federal groundfish fisheries in 2005 and 2006, creating large reductions in supplies to U.S. consumers (as well as, severe disruptions of world seafood markets). This alternative would eliminate the consumers' surplus from consumption of Alaska groundfish and lead to price increases in markets for substitute species. As a result, this alternative has been given a "significantly negative" rating.

Management and Enforcement Costs

Enforcement expenses are related to TAC sizes in complicated ways. Larger TACs may mean that more offloads would have to be monitored and that each offload would take longer. Both these factors might increase the enforcement expenses to obtain any given level of compliance. Conversely, smaller TACs may lead to increased enforcement costs as it becomes necessary to monitor more openings and closures and to prevent poaching[18].

In-season management expenses are believed to be more closely related to the nature and complexity of the regulations governing the fishery (for example, on the number of separate quota categories that must be monitored and closed on time) than on TACs. Over a wide range of possible specifications, in-season management expenses are largely fixed. For example, increases in TACs from 50% above 2004 levels to 50% below 2002 levels could probably be handled with existing in-season management resources[19] (Tromble, pers. comm[20].).

Alternative 1 increases TACs more than 50 % above 2004 levels for several species and is therefore rated as "negatively significant" for management and enforcement costs. Alternative 2 does not change TACs to a great extent. Therefore, the management and enforcement cost impacts of this alternative has been rated "insignificant." Alternatives 3 and 4 impose larger reductions in TACs, but, in light of the considerations described above, the impacts of these have also been rated "insignificant."

Under Alternative 5, in which there would be no groundfish fishing in 2005 and 2006, management and enforcement costs would be reduced, but not eliminated. Prohibitions on fishing activity would still need to be enforced to prevent poaching; however, enforcement expenses would be reduced because it would be immediately clear, in any instance, that a vessel found using groundfish gear in the Federal waters would be in violation. In-season management expenses and activities would be eliminated if there were

[18] Jeff Passer. (2001). NOAA Enforcement. "Personal Communication." NMFS Alaska Region, P.O. Box 21668, Juneau, Alaska 99802. November 19, 2001.

[19] Although at low levels of TACs (but above a zero level) in-season management costs might increase due to the difficulties in managing numerous small quotas (Tromble, pers. comm.).

[20] Galen Tromble. (2002). National Marine Fisheries Service. Alaska Region, Sustainable Fisheries Division, P.O. Box 21668, Juneau, Alaska 99802 "Personal Communication." November 21, 2002.

no fishing in 2005 and 2006, however, management and research efforts devoted to the longer term would still continue. Because of the expected reduction in groundfish management and enforcement costs under Alternative 5, it has been given a significance rating of "positively significant."

Excess Capacity

The Groundfish fisheries off of Alaska have considerable excess capacity. A recent study tried to estimate the difference between the maximum amount of fish that could be caught and would be caught by fishermen, given existing technological and economic constraints if the limitations imposed by TACs were removed, and the amounts of fish harvested in 2001. This study used two methodologies to address this question, the results of the more conservative method are summarized here. The study estimated that, conservatively, there was about 17% excess capacity (as described above) in the Atka mackerel fleet, about 26% for flatfish, 35% for Pacific cod, 39% for pollock, 21% for rockfish, 24% for sablefish, and 30% for other groundfish. (Hiatt, *et al.* 2002, page 111).[21] These estimates apply to the catcher vessel and catcher-processor components of the fleet. Excess capacity for pollock may have been reduced since 2001 as fishing operations take advantage of cooperative fishing arrangements under the American Fisheries Act (AFA). Corresponding data are not available for on-shore processors.

Alternative 1 increases TACs significantly for several species. Significantly greater TACs may be expected to improve capacity utilization in limited entry fisheries. Therefore, Alternative 1 is rated as "positively significant." TACs projected under Alternative 2 are not expected to change much from those in 2004 and the overall effect of alternatives 3 and 4 have been rates as insignificant on operational aspects of the fleet. These alternatives have therefore been given a significance rating of "insignificant." Under Alternative 5, no groundfish fishing would occur in 2005 and 2006, and would increase "excess capacity" in 2005 and 2006, by an even greater amount. These three alternatives have been rated "negatively significant."

Bycatch and Discards

Halibut, salmon, king crab, Tanner crab, and herring are important species in other directed subsistence, commercial, and recreational fisheries. These species have been designated "prohibited species" in the BSAI and GOA groundfish fisheries. Groundfish fishing operations are required to operate so as to minimize their harvests of prohibited species, and, under most circumstances, to discard prohibited species if they are taken.

In the BSAI prohibited species are protected by harvest caps and/or the closure of areas to directed groundfish fishing if high concentrations of the prohibited species are present. Because of the caps or other protection measures, changes in the harvests in the directed groundfish fisheries, associated with the different specifications alternatives, should have little impact on catches of prohibited species. The exception is Alternative 5, which, in shutting down the groundfish fisheries, clearly would reduce associated prohibited species catches to zero.

In the GOA bycatch rates are typically low. The only average bycatch amounts that are meaningful in terms of numbers or weight in the Gulf of Alaska are Pacific halibut in the Pacific cod fishery, chinook salmon in the pollock fishery, other salmon (primarily chums) in the pollock fishery, and small amounts

[21]Felthoven, Ron, Economist. Alaska Fisheries Science Center, 7600 Sand Point Way N.E., Seattle WA. 98115-6349. Personal communication, 11-15-02.

of *C. bairdi* crab in the Pacific cod fishery. Halibut is the only prohibited species managed under a cap in the Gulf.

The impacts of the alternatives on the bycatch and discard of prohibited species are discussed in EA Section 4.4. The results of the analysis are summarized in Table 6.0-1. This table indicates that all alternatives have "insignificant" ratings, with the exception of Alternative 5, which has a positively significant rating for bycatch levels of prohibited species in directed groundfish fisheries. These ratings have been adopted for this criterion (i.e., Alternatives 1 through 4 have been rated "insignificant," while Alternative 5 has been rated positively significant").

Subsistence

The commercial groundfish fisheries can affect subsistence fisheries in several ways. Commercial fisheries may target stocks also targeted by subsistence fishermen. Examples of jointly targeted stocks include sablefish and demersal shelf rockfish in the GOA. Commercial groundfish fisheries may take species harvested by subsistence fishermen as incidental catches. This may include species such as salmon and halibut. Commercial fisheries may alter habitat used by important subsistence species, or they may affect species interactions by harvesting species used as prey by, that predate on, or that compete ecologically with, important subsistence species. Finally, commercial fishing operations may directly impact subsistence fishermen by creating congestion, or by damaging subsistence gear.

While some persons use small amounts of groundfish for subsistence purposes, groundfish are not one of the more important subsistence products (NMFS 2001b, page F3-109). Groundfish specifications, however, may affect subsistence harvests of other natural resources through two mechanisms: (1) they influence the levels of harvest of groundfish which may be used by other animals that are themselves used for subsistence purposes; (2) they influence the bycatch of prohibited species that have subsistence uses. Changes in groundfish harvests, for example, could affect the prey available to Steller sea lions and thus affect sea lion population status and sea lion availability to subsistence hunters. Alternatively, changes in bycatch of prohibited species, particularly salmon and herring, could directly affect subsistence use of these species.

The mechanisms relating changes in the harvest of groundfish prey to changes in populations of animals used for subsistence purposes, and the mechanisms relating changes in populations of animals to changes in subsistence use are poorly understood. In addition, as noted earlier in this section, prohibited species bycatch is limited by bycatch caps and area closures. These measures limit groundfish harvests if necessary to protect prohibited species. It thus seems unlikely that Alternatives 1 to 4 might affect subsistence harvests by changing bycatch. Alternative 5, which completely shuts down the groundfish fisheries would reduce bycatch to zero; however, even under these conditions, it is not clear how much of the bycatch that had been eliminated would flow to subsistence fishermen, how much to commercial fishermen targeting bycaught species, and how much would be lost to natural mortality.

TACs projected under Alternative 2 are not expected to change much from those in 2004. This alternative has, therefore, been given a significance rating of "insignificant". Alternatives 3, 4, and 5 all reduce groundfish harvests to a greater or lesser extent, while Alternative 1 significantly increases groundfish TACs. However, since the impact of this on subsistence activity is hard to gauge, Alternatives 1, 3, 4, and 5 have been rated "unknown" on this criterion.

Recreation

The commercial groundfish fisheries can affect recreational fisheries in several ways. Commercial fisheries may target stocks also targeted by recreational fishermen. Examples of jointly targeted stocks include sablefish and demersal shelf rockfish in the GOA. Commercial groundfish fisheries may take species harvested by recreational fishermen as incidental catches. This may include species such as salmon and halibut. Commercial fisheries may alter habitat used by recreationally important species, or they may affect species interactions by harvesting species used as prey by, that predate on, or that compete ecologically with, recreational species. Finally, commercial fishing operations may directly impact recreational fishermen by creating congestion, or by damaging recreational gear.

In general, alternatives that reduce TACs available to commercial harvest will tend to decrease negative effects on recreation, while alternatives that increase TACs available for commercial harvest will tend to increase negative effects on recreation. However, the extent to which these effects accrue are unknown. Thus, Alternative 2, which maintains TACs at levels similar to the recent past is expected to have insignificant effects on recreation as compared to the status quo. Alternative 1 is expected to have negative effects on recreations, while alternatives 3, 4, and 5 are expected to have positive effects on recreation. However, the magnitude of such effects is unknown. Thus, the significance rating for Alternatives 1, 3, 4, and 5 are unknown.

Non-consumptive benefits from ecosystems

Passive use is also called "non-use" value, because a person need never actually use a resource in order to derive value from it.[22] That is, people enjoy a benefit (which can be measured in economic terms) from simply knowing that some given aspect of the environment exists. Survey research suggests that passive use values can be significant in at least some contexts. Because passive use values pertain to the continued existence of resources, the focus in this discussion is on classes of resources in the GOA and BSAI that have been listed as endangered under the U.S. Endangered Species Act. Under the Act, an endangered species is one that is "...in danger of extinction throughout all or a significant portion of its range..." and not one of certain insects designated as 'pests."(16 U.S.C. §1532(6).)

Changes in groundfish harvests in the GOA and the BSAI may affect passive use values by affecting the probability of continued existence or recovery of a listed species. At present, four endangered species or classes of endangered or threatened species range into the GOA and BSAI management areas: (a) Steller sea lions; (b) seven species of Great Whales; (c) Pacific Northwest salmon; (d) three species of sea birds (Table 6.0-2 lists the affected species).

The mechanisms through which the fisheries might affect endangered species are poorly understood. Models that would relate fishing activity to changes in the probability that a species would become extinct are not available or do not yet have strong predictive power. Moreover, information on the ways in which passive use values would change as these probabilities change is not available.

Section 4.5 of the EA described the effects of the alternatives on prohibited species. Section 4.6 described the effects on Marine Mammals (including ESA listed marine mammals. Section 4.7 described the effects on seabirds." The significance ratings for these impacts are summarized in Table 6.0-1 in Section 6.0 ("Conclusions"). Alternative 1 has been rated significant adverse with respect to marine

[22]"Passive use" has also been referred to in the literature as "existence value" since it picks up the value people place on the mere existence of a resource, whether or not they ever expect to have anything to do with it.

mammals. All alternatives have been rated unknown with respect to at least one potential impact on marine mammals and/or seabirds. This impact is concerned with the impact of fishing activity on human passive use values, rather than with the impact on the resources themselves (impacts on the resources are treated in other sections). Given the uncertainty with respect to the environmental impacts, and the uncertainty about how a given impact would affect passive use values, all alternatives have been rated unknown for this criterion.

Communities

Impact to communities are inextricably linked to impacts on gross, and net, revenue in the fishery. In general, specifications associated with gross revenues that are larger than current levels of production would relax constraints on fishermen and fish processors and would almost certainly be associated with higher levels of profits leading to improvements in the economic conditions in communities that are dependent on fishing activities. In contrast, specifications associated with lower gross revenues would increase the constraints on fishermen and would likely result in lower profits and may have negative effects on the economies of communities that are dependent on fishing activities.

As described previously for gross revenue effects, the overall effect of Alternative 1 on gross revenue is positively significant in 2005 and insignificant in 2006. Thus, the effect on communities is given the same ratings.

Alternative 2, which is the status quo alternative, show "insignificant" changes in gross revenues in both 2005 and 2006 in all cases. Thus the effects on communities of Alternative 2 are given the same rating. Alternative 5, which sets all ABCs to zero, eliminates all revenues from the fishery. This alternative has been given a significance rating of "negatively significant" in both years and all cases for gross revenue effects as well as for effects on communities.

Alternative 3 triggered the significance threshold in both 2005 and 2006 for the GOA revenue estimates as well as in 2006 for both the BSAI and BSAI CDQ revenue estimates. Thus, Alternative 3 has been given a significance rating of "negatively significant" in these instances. However, the combined effects of alternative 3 is insignificant in 2005 and significantly negative in 2006. Alternative 4 triggered the thresholds in all cases. Thus, Alternative 4 has been given a significance rating of "negatively significant" in all cases. These ratings have also been adopted for community effects.

Summary of the significance analysis

The significance ratings for the different indicators, discussed in this section, are summarized in the following table.

Table 4.11-5 Summary of effects of Alternatives 1 through 5 on Economic Impacts

Economic Indicators	Year	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5
First wholesale gross revenues	2005	S+	I	I	S-	S-
	2006	I	I	S-	S-	S-
Operating cost impacts	2005	S-	I	I	S+	S+
	2006	I	I	S+	S+	S+
Net returns to industry	2005	S+	I	I	S-	S-
	2006	I	I	S-	S-	S-
Safety and health impacts	2005	U	I	U	U	U
	2006	U	I	U	U	U
Impacts on related fisheries	2005	U	I	U	U	S-
	2006	U	I	U	U	S-
Consumer effects	2005	S+	I	I	I	S-
	2006	S+	I	I	I	S-
Management and enforcement costs	2005	S-	I	I	I	S+
	2006	S-	I	I	I	S+
Excess capacity	2005	S+	I	I	I	S-
	2006	S+	I	I	I	S-
Bycatch and discards	2005	I	I	I	I	S+
	2006	I	I	I	I	S+
Non-consumptive use values	2005	U	U	U	U	U
	2006	U	U	U	U	U
Subsistence	2005	U	I	U	U	U
	2006	U	I	U	U	U
Recreation	2005	U	I	I	U	U
	2006	U	I	I	U	U
Communities	2005	S+	I	I	S-	S-
	2006	I	I	S-	S-	S-
S = Significant, I = Insignificant, U = Unknown, + = positive, - = negative						

4.11.2 Interim Specifications Analysis

NMFS annually publishes interim specifications to manage the fisheries from January 1 until they are superceded by the final specifications. The best available scientific information for fisheries management becomes available at the BSAI and GOA Plan Team meetings in November of the year before the

specifications are to take effect. The Council's recommended specifications for 2005 and 2006 will be made at the December 2004 Council meeting, drawing on the information provided by the plan teams. It takes a period of months to publish the specifications; typically the final specifications publish in March of the year in which they become effective. Some of the most important fisheries of the year, however, take place in January, February, and March. Many of these fisheries harvest species in a spawning condition, and produce valuable roe in addition to other products. In order to ensure that fishing can take place during this early period, NMFS annually publishes interim specifications to manage the fisheries from January 1 until they are superceded by the final specifications. As described in Section 1.3, this is the last year the Alaska Region will use interim specification.

As specified in 50 CFR § 679.20(c)(2), interim specifications are one-fourth of each proposed initial TAC (ITAC) and apportionment thereof, one-fourth of each proposed PSC allowance, and the first seasonal allowance of GOA and BSAI pollock, Pacific cod, and BSAI Atka mackerel. These interim specifications are in effect on January 1 and remain in effect until superceded by final specifications. For most BSAI target species, the ITAC is calculated as 85 percent of the proposed TACs (50 CFR § 679.20(b)). The remaining 15 percent is split evenly between the Western Alaska Community Development Quota (CDQ) program reserve and a non-specified groundfish reserve. In the GOA, ITACs equal the full TAC except for pollock, Pacific cod, flatfish, and "other species. " The ITACs for these four species or species groups equal 80 percent of the TACs. The remaining 20 percent of the TACs are established as a species-specific reserve.

First seasonal allowances generally exceed one-fourth of the TAC. The first seasonal allowance of GOA and BSAI Pacific cod is 60% of the annual TAC, the first seasonal allowance for BSAI Atka mackerel is 50% of the TAC, the first seasonal allowance for BSAI pollock is 40% of the TAC, and the first seasonal allowance of GOA pollock is 25% of the TAC. Interim specifications apply to CDQ allocations as well as to TACs. In the GOA, interim specifications for fixed gear sablefish have been set equal to zero, since the sablefish IFQ fishery doesn't begin until mid-March, about the time the final specifications would become effective.

The interim PSC limits are one quarter of the annual limit and PSC reserves. A PSC reserve of 7.5 percent is set aside to establish the prohibited species quota (PSQ) for the CDQ program (50 C FR § 679.21(e)(1)(i)). For interim specifications PSQ reserves are subtracted from the previous year's PSC limit and 25 percent of the remaining amount is established as an interim value until final specifications are adopted.

NMFS publishes the interim specifications in the Federal Register as soon as practicable after the October Council meeting and prior to the December meeting. Retention of sablefish with fixed gear is not currently authorized under interim specifications. Further, existing regulations do not provide for an interim specification for the CDQ non-trawl sablefish reserve or for an interim specification for sablefish managed under the IFQ program. This means that retention of sablefish is prohibited prior to the effective date of the final harvest specifications.

Estimated interim specifications associated with the five proposed specifications alternatives are summarized in Tables 2.4-1 and 2.4-2 in Section 2.4. These interim specifications were compared on the basis of the gross revenues associated with Alternatives 1, 2, 3, 4, and 5. The gross revenues for the alternatives are summarized in Table 4.11.2-1. The gross revenues for Alternative 1 are approximately 50% larger than those for Alternative 2. The interim specifications for Alternatives 1 and 2 were associated with higher gross revenues than the Alternatives 3, 4, and 5. The model was used to estimate gross revenues for the year 2004 as well as for the alternatives in 2005 and 2006. Gross revenues in 2004 were estimated to be $1,158 for the BSAI ITAC, $117 for the BSAI CDQ program, and $201 for the

GOA. These revenues are similar to those generated by Alternative 2, below those generated by Alternative 1, and above those generated by Alternatives 3, 4, and 5.

Table 4.11.2-1 Estimated Proposed Gross Revenues by Alternative (in millions of dollars)

Alternative	BSAI ITAC		BSAI CDQ		GOA	
	2005	2006	2005	2006	2005	2006
Alt 1	$1,795.9	$1,371.9	$181.7	$136.5	$247.0	$274.3
Alt 2 (proposed)	$1,160.2	$1,155.1	$116.8	$116.2	$184.3	$171.0
Alt 3	$974.8	$914.4	$99.0	$92.3	$127.2	$131.4
Alt 4	$877.2	$838.1	$88.4	$84.0	$155.1	$149.6
Alt 5	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0

Table 4.11.2-2 summarizes estimates of gross revenues for interim specifications associated with each of the five alternatives analyzed in this EA. These were calculated using interim 2005 TACs provided by the Groundfish Plan Team in September of 2004. The calculation method is the same as that used for estimation of gross revenues presented in Table 4.11-5.

Table 4.11.2-2 Estimated Interim Gross Revenues by Alternative for 2005 (in millions of dollars)

Alternative	BSAI ITAC	BSAI CDQ	GOA
Alt 1	$844.2	$76.9	$88.0
Alt 2 (proposed)	$559.8	$50.6	$68.5
Alt 3	$458.8	$41.9	$45.6
Alt 4	$417.6	$37.7	$56.5
Alt 5	$0.0	$0.0	$0.0

These represent estimated gross revenues for interim TACs associated with the five alternatives. Note that annual prices were used to prepare these estimates. Since prices are often higher in the first half of the year, these gross revenue estimates are likely underestimates of actual interim revenues.

Note that annual prices were used to prepare these estimates. For many species, including pollock and Pacific cod, the actual prices received during this period for which the interim specifications apply should be well above the annual average. That is because these species are in spawning condition at this time and the market for the roe increases the market value of the fish, substantially. Since prices are often higher in the first half of the year, these gross revenue estimates likely underestimate actual interim revenues. This, however, should not interfere with the comparison among alternatives in the table.

4.12 Aleutian Islands pollock

The Consolidated Appropriations Act of 2004 (Public Law (Pub. L.)108-199) was signed into law on January 23, 2004. Section 803 of this law allocates the AI directed pollock fishery to the Aleut Corporation for economic development of Adak, Alaska. The statute permits the Aleut Corporation to authorize one or more agents for activities necessary for conducting the AI directed pollock fishery.

In June 2004, the Council adopted Amendment 82 by a 10 to 1 vote. If approved by the Secretary of Commerce, Amendment 82 would revise the FMP to establish the management framework for the AI

directed pollock fishery. This proposed rule would implement the following management provisions for the AI directed pollock fishery:

- Restrictions on the harvest specifications for the AI directed pollock fishery, including: limitations on the size of the annual AI pollock initial total allowable catch (ITAC) (annual TAC minus the Western Alaska community development quota (CDQ) for pollock established under the AFA and in regulations at ' 679.31), limits on the A season harvest of ITAC, allocation requirement for vessels 60 feet (18.3 m) LOA or less, and rollover provisions for unharvested amounts of the AI directed pollock fishery allocation;
- Provisions for fishery monitoring, including: the Aleut Corporation=s selection and NMFS=s approval of vessels and processors participating in the AI directed pollock fishery, restrictions on having pollock from the AI and either the Bering Sea subarea (BS) or the Gulf of Alaska on a vessel at one time, observer and scale requirements, catch monitoring control plans for shoreside and stationary floating processors, and Aleut Corporation=s and participants= responsibility for ensuring the harvest does not exceed the AI directed pollock fishery allocation;
- Reporting requirements; and
- A new AI Chinook salmon prohibited species catch limit that, when reached, would close the existing Chinook salmon savings areas in the AI.

The Council's June action, analyzed in an EA/RIR prepared for Amendment 82, creates the structure within which an allocation may be made to the Aleut Corporation. An actual AI pollock DPF itself would be created in the course of the annual specifications process.

This section provides a special review of the AI TAC alternatives. The purpose is to provide a heightened level of scrutiny for this portion of the specifications. Although the potentials for significance of the different alternatives are discussed in this section, the significance analysis itself is subsumed in the general analysis of the specifications, the results of which may be found in Table 6.0-1.

The Alternatives

The Council's final motion in June 2004 stated:

Starting in 2005:

1. Annual ITAC

   (a) When the AI ABC is equal to or more than 19,000 mt, the AI ITAC shall equal 19,000 mt.
   (b) When the AI ABC is less than 19,000 mt, the AI ITAC shall be no more than the ABC.

2. The ICA shall be deducted from the annual ITAC.

3. Seasonal Apportionments

   The A season apportionment of the DPF shall be the lesser of

   (a) no more than 40% of the ABC or
   (b) the annual ITAC after subtraction of the ICA

The total harvest in the A season (DPF and ICA) shall not exceed 40% of the ABC.

The B season apportionment will be equal to the annual ITAC minus the ICA and minus the A season DPF. The B season apportionment may be further adjusted by rollover of unharvested A season pollock.

Table 4.4-1 summarizes AI pollock ITACs, and "A" and "B" season DPF levels for a range of AI pollock ABCs from 5,000 mt to 55,000 mt.

One concern that affects the harvest specifications was identified regarding the Council's motion. This concern is how the CDQ directed fishing allowance for BSAI pollock is established. The Council may reconsider this portion of its motion at the October 2004 Council meeting to clarify this issue. The second concern is the appropriateness of establishing in regulations Council policy on how it allocates the total allowable catch amounts (TACs) within the two million mt optimum yield (OY) and "funding" of the AI pollock TAC.

CDQ directed fishing allowance. Section 206(a) of the American Fisheries Act (AFA) requires that "10 percent of the total allowable catch of pollock in the Bering Sea and Aleutian Islands management area be allocated as a directed fishing allowance" to the CDQ program. Pub. L. 108-199 prohibits the AFA directed pollock fishery in the AI, but it does not prohibit CDQ groups from harvesting a portion of their directed fishing allowance in the AI.

In June 2004, the Council's motion did not directly prohibit a CDQ pollock directed fishing allowance in the AI subarea. It also did not fully take into account the potential situation when the sum of the BSAI TACs (minus the AI pollock TAC) is below the two million mt OY. If some or all of the AI pollock TAC is funded from the difference between the sum of the BSAI TACs and the two million OY, that portion must be reduced by 10 percent for the CDQ pollock directed fishing allowance in the AI subarea to maintain compliance with the AFA. Thus, even the Council's June motion would result in a CDQ pollock directed fishing allowance in the AI when the sum of TACs is less than the two million mt OY.

Based on the above considerations, NMFS has recommend for Council reconsideration that separate TACs for the AI and BS subareas be adopted by the Council during the annual harvest specifications process. These separate TACs would give rise to separate AI and BS CDQ pollock directed fishing allowances, rather than a combined CDQ pollock directed fishing allowance for the BSAI that would be harvested only in the BS. This modification meets NMFS' management needs by facilitating the specification of pollock fishery allocations and the management of the CDQ pollock directed fishing allowance without special consideration of whether or not the sum of TACs equal OY. It ensures that the pollock harvest is distributed between the AI and BS subareas consistent Steller sea lion protection measures and any future changes in pollock stock abundance, and maintaining consistency with AFA provisions for the CDQ pollock directed fishing allowance.

This approach also maintains the Council's intent to not reduce the BSAI CDQ pollock directed fishing allowance as a result of the Aleut Corporation allocation. However, it also means that the Aleut Corporation's directed pollock fishery would be reduced by the AI CDQ pollock directed fishing allowance in a manner that was not clear when the Council took action in June 2004.

The Council's reconsideration in October 2004 should pertain to the sections of the June motion titled: *Allocation size, Allocation mechanism,* and *Economic Development reports*. Under *Allocation Size,* the specification of a CDQ pollock directed fishing allowance in the AI subarea should be clarified. Further, A season CDQ pollock harvest should be added to the total harvest for the A season harvest limit to clearly state the Council's intent to limit all harvest in the A season to 40 % of the ABC and to maintain consistency with ESA informal consultation completed on this action. In the *Allocation Mechanism* and *Economic Development reports* sections, the term ITAC should be revised to TAC because the development of the AI pollock TAC should include the CDQ and ICA amounts for the AI subarea and should not be only for the directed pollock fishery.

2005 Implementation Strategy and Future Actions: For the interim and final harvest specifications in 2005, NMFS will prohibit the AI directed pollock fishery until the management provisions for the AI directed pollock fishery become effective under Amendment 82. Any AI pollock TAC recommended by the Council under the provisions of proposed Amendment 82 will be included in the interim and final harvest specifications to allow the Regional Administrator to open the AI directed pollock fishery if and when the regulations for Amendment 82 are effective. This prohibition is authorized by the Pub. L. 108-199 and the associated draft proposed rule, which requires that only those who are selected by the Aleut Corporation and approved by NMFS may participate in the AI directed pollock fishery.

These considerations change the calculations behind the Aleutian Islands pollock ICA and DPF. The TAC is equal to 19,000 mt or the ABC, whichever is less. The CDQ allocation is equal to 10% of the TAC. The CDQ "A" season allocation is equal to 40% of the CDQ allocation, and the "B" season allocation is equal to 60% of the allocation. The ICA is given exogenously, by incidental catch needs estimated for non-pollock directed fisheries. In the following calculations, these have been assumed to be 1,000 mt (the ICAs in recent years). It was assumed that 600 mt of these would be needed in the "A" season, and 400 mt in the "B" season. This ICA is used here for illustrative purposes; the ICAs have been exceeded in recent years, and there is reason to believe that a higher ICA may be appropriate.

The DPF is equal to the TAC minus the CDQ and ICA requirements. The "A" season DPF is equal to 19,000 mt or 40% of the ABC (whichever is less) minus the CDQ and ICA. The "B" season DPF is equal to the DPF minus the "A" season DPF. Table 4.12-1 shows the "A" and "B" season DPFs for a range of ABCs between 5,000 mt and 55,000 mt.

Table 4.12-1 "A" and "B" season DPFs under different assumptions about ABCs (mt)

ABC	TAC	CDQ	CDQA	CDQB	ICA	ICAA	ICAB	DPF	DPFA	DPFB
5,000	5,000	500	200	300	1,000	600	400	3,500	1,200	2,300
10,000	10,000	1,000	400	600	1,000	600	400	8,000	3,000	5,000
15,000	15,000	1,500	600	900	1,000	600	400	12,500	4,800	7,700
20,000	19,000	1,900	760	1,140	1,000	600	400	16,100	6,640	9,460
25,000	19,000	1,900	760	1,140	1,000	600	400	16,100	8,640	7,460
30,000	19,000	1,900	760	1,140	1,000	600	400	16,100	10,640	5,460
35,000	19,000	1,900	760	1,140	1,000	600	400	16,100	12,640	3,460
39,400	19,000	1,900	760	1,140	1,000	600	400	16,100	14,400	1,700
40,000	19,000	1,900	760	1,140	1,000	600	400	16,100	14,640	1,460
45,000	19,000	1,900	760	1,140	1,000	600	400	16,100	16,100	0
50,000	19,000	1,900	760	1,140	1,000	600	400	16,100	16,100	0
55,000	19,000	1,900	760	1,140	1,000	600	400	16,100	16,100	0

Notes: An ICA of 1,000 mt has been assumed solely for the purposes of calculations. While the ICA has been 1,000 mt in the recent past, it has often been exceeded. A 1,000 mt ICA may not be appropriate in the future. The ICA has been assumed to be divided 600 mt in the "A" season and 400 mt in the "B" seasons, again solely for the purpose of illustration. Actual seasonal ICA apportionments may differ. CDQ allocations are assumed to be divided between the "A" and "B" seasons using the 40/60 split.

Tables 4.12-2 and 4.12-3 calculate the AI pollock specifications for the ABC alternatives in 2005 and 2006. These tables are identical.

Table 4.12-2 2005 Specifications for the AI pollock fishery (metric tons)

Year	ABC	TAC	CDQ	CDQA	CDQB	ICA	ICAA	ICAB	DPF	DPFA	DPFB
1	39,400	19,000	1,900	760	1,140	1,000	600	400	16,100	14,400	1,700
2	39,400	19,000	1,900	760	1,140	1,000	600	400	16,100	14,400	1,700
3	39,400	19,000	1,900	760	1,140	1,000	600	400	16,100	14,400	1,700
4	39,400	900	90	36	54	810	600	400	0	0	0
5	39,400	0	0	0	0	0	0	0	0	0	0

Table 4.12- 3 2006 Specifications for the AI pollock fishery (metric tons)

Year	ABC	TAC	CDQ	CDQA	CDQB	ICA	ICAA	ICAB	DPF	DPFA	DPFB
1	39,400	19,000	1,900	760	1,140	1,000	600	400	16,100	14,400	1,700
2	39,400	19,000	1,900	760	1,140	1,000	600	400	16,100	14,400	1,700
3	39,400	19,000	1,900	760	1,140	1,000	600	400	16,100	14,400	1,700
4	39,400	900	90	36	54	810	600	400	0	0	0
5	39,400	0	0	0	0	0	0	0	0	0	0

These estimates are contingent on the assumption that the spawning biomass in the AI is above 20% of the projected unfished spawning biomass. Federal regulations promulgated as part of the measures implemented to protect the SSL require that, if a biological assessment of the pollock stock in the AI is equal to or below 20% of the projected unfished spawning biomass during a fishing year, the Regional Administrator will prohibit the directed fishery, and that the fishery will remain closed until a subsequent biological assessment projects that the spawning biomass for the species in the area will exceed 20% of the projected unfished spawning biomass (679.20(d)(4)). This condition would be met, given the 39,400 mt ABC in 2004.

When the ABC is equal to or greater than 19,000 mt, the AI pollock TAC is capped at 19,000 mt per year. Deducting a 10% CDQ allocation, and a 1,000 mt ICA, the DPF would be 16,100 mt. The lowest ABC during between 1991 and 2004 was 23,800 mt. Thus, the DPF, ICA, and CDQ combined are about 24% below the lowest ABC in recent years. The lowest targeted catch in that period was 23,159 mt in 1998. The CDQ, ICA, and DPF combined are thus about 22% below the lowest catch. (NMFS, 2004, page 24)

For ABCs under 19,000 mt, the action allows the Council to select a TAC at any level between zero and the ABC. Moreover, the 18,000 mt available for the CDQ and DPF represents the potential maximum catch impact from the specifications. Recent ICA harvests have exceeded 1,000 mt, perhaps due to some targeting of pollock. Consideration has been given to increasing the ICA up to 2,000 mt. If this is found to be necessary, the current action represents a combined CDQ and DPF of 17,000 mt rather than 18,000 mt.

The CDQ and DPF fisheries may not be able to harvest the available pollock. A large proportion of the historical domestic fish production (in the 1990s) came from waters that are now closed to pollock fishing because of Steller sea lion protection measures. If the Aleut Corporation and its associated fishermen are unable to fully harvest the DPF, the Council's recommendation would require a roll back of the unused portion of the pollock allocation to the EBS pollock ITAC. There would be no roll back of unused CDQ.

Effects on Pollock

The criteria for the evaluation of target species are described in Section 4.1, and summarized in Table 4.1-2. Target species affected include: (1) AI pollock, (2) species taken as bycatch in AI pollock (flatfish, rockfish, Pacific cod and Atka mackerel), and (3) EBS pollock (as the funding source). This section deals with AI pollock; incidental catches of other species, and impacts on EBS pollock are addressed in following sections.

This alternative requires that any AI pollock TAC be less than or equal to the ABC level; no TAC may exceed ABC. For ABCs under 19,000 mt, this alternative gives the Council complete discretion to set the TAC at any level between zero and the ABC in any given year. For ABCs equal to or above 19,000 mt, the alternative mandates a TAC of 19,000 mt. As noted above, this means that TACs will be at least 24% less than the lowest ABC in the AI since 1991. For ABCs just above 19,000 mt, the rule will mandate that the Council choose a TAC of 19,000 mt. Thus for ABCs in this range, which are fairly low compared to historical ABCs, the rule requires that the Council choose a TAC that is equal to (if the ABC=19,000 mt), or fairly close to, the ABC. As noted above, these considerations are contingent on a spawning pollock biomass in the AI that is above 20% of the projected unfished spawning biomass. For a biomass below this level, the DPF and CDQ would have to equal zero, and only incidental catches would be allowed.

In 2005 and 2006, the ABC is projected to be 39,400 mt. This would be associated with a maximum TAC of 19,000 mt. The ICA has been 1,000 mt in recent years, and may be increased in 2005 (because it has been exceeded in recent years). Thus, Alternatives 1, 2, and 3 for this action would be associated with TACs of 19,000 mt. This is less than half of the ABC. Alternative 4 would be associated with a TAC equal to just under recent ICA levels, while Alternative 5 would be associated with a TAC of zero.

The 2003 SAFE document noted that the fish to the east of 174° W and the fish west of 174° W may belong to two different stocks. In the 2003 assessment proposal the Aleutian Islands region was divided into areas where discontinuities in pollock distribution were apparent (see Appendix A). These breaks separate the northern "Basin" area from the Aleutian Islands chain and split the eastern-most portion of the Aleutian Islands region from the Aleutian Islands. Two regional partitions were developed, one called NRA (for Near, Rat, and Andreanof Island groups) extending to 170°_E, and another that excludes the eastern portion between 174° W and 170° W. This partitioning was done based primarily on fishery distribution data. More information is available for the portion of the pollock stock located to the west of 174° W longitude so that it may be assessed as a tier 3 stock. Less stock information for the portion of the pollock stock east of 174° W longitude is available, leading the assessment of that portion to be recommended under tier 5. The Plan Team and the SSC will need to decide if there is sufficient information to establish separate management stocks for AI pollock or if AI pollock may be managed subarea wide. Also, the potential stock divisions are more consistent with the area covered by summer bottom-trawl surveys. The stock assessment authors have recommended that additional

information be collected in the winter through a scientific research permit to better understand the AI pollock stock structure.

The 2004 AI ABC was calculated by adding separate Tier 5 ABC estimates for these two areas. The ABC for the western area was 27,400 mt, while the ABC for the eastern area was 12,000 mt. These totaled the AI pollock ABC of 39,400 mt. (SAFE, page 852) If an entire AI pollock DPF of 18,000 mt were harvested from the area between 170° W and 174° W, the catch in that area would exceed the ABC, at current ABC levels.

If this is a concern, the Council may choose, during the annual specifications process, to allocate the AI pollock TAC among the different management areas defined for the region. For illustrative purposes, it could impose a 12,000 mt TAC in the easternmost management area, Area 541, and could impose a separate 27,400 mt TAC in the central and western Aleutians management areas (Areas 542 and 543).

Area 541 includes waters that fall outside the 170° W and 174° W range identified in the SAFE document as the waters within which the eastern AI pollock stock is located. This smaller area itself, however, could not be assigned a separate TAC until regulatory action was taken to create an appropriate management area. Given such a regulatory action, however, it would be possible to more finely tune the areas to the fish stocks.

The 2003 SAFE document noted that "given uncertainty in the status of the pollock in the NRA area east of 174_**W it may be prudent to declare this area, along with the Bogoslof area, a protected transition zone between the Aleutian Islands, the Eastern Bering Sea, Central Bering Sea, and the Gulf of Alaska pollock stocks**. [emphasis in the original] This would provide some measure of insurance over stock structure uncertainty and better justify current regional management stocks (since they will no longer be contiguous). We expect that this will also enhance the current conservation measures in place for the Bogoslof region related to the Central Bering Sea and Aleutian Basin pollock..." (Appendix A, page 852) Should the Council close the areas east of 174° W to protect weaker elements of the overall AI pollock stock, the ABC recommendations for the remaining fishable areas in the AI region west of 174° W might be lower, reflecting only the NRA biomass.

AI TACs of 19,000 mt, or less, associated with the alternative actions, are small compared to the ABC of 39,400 metric tons, and are not expected to jeopardize the capacity of the pollock stock to produce MSY on a continuing basis, to alter the genetic structure, to change reproductive success, to change prey availability, or to affect habitat so as to jeopardize the ability of the stock to sustain itself at or above MSST.[8] This impact has thus been rated "not significant."

Effects on Target Species and Fisheries

The bycatch of species targeted in other fisheries by an AI pollock fishery could reduce the quantity of fish available for harvest in these other fisheries, causing some economic effects. Quotas for other target fisheries might be affected if this incidental harvest becomes large. Mortality to non-target species could affect potential yield from these stocks or affect the spatial

[8]The assessment authors use the size of the female spawning biomass with respect to the B_{35} biomass level for MSST determinations in the NRA stock. They do not have a similar threshold for the stock east of 174° W.

or temporal distribution of these species. Harvest of pollock also may reduce the yield from the AI pollock population, possibly reducing production of juvenile pollock that are important prey for fish species harvested in other directed fisheries.

None of the five alternatives under consideration in this action would create a pollock TAC greater than 19,000 mt in 2005 or 2006. At least 1,000 mt are needed to maintain existing incidental catch limits. This means that the increase in directed CDQ and DPF harvests would be less than or equal to 18,000 mt. At an AI pollock CDQ and DPF of 18,000 mt, the effects on other target fisheries are likely to be small. The four other target species that appear in non-trivial amounts in pollock bycatch during the domestic fishery of the 1990s (from 1991 to 1998) were Atka mackerel, flatfish (primarily Greenland turbot), rockfish (primarily Pacific ocean perch) and Pacific cod.

The average bycatch rate for Atka mackerel during this period was 0.0005 mt of Atka mackerel for each ton of pollock. The low yearly rate was zero, while the high yearly rate was .0058. At the average rate, the incidental Atka mackerel catch associated with 18,000 mt of pollock harvest would be 10 mt. At the low rate it would be zero and at the high rate it would be 104 mt. (NMFS AKR blend) The Atka mackerel biomass estimate from the most recent (2002) survey was about 773,000 mt (2003 SAFE, page 720).

The average bycatch rate for flatfish during this period was 0.0011 mt of flatfish for each ton of pollock. The low yearly rate was 0.0001, while the high yearly rate was 0.0074. At the average rate, the incidental flatfish catch associated with 18,000 mt of pollock harvest would be 19 mt. At the low rate it would be 2 and at the high rate it would be 133 mt. (NMFS AKR blend)

The average bycatch rate for Pacific cod during this period was 0.0085 mt of cod for each ton of pollock. The low yearly rate was 0.0011, while the high yearly rate was 0.0085. At the average rate, the incidental Atka mackerel catch associated with 18,000 mt of pollock harvest would be 20 mt. At the low rate it would be 1 and at the high rate it would be 154 mt. (NMFS AKR blend)

The average bycatch rate for rockfish during this period was 0.00085 mt of rockfish for each ton of pollock. The low yearly rate was 0.000125, while the high yearly rate was .0035. At the average rate, the incidental Atka mackerel catch associated with 18,000 mt of pollock harvest would be 15 mt. At the low rate it would be 2 and at the high rate it would be 63 mt. (NMFS AKR blend) The rockfish harvest is almost entirely Pacific ocean perch (NMFS, AKR Blend). The Aleutian Islands Pacific ocean biomass, based on the 2002 survey, is about 452,000 mt. (2003 SAFE, page 596).

These bycatches would count against the rockfish TACs in the AI, reducing the TAC available for targeted harvests, and buffering any impact these small amounts might have on the total harvest of rockfish in the AI. Because these bycatches would come at the expense of other groups fishing in the BSAI, they would impose an economic cost on these groups. This cost is addressed under the economic and social criteria.

A future AI pollock fishery will be prosecuted with smaller vessels than in previous years, and perhaps more intensively in some geographic areas (because of SSL closures). The trawl nets used, the horsepower of participating vessels, and fishing strategies used may all be quite different than prior to 1998, resulting in bycatch rates and patterns quite different from historic. These differences may create problems with the extrapolation of future bycatch rates in the AI pollock fishery.

An AI pollock fishery would be prosecuted with pelagic trawls, and would not likely affect habitat for such non-target species as Pacific cod, Atka mackerel, sablefish, flatfish, or rockfish since these species are more demersal or benthic oriented, are often associated with benthic structure and relief, and pollock fishing would be targeting schools of pollock that would likely be more bathypelagic or midwater oriented.

Higher removals of pollock may be associated with incidental catches of juvenile pollock, and may reduce the biomass of pollock, thereby reducing the production of juvenile pollock. Juvenile pollock are preyed upon by other pollock, Pacific cod, and other species of fish. Juvenile pollock are important components of the diet of other fishes, with pollock being the number one consumer of juvenile pollock followed by Pacific cod and arrowtooth flounder as numbers two and three, respectively (Lang et al. 2003). But the levels of reduced yield are very small and are judged to be insignificant given the very large biomass of pollock in the AI region. Thus this alternative is not likely to impact prey items for fish species harvested in other target fisheries in the AI.

Historical evidence indicates that pelagic pollock fisheries will only catch small amounts of these other target species incidentally. There appears to be limited potential for overlap between pollock and fixed gear fishing areas. None of the five specifications alternatives are expected to jeopardize the capacity of the other target stocks to produce MSY on a continuing basis, or to alter the genetic structure, change reproductive success, change prey availability, or affect habitat, so as to jeopardize the ability of these stocks to sustain themselves at or above MSST. For these reasons, the impacts of this alternative on other target species have been rated "insignificant."

The pollock ITAC in the EBS would have to be reduced by 18,000 mt to fund an AI CDQ and DPF under Alternatives 1, 2 and 3, The reduction would be smaller for Alternative 4, and zero for Alternative 5. Historical and current pollock ABCs and TACs in the EBS are very high. An 18,000 mt reduction in the AI TAC is a change of about 1% in the 2003 harvests. Moreover, a reduction in removals in the EBS will not have adverse impacts on species taken incidentally there. These alternatives are not expected to jeopardize the capacity of the EBS pollock stocks to produce MSY on a continuing basis, and would not be expected to alter the genetic structure, change reproductive success, change prey availability, or affect habitat, so as to jeopardize the ability of this stock to sustain its self at or above MSST.[9]

Effects on Incidental Catch of Other and Non-specified Species

Other species include sculpins, skates, sharks, and octopus. This category also includes squid, which in the BSAI are separately assessed annually by the Plan Team. Information on these species is generally limited when compared with other species upon which directed fisheries are prosecuted. However, these species have some current or potential economic value, are an integral part of the marine ecosystem, and thus are monitored by NMFS. Catch levels are small when compared with target species, but levels of catch are increasing (NPFMC 2003b).

Non-specified species are marine organisms, which have little or no economic value and are generally discarded and certainly not targeted; non-specified species catch levels presumably track the catches of the target species in various fisheries. Since target fishers realize adverse

[9]The assessment authors use the size of the female spawning biomass with respect to the B_{35} biomass level for MSST determinations in the NRA stock. They do not have a similar threshold for the stock east of 174_W.

effects from harvest of species not targeted, efforts are generally made to minimize catch of these species to reduce the time it takes to sort or otherwise deal with unwanted catch. Thus, levels of catch of other or non-specified species are generally low.

Between 1999 and 2003, groundfish fishermen have taken between 98,000 and 120,000 mt of groundfish from the Aleutian Islands each year. (AKR Blend and Catch Accounting System) The proposed FMP and regulatory amendments would structure an AI pollock fishery that might add a maximum of 18,000 mt to that (1,000 mt are already taken as incidental catch), if the entire TAC can be harvested. Assuming that other and non-target harvests would increase or decrease in proportion to the total volume of groundfish harvested in the AI, the increase in pollock harvest would not change the incidental catches of these species by more than 50% (See Table 4.1-2 in Section 4.1 for the relevant significance criteria). This impact is therefore classified as "insignificant."

Effects on Incidental Catch of Forage Fish Species

Forage species are taken incidentally in many groundfish fisheries, and prior to 1998 directed fisheries for these species were primarily capelin and eulachon. After 1998, no commercial fishery on forage species has been allowed (BSAI FMP Amendment 36). At the present time, the incidental catch of forage species likely would be very small to negligible. Current regulations permit maximum retainable forage species catch of 2 percent of total catch.

Between 1999 and 2003, groundfish fishermen have taken between 98,000 and 120,000 mt of groundfish from the Aleutian Islands each year. The proposed FMP and regulatory amendments would structure an AI pollock fishery that might add a maximum of 18,000 mt to that (1,000 mt are already taken as incidental catch), if the entire TAC can be harvested. Assuming that forage fish harvests would increase or decrease in proportion to the total volume of groundfish harvested in the AI, the increase in pollock harvest would not change the incidental catches of these species by more than 50% (See Table 4.1-3 in Section 4.1 for the relevant significance criteria). This impact is therefore classified as "insignificant."

Effects on Incidental Catch of Prohibited Species

The average bycatch mortality rate for halibut during this period was 0.00002 mt of halibut for each ton of pollock. The low yearly rate was zero, while the high yearly rate was .00011. At the average rate, the incidental halibut catch associated with 18,000 mt of pollock harvest would be 0.4 mt. At the low rate it would be zero and at the high rate it would be 2 mt (NMFS AKR blend). This compares to BSAI groundfish fisheries halibut bycatch mortality of 3,790 mt in 2003.

The average bycatch rate for bairdi crab during this period was 0.00315 crabs for each ton of pollock. The low yearly rate was zero, while the high yearly rate was .01968. At the average rate, the incidental bairdi catch associated with 18,000 mt of pollock harvest would be 57 crabs. At the low rate it would be zero and at the high rate it would be 354 crabs (NMFS AKR blend). This compares to BSAI groundfish fisheries bairdi bycatch of about 897,000 crab in 2003.

The average bycatch rate for red king crab during this period was almost zero crabs for each ton of pollock. The low yearly rate was zero, while the high yearly rate was .00002. At the average rate, the incidental red king crab catch associated with 18,000 mt of pollock harvest would be zero crabs. At the low rate it would be almost zero and at the high rate it would be less than one

crab (NMFS AKR blend). This compares to BSAI groundfish fisheries red king crab bycatch of 73,378 crab in 2003.

The average bycatch rate for Chinook salmon during this period was 0.02389 salmon for each ton of pollock. The low yearly rate was 0.00365, while the high yearly rate was .04326. At the average rate, the incidental Chinook salmon catch associated with 18,000 mt of pollock harvest would be 430 salmon. At the low rate it would be about 66 salmon and at the high rate it would be 779 salmon (NMFS AKR blend). This compares to Chinook salmon bycatch of 44,706 salmon in 2003.

The average bycatch rate for other salmon (almost all chum) during this period was 0.01658 salmon for each ton of pollock. The low yearly rate was 0.00167, while the high yearly rate was 0.15724. At the average rate, the incidental other salmon catch associated with 18,000 mt of pollock harvest would be 299 salmon. At the low rate it would be about 30 salmon and at the high rate it would be 2,830 salmon (NMFS AKR blend). This compares to a BSAI other salmon bycatch of 187,323 salmon in 2003.

There are limited data on the origins of Chinook salmon taken as bycatch in the BSAI. Witherell, et al. (2002) found that the most recent information is scale pattern analysis data from 1979-1982. These are data from the early years of the foreign and joint venture harvests. These data suggested that the Chinook harvested in the BSAI came from Western Alaska, Southcentral Alaska, Asia, Southeast Alaska, and Canada. Somewhat over half of the salmon came from Western Alaska. Witherall et al. (2002) point to more recent scale pattern and genetic data for chum salmon from the mid-1990s. Chum salmon also originated in many places around the North Pacific. Somewhat smaller proportions of the chum catch (on the order of 20% to 25% appear to have originated in Western Alaska (Witherell et al., 2002, pages 59-60).

Witherall et al. also point out that BSAI groundfish fisheries can take salmon as bycatch one or two years before they return to their natal streams. Given normal mortality some proportion of the salmon harvested as bycatch would not have lived to return to their natal streams if they had not been caught. They use the concept of “adult equivalents” to refer to the reduction in fish returning to their streams as adults for any given bycatch of salmon. For example, a bycatch of 18,000 Chinook translates into a reduction in returning salmon of 14,581 adult equivalents (Witherell et al., 2002, page 61). The calculations are rough, and are only provided here to illustrate the general concept, and provide a sense of the possible difference between bycatch and adult equivalent returns.

Figure 4.2.2-7a in the Amendment 82 EA/RIR showed locations of salmon bycatch in pollock fisheries in the Aleutian Islands. A relatively large part of historical AI bycatch of Chinook salmon occurred outside of Steller sea lion critical habitat on the eastern border of Area 541, and north of Atka Island. A large part of AI Chinook bycatch appears to have occurred outside of Steller sea lion critical habitat, so additional pollock trawling there could lead to additional Chinook salmon bycatch in the Aleutian Islands. A relatively large part of historical AI bycatch of other (primarily chum) salmon occurred between the Rat Islands and the Near Islands in waters outside of SSL critical habitat, and also in the waters just north of Atka, some of which are outside Steller sea lion critical habitat. Additional pollock trawling in these waters could also lead to additional salmon bycatch.

The average bycatch rate for herring during this period was 0.00033 mt of herring for each ton of pollock. The low yearly rate was zero, while the high yearly rate was 0.00248. At the average rate, the incidental herring catch associated with 18,000 mt of pollock harvest would be 6 mt. At

the low rate it would be about zero mt and at the high rate it would be 45 mt (NMFS AKR blend). This compares to a BSAI herring bycatch of 1,099 mt in 2003 (almost all in the EBS pollock fishery).

The average bycatch rate for other tanner crab during this period was 0.00275 crab for each ton of pollock. The low yearly rate was zero, while the high yearly rate was 0.02049. At the average rate, the incidental herring catch associated with 18,000 mt of pollock harvest would be 50 crab. At the low rate it would be about zero mt and at the high rate it would be 369 (NMFS AKR blend). This compares to a BSAI other tanner crab bycatch of about 615,000 crab in 2003.

The average bycatch rate for other king crab during this period was 0.00022 crab for each ton of pollock. The low yearly rate was zero, while the high yearly rate was 0.00088. At the average rate, the incidental herring catch associated with 18,000 mt of pollock harvest would be 4 crab. At the low rate it would be about zero mt and at the high rate it would be 16 (NMFS AKR blend).

The AI pollock fishery may be prosecuted with smaller vessels than in previous years, and perhaps more intensively in some geographic areas (because of SSL closures). The trawl nets used, the horsepower of participating vessels, and fishing strategies used may all be quite different than prior to 1998, resulting in bycatch rates and patterns that differ from historical experience. Thus there are concerns about extrapolation or inferring the future bycatch rates in the AI pollock fishery.

In 2003 and 2004, NMFS stock assessment biologists have reevaluated the stock structure of pollock in the AI region given uncertainty over stock composition. Future AI pollock ABCs may be changed in amount, and geographic boundary, in future stock assessments. A change in pollock stock structure, with possible changes in where pollock may be fished, and at what levels, may result in a change in the overall PSC bycatch scenario, placing some uncertainty in predicting future effects of these alternatives on PSC bycatch.

Not all vessels in the AI pollock fishery will be observed. In the absence of observer coverage, NMFS cannot be certain that vessels are accurately reporting PSC bycatch. Catcher vessels under 60 feet are not normally required to carry observers, and catcher vessels from 60 to 120 feet are only required to carry observers 30% of the time. Under the provisions of the Council's final action establishing the AI pollock fishery, vessels under 60 feet are required to carry a NMFS Cadre observer if one is provided by NMFS. However, the number of Cadre observers is limited, and the program was established for a different purpose. It is not clear that the Cadre requirement will generate observer data. Pollock vessels tend to sort their catch at sea somewhat less than other fishing operations, and deliveries will be monitored under this program. Moreover, in 2005-2006, the use of catcher vessels under 60 feet in this fleet may be limited. Program rules prohibit more than 25% of the harvest from being taken by vessels of this class in these years. It is also likely that the main focus of the Aleut Corporation in these years will be harvests by larger vessels, with the smaller trawlers used experimentally. The Council has committed to a review of the observer issue at its June 2006 meeting.

The Aleutian Islands pollock ABC for 2005 is 39,400 mt. The TAC associated with this ABC is 19,000 mt, implying that 18,000 mt would be available for the CDQ and DPF if the ICA is 1,000 mt. As noted earlier, using low and high bycatch rates from 1991 to 1998, this implies Chinook bycatches between 66 and 779 salmon. Using the average bycatch rate over the period, the bycatch would be 430 salmon. Similar estimates for chum salmon are a range between 30 and 2,830 salmon, with a mean of 299 salmon toward the lower end of this. At the high ends, this is

about 1.7% of the 2003 BSAI Chinook salmon bycatch, and 3%% of BSAI chum salmon bycatch. At the mean bycatch rates from 1999 to 1998, these are 1% and a third of a percent, respectively.

Considering the modest levels of expected bycatch, the evidence of the dispersed origins of the salmon taken as bycatch in the BSAI groundfish fisheries, the relationship between bycatch and salmon adult equivalent returns, and the fact that increased AI bycatches would be offset to some extent by reduced EBS bycatches, PSC bycatch amounts are not expected to be large enough to jeopardize the capacity of the PSC stocks to maintain benchmark population levels, produce 20% decreases in harvest levels in directed fisheries, or increase BSAI harvests of prohibited species by more than 50%. Bycatch of other species are relatively small. For these reasons, the PSC impacts are rated "not significant" for these alternatives.

Effects on Marine Mammals

The Aleutian Islands would be open to a directed pollock fishery with the TAC set as previously described (see Table 4.4-1) and apportioned to A and B seasons. The current regulations (and ESA consultations) provide for an Aleutian Islands Subarea pollock fishery that is outside of Steller sea lion designated critical habitat, with TAC apportioned 40%/60% to the "A" and "B" seasons, respectively, and based upon an ABC value which conforms to the harvest control rule and is based on the annual pollock stock assessment which appropriately evaluates the stock being harvested. Possible adverse effects of an offshore (i.e., outside of critical habitat) fishery for pollock were fully considered in the 2001 Biological Opinion and those adverse effects were accounted for under the incidental take statement provided by that consultation. An AI pollock fishery would fall within the terms of that previous consultation and would not be considered an adverse impact on Steller sea lions. An informal consultation dated August 19, 2004, between the NMFS Sustainable Fisheries Division and the Protected Resources Division found that Amendment 82 and its proposed regulations were not likely to adversely affect Steller sea lions or their critical habitat beyond those effects already identified in previous consultations.

The Aleutian Islands area previously has been open to a directed pollock fishery. Prior to 1999, this fishery's TAC was as high as 100,000 mt. In recent years the TAC has been much lower (since 1999 basically only an ICA apportionment), and the BSAI Plan Team's reevaluation of the AI pollock structure may lead to recommended closure to fishing east of 174 degrees W and perhaps lowered ABCs for the remainder of the AI region. The impacts of a reopened fishery on marine mammals would likely be similar to those impacts realized in this fishery in prior years. Those impacts were reviewed periodically in previous years as the fishery was prosecuted in these years, and those levels of harvest were not judged to be adversely impacting marine mammals. Where issues of concern arose, as in the instance of Steller sea lions, the Council established appropriate measures to mitigate these concerns. However, a reopened fishery will occur in areas outside of Steller sea lion protection areas; these protection areas will remain closed to pollock trawling. This may displace the Aleut Corporation pollock fishing activities into areas perhaps not fished as intensely as before.

The proposed pollock fishery would be prosecuted in compliance with existing SSL protection measures. Several potential direct and indirect effects on Steller sea lions are considered in this analysis. Annual levels of fishery-related incidental mortality to Steller sea lions are estimated by comparing the ratio of observed incidental take of animals to observed groundfish catch (stratified by area and gear type). Incidental take frequencies also reflect locations where fishing effort is highest. In the Aleutian Islands and GOA, incidental takes are often within Steller sea lion critical habitat. In the Bering Sea, takes are farther off shore and along the continental shelf. Otherwise there seems to be no apparent "hot spot" of incidental take disproportionate with

fishing effort. Given that critical habitat is closed to directed fishing for pollock in the Aleutian Islands, an AI pollock fishery apportionment would not likely result in an increase in the incidental take of Steller sea lions. Use of areas beyond critical habitat by sea lions is very limited in the Aleutian Islands subarea (2001 BiOp). Also, it is unlikely that the allocational regime chosen for the offshore fishery would result in additional adverse impacts. Therefore, incidental take would be insignificant under this alternative.

The spatial and temporal effects on Steller sea lion prey by the Aleutian Islands directed pollock fishery previously has been analyzed and the fishery modified to comply with the Endangered Species Act (ESA)(2001 BiOp and August 19, 2004 informal consultation memorandum). The fishery as prosecuted under the alternatives would be conducted according to these protection measures and no impacts are expected beyond those already analyzed. The specifics of the fishery seasonal apportionments and fishery location were described above. Telemetry data suggest that most Steller sea lions forage relatively close to haulouts and rookeries, generally within 10 nm and most within 20 nm, although in winter they may forage further offshore. The Steller sea lion protection measures provide a buffer around haulouts and rookeries to provide an area protected from fishery removals of fish species important in Steller sea lion diets. In parts of the AI region, especially the western Aleutians, Steller sea lions continue to decline, and there is heightened concern over these animals in this particular area. Aerial surveys of Steller sea lions conducted in 2004 will provide valuable data on population levels in this region.

There could be some effect of an AI pollock fishery if spatial concentration of fishing activity occurs. This could result from either larger AFA vessels fishing a relatively small TAC concentrating their efforts in an area or areas that yield good CPUEs, encouraging the vessels to remain in such areas to attain their TAC quotas as quickly and efficiently as possible. Also, when small vessels enter this fishery, and given the continued closures of areas near shore within 20 nm of SSL protection areas, conceivably small vessels also could concentrate in areas open to fishing that are closest to ports or areas of refuge in stormy weather. In either case, some local depletion of marine mammal prey items could occur, but the volumes of potential harvest are small compared with available biomass. And the harvests would be required to be spilt 50:50 among large and small vessels, effectively spreading out the catch spatially and temporally. These impacts on marine mammals would be in proportion to the amount of TAC apportioned to this fishery. The projected TACs for alternatives 1-4 allow for harvest well below the ABCs, reducing the likelihood of adverse impacts due to the quantity of harvest.

Steller sea lion protection measures require the control of overall harvest of pollock, Pacific cod, and Atka mackerel, which are considered key Steller sea lion prey species (50 CFR 679.20(d)(4)). If the spawning biomass of a prey species is predicted to fall below 20 percent of its unfished spawning biomass, directed fishing for that species would be prohibited. The analysis of the harvest control rule is in the Steller sea lion protection measures SEIS (NMFS 2001). All alternatives would not allow directed fishing for pollock if the spawning biomass fell below 20 % of the unfished spawning biomass, and therefore would have insignificant impacts on the global availability of pollock in the Aleutian Islands area. Further, the resumption of a fishery in the Aleutian Islands area would be provided such that the 2 million metric ton cap for the BSAI would not be exceeded, as required by the 2000 Biological Opinion. Overall, with the current Steller sea lion protection measures in place, Alternatives 1-4 would have insignificant effects on spatial and temporal concentration of harvest and on global harvest of prey species for marine mammals. Alternative 5 would likely have a significant beneficial affect on the spatial and temporal harvest of prey species due to no groundfish fishing and insignificant effects on the global harvest of prey species.

Vessel traffic, nets moving through the water column, or underwater sound production may all represent perturbations that could affect Steller sea lion behavior. An increase in fishing activity in the AI region could result in increased discard or accidental loss of fishing materials such as nets, package bands, lines, etc. that could increase the incidence of entanglement with Steller sea lions. Foraging could potentially be affected not only by interactions between vessel and species, but also by changes in fish schooling behavior, distributions, or densities in response to harvesting activities. In other words, disturbance to the prey base may be as relevant a consideration as disturbance to the predator itself. For the purposes of this analysis, we recognize that some level of prey disturbance may occur as a fisheries effect. The impact on marine mammals using those schools for prey is a function of both the amount of fishing activity and its concentration in space and time. The criterion set for insignificant impacts is a similar level of disturbance as that which was occurring in 2001. In 2001, the total pollock catch in the Aleutian Islands was only 824 mt (Table 3.2-1); thus a fishery up to 19,000 mt would be a substantial increase in the amount of catch compared to 2001. However, the test for significance is whether there would be more disturbance to the Steller sea lion population. Given that all of sea lion critical habitat is closed in the Aleutian Islands, and the effects of a fishery up to the ABC was considered in the 2001 BiOp and the Steller sea lion protection measures SEIS (NMFS 2001), no substantial disturbance effects are likely given the vast area beyond 20 n mi from land and the very limited use of this area by sea lions in the Aleutian Islands due to the bathymetry (i.e., deep water off the continental shelf). Thus, the indirect effects under Alternatives 1-4 are insignificant according to the criteria set for significance. The effects of Alternative 5 could be significantly beneficial because the groundfish fisheries would not be authorized and the disturbance would be eliminated.

The northern fur seal population has declined over the past decade, and recent counts in the Bering Sea region suggest the decline is continuing. Fur seals breed and pup on the Pribilof Islands and on a few other islands in the Bering Sea region, and lactating females forage at sea to maintain a nutritional status sufficient to successfully nurse pups during the summer months. These foraging areas are primarily in the Bering Sea, and thus an AI pollock fishery would not likely overlap this foraging habitat. However, most of the Bering Sea fur seal population migrates through Aleutian Island passes en route to/from summer habitat and winter habitat. The fur seal is pelagic during the winter months in the north Pacific, although some remain in the Bering Sea region in winter. Migrations through the AI region could be affected by an AI pollock fishery through disturbance or direct take. Fur seals are susceptible to entanglement with derelict fishing gear because of their seasonal pelagic activity, and often entangle with lost nets and line around rookery areas. Even today, efforts to remove derelict gear, nets, lines, and other debris from beaches on the Pribilof Islands have reduced large amounts of such debris on beaches. Fur seals feed on pollock, although primarily juvenile fish, and a pollock fishery could remove prey items used by fur seals; however, given the difference in size between fishery-targeted pollock and pollock consumed by fur seals, this overlap may be of less concern. Also, the AI pollock fishery is very distant from the main Bering Sea fur seal foraging areas, and would unlikely affect foraging fur seals. There still could be some impact on fur seals as they move through Aleutian Island passes, but the AI pollock fishery has operated there in the past, and many other fisheries continue to operate there, and the addition of the AI pollock fishery to the 2005 and 2006 harvest specifications does not rise to a level of concern and thus is considered to be insignificant.

Similarly, some cetaceans migrate through the AI region, and special concern has been expressed over the extremely small population of northern right whale that seasonally occupies habitat in the Bering Sea. This highly endangered whale may be sensitive to encounters with fishing activity; as is currently understood, this whale is susceptible to vessel strikes because of its low profile when at the water surface making it difficult to see. Members of the right whale group

(including the Atlantic stock) may entangle with lines from floating buoys, damaging baleen plates and impairing feeding. However, very little is known about the northern right whale's habitat, movement patterns, or other vital activities in the north Pacific region. Other cetaceans also may be susceptible to gear entanglement. Some mortality to humpback whales has been reported for trawl fisheries in the Bering Sea (Angliss and Lodge 2002), and mortality to fin whales also has been reported from BSAI groundfish trawl fisheries. Most baleen whales do not target food species that would be harvested in an AI pollock fishery (although some baleen plates in larger whales may sieve large quantities of larval or small juvenile pollock, among other fish species). And the AI pollock fishery will be prosecuted with pelagic nets, which do not contact the bottom to any great degree and thus are not very susceptible to loss, and thus gear loss and subsequent entanglement with whales is considered to likely be very rare. Overall, the potential for encounters between AI pollock fishing operations and cetaceans is low. There will be few vessels participating, and fishing operations will be primarily during the A season which will be before the main migration of those whales that migrate seasonally through the AI passes en route to summer feeding grounds in the Bering Sea. Given the very small incremental increase in vessel activities, the low likelihood of gear loss, very little concern over prey removal, and a low level of spatial and temporal overlap with cetacean habitat, the potential for adverse effects from an AI pollock fishery is very small. Thus this is considered an insignificant for Alternatives 1-4 and significantly beneficial for Alternative 5's impact on spatial and temporal concentration of prey removal and disturbance.

The Bering Sea stock of northern harbor seal experiences mortality from BSAI trawl fisheries of 2 or more individuals annually (Angliss and Lodge 2002). However, this level of mortality likely comes from a variety of groundfish fishery activities, and at these levels is not considered a threat to this population. Increased fishing in the AI by trawl vessels will likely be a small fraction of any future injury or mortality to harbor seals, primarily because these fisheries will be prosecuted distant from shore where harbor seals tend to concentrate throughout the year. Some heightened concern may remain, however, as the Alaskan populations of harbor seals (their stock structure is still not understood and is the subject of ongoing genetic and other research) have declined in some areas and managers are seeking to understand reasons so that mitigative actions might be taken in the future.

The southwest Alaska stock (Distinct Population Segment or DPS) of the northern sea otter is a candidate for listing as threatened under the Endangered Species Act (65 *FR* 67343; 11/9/00). This DPS of sea otter (see Figure 4.2.2-7b) is under a heightened level of concern because of the significant population decline in the Aleutian Islands in the past several years. It is unlikely that the AI pollock fishery would have any appreciable effect on sea otters because this species is very coastally oriented, does not migrate from area to area, and feeds on prey items not targeted by the fishery. Fuel spills and loss of nets and lines could result in direct contact and mortality to sea otters. However, the AI pollock fishery would be prosecuted well offshore and not in contact or proximity to sea otters, and thus would not likely have measurable effects on the sea otter population. Future impacts on this DPS may depend on action taken by Congress and the U.S. Fish & Wildlife Service on defining critical habitat. It is possible that some features of critical habitat may be susceptible to impact from groundfish fishing activities, although it again appears unlikely that an AI pollock fishery will overlap with sea otter critical habitat to any extent such that significant concern results.

The overall combination of effects described above seem to indicate a small impact on marine mammals of an AI pollock fishery with a maximum CDQ and DFA of 18,000 mt apportioned to A and B seasons as previously described (see Table 4.4-1). Some species are known to have potential interactions with groundfish fisheries (some whales, northern fur seals), and in some

cases the effects of the proposed action in the context of this interaction are unknown. For some marine mammals, pollock are a component of their diet (harbor seals, Steller sea lions, northern fur seals), and some localized prey depletion might be a concern, depending on how the fishery is actually prosecuted. In the past, groundfish fishery effects on prey availability was one reason SSL protection measures were put in place, limiting prey removals within 3, 10, or 20 nm from SSL haulouts and/or rookeries. Thus, setting a TAC that could result in prey removals is of some concern. In some other cases insufficient information is available on the distribution, abundance, or habitat use patterns by many marine mammal species, making it impossible to predict impact, although from past history with the AI pollock fishery no significant concerns were raised. Some marine mammals that likely use the AI region for seasonal habitat, or migrate through the AI passes en route to or from seasonal habitat in the Bering Sea, are endangered, heightening the level of concern over any fishery prosecuted in their habitat. Some are in continued decline (e.g. northern fur seals) or have declined such that their population condition is uncertain (northern harbor seals, northern right whale). Given the potential for some overlap of this fishery with pelagic fur seals, movement corridors for northern right whales en route to/from summering areas in the Bering Sea, and movement corridors for some other cetaceans, the impacts of this alternative could be of concern but the fact that this fishery has occurred in the region before without adversely impacting these marine mammals suggests that it will not have adverse impacts in the future. Also, this will be a small incremental addition to fishing activity in the region. Plus many other marine activities occur in the area, and this small pollock fishery is considered insignificant in light of the larger picture. Overall, then, an insignificant rating is assigned to this issue.

Effects on Seabirds

The Aleutian Islands would be open to a directed pollock fishery with the TAC set as previously described (see Table 4.4-1) and apportioned to A and B seasons. The proposed pollock fishery would be prosecuted in compliance with existing seabird protection measures. Several potential direct and indirect effects on seabirds are considered in this analysis. In the Aleutian Islands and GOA, overlap between seabirds and trawl fishing effort is most likely to occur near shore or in the relatively narrow band of the continental shelf. In the Bering Sea, trawling overlaps with birds along the continental shelf and mid shelf regions, thus extending farther from land masses than in the GOA (see GOA and BSAI SAFE documents).

The most frequent incidental take in trawl fisheries is of the northern fulmar (about 75% of trawl seabird bycatch), and over 500,000 northern fulmars nest on the Aleutian Islands. The next most common, shearwaters and Laysan albatross, do not nest in Alaska. Birds which utilize bottom fish and crustaceans, such as some alcids and cormorants (< 2% of total bycatch), may be taken in trawls or have their foraging affected. Between 5 - 7 % of birds taken in trawls are not identified, which may mean that alcids comprise a larger proportion of incidental take than previously recognized. The species most commonly subject to vessel strike mortality (especially in dark, stormy conditions or where lights are used) include five species of small auklets; auklets comprise about 32% of the colonial birds that nest on these islands. Annual levels of fishery-related incidental mortality to seabirds are estimated by comparing the ratio of observed incidental take of dead birds to observed groundfish catch (stratified by area and gear type). Incidental take frequencies also reflect locations where fishing effort is highest.

In the Aleutian Islands (Unimak Pass to Attu), the Beringian Seabird Colony Catalog (USFWS 2004) lists approximately 10.5 million seabirds nesting at 274 colony sites. The colonies would usually be occupied by nesting birds from May through September, although some species, notably fulmars, may be raising chicks through October. Thus, primarily the “B” pollock season

would substantially overlap temporally with colonially nesting birds, although the same species listed below are likely to be in the Aleutian area, further offshore, during their non-breeding season. These colonially nesting birds consist of 29 species, with the most abundant being fork-tailed storm-petrel (22% of total), leach's storm-petrel (24%), least auklet (22%) and tufted puffin (12%).

In terms of bird distribution at sea, the North Pacific Pelagic Seabird Database (NPPSD) (See SAFE 2002 report for figures) indicates that northern fulmars overlap with trawl fisheries in the Aleutians near the major passes and around the eastern Aleutian Islands. Shearwaters also occur primarily around Unimak Pass and the central to eastern Aleutians. Laysan albatrosses are most likely to overlap in the western Aleutians, whereas black-footed albatrosses are relatively rare in the Aleutians. In the Aleutians, short-tailed albatrosses have been observed most frequently near the central Aleutians and on the GOA side of the eastern Aleutians.

Because of the 20 n mi closure around SSL critical habitat, and the consequent closure of these areas to any pollock trawl fishery, many of the nearshore feeding birds, such as guillemots, cormorants, and sea ducks, should not experience significant increase in incidental take from the proposed trawl fishery in the AI. Species that may experience a shift in location of incidental take in the Aleutians include albatrosses and shearwaters, although the global take should not increase significantly. An exception may be the Laysan albatross, which occurs primarily in the central and western Aleutians, and thus could experience an increase in total incidental take. The short-tailed albatross has only been observed to be taken in long-line fisheries, and the spectacled and Steller's eiders have not been recorded as incidental take in groundfish fisheries. The impact of third-wire interactions with albatrosses is not well defined, and is being addressed through on-going studies.

Piscivorous seabirds utilize a wide variety of forage fish, as well as the juvenile stages of some commercial species such as pollock and Pacific cod. Forage fish are not commercially fished, and although their bycatch in trawl fisheries is not well defined, they do not appear to be a large proportion of fish bycatch (SAFE Ecosystem Considerations chapter, Forage fish, 2004). The AI pollock fishery will target large adult pollock, and will not harvest to any appreciable extent fish species consumed by seabirds. Thus this is considered an insignificant concern. [10]

Vessel traffic, nets moving through the water column, or underwater sound production may all represent perturbations that could affect seabird behavior. Foraging could potentially be affected not only by interactions between vessel and species, but also by changes in fish schooling behavior, distributions, or densities in response to harvesting activities that disturb the prey base. Some level of prey disturbance may occur as a fisheries effect. The impact on seabirds using those schools for prey is a function of both the amount of fishing activity and its concentration in space and time. The AI pollock fishery will be prosecuted by a small number of vessels, outside Steller sea lion closed areas, and thus will likely not impact schooling or other behavior of fish species consumed by seabirds; this issue is not considered significant.

Some seabirds dive to the ocean bottom to obtain food, particularly eiders and scoters as well as guillemots and cormorants. Adverse impacts could accrue if there is major damage to their feeding areas. These would be a particular concern with respect to the threatened Steller's eider,

[10] As noted in the ecosystem section, at the June 2004 Council meeting, the SSC recommended that advantage be taken of any new AI pollock fishery to study the effects on upper trophic level predators, such as piscivorous seabirds, of fishing for pollock. A more detailed summary of the SSC's proposal may be found in the ecosystem analysis in this section.

which winters throughout the AI region's coastal areas. However, the AI pollock fishery will be prosecuted by pelagic trawl gear that normally does not encounter the sea floor. Thus the potential for disturbance or damage to important seabird food resources on the sea floor is considered to be insignificant.

Offal may be produced during the AI pollock fishing operations. Offal may attract seabirds to vessels and birds may be subject to incidental mortality through vessel superstructure collisions (primarily at night when disoriented by bright deck lights), encounters with cables and warps, or capture in nets. On the other hand, offal production also may be an important seasonal food source for some seabirds, and thus may be considered a positive effect of some fishing operations. The AI pollock fishery will involve very few vessels. Issues around offal production will therefore be very minor. Thus the impact of offal production on subsequent fishery interactions with seabirds is considered to be insignificant.[11]

Fishing vessels may carry rats, although to an unknown extent. Vessel sinkings or visits to islands may introduce rats to those islands. The introduction of rats to a previously rat-free island can have adverse impacts of local bird populations, because rats may eat birds, bird eggs, and chicks. Bird species that nest in burrows such as storm petrels, puffins, and auklets, may be at risk to a greater extent than other species. Local populations may be reduced, and potentially driven to extinction. This issue was discussed at more length in the 2004 EA/RIR for Amendment 82. There is already vessel traffic in the region from military, cargo shipment, other target fisheries, tendering, subsistence, and recreational activity. The incremental addition of a small number of vessels fishing the AI pollock resource would likely have a small probability of contributing rats to an uninfested island that harbors a significant population of burrow-nesting seabirds. These AI pollock vessels would be required to fish outside of SSL critical habitat, generally keeping them well offshore while engaged in fishing, and further reducing the likelihood of the introduction of rats. Given available information, it is unlikely that the proposed action would lead to an incident that accidentally brought rats to an uninfested island, and thus is judged to be an "insignificant" impact.

None of the alternatives under consideration for this action would result in an AI pollock TAC greater than 19,000 mt. The test for significance is whether there would be sufficient take, prey removal, production of offal, or damage to important benthic habitat that it would cause impacts at the colony or population level. Because sea lion critical habitat is closed in the Aleutian Islands, no substantial disturbance effects are likely within the 20 nm zone around those islands. This closure would continue to provide "protection" of food resources for guillemots, cormorants, and eiders near the protected rookeries and haulouts. Many species of birds forage extensively beyond this zone, however, and may also be attracted to fishing activity. Also some effects may occur with respect to birds nesting during the "B" pollock season; the "B" season overlaps with seabird occupation of nesting areas from May to September. This would also be the period when obtaining sufficient prey is critical to building reserves for egg laying, and for supplying food to newly hatched chicks. However, the level of fishing activity with a 19,000 mt TAC would be small; as noted in Table 4.4-1, at the 39,400 mt ABC level, about 4,780 mt of this would be taken in the "B" season (more could be taken in the "B" season if the "A" season allocation is not fully harvested, however the primary commercial interest in this fishery is in the roe season) , and part of that, (assumed to be here 400 mt here) of that is estimated "B" season ICA harvest that would be taken whether or not fishing were allowed. These levels of fishing activity are not

[11] Although the overall effect is considered insignificant, it may still be beneficial to mitigate or minimize offal, especially when albatrosses are around, because of the potential for third wire interactions, which are not yet well quantified or understood.

expected to result in an appreciably increased level of incidental mortality from vessel strikes, third wire encounters, or other fishery-related take or mortality. Also, the fishery will focus almost exclusively on adult pollock, and this coupled with the small level of vessel activity, should not result in any appreciable impact on prey availability for seabirds. Trawling will be by pelagic gear, reducing the likelihood of damage to benthic habitat important to diving birds, and offal production will likely be limited in offshore areas where seabird encounters may occur. Finally, while there are also concerns over rats gaining access to non-infested islands, and having subsequent adverse impacts on nesting seabirds, the potential for such an event is considered small. Thus, the overall impacts on seabirds from the AI pollock fishery are expected to be insignificant.

Effects on Habitat

The primary habitat concerns in the AI region are the potential adverse effects of an AI pollock fishery on the coral and sponge assemblages that are evident throughout the region; the locations of these habitat types are known based on bycatch of these organisms in previous trawl hauls over the past several decades. These distributions are shown in Figures 4.2.2-8 and 4.2.2-9 of the Amendment 82 EA/RIR.

Pollock in the BSAI are targeted exclusively by pelagic trawls. Non-pelagic trawling for pollock is prohibited (679.24(b)(4)). Bottom contact is discouraged on sea floors that are rough by prohibiting the use of chafe protection gear to protect pelagic trawl footropes (679.2).

In the Aleutian Islands pollock fishery no intentional sea floor contact is expected, because the rough bottom conditions would result in torn or lost midwater trawls (EFH Committee 2002). Pelagic gear is large and fairly delicate compared to more traditional non-pelagic gear. While larger pelagic gear is usually fished near softer substrates, such as the mud and sand of Bering Sea, rougher substrates easily damage pelagic gear. Fishing areas in the Aleutian Islands are typically rougher in bottom type and more vertical in slope. The roughness of the bottom and the fragile pelagic pollock net configuration discourage even accidental contact of the net and bottom. The high cost of repairing a pelagic net damaged by contact with the bottom provides a built-in protection for habitat from fishing effort in the directed pollock fishery. When pelagic trawling, such as for pollock, the trawls are fished with doors that do not contact the sea floor, so any door effects are eliminated. Because the pelagic trawl's unprotected footrope effectively precludes the use of trawl nets on rough or hard substrates, pelagic trawls do not generally affect the more rare, fragile, and complex habitats that occur on these rougher substrates. Moreover, in the BSAI, vessels fishing for pollock are also limited by a performance standard that states that if more than twenty crabs are on board this is an indication of bottom trawling.

Under all these alternatives, the Aleutian Islands Steller sea lion Critical Habitat, and significant parts of the AI shelf, remain closed to directed fishing for pollock. Critical Habitat includes 20 nautical mile buffers around the rookeries and haulouts and also includes the Seguam Pass foraging area. For the following analysis the 0-1000-meter bathymetry lines in the Aleutian Islands represent the continental shelf and the habitats at risk.[12]

[12]Bathymetry is based on ETOPO2. This is bathymetric data based on NOAA vessel soundings and satellite altimetry. Source: NOAA\NEMA. Boulder, CO.

- Steller sea lion Critical Habitat removes approximately 65% of the Aleutian Islands shelf available to a pollock fishery. This leaves only 35% of the entire Aleutian Islands shelf potentially susceptible to benthic disturbance from a directed pollock fishery.

- Within 100 nautical miles of Adak, only 9% of the remaining open shelf is available to a directed pollock fishery. The open areas include a small area approximately five nautical miles below Tanaga Island and a larger area to the north and south of the western wing of Atka Island.

- Within 200 nautical miles of Adak, only 44% of the remaining open shelf is open to a directed fishery for pollock. The open areas includes a small area to the east of Seguam pass, to the north and south of the western wing of Atka Islands, a small area five miles to the south of Tanaga Island, a section of shelf crossing Amchitka Pass, most of Petrel Banks, and the southern half of Bowers Ridge.

The distribution of fishing effort likely would be proportional to the quota set for pollock in the AI. Because of the current spatial restrictions of Steller sea lion critical habitat out to 20nm from shore, it would be necessary for the fleet to travel at least twenty miles from shore or travel to the nearest open coastline (outside 3 n mi). Much of the early pollock fishery was inside Critical Habitat. After Steller sea lion restrictions increased, some of this effort moved offshore to deep water near the west of the Bogoslof foraging area and east and north of Seguam Pass. Historically these new areas where effort may move were not high pollock catch areas, but under the proposed action these areas likely will be fished, leading to some more intensified fishing effort. Comparing these areas with Figures 4.2.2-8 and 4.2.2-9 in the Amendment 82 EA/RIR, there is some potential overlap with known sponge and coral assemblages, but not in areas where sponge or coral are considered to be heavily concentrated.

Rare occurrences of bottom contact by pelagic pollock gear may occur in areas not currently fished. It is possible that these could impact benthic community structure. The more trawl hauls that occur, the greater the potential area of bottom contact, and thus, the greater the intensity of impact. This could result in damage to, or removals of, some larger coral and sponges. Large pelagic trawl nets full of target species catch may touch the sea floor in some situations. Such light contact could have a potentially greater impact on fragile AI habitats, such as hard corals and larger sponges, than in the less structured, softer substrates of the EBS.

However, given the nature of pelagic fishing gear, the potential costs to operators of fishing too close to the rugged bottoms in the AI, the limited amount of AI shelf area open to pollock fishing, and the relatively small size of the AI TAC, a directed pollock fishery is expected to have limited contact with bottom habitat. Thus, the introduction of a pelagic pollock fishery in the AI is expected to produce levels of mortality and damage to living habitat, changes to benthic community structure, and changes in the distribution of fishing effort and geographic diversity of management measures that are similar to baseline levels. The action is has been rated “non significant” with respect to these criteria.

Table 4.12-4 Ecosystem Effects

Issue	Effect	Discussion	Significance
Predator-prey relationships	Pelagic forage availability	Atka mackerel and pollock are important prey items for marine mammals and other species in the AI marine ecosystem. Over the period 1977-2003, point estimates of Atka mackerel biomass age 1+ ranged between 260,860 mt and 771,360 mt. In recent years (1997-2003) modeled biomass estimates ranged from about 415,000 to about 459,000 mt (2004 SAFE page 749). Pollock biomass from AI groundfish survey estimates has ranged between 77,000 mt and 175,000 mt since 1991. In recent years (since 1997), Atka mackerel catches have ranged from about 46,000 mt to about 66,000 mt. Pollock catches have been very low (less than 1,000 mt), as only pollock bycatch in other target fisheries was allowed. The 2004 pollock ABC in the AI was 39,400 mt. The TAC cap of 19,000 mt means that any pollock harvest will be far below ABC. The Aleut Corporation likely will be primarily interested in the pollock roe fishery, and any pollock fishery in the A season is subject to the 40% Steller sea lion protection measure limit. Thus, actual harvest, especially in the early years of this program, may be significantly less than the TAC. Also, as noted previously, fishermen will have to direct their attention to new waters. Considering Atka mackerel and pollock as indicators of forage species abundance in this area, the effects of a 19,000 mt TAC for an AI pollock fishery would not likely adversely affect forage availability given the large amounts of forage biomass in the AI region.	Not significant under all five alternatives.
	Spatial and temporal concentration of fishery impact on forage	No more than 40% of the ABC may be harvested in the "A" season. Thus, although the TAC is 19,000 mt in 2005, given an ABC of 39,400 mt, no more than 14,220 mt may be taken in the "A" season. The balance, 4,780 mt, must be taken in the "B" season (see Table 4.12-1). While ICA harvests may be taken within 20 miles of shore in critical habitat in connection with other target fisheries, such as that for Pacific cod, Steller sea lion protection measures will prevent CDQ or DPF harvests from taking place within 20 miles of these shore areas. These measures will limit spatial and temporal concentration of the fishery on forage fish.	Not significant under all five alternatives.

Issue	Effect	Discussion	Significance
	Removal of top predators	As discussed earlier, the impacts on marine mammals were designated as "not significant." Sharks did not appear often in historical bycatch. This action is not expected to have a significant impact on removals of marine mammals or seabirds (see the relevant sections in this EA). In accordance with the NRC's recommendation for examining the ecosystem effects of fishery removals on SSL, the SSC proposed, in June 2004, that when the pollock fishery in the Aleutian Islands reopens, a research program be established to test hypotheses concerning the effects on upper trophic level predators of fishing for pollock. This fishery provides an opportunity to determine how changing the rate of pollock removals will influence the local distribution and abundance of adult pollock (local depletion hypothesis), the abundance, pupping rate and foraging distribution of SSL (prey depletion hypothesis), the reproductive success of seabirds (indices of forage fish abundance and availability, prey quality hypothesis) and the distribution and abundance of forage fish, including age-0 and age-1 pollock. These objectives can be achieved by conducting appropriately timed and thorough surveys of seabird colonies and sea lion rookeries and haulouts, as well as quantitative acoustic surveys of fish distribution and abundance. To account for bottom-up effects that could affect pollock and forage fish distribution and abundance, the SSC recommends measuring physical processes, nutrient availability, and standing stocks of phytoplankton and zooplankton. The program should be a closely integrated, interdisciplinary study that is closely focused on the region to be fished or potentially fished, including inshore waters. The duration of the study should be a minimum of five years to allow observations under the variety of conditions reflecting interannual variation in climate patterns.	Not significant under all five alternatives.

Issue	Effect	Discussion	Significance
	Introduction of non-native species	These could include non-native species introduced in ballast water of vessels as they move from one region to another, or rats introduced into rat-free islands through vessel visits or sinkings. Rats are a concern because of the threat they pose to burrowing bird species. There is already significant fishing activity in the AI for Pacific cod, Atka mackerel, halibut and sablefish, flatfish, crab and other species. This action represents a modest change in overall harvest activity in the BSAI area. Some vessels that may be active in the pollock fishery may already be active locally (for example, the Aleut Corporation may use the pollock allocation to provide additional targets for vessels already fishing for Pacific cod in the AI). Some vessels will likely change their operating patterns within the BSAI or between the BSAI and GOA. This action is not expected to attract significant numbers of new vessels from the continental U.S. Any that may come will almost certainly come from the Pacific Northwest, which has been the situation for many years. While the introduction of rats is a concern, the increased likelihood of this because of fishing in 2005 is likely to be low since the fishery will probably involve a relatively small number of vessels in 2004, many of the vessels (small trawlers) may already be involved in AI fisheries, and the fishery will be conducted outside of critical habitat, which generally provides a 20 mile buffer between fishing activity and shore.	Not significant under all five alternatives.
Energy flow and balance	Energy redirection	The reduction in Bering Sea pollock quota to fund the AI fishery and the use of C/Ps to harvest the AI pollock quota and the likely shift in deliveries of harvested pollock to Adak should shift some offal production from the Bering Sea to the AI. Limits on offal production associated with the 40%/60% "A"/"B" season split, and the early emphasis of interest in fishing primarily the "A" season, may shift energy into certain areas and seasons. If the fishery concentrates only in the "A" season, and the "B" season apportionment is not harvested, it is possible that larger proportions of the TAC will not be harvested in AI in this situation, but will be rolled over back to the Bering Sea. The AI fishery will be pursued with pelagic trawl gear, and thus any impacts on benthos should be relatively minor. Certainly some fraction of any discards or offal from C/Ps or catcher vessels will settle through the water column, providing an energy source for pelagic or benthic organisms. The total TAC of 19,000 mt is fairly small, which will also limit energy redirection.	Not significant under all five alternatives.
	Energy removal	An increase in pollock removals in the AI may be partially offset by a reduction in pollock and other species removals in the Bering Sea. Concentration of removals of pollock biomass would be limited by the required A/B season split and the 20 n mi SSL closure zones. If a relatively minor interest in fishing the "B" season materializes, this may mean that the full AI TACs won't be harvested, and that some part of the TAC will be rolled over to the Bering Sea. The total AI TAC of 19,000 mt represents a relatively modest amount compared to overall AI groundfish biomass.	Not significant under all five alternatives.

Issue	Effect	Discussion	Significance
Diversity	Species diversity	Pelagic pollock trawling is a relatively clean fishery with limited bycatch. This fishery will not harvest a diverse assemblage of other marine species. Pollock removals will be capped by a 19,000 mt TAC, and will be well below the ABC of 39,400 mt. A CDQ and DPF as large as 18,000 mt is not expected to affect the diversity of species in the AI.	Not significant under all five alternatives.
	Functional (tropic, structural habitat) diversity	The fishery would be almost purely pollock, with some bycatch of Pacific cod, Atka mackerel, sablefish, flatfish, and rockfish, but at very low levels. Thus there likely would be little change in the trophic level of the catch and the trophic level of the remaining groundfish community. The fishery would be prosecuted only with pelagic gear; and fishing would be prohibited within 20 n mi of most AI shoreline; these factors would limit the potential for impacts on structural habitat diversity.	Not significant under all five alternatives.
	Genetic diversity	While the fishery would likely focus on roe-bearing pollock, in 2005 the pollock stock would be protected from over harvest because the 19,000 mt TAC will be set well below the ABC of 39,400 mt. The 40/60 A/B season split would spread out the harvest somewhat, reducing the chance for over harvest of pollock. A re-evaluation of the pollock stock structure is currently being conducted by the BSAI Plan Team. TACs set for this fishery in future years may be impacted by the results of this analysis should a different stock structure emerge; in this case, the Plan Team likely would recommend an appropriate ABC or ABCs for the apparent stock(s) in the AI region. The results of this effort would be to enhance protection and conservation of the genetic stock structure of pollock in the overall BSAI system. New information on stock structure or other characteristics of pollock in the AI region might add data that are useful in this re-evaluation of the AI pollock stock. Impacts on other species would be small since the pelagic pollock fishery has relatively small bycatches.	Not significant under all five alternatives.

Effects on State-managed and Parallel Fisheries

A Federal AI pollock fishery could trigger the creation of a new state managed pollock fishery inside state waters, which would require action by the BOF. However, under the State of Alaska Constitution, the ADF&G and BOF cannot create an exclusive fishery, restricting participants to Aleut Corporation-approved entities. If a pollock fishery were to open inside state waters, it would be subject to Board of Fisheries regulations, but would not be limited to participants of any specific group. The state would likely adopt most Federal requirements including Steller sea lion protection measures, pollock quotas, and seasonal fishing restrictions. Any AI pollock fishery proposed for areas inside state waters that are currently within closed areas under SSL protection measures would trigger reinitiation of formal consultation under the ESA.

About 95% of state waters in the Aleutian Islands are in areas that are closed to pollock fishing by Steller sea lion protection measures. The only state waters in NMFS areas 541, 542, and 543 that are not inside critical habitat are waters south of Atka Island from Vasilief Bay to Sergief Bay, and waters immediately north of Atka Island. There does not appear to have been any significant historical catch of pollock in these areas. ADF&G regional staff communication, and review of observer and fish ticket catch data, indicate that this area has been subject to only minimal fishing effort for any species. For these reasons, it is likely that this action will be "insignificant" for AI pollock TACs up to the 19,000 mt cap.

The specifications criterion for significance was a 50% change in harvest levels in state waters. This criterion implicitly incorporates an assumption that there is an existing fishery in place; however, when there is no existing fishery and a zero harvest, the 50% change harvest is not defined. A qualitative analysis has been substituted here. Because (a) only a small part of the AI state waters (about 5%) would be available for fishing, (b) because it appears that these areas have not been important pollock (or other species) target areas in the past, (c) because opening additional state waters to pollock fishing would trigger a formal consultation, and (d) because the action would only have a small (about 1%) impact on EBS pollock TAC at current EBS TAC levels, this impact has been given a "not significant" rating.

Table 4.12-5 Economic and socio-economic significance analysis

Issue	Discussion	Significance analysis
Gross revenues	At historical ICA levels, these alternatives would create an AI CDQ and DPF of a maximum of 18,000 mt. Valuing this at an "A" season EBS first wholesale price of $959/mt, this would be associated with about $17.3 million. This is only a rough approximation. For example, it is not clear that the fishery will be able to fully harvest the CDQ and DPF; there is some hope that larger roe bearing fish in this fishery will bring a higher royalty rate, but it is also likely that some harvest will take place at lower prices in the "B" season.	Not significant under any of the alternatives.
Operating costs	Operating costs are not known. Aggregate BSAI pollock costs are likely to rise somewhat since it may cost more to harvest pollock in the AI than in the EBS. Efforts to increase the proportion of the harvest taken with small trawlers (under 60 feet) may also increase operating costs.	Not significant under any of the alternatives.
Net returns	At historical ICA levels, this action could create an AI CDQ and DPF of as much as 18,000 mt. Valuing this at an "A" season EBS royalty rate of $304/mt, this would be associated with about $5.5 million. This is only a rough approximation. For example, it is not clear that the fishery will be able to fully harvest the DPF; there is some hope that larger roe bearing fish in this fishery will bring a higher royalty rate.	Not significant under any of the alternatives.
Safety and health	The weather can be very poor in the AI in winter. This may be a dangerous area for fishing operations, particularly for pelagic fishing trawlers under 60 feet. Serious concerns have been expressed about the potential for the loss of a small trawler and its crew. It is difficult to estimate the likelihood that this will happen. To some extent it will depend on decisions made by the Aleut Corporation about the numbers of small trawlers to involve in the program.	Unknown
Related fisheries	Pelagic pollock fishing is a relatively clean, with relatively small amounts of bycatch of other species. Four other groundfish target species appeared in non-trivial amounts in the AI pollock fisheries of the 1990s: Atka mackerel, Pacific cod, flatfish (mainly Greenland turbot) and rockfish (almost entirely Pacific ocean perch). The discussion of impacts on other fisheries, earlier in this section, indicated that pollock fishery bycatch of these species, based on low and high annual bycatch rates between 1991 and 1998, could range between zero and 104 mt of Atka mackerel, 2 and 133 mt of flatfish, 1 and 154 mt of Pacific cod, and 2 and 63 mt of rockfish. Chinook and chum salmon bycatch could affect salmon commercial and subsistence fisheries in western Alaska, or, through shared PSC caps, other BSAI pollock fisheries. While the bycatch has some potential for adverse impacts, these were rated "not significant" in the discussion of PSC impacts earlier in this section. Under the Council's motion, AI Chinook PSC don't count against the BSAI Chinook PSC cap, and will not contribute to closure of the Chinook salmon savings area in the EBS. The EA/RIR for Amendment 82 examined the potential for gear conflicts and fishery overlap between pollock fishing and fishing for other targets, and found little potential for problems.	Not significant under any of the alternatives.
Consumer effects	This action is not expected to have noticeable effects on U.S. consumers. Pollock quota is being shifted from the EBS to the AI. To the extent that the AI fishery is not economically viable, some of this quota may not be caught. Much of it is destined for foreign markets and consumers.	Not significant under any of the alternatives.
Management and enforcement	No significant change in management and enforcement efforts are expected.	Not significant under any of the alternatives
Excess capacity	This action will reduce EBS pollock TACs by a small amount (about 1%) and will create a new fishery in the AI. Some of the AFA operations, which will have lost TAC in the EBS, will be able to fish in the AI. Moreover, the AI fishery may create fishing opportunities for small vessels, including vessels already fishing for other species in the Aleutians, or for vessels fishing out of Sand Point or King Cove. Overall creation or utilization of excess capacity will be very small.	Not significant under any of the alternatives.

Issue	Discussion	Significance analysis
Bycatch and discards	By catch of other target species, non-specified species, forage species and PSC species were described in earlier sections, and found to not be significant in the AI. Moreover, since the action represents a shifting of pollock harvest from the EBS to the AI, to some extent increased bycatch in the AI will be offset at the BSAI scale by reduced bycatch in the EBS. Pelagic pollock fishing is relatively clean with smaller levels of bycatch than other bottom trawl fisheries for other species.	Not significant under any of the alternatives.
Subsistence use	Pollock are not an important subsistence product. Primary subsistence impact would probably be through impacts on BSAI salmon PSC bycatch.	Not significant under any of the alternatives.
Impacts on benefits from marine ecosystems	As noted in the discussions of habitat and ecosystems, this action is not expected to have significant impacts on these elements of the human environment. Thus, this action is not expected to have significant impacts on benefits received from the environment (other than the commercial benefits described in other sections of this table).	Not significant under any of the alternatives.
Community impacts	The Aleut Corporation will be able to use the allocation in different ways to promote economic development in Adak. Royalty value could be in excess of $5 million. This will be accompanied by a reduction in deliveries to other Alaskan ports; 9,000 mt of the DPF could have been expected to be delivered by CV to Dutch Harbor if this program had not been initiated (this is compared to an overall shoreside CV allocation of almost 700,000 mt in 2003). Benefits may accrue to Sand Point and King Cove if their under 60 foot vessel fishermen enter the AI pollock fishery. In general, benefits accruing to one community appear to offset costs to others. Overall impacts appear modest compared to BSAI pollock production.	Not significant under any of the scenarios.

5.0 Cumulative Effects

5.1 Cumulative effects and the PSEIS

NEPA requires that environmental assessments analyze the potential cumulative effects of a proposed action and its alternatives. An environmental assessment or environmental impact statement must consider cumulative effects when determining whether an action significantly affects environmental quality. The 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)

Cumulative effects of the groundfish fisheries are thoroughly analyzed in the final PSEIS in Chapter 4.0 (NMFS 2004d). Section 4.1.4 describes the methodology used in the cumulative effects analyses, and in section 4.9 and the accompanying tables in Appendix A, groundfish management under the Preferred Alternative is analyzed for effects on the environment, including cumulative effects for each component of the environment. See section 4.9 of the PSEIS for further details on the cumulative effects of the Preferred Alternative.

To the extent that harvest levels remain within the range allowed under the Preferred Alternative (PA) (and illustrated in the PSEIS's illustrative "bookends" of possible management actions under the PA), the cumulative effects of such harvest levels are analyzed in the PSEIS. Alternatives 1-4 in this EA are consonant with the harvest policy of the PA, and implementation of any one of these alternatives would thus not be expected to have additional cumulative effects beyond those examined in the PSEIS.

Moreover, the harvest reports discussed in Chapter 3 establish that the groundfish fisheries in 2002, 2003, and 2004 continue to be prosecuted with the same temporal and spatial scope allowed under the PA and foreseen in the catalogue of "reasonably foreseeable future effects" examined in the PSEIS's cumulative effects analysis. Alternatives 1-4 of this EA would not impose a radical departure from these recent and current fishing practices. Hence, with the exception of Alternative 5, the alternatives considered in this EA would have incremental effects that are sufficiently minor on the spatial and temporal conduct of the fisheries so as to not deviate from the conclusions of the cumulative impact assessment presented in the PSEIS.

Alternative 5 would reach beyond the PA of the PSEIS to implement a more radically conservative harvest policy. This alternative too, however, reflects harvest strategies examined for cumulative effects in the PSEIS, specifically, in the analysis of example FMP 4.2 of Alternative 4, a highly precautionary management policy. As with Alternative 5 of the present document, example FMP 4.2 in the PSEIS allowed analysis of a scenario in which all TACs would be set at zero. The cumulative effects of such a scenario are analyzed in Section 4.8 of the PSEIS.

Hence, as none of the alternatives put forward in this EA would have cumulative effects beyond those examined for either the PA or Alternative 4 of the PSEIS, the cumulative effects analyses of the PSEIS are incorporated by reference into this document.

5.2 Cumulative effects of actions since the PSEIS baseline

Since 2002, the terminal year in the PSEIS's environmental baseline, NOAA Fisheries has implemented or is proposing a number of significant management actions for which appropriate NEPA documents have been prepared and which examine the cumulative effects of those actions.

On January 13, 2004, NMFS issued a final rule requiring seabird avoidance measures in the BSAI and GOA hook-and-line groundfish fisheries and in the Pacific halibut fishery in U.S. Convention waters off Alaska (69 FR 1930). This action is intended to improve the current requirements and further mitigate interactions with the shorttailed albatross (Phoebastria albatrus), an endangered species protected under the Endangered Species Act (ESA), and with other seabird species in hook-and-line fisheries in and off Alaska. No significant cumulative impacts on these seabirds are expected to derive from specifications set under these alternatives.

In 2004, NMFS implemented Amendment 63 to the GOA FMP that moves skates from the "other species" to the "target species" category (69 FR 26313, May 12, 2004) and announced 2004 harvest specifications for skates (69 FR 26320, May 12, 2004) to manage the newly developed skate fishery in the GOA. The shifting of skates (along with sharks) to the "target species" category was foreseen as a reasonably foreseeable future effect in the cumulative effects analysis of the PSEIS, which is incorporated herein by reference, as is the cumulative effects analysis in the EA prepared for Amendment 63 which determined the cumulative effects to be similar to those seen for the harvest specifications under target species (other species and Pacific cod), prohibited species (halibut in the GOA), and socioeconomic effects.

5.3 Reasonably foreseeable future actions

The following are substantial actions and proposals scheduled for review by the Council or for proposed or final action by NMFS in the near future.

BSAI FMP Amendment 82

In June 2004, the Council adopted Amendment 82, which, if approved by NMFS, would establish a framework for management of the Aleutian Islands (AI) directed pollock fishery. The Consolidated Appropriations Act of 2004 (Pub. L. 108-199, Sec. 803) requires the AI directed pollock fishery to be allocated to the Aleut Corporation for economic development of Adak, Alaska. This proposed rule would establish the regulatory structure for allocating the directed pollock fishery to the Aleut Corporation and would implement the management provisions for this fishery.

Since this action is procedural in nature, the impacts of the Council's action are largely administrative. The impacts on the environment will be evaluated again when specific TAC amounts are apportioned and the other actions described above are actually taken. Thus, in and of itself, the proposed action will have little impact on the environment.

For the interim and final harvest specifications in 2005, NMFS will prohibit the AI directed pollock fishery until the management provisions for the AI directed pollock fishery become effective. Any AI pollock TAC recommended by the Council under the provisions of proposed Amendment 82 will be included in the interim and final harvest specifications to allow the Regional Administrator to open the AI directed pollock fishery if and when the regulations for Amendment 82 become effective. This prohibition is authorized by the Consolidated Appropriations Act of 2004, which requires that only the Aleut Corporation may participate in the AI directed pollock fishery. Current regulations that provide

for the AI directed pollock fishery to be allocated to the American Fisheries Act program are no longer effective as they are in conflict with Section 803 of the Consolidated Appropriations Act of 2004.

GOA and BSAI FMP Amendments 48/48

NMFS has published a proposed rule to implement Amendments 48/48 to the groundfish FMPs and, thus, revise the harvest specifications process (69 FR 44634, July 27, 2004). The goals in revising the harvest specifications process are to: (1) manage fisheries based on the best scientific information available, (2) provide for adequate prior public review and comment to the Secretary on Council recommendations, (3) provide for additional opportunity for Secretarial review, (4) minimize unnecessary disruption to fisheries and public confusion, and (5) promote administrative efficiency. This proposed action has no major changes to fishing practices nor to total allowable harvest amounts and management measures, only administrative changes to the process of setting harvest specifications.

Rationalization of the GOA Groundfish Fisheries

At the request of the GOA groundfish industry, the Council is considering recommending management measures that would rationalize fisheries managed under the GOA groundfish FMP. Rationalization may improve economic stability for the fisheries' various participants, including harvesters, processors, and residents of fishing communities. Industry has raised concerns about changing market opportunities and stock abundance, the long-term economic health of fishing dependent communities, and the limited ability of the fishing industry to respond to environmental concerns under the existing management regime. The Council may consider rationalizing the fishery through individual fishing quotas, allocations to communities or processors, or cooperatives. Alternatively, the Council may choose to modify the License Limitation Program or maintain the existing management system. Specific alternatives have not been selected, and the SEIS will guide the Council in its decision making process.

The Council and NMFS will prepare an SEIS to examine the potential scope, alternatives, and effects of this proposed action. NMFS accepted written comment on this proposed action through November 15, 2002 and held a series of public scoping meetings to gather additional information. Additional information on the SEIS and public participation is available through the scoping guides and the Council website.

Essential Fish Habitat and Habitat Areas of Particular Concern

The Council is currently in the process of amending the FMPs to identify essential fish habitat (EFH) and habitat areas of particular concern (HAPCs) and to identify measures to protect habitat generally and allow a more focused application of protection measures to those habitat areas most sensitive to impact. A draft EA for defining HAPCs is scheduled for Council review in October, 2004.

In January 2004, NMFS published a draft EIS evaluating alternatives for three actions: (1) describing EFH for fisheries managed by the Council; (2) adopting an approach for the Council to identify HAPCs within EFH; and (3) minimizing to the extent practicable the adverse effects of Council-managed fishing on EFH. The draft EFH EIS discusses the effects of these actions and their alternatives on habitat, target species, the economic and socioeconomic aspects of federally managed fisheries, other fisheries and fishery resources, protected species, ecosystems and biodiversity, and non-fishing activities.

A draft HAPC EA is scheduled for initial review by the Council in October, 2004, and the Council has tentatively scheduled taking final action on both the EFH EIS and the HAPC EA in February 2005.

5.4 Summary

Beyond the cumulative impacts analysis documented in the PSEIS and the SSL Protection Measures SEIS and the EA developed for Amendment 63, no additional past, present, or reasonably foreseeable cumulative impact issues have been identified that would accrue from the 2005-2006 harvest specifications. The 2005-2006 harvest specifications and 2005 interim specifications are therefore determined to have no new significant cumulative impacts over and above impacts evaluated in the most recent environmental impact statements prepared for these fisheries.

The specifications were determined following a process that has been fully analyzed in the 1998 SEIS and in the Final PSEIS. Moreover, this action in and of itself is of short duration, and its effects will be measurable only on a very fine scale. At the population level, the effects of a single year's specifications may be impossible to detect. The agency will attempt to more fully assess cumulative effects in future editions of the PSEIS when sufficient time has passed for analysts to be able to evaluate more clearly the cumulative environmental consequences of the annual BSAI and GOA specifications.

6.0 Environmental Analysis Conclusions

As stated in section 4.0 of this EA, the intent of TAC setting deliberations is to balance the harvest of fish during the 2005 and 2006 fishing years consistent with established total optimum yield amounts and ecosystem needs. The effect of the alternatives must be evaluated for all resources, species, and issues that may directly or indirectly interact with the groundfish fisheries within the action area as a result of specified TAC levels. The impacts of alternative TAC levels are assessed in section 4 and 5 of this EA.

In addition to the PSEIS and other NEPA analyses for the groundfish fisheries, the significance of impacts of the actions analyzed in this EA were determined through consideration of the following information as required by NEPA and 50 CFR Section 1508.27:

Context: For the 2005 and 2006 harvest specifications action, the setting of the proposed action is the groundfish fisheries of the BSAI and GOA. Any effects of these actions are limited to these areas. The effects of the 2005 and 2006 harvest specifications and the interim harvest specifications on society within these areas is on individuals directly and indirectly participating in the groundfish fisheries and on those who use the ocean resources. Because this action continues groundfish fisheries in BSAI and GOA into the future, this action may have impacts on society as a whole or regionally.

Intensity: Listings of considerations to determine intensity of the impacts are in 50 CFR § 1508.27 (b) and in the NOAA Administrative Order 216-6, Section 6. Each consideration is addressed below in order as it appears in the regulations.

Adverse or beneficial impact determinations for marine resources, **including sustainability of target and nontarget species, damage to ocean or coastal habitat or essential fish habitat, effects on biodiversity and ecosystems**, **and marine mammals** Adverse or beneficial impact determinations for marine resources accruing from establishment of year 2005 and 2006 federal groundfish fisheries harvest specifications and the 2005 interim specifications are summarize in Table 6.0-1.

Alternative 1

Alternative 1 had significant adverse impacts identified for marine mammals, marine benthic habitat, and the ecosystem. Some significant beneficial socioeconomic effects may result from Alternative 1.

Alternative 2

No significant adverse impacts were identified for the preferred alternative (Alternative 2) for the harvest specification. The interim specifications under Alternative 2 had unknown effects on the temporal concentration of fishing in relation to marine mammals. Because this unknown effect is potentially mitigated by the capability to use emergency rulemaking to adjust harvest levels to appropriate amounts, it is unlikely that this effect would be significantly adverse.

Alternative 2 also has unknown incidental take effects on seabirds because it is not possible to determine the population trend that may result from the fishing activities. Because of the seabird avoidance measures recently adopted in the groundfish fisheries, the likely incidental take will be lower than in past groundfish fisheries, making it less likely that the unknown effects for incidental take would be significantly adverse, especially in comparison to past years incidental take amounts. Additional research is currently being conducted to improve seabird avoidance measures which if implemented will likely result in further reductions in incidental take within the time span of the 2005 and 2006 harvest

specifications. The effects of trawling on piscivorous bird species' benthic habitat are unknown but not likely to be significantly adverse. No consistent or widespread population declines have been experienced by these species and there is no indication that fishing has affected the benthic habitat to cause the carrying capacity of the environment to change.

Unknown effects were also identified for the ecosystem under Alternative 2. The population status for many top predator seabird, marine mammals and sharks is unknown so that it is not possible to determine the impacts of fishing under Alternative 2 on these population trends. Unknown effects on HAPC biota were also identified based on the unknown abundance levels needed of the structural HAPC species for a functional HAPC biota guild. It is likely that the mitigation measures in place and the application of the ecosystems management policy adopted with Amendments 81 and 74 to the groundfish FMP will reduce the potential for significantly adverse effects on the top predator populations and on HAPC biota. Also, this action of annual and interim harvest specifications is for a short duration at a similar level of harvest experienced in the groundfish fisheries in the past, reducing the potential for adverse population trend effects for top predator species and adverse effects on HAPC biota.

Alternatives 3 and 4

The effects of alternatives 3 and 4 for the environmental components were nearly identical. All effects were either unknown or insignificant. Unknown effects were similar to Alternative 2 with a few exceptions. See Table 6.0-1 for more details.

Public health and safety will not be affected in any way not evaluated under previous actions or disproportionally. The harvest specifications will not change fishing methods, timing of fishing or quota assignments to gear groups which are based on previously established seasons and allocation formulas in regulations.

Cultural resources and ecologically critical areas: These actions take place in the geographic areas of the Bering Sea, Aleutian Islands, and Gulf of Alaska, generally from 3 nm to 200 nm offshore. The land adjacent to these areas contain cultural resources and ecologically critical areas. The marine waters where the fisheries occur contain ecologically critical area. Effects on the unique characteristics of these areas are not anticipated to occur with these actions and mitigation measures such as a bottom trawling ban in the Bering Sea are part of fisheries management measures.

Controversiality: These action deals with management of the groundfish fisheries. Differences of opinion exist among various industry, environmental, management, and scientific groups on the appropriate levels of TAC to set for various target species and in particular fishery management areas. Alternative 2 is less likely to be controversial compare to the other alternatives analyzed because it continues to apply similar scientific and public processes used for harvest specifications as in the past for the groundfish fisheries. Alternatives 1 and 5 would be more likely to be controversial because of the large increase and decrease in harvest, respectively. Alternatives 3 and 4 would also be more likely than Alternative 2 to be controversial because it does not apply the scientific or public processes for harvest specifications.

Risks to the human environment, **including social and economic effects:** Risks to the human environment by setting harvest specifications in the BSAI and GOA groundfish fisheries are described in detail in the PSEIS (NMFS 2004d). Because of the mitigation measures implemented with every past action, it is anticipated that there will be minimal or no risk to the human environment beyond that

disclosed in the PSEIS (NMFS 2003b) or the Steller Sea Lion Protection Measures SEIS (NMFS 2001b). No significant adverse impacts were identified for the preferred alternatives (Alternative 2) for the harvest specification, including socioeconomic effects. Unknown impacts were identified for Alternative 2 regarding the nonconsumptive use of marine resources. This is related to the unknown impacts that were identified for seabird and marine mammals under this alternative.

Future actions related to this action may result in impacts and are addressed in Section 5.0 of this EA. NMFS is required to establish fishing harvest levels for up to two years for the BSAI and GOA groundfish fisheries. Changes may occur in the environment or in fishing practices that may result in significant impacts. Additional information regarding marine species may make it necessary to change management measures. Pursuant to NEPA, appropriate environmental analysis documents (EA or EIS) will be prepared to inform the decision makers of potential impacts to the human environment and will strive to implement mitigation measures to avoid significant adverse impacts.

Cumulatively significant effects, including those on target and nontarget species Cumulatively impacts are analyzed in Section 5.0 of this EA. Beyond the cumulative impacts analysis documented in the PSEIS and the SSL Protection Measures SEIS, no additional past, present, or reasonably foreseeable cumulative impact issues have been identified that would accrue from the 2005-2006 harvest specifications and the 2005 interim specifications. The 2005-2006 harvest specifications and 2005 interim specifications are therefore determined to have no new significant cumulative impacts over and above impacts evaluated in the most recent environmental impact statements prepared for these fisheries.

The specifications were determined following a process that has been fully analyzed in the 1998 SEIS and in the Final PSEIS. Moreover, this action in and of itself is of short duration, and its effects will be measurable only on a very fine scale. At the population level, the effects of a single year's specifications may be impossible to detect. The agency will attempt to more fully assess cumulative effects in future editions of the PSEIS when sufficient time has passed for analysts to be able to evaluate more clearly the cumulative environmental consequences of the annual BSAI and GOA specifications.

Districts, sites, highways, structures, or objects listed or eligible for listing in the National Register of Historic Places: 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. This consideration is not applicable to this action.

Impact on ESA listed species and their critical habitat: ESA listed species that range into the fishery management areas are listed in Table 6.0-2. An FMP level Section 7 consultation was completed for the groundfish fisheries in November 2000 (NMFS 2000) for those species under the jurisdiction of NMFS. The FMP level BiOp is limited to those species under NMFS jurisdiction and covers most of the endangered and threatened species which may occur in the action area, including marine mammals, turtles, and Pacific salmon.

Listed seabirds are under the jurisdiction of the USFWS which has completed an FMP level (USFWS 2003a) and project level BiOp (USFWS 2003b) for the groundfish fisheries. Both USFWS BiOps concluded that the groundfish fisheries and the annual setting of harvest specifications were unlikely to cause the jeopardy of extinction or adverse modification or destruction of critical habitat for ESA listed birds.

Under NMFS' FMP level BiOp (NMFS 2000), the western distinct population segment of Steller sea lions was the only ESA listed species identified as likely to be adversely affected by the groundfish fisheries. A subsequent biological opinion on the Steller sea lion protection measures was issued in 2001

(NMFS 2001b, appendix A). The 2001 BiOp found that the groundfish fisheries conducted in accordance with the Steller sea lion protection measures were unlikely to cause jeopardy of extinction or adverse modification or destruction of critical habitat for Steller sea lions.

No consultations are required for the 2005 and 2006 harvest specification or for the 2005 interim harvest specifications because the proposed actions will not modify the actions already analyzed in previous BiOps, are not likely to adversely affect ESA listed species beyond the effects already analyzed, and the incidental take statements of ESA species are not expected to be exceeded. Summaries of the ESA consultations on individual listed species are located in the section 3.0 and accompanying tables of the PSEIS under each ESA listed species' management overview (NMFS 2004d).

This action poses **no known violation of Federal, State, or local laws or requirements for the protection of the environment**. Implementation of the harvest specifications 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.

Alternatives 2-4 pose poses **insignificant effects on the introduction or spread of nonindigenous species** into the BSAI and GOA because it does not change fishing, processing or shipping practices that may lead to the introduction of nonindigenous species. Alternative 1 poses a significant adverse effect by increasing fishing effort leading to increases in activities that may introduce nonindigenous species beyond those potentials under other alternatives. Alternative 5 would have a significant beneficial impact by eliminating activities that may spread nonindigenous species.

Comparison of Alternatives and Selection of a Preferred Alternative

Alternative 1 would set TACs in the BSAI above the upper limit of 2,000,000 mt for OY and has more potential for significantly adverse effects on a number of environmental components compared to Alternatives 2-5. Alternative 5 has the most significantly beneficial impact on environmental components but setting TACs to zero in both the BSAI and GOA would result in severe socioeconomic impacts. Neither Alternative 3 nor 4 uses the best and most recent scientific information on status of groundfish stocks nor takes into account socioeconomic benefits to the nation.

Alternative 2 is the preferred alternative because: 1) it takes into account the best and most recent information available regarding the status of the groundfish stocks, public testimony, and socio-economic concerns; 2) it sets all TACs at levels equal to or below ABC levels; 3) it falls within the specified range of OY for both the BSAI and GOA, and 4) it is consistent with the Endangered Species Act and the National Standards and other requirements of the Magunson Stevens Fishery Conservation and Management Act. Unknown effects on the environment are not likely to be significant effects. The unknown impacts identified under the socioeconomic effects are not likely to affect the ability to determine that the implementation of Alternative 2 is not likely to cause significant impacts on the human environment. Council of Environmental Quality regulations at 40 CFR 1508.14 described the human environment as including socioeconomic concerns but those social or economic effects along are not intended to trigger the need for an EIS.

Table 6.0-1 Summary of significant determinations with respect to direct and indirect impacts.

Coding: I = Insignificant, S = Significant, + = beneficial, - = adverse, U = Unknown					
Issue	**Alt. 1**	**Alt. 2**	**Alt. 3**	**Alt. 4**	**Alt. 5**
Target Fish Species (Section 4.2)					
Fishing mortality	I	I	I	I	I
Spatial temporal concentration of catch	I	I	I	I	S+
Change in prey availability	I	I	I	I	S+
Habitat suitability: change in suitability of spawning, nursery, or settlement habitat, etc.	I	I	I	I	S+
Other and non-specified species (Section 4.3)					
Incidental catch of other species and non-specified species	U	I	U	U	S+
Forage species (Section 4.4)					
Incidental catch of other species and non-specified species	U	I	U	U	S+
Prohibited Species Management (Section 4.5)					
Incidental Catch of prohibited species	I	I	I	I	I
Harvest levels in directed fisheries targeting prohibited species	I	I	I	I	I
Bycatch levels of prohibited species in directed groundfish fisheries	I	I	I	I	S+

Marine Mammals (Section 4.6)					
Incidental take/entanglement in marine debris	U	I	I	I	I
Spatial/temporal concentration of fishery	I	I	I	I	S+
Spatial/temporal concentration of fishery for interim specs.	U	U	U	U	S+
Global Harvest of prey species	I	I	I	I	I
Disturbance	S-	I	I	I	S+
Northern Fulmar (Section 4.7)					
Incidental take–BSAI	U	U	U	U	I
Incidental take–GOA	U	U	I	U	I
Prey availability	I	I	U	U	I
Benthic habitat	I	I	I	I	I
Proc. waste & offal	U	I	U	U	U
Short-tailed Albatross (Section 4.7)					
Incidental take	U	U	U	U	I
Prey Availability	I	I	U	U	I
Benthic Habitat	I	I	I	I	I
Proc. Waste & Offal	I	I	I	I	U
Other Albatrosses & Shearwaters (Section 4.7)					
Incidental Take	U	U	I	U	I
Prey Availability	I	I	U	U	I
Benthic Habitat	I	I	I	I	I

Proc. Waste & Offal	I	I	I	I	U
Piscivorous Seabirds (Also Breeding in Alaska) (Section 4.7)					
Incidental Take	U	U	I	I	I
Prey Availability	U	U	U	U	I
Benthic Habitat	U	U	U	U	I
Proc. Waste & Offal	I	I	I	I	I
Eiders (Spectacled and Stellers) (Section 4.7)					
Incidental Take	U	U	I	I	I
Prey Availability	I	I	U	U	U
Benthic Habitat	I	I	I	I	I
Proc. Waste & Offal	I	I	I	I	I
Other Seabird Species (Section 4.7)					
Incidental Take	U	U	I	I	I
Prey Availability	I	I	U	U	I
Benthic Habitat	I	I	I	I	I
Proc. Waste & Offal	I	I	I	I	I
Marine Benthic Habitat (Section 4.8)					
Level of mortality and damage to living habitat	S-	I	I	I	S+
Modification of Benthic Community Structure	U	I	I	I	U
Changes in Distribution of Fishing Effort	I	I	I	I	S+

Ecosystem Considerations					
Pelagic forage availability	I	I	I	I	S+
Spatial and temporal concentration of fishery impact on forage	U	I	I	I	S+
Removal of top predators					
Trophic level of catch	U	I	I	I	I
Sensitive Top predator bycatch	S-	I	I	I	S+
Population Status of Top Predator	U	U	U	U	U
I**ntroduction of nonnative species**	S-	I	I	I	S+
Energy redirection					
Trends in offal and discard production levels	I	I	I	I	I
Scavenger population trends related to offal and discards	I	I	I	I	I
Bottom gear effort	S-	I	I	I	S+
Energy removal	I	I	I	I	I
Species diversity					
Population levels of target and nontarget relative to MSST or ESA listing thresholds linked to fishing removals	U	I	U	U	S+
Bycatch amounts of sensitive species lacking population estimates	S-	I	I	I	S+
Number of ESA listed marine species	I	I	I	I	I
Area closures	I	I	I	I	S+
Functional (trophic, structural habitat) diversity					

Guild diversity or size diversity changes linked to fishing	U	I	I	I	I
Bottom gear effort	S-	I	I	I	S+
HAPC biota bycatch	U	U	U	U	S+
Genetic diversity					
Degree of fishing on spawning aggregations or larger fish	U	I	U	U	U
Older age group abundances of target groundfish stocks	U	I	U	U	U
State waters seasons					
Harvest levels of groundfish in state waters seasons and parallel seasons	I	I	I	I	S-

Economic Indicators	**Year**	**Alt. 1**	**Alt. 2**	**Alt. 3**	**Alt. 4**	**Alt. 5**
First wholesale gross revenues	2005	S+	I	I	S-	S-
	2006	I	I	S-	S-	S-
Operating cost impacts	2005	S-	I	I	S+	S+
	2006	I	I	S+	S+	S+
Net returns to industry	2005	S+	I	I	S-	S-
	2006	I	I	S-	S-	S-
Safety and health impacts	2005	U	I	U	U	U
	2006	U	I	U	U	U
Impacts on related fisheries	2005	U	I	U	U	S-
	2006	U	I	U	U	S-
Consumer effects	2005	S+	I	I	I	S-
	2006	S+	I	I	I	S-
Management and enforcement costs	2005	S-	I	I	I	S+
	2006	S-	I	I	I	S+
Excess capacity	2005	S+	I	I	I	S-
	2006	S+	I	I	I	S-
Bycatch and discards	2005	I	I	I	I	S+
	2006	I	I	I	I	S+
Non-consumptive use values	2005	U	U	U	U	U

Economic Indicators	Year	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5
	2006	U	U	U	U	U
Subsistence	2005	U	I	U	U	U
	2006	U	I	U	U	U
Recreation	2005	U	I	I	U	U
	2006	U	I	I	U	U
Communities	2005	S+	I	I	S-	S-
	2006	I	I	S-	S-	S-

Table 6.0-2 ESA listed and candidate species that range into the BSAI or GOA groundfish management areas.

Common Name	Scientific Name	ESA Status
Blue Whale	*Balaenoptera musculus*	Endangered
Bowhead Whale	*Balaena mysticetus*	Endangered
Fin Whale	*Balaenoptera physalus*	Endangered
Humpback Whale	*Megaptera novaeangliae*	Endangered
Right Whale	*Balaena glacialis*	Endangered
Sei Whale	*Balaenoptera borealis*	Endangered
Sperm Whale	*Physeter macrocephalus*	Endangered
Steller Sea Lion (WesternPopulation)	*Eumetopias jubatus*	Endangered
Steller Sea Lion (Eastern Population)	*Eumetopias jubatus*	Threatened
Chinook Salmon (Puget Sound)	*Oncorhynchus tshawytscha*	Threatened
Chinook Salmon (Lower Columbia R.)	*Oncorhynchus tshawytscha*	Threatened
Chinook Salmon (Upper Columbia R. Spring)	*Oncorhynchus tshawytscha*	Endangered
Chinook Salmon (Upper Willamette .)	*Oncorhynchus tshawytscha*	Threatened
Chinook Salmon (Snake River Spring/Summer)	*Oncorhynchus tshawytscha*	Threatened
Chinook Salmon (Snake River Fall)	*Oncorhynchus tshawytscha*	Threatened
Sockeye Salmon (Snake River)	*Oncorhynchus nerka*	Endangered
Steelhead (Upper Columbia River)	*Onchorynchus mykiss*	Endangered
Steelhead (Middle Columbia River)	*Onchorynchus mykiss*	Threatened
Steelhead (Lower Columbia River)	*Onchorynchus mykiss*	Threatened
Steelhead (Upper Willamette River)	*Onchorynchus mykiss*	Threatened
Steelhead (Snake River Basin)	*Onchorynchus mykiss*	Threatened
Steller's Eider [1]	*Polysticta stelleri*	Threatened
Short-tailed Albatross [1]	*Phoebaotria albatrus*	Endangered
Spectacled Eider[1]	*Somateria fishcheri*	Threatened
Kittlitz Murrelet[1]	*Brachyramphus brevirostris*	Candidate
Northern Sea Otter[1]	*Enhydra lutris*	Candidate

[1]The Steller's eider, short-tailed albatross, spectacled eider, and Northern sea otter are species under the jurisdiction of the U.S. Fish and Wildlife Service. For the bird species, critical habitat has been established for the Steller's eider (66 FR 8850, February 2, 2001) and for the spectacled eider (66 FR 9146, February 6, 2001). The northern sea otter has been proposed by USFWS as a candidate species (November 9, 2000; 65 FR 67343). The Kittlitz murrelet has been proposed as a candidate species by the USFWS (69 FR 24875, May 4, 2004)

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7.0 Initial Regulatory Flexibility Analysis

7.1 Introduction

This Initial Regulatory Flexibility Analysis (IRFA) evaluates the adverse impacts on small entities of the proposed harvest level specifications for the groundfish fisheries in the Bering Sea and Aleutian Islands and the Gulf of Alaska in 2005 and 2006. Sections 7.1 through 7.4 provide background on IRFA requirements, and section 7.5 evaluates the annual specifications. This IRFA meets the statutory requirements of the Regulatory Flexibility Act (RFA) of 1980, as amended by the Small Business Regulatory Enforcement Fairness Act (SBREFA) of 1996 (5 U.S.C. 601-612).

7.2 The purpose of an IRFA

The Regulatory Flexibility Act (RFA), first enacted in 1980, was designed to place the burden on the government to review all regulations to ensure that, while accomplishing their intended purposes, they do not unduly inhibit the ability of small entities to compete. The RFA recognizes that the size of a business, unit of government, or nonprofit organization frequently has a bearing on its ability to comply with a Federal regulation. Major goals of the RFA are: (1) to increase agency awareness and understanding of the impact of their regulations on small business, (2) to require that agencies communicate and explain their findings to the public, and (3) to encourage agencies to use flexibility and to provide regulatory relief to small entities. The RFA emphasizes predicting impacts on small entities as a group distinct from other entities and on the consideration of alternatives that may minimize the impacts while still achieving the stated objective of the action.

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

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

Data on cost structure, affiliation, and operational procedures and strategies in the fishing sectors subject to the proposed regulatory action are insufficient, at present, to permit preparation of a "factual basis" upon which to certify that the preferred alternative does not have the potential to result in "significant adverse impacts on a substantial number of small entities" (as those terms are defined under RFA). Because, based on all available information, it is not possible to 'certify' this outcome, should the proposed action be adopted, a formal IRFA has been prepared and is included in this package for Secretarial review.

7.3 What is required in an IRFA?

Under 5 U.S.C., Section 603(b) of the RFA, each IRFA is required to contain:

- A description of the reasons why action by the agency is being considered;
- A succinct statement of the objectives of, and the legal basis for, the proposed rule;
- A description of and, where feasible, an estimate of the number of small entities to which the proposed rule will apply (including a profile of the industry divided into industry segments, if appropriate);
- A description of the projected reporting, record keeping and other compliance requirements of the proposed rule, including an estimate of the classes of small entities that will be subject to the requirement and the type of professional skills necessary for preparation of the report or record;
- An identification, to the extent practicable, of all relevant Federal rules that may duplicate, overlap or conflict with the proposed rule;
- A description of any significant alternatives to the proposed rule that accomplish the stated objectives of the proposed action, consistent with applicable statutes, and that would minimize any significant economic impact of the proposed rule on small entities. Consistent with the stated objectives of applicable statutes, the analysis shall discuss significant alternatives, such as:

1. The establishment of differing compliance or reporting requirements or timetables that take into account the resources available to small entities;

2. The clarification, consolidation, or simplification of compliance and reporting requirements under the rule for such small entities;

3. The use of performance rather than design standards;

4. An exemption from coverage of the rule, or any part thereof, for such small entities.

7.4 What is a small entity?

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

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

The SBA has established size criteria for all major industry sectors in the United States, including fish harvesting and fish processing businesses. A business involved in fish harvesting is a small business if it is independently owned and operated and not dominant in its field of operation (including its affiliates) and if it has combined annual receipts not in excess of $3.5 million for all its affiliated operations worldwide. A seafood processor is a small business if it is independently owned and operated, not

dominant in its field of operation, and employs 500 or fewer persons on a full-time, part-time, temporary, or other basis, at all its affiliated operations worldwide. A business involved in both the harvesting and processing of seafood products is a small business if it meets the $3.5 million criterion for fish harvesting operations. Finally a wholesale business servicing the fishing industry is a small businesses if it employs 100 or fewer persons on a full-time, part-time, temporary, or other basis, at all its affiliated operations worldwide.

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

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

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

Small organizations The RFA defines "small organizations" as any not-for-profit enterprise that is independently owned and operated and is not dominant in its field.

Small governmental jurisdictions The RFA defines small governmental jurisdictions as governments of cities, counties, towns, townships, villages, school districts, or special districts with populations of less than 50,000.

7.5 2005 and 2006 Specifications

What is this action?

Detailed descriptions of each alternative analyzed in this EA/IRFA can be found in Section 2.0. The proposed action is adoption of TAC specifications, for 2005 and 2006, based on the ABCs recommended by the BSAI and GOA plan teams during their September 2004 meetings. The details of these specifications may be found in Tables 2.22-1, 2.23-1, 2.32-1, and 2.33-1 of this EA/IRFA

Reason for considering the proposed action

The reasons for the proposed action are discussed in detail in Sections 1.2 of this EA/IRFA.

TAC specifications define upper retained harvest limits, or fishery removals, for the subject fishing year. Catch specifications are made for each managed species or species group, and in some cases, by species and sub-area. Sub-allocations of TAC are made for biological and socio-economic reasons according to percentage formulas established through fishery management plan (FMP) amendments. For particular target fisheries, TAC specifications are further allocated within management areas (Eastern, Central, Western Aleutian Islands; Bering Sea; Western, Central, and Eastern Gulf of Alaska) among management programs (open access or community development quota program), processing components (inshore or offshore), specific gear types (trawl, non-trawl, hook-and-line, pot, jig), and seasons according to regulations § 679.20, § 679.23, and § 679.31. TAC can be sub-allocated to the various gear groups, management areas, and seasons according to pre-determined regulatory actions and for regulatory announcements by NMFS management authorities opening and closing the fisheries accordingly. The entire TAC amount is available to the domestic fishery. The gear authorized in the Federally managed groundfish fisheries off Alaska includes trawl, hook-and-line, longline pot, pot, and jig (50 CFR 679.2).

Fishing areas correspond to the defined regulatory areas within the fishery management units. The BSAI is divided into nineteen reporting areas, some of which are combined for TAC specifications purposes. The Aleutian Islands group comprises regulatory Areas 541, 542, and 543. When the Aleutian Islands are referred to individually, 541 represents the Eastern Aleutian Islands, 542 the Central Aleutian Islands, and 543 the Western Aleutian Islands. The GOA is divided into eight reporting areas. The Western Gulf is Area 610, the Central Gulf includes Areas 620 and 630, and the Eastern Gulf includes Areas 640 and 650. State waters in Prince William Sound is Area 649. State waters in southeast Alaska is Area 659. Management areas are shown in Figures 1.2-1 and 1.2-2 of this EA.

The fishing year coincides with the calendar year, January 1 to December 31 (§ 679.2 and 679.23). Depending on the target species' spatial allocation, additional specifications are made to particular seasons (defined portions of the year or combinations of defined portions of the year) within the fishing year. Any TACs not harvested during the year specified are not rolled over from that fishing year to the next. Fisheries are opened and closed by regulatory announcement. Closures are made when inseason information indicates the apportioned TAC or available prohibited species catch (PSC) limit has been or will soon be reached, or at the end of the specified season, if the particular TAC has not been taken.

TAC specifications for the federal groundfish fisheries are set annually. The process includes review by the North Pacific Fishery Management Council (Council), its Advisory Panel, and its Scientific and Statistical Committee of the SAFE reports (Appendices A, B, C, and D). Using the information from the SAFE Reports and the advice from Council committees, the Council makes both ABC and TAC recommendations toward the next year's TAC specifications. NMFS packages the recommendations into specification documents and forwards them to the Secretary of Commerce for approval.

Objectives of, and legal basis for, the proposed action

The objectives of the proposed action (publication of specifications) are to (1) allow commercial fishing for the groundfish stocks in the BSAI and GOA, (2) while protecting the long run health of the fish stocks and the social and ecological values that those fish stocks provide.

Under the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) of 1996, the United States has exclusive fishery management authority over all living marine resources, except for marine mammals and birds, found within the exclusive economic zone (EEZ) between 3 and 200 nautical miles from the baseline used to measure the territorial sea. The management of these marine resources is vested in the Secretary of Commerce (Secretary) and in Regional Fishery Management Councils. In the Alaska region, the North Pacific Fishery Management Council (Council) has the responsibility to prepare fishery management plans (FMPs) for the marine resources it finds require conservation and management. The National Marine Fisheries Service (NMFS) is charged with carrying out the federal mandates of the Department of Commerce with regard to marine fish. The Alaska Regional Office of NMFS and Alaska Fisheries Science Center (AFSC), research, draft, and support the management actions recommended by the Council.

The Magnuson-Stevens Act requires that the FMPs must specify the optimum yield from each fishery to provide the greatest benefit to the Nation, and must state how much of that optimum yield may be harvested in U.S. waters. The FMPs must also specify the level of fishing that would constitute overfishing. Using the framework of the FMPs and current information about the marine ecosystem (stock status, natural mortality rates, and oceanographic conditions), the Council annually recommends to the Secretary total allowable catch (TAC) specifications and prohibited species catch (PSC) limits and/or fishery bycatch allowances based on biological and economic information provided by NMFS. The information includes determinations of acceptable biological catch (ABC) and overfishing level (OFL) amounts for each of the FMP established target species or species groups.

Number and description of small entities regulated by the proposed action

The entities regulated by this action are those entities that harvest fish in the BSAI and GOA. These entities include the groundfish catcher vessels and catcher/processor vessels active in these areas. It also includes organizations to whom direct allocations of groundfish are made. In the BSAI, this includes the CDQ groups and the AFA fishing cooperatives.

Table 7.8-1 shows the estimated numbers of small and large entities in the BSAI and GOA groundfish fisheries. The reasoning behind these estimates is summarized in the paragraphs which follow the table.

Table 7.8- 1 Estimated numbers of regulated entities in the BSAI and GOA groundfish fisheries

Fleet segment	Number small entities	Number large entities	Total number of entities
Catcher vessels	844	18 (75 vessels)	862
Catcher processors	33	43 (54 vessels)	76
Motherships	0	3	3
CDQ groups	6	0	6
Shoreside Processors	unknown	unknown	73

Notes: In some cases, the number of entities is smaller than the number of vessels or shoreplants - indicating that at least some entities have multiple vessels or plants. The estimated numbers of vessels and plants have been placed in parentheses. Catcher vessel and catcher/processor estimates prepared from fishtickets, weekly processor reports, product price files, and intent-to-operate listing. The methodology used probably overstates the numbers of small entities. Shoreside processors include all Alaska processors that reported processing of groundfish to NOAA Fisheries in 2002. The number of small processing entities cannot be determined at this time due to insufficient ownership and affiliation information. All CDQ groups are non-profits and are therefore treated as small.

Fishing vessels, both catcher vessels and catcher/processors, are small if they gross less than $3.5 million in a year. Table 7.8-2 provides estimates of the numbers of catcher vessels and catcher/processors with less than $3.5 million in gross revenues from groundfish fishing in the BSAI and GOA.[24] Estimates of the numbers of vessels are provided by year and gear type from 1997 to 2002. Estimates are also broken out for the GOA, the BSAI, and for all of Alaska. Table 7.8-3, provides similar information for catcher vessels and catcher/processors grossing more than $3.5 million.

Table 7.8-2 indicates that, in 2002, there were 781 small catcher vessels in the GOA and 251 in the BSAI. There were 913 small catcher vessels in total. These numbers suggest that 119 vessels must have operated in both the BSAI and the GOA. Table 7.8-2 implies that each of the small catcher vessels is treated as a separate small entity. This may overstate the number of separate entities since there is probably not a strict one-to-one correspondence between vessels and entities; some persons or firms may own more than one vessel.

It is possible to draw on analysis done recently for the American Fisheries Act amendments (61/61/13/8) to add somewhat more precision to the estimates of small catcher vessel entities in the BSAI (NMFS 2002a. The FRFA prepared for those amendments provides the most detailed current picture of the affiliations and sizes of the catcher vessel entities active in the BSAI pollock fisheries. This FRFA reports that 112 catcher vessels were active in the pollock fisheries covered by the American Fisheries Act. One hundred of these delivered to inshore processing plants, 7 delivered to catcher/processors offshore, and 5 delivered only to motherships (a total of 20 delivered to motherships, but 15 of these also delivered to onshore processors and these 15 are included here with the onshore processing group).

While Tables 7.8-2 and 7.8-3 suggest that all but six of these had gross revenues under $3.5 million, the FRFA indicates that 69 of them had affiliations with large entities and should be considered large under the SBA criteria. (NMFS 2002a, pages 4-176 to 4-181) Adjusting the numbers of small entities in light of these considerations, the number for the BSAI drops from 251 to 182 and the total for the BSAI and GOA drops from 913 to 844. The change in the GOA alone can't be determined.

The number of large catcher vessel entities from Table 7.8-1 is 6, all of which operated in the BSAI. In addition, the 69 pollock catcher vessels determined to be large based on their affiliations in the AFA

FRFA were associated with an estimated 12 entities.[26] (NMFS 2002a, pages 4-176 to 4-181. Thus the total number of large catcher vessel entities is estimated to be 18.

Table 7.8-2 indicates that, in 2002, there were 20 small catcher/processors in the GOA and 32 in the BSAI. There were 33 small catcher/processors in total. These numbers suggest that 19 catcher/processors must have operated in both the BSAI and the GOA. Table 7.8-2 implies that each of the small catcher/processors is treated as a separate small entity. This may overstate the number of separate entities since there is probably not a strict one-to-one correspondence between vessels and entities; some persons or firms may [27]own more than one vessel. The AFA FRFA used above for the catcher vessel analysis indicates that in 2000, 20 large catcher/processors owned by 9 companies were authorized to fish for pollock in the BSAI under the AFA. (NMFS 2002a, pages 4-176 to 4-181 For the purposes of this IRFA, there were an estimated 33 small catcher/processor entities, and 43[28] large entities, for a total of 76 catcher/processor entities in 2002. These may be underestimates of the numbers of large entities, and overestimates of the numbers of small entities, for the reasons discussed above in the catcher vessel paragraph.

The estimates of shoreside processors in Table 7.8-1include all Alaska processors that reported processing of groundfish to NOAA Fisheries in 2002. It is not possible, at this time, to determine how many of the 73 shoreside processors qualify as small entities due to insufficient ownership and affiliation information. However, while shoreside processors are affected by this action, because the specifications will affect deliveries by catcher vessels, they are not directly regulated by it. The three motherships are believed to be large entities. The six Community Development Quota (CDQ) groups are non-profit entities supporting the community development objectives of 65 Western Alaska communities and, as such, are small entities, consistent with SBA definitions.

[26]This estimate is not provided in the AFA FRFA, but is inferred from information contained in it. The 63 large catcher vessels delivering to inshore cooperatives were affiliated with seven large entities. The two delivering to catcher/processors and the four delivering only to motherships were each assumed to be affiliated with a separate entity (except that there were only three motherships so that there could be no more than three large entities in that case). (NMFS 2002a, pages 4-176 to 4-181)

[27]This total of 69 catcher vessels affiliated with large entities is made up of 63 vessels delivering inshore, 2 of those delivering to catcher/processors, and 4 of those delivering to motherships. (NMFS 2002a, pages 4-176 to 4-181)

[28]43 large entities = (54 vessels with gross revenues over $3.5 million) minus (20 vessel affiliated with companies) plus (the nine companies with which they were affiliated).

Table 7.8-2 Number of vessels that caught or caught and processed less than $3.5 million ex-vessel value or product value of groundfish by area, catcher type and gear, 1998-2002.

	Gulf of Alaska			Bering Sea and Aleutian			All Alaska		
	Catcher Vessels	Catcher process	Total	Catcher Vessels	Catcher process	Total	Catcher Vessels	Catcher process	Total
1998									
All gear	915	21	936	232	41	273	998	41	1,039
Hook & line	658	15	673	62	29	91	676	29	705
Pot	180	1	181	71	7	78	225	7	232
Trawl	167	5	172	115	7	122	205	7	212
1999									
All gear	889	29	918	277	31	308	1,010	34	1,044
Hook & line	625	17	642	67	19	86	651	22	673
Pot	201	10	211	90	11	101	256	11	267
Trawl	154	3	157	126	4	130	202	4	206
2000									
All gear	991	16	1,007	278	30	308	1,143	32	1,175
Hook & line	719	8	727	79	17	96	749	18	767
Pot	252	5	257	91	11	102	302	12	314
Trawl	127	3	130	114	5	119	206	6	212
2001									
All gear	853	21	874	280	43	323	1,013	44	1,057
Hook & line	650	15	665	92	31	123	681	31	712
Pot	154	4	158	74	7	81	212	9	221
Trawl	120	4	124	118	6	124	196	7	203
2002									
All gear	781	20	801	251	32	283	913	33	946
Hook & line	619	13	632	78	24	102	633	24	657
Pot	127	4	131	59	5	64	169	6	175
Trawl	107	3	110	118	3	121	186	3	189

Note: Includes only vessels that fished part of Federal TACs.

Source: CFEC fish tickets, weekly processor reports, NMFS permits, annual processor survey, ADFG intent-to-operate listings. National Marine Fisheries Service, P.O. Box 15700, Seattle, WA 98115-0070.

Table 7.8-3 Number of vessels that caught or caught and processed more than $3.5 million ex-vessel value or product value of groundfish by area, catcher type and gear, 1998-2002.

	Gulf of Alaska		Bering Sea and Aleutian			All Alaska		
	Catcher process	Total	Catcher Vessels	Catcher process	Total	Catcher Vessels	Catcher process	Total
1998								
All gear	26	26	0	58	58	0	58	58
Hook & line	7	7	0	14	14	0	14	14
Pot	0	0	0	1	1	0	1	1
Trawl	19	19	0	44	44	0	44	44
1999								
All gear	29	29	1	57	58	1	57	58
Hook & line	13	13	0	22	22	0	22	22
Pot	1	1	0	3	3	0	3	3
Trawl	15	15	1	36	37	1	36	37
2000								
All gear	28	28	4	58	62	4	58	62
Hook & line	13	13	0	26	26	0	26	26
Pot	0	0	0	2	2	0	2	2
Trawl	15	15	4	34	38	4	34	38
2001								
All gear	19	19	5	47	52	5	47	52
Hook & line	5	5	0	14	14	0	14	14
Trawl	14	14	5	33	38	5	33	38
2002								
All gear	23	23	6	54	60	6	54	60
Hook & line	10	10	0	18	18	0	18	18
Trawl	13	13	6	36	42	6	36	42

Note: Includes only vessels that fished part of Federal TACs.

Source: CFEC fish tickets, weekly processor reports, NMFS permits, annual processor survey, ADFG intent-to-operate listings. National Marine Fisheries Service, P.O. Box 15700, Seattle, WA 98115-0070.

Tables 7.8-4 and 7.8-5 provide estimates of average gross revenues from groundfish production in the BSAI and GOA for small and for large catcher vessels and cather-processors.[29] Considering activity in both the BSAI and the GOA, small catcher vessels grossed an average of about $230,000 in 2002. This average conceals variation by fishery management area and gear type. Small hook and line gear vessels (longline and jig) in the GOA had the smallest average gross revenues at about $100,000, while small trawlers in the BSAI had the largest at $1.070 million. The overall average gross revenues for all small catcher vessels active in the GOA were $140,000, while the overall average gross revenues for all small catcher vessels active in the BSAI was $600,000.

Catcher/processors carry the equipment and personnel they need to process the fish that they themselves catch. In some cases catcher/processors will also process fish harvested for them by catcher vessels and transferred to them at sea. There are several types of catcher/processors operating in the BSAI and GOA groundfish fisheries. They are distinguished by target species, gear, products, and vessel size. Considering activity in both the BSAI and GOA, small catcher/processors grossed an average of about $1.76 million in 2002. Small pot catcher/processors operating in the GOA has the smallest average gross revenue at about $380,000, while small hook and line catcher/processors operating in the BSAI had the largest at $1.96 million. Overall, the 33 small catcher/processor vessels had first wholesale gross revenues of about $59 million in 2002; average revenues were about $1.8 million.

Corresponding average gross revenues for large entities for these gear types and areas may be found in Table 7.8-5. There were no large catcher vessels operating in the GOA in 2002. In the BSAI, large catcher vessel revenue was recorded for only the trawl gear type and averaged about $4.22 million in 2002. Large catcher/processors operated in both the GOA and the BSAI in 2002. Overall they earned average revenue of $12.76 million. The smallest 2002 average gross revenue of $4.25 million occurred among BSAI hook and line catcher/processors, while the largest was the $17.02 million average gross revenue for BSAI trawl catcher/processors. Overall, the 54 large catcher/processor vessels had first wholesale gross revenues of about $689 million in 2002; average revenues were about $12.8 million.

Through the Community Development Quota (CDQ) program, the North Pacific Fishery Management Council and NMFS allocate a portion of the BSAI groundfish, prohibited species, halibut and crab TAC limits to 65 eligible Western Alaska communities. These communities work through six non-profit CDQ Groups to use the proceeds from the CDQ allocations to start or support commercial fishery activities that will result in ongoing, regionally based, commercial fishery or related businesses. The CDQ program began in 1992 with the allocation of 7.5 percent of the BSAI pollock TAC. The fixed gear halibut and sablefish CDQ allocations began in 1995, as part of the halibut and sablefish Individual Fishing Quota Program. In 1998, allocations of 7.5 percent of the remaining groundfish TACs, 7.5 percent of the prohibited species catch limits, and 7.5 percent of the crab guidelines harvest levels were added to the CDQ program. At this time, the CDQ share of the pollock TAC was increased to 10 percent. The CDQ groups are reported to have had gross revenues of about $63.2 million in 2000 (Alaska Department of Community and Economic Development 2001, page 25; average gross revenues were thus about $10.5 million.

Table 7.8- 4 Average revenue of vessels that caught or caught and processed less than $3.5 million ex-vessel value or product value of groundfish by area, catcher type and gear, 1998-2002. ($ millions)

	Gulf of Alaska			Bering Sea & Aleutians			All Alaska		
	Catcher Vessels	Catcher process	Total	Catcher Vessels	Catcher process	Total	Catcher Vessels	Catcher process	Total
1998									
All gear	.14	1.77	.18	.43	1.63	.61	.16	1.63	.22
Hook & line	.07	1.59	.10	.12	1.57	.58	.07	1.57	.13
Pot	.11	-	.12	.24	.84	.29	.15	.84	.17
Trawl	.50	2.40	.56	.76	2.58	.86	.53	2.58	.59
1999									
All gear	.20	1.44	.24	.53	1.51	.63	.21	1.38	.25
Hook & line	.09	1.48	.12	.14	1.79	.50	.08	1.55	.13
Pot	.17	1.23	.22	.15	1.16	.26	.16	1.16	.20
Trawl	.75	-	.77	1.00	1.59	1.02	.73	1.59	.75
2000									
All gear	.16	1.33	.18	.65	1.34	.72	.24	1.34	.27
Hook & line	.11	1.24	.12	.23	1.60	.47	.10	1.53	.14
Pot	.16	1.03	.18	.16	.63	.21	.17	.75	.19
Trawl	.56	-	.60	1.33	1.72	1.34	.89	1.83	.92
2001									
All gear	.13	1.76	.17	.48	1.76	.65	.20	1.77	.26
Hook & line	.10	1.82	.14	.16	1.91	.60	.09	1.91	.17
Pot	.12	1.73	.16	.13	.86	.19	.12	1.17	.16
Trawl	.37	1.80	.42	.93	1.93	.98	.66	1.95	.70
2002									
All gear	.14	1.70	.18	.60	1.81	.74	.23	1.76	.29
Hook & line	.10	1.89	.14	.19	1.96	.61	.10	1.96	.17
Pot	.15	.38	.16	.19	.62	.23	.15	.52	.16
Trawl	.40	-	.46	1.07	-	1.11	.76	-	.79

Notes: Includes only vessels that fished part of Federal TACs.
Categories with fewer than four vessels are not reported.
Averages are obtained by adding the total revenues, across all areas and gear types, of all the vessels in the category, and dividing that sum by the number of vessels in the category.

Source: CFEC fish tickets, weekly processor reports, NMFS permits, annual processor survey, ADFG intent-to-operate listings. National Marine Fisheries Service, P.O. Box 15700, Seattle, WA 98115-0070.

Table 7.8- 5 Average revenue of vessels that caught or caught and processed more than $3.5 million ex-vessel value or product value of groundfish by area, catcher type and gear, 1998-2002. ($ millions)

	Gulf of Alaska		Bering Sea & Aleutians			All Alaska	
	Catcher process	Total	Catcher Vessels	Catcher process	Total	Catcher Vessels	Catcher process	Total
1998								
All gear	6.41	6.41	-	8.64	8.64	-	8.64	8.64
Hook & line	4.46	4.46	-	4.51	4.51	-	4.51	4.51
Trawl	7.12	7.12	-	9.95	9.95	-	9.95	9.95
1999								
All gear	5.53	5.53	-	10.09	10.00	-	10.09	10.00
Hook & line	4.69	4.69	-	4.70	4.70	-	4.70	4.70
Trawl	6.36	6.36	-	13.23	13.00	-	13.23	13.00
2000								
All gear	6.57	6.57	4.66	10.72	10.33	4.66	10.72	10.33
Hook & line	4.82	4.82	-	5.09	5.09	-	5.09	5.09
Trawl	8.09	8.09	4.66	14.87	13.80	4.66	14.87	13.80
2001								
All gear	7.54	7.54	4.29	13.02	12.18	4.29	13.02	12.18
Hook & line	4.97	4.97	-	4.66	4.66	-	4.66	4.66
Trawl	8.45	8.45	4.29	16.57	14.95	4.29	16.57	14.95
2002								
All gear	6.96	6.96	4.22	12.76	11.91	4.22	12.76	11.91
Hook & line	4.28	4.28	-	4.25	4.25	-	4.25	4.25
Trawl	9.03	9.03	4.22	17.02	15.19	4.22	17.02	15.19

Notes: Includes only vessels that fished part of Federal TACs.
Categories with fewer than four vessels are not reported.
Averages are obtained by adding the total revenues, across all areas and gear types, of all the vessels in the category, and dividing that sum by the number of vessels in the category.

Source: CFEC fish tickets, weekly processor reports, NMFS permits, annual processor survey, ADFG intent-to-operate listings. National Marine Fisheries Service, P.O. Box 15700, Seattle, WA 98115-0070.

Impacts on regulated small entities

The impacts of the preferred alternatives on first wholesale revenues in the BSAI and the GOA are summarized in Tables 7.8-6 through 7.8-8.

Table 7.8-6 Estimated and Projected First Wholesale Gross Revenues in the BSAI, 2002-2006.

BSAI	Estimated Earned Revenue			Projected Revenue	
	2002	2003	2004	2005 Alt. 2	2006 Alt. 2
Pollock	852,470,951	856,320,005	856,457,676	856,686,818	857,323,023
Sablefish	9,530,117	12,789,094	13,088,075	11,093,399	10,294,632
Pacific cod	190,500,954	197,644,739	205,264,778	214,789,825	210,027,301
Arrowtooth	696,994	522,745	522,745	534,346	566,556
Flathead sole	5,296,251	4,237,001	4,025,151	4,025,151	4,025,151
Rock sole	8,720,059	7,105,234	6,620,786	6,767,715	7,175,662
Turbot	2,961,255	1,480,628	1,295,549	1,324,300	1,404,127
Yellowfin	30,404,383	29,608,919	30,430,898	31,106,225	32,981,256
Flats (other)	274,432	237,841	237,841	243,119	257,774
Rockfish	8,417,568	8,074,095	6,910,422	7,077,883	7,067,194
Atka	23,004,466	28,168,734	29,577,171	23,225,121	20,741,578
Other	3,832,374	4,005,792	3,328,129	3,328,129	3,328,129
Column total	1,136,109,803	1,150,194,828	1,157,759,222	1,160,202,033	1,155,192,383

Table 7.8-7 Estimated and Projected First Wholesale Gross Revenues for BSAI CDQ groups, 2002-2006.

BSAI CDQ	Estimated Earned Revenue			Projected Revenue	
	2002	2003	2004	2005 Alt. 2	2006 Alt. 2
Pollock	95,012,499	95,441,497	95,456,841	95,482,380	95,553,288
Sablefish	1,059,997	1,404,191	1,404,191	1,223,394	1,135,299
Pacific cod	14,444,041	14,985,693	15,563,454	16,285,656	15,924,555
Arrowtooth	67,718	50,788	50,788	51,915	55,045
Flathead sole	152,521	122,017	115,916	115,916	115,916
Rock sole	124,387	101,352	94,442	96,538	102,357
Turbot	90,568	45,284	39,624	40,503	42,944
Yellowfin	975,323	949,806	976,174	997,837	1,057,985
Flats (other)	15,272	13,236	13,236	13,530	14,345
Rockfish	522,805	501,472	429,198	439,599	438,935
Atka	1,818,885	2,227,206	2,338,566	1,836,331	1,639,966
Other	275,009	287,453	238,825	238,825	238,825
Column total	114,559,025	116,129,996	116,721,255	116,822,424	116,319,461

Estimated BSAI gross revenues by species group are shown in Table 7.8-6. Between 2002 and 2004, overall revenue trended upward and that trend is projected to continue into 2005. A slight increase of about $2 million is projected for 2005. However, a similar decrease is projected for 2006.

Table 7.8-7 provides similar revenue estimates for the BSAI CDQ groups, which are considered to be small entities, over the years 2002-2006. From 2002-2004, an increasing trend in overall revenue is

evident. The projected 2005 CDQ allocation of TAC will continue that trend with a slight increase. However, 2006 allocation of TAC to CDQ groups is estimated to result in a slight decline in overall revenue when compared to 2004 revenue.

Table 7.8-8 Estimated and Projected First Wholesale Gross Revenues in the GOA, 2002-2006.

GOA	Estimated Earned Revenue			Projected Revenue	
	2002	2003	2004	2005 Alt. 2	2006 Alt. 2
Pollock	32,280,964	30,119,663	39,490,841	39,490,841	39,490,841
Sablefish	65,039,559	75,541,266	83,962,925	67,941,480	63,050,830
Pacific cod	42,308,654	38,778,947	45,946,452	45,946,452	35,370,600
Arrowtooth	5,157,687	5,157,687	5,157,687	5,157,687	5,157,687
Flathead sole	936,758	1,125,523	1,098,268	1,047,954	1,030,924
Rex sole	2,075,505	2,075,505	2,772,454	2,772,454	2,772,454
Flat (deep)	522,787	522,787	650,270	650,270	650,270
Flat (shallow)	3,244,926	3,435,617	3,295,777	3,295,777	3,295,777
Rockfish	13,172,206	13,664,840	12,457,656	12,222,214	11,899,976
Atka	106,341	106,341	106,341	106,341	106,341
Skates	0	0	4,663,788	4,663,788	4,663,788
Other	864,712	859,369	961,028	971,813	922,629
Column total	165,710,099	171,387,547	200,563,488	184,267,071	168,412,117

Table 7.8-8 provides estimates of first wholesale gross revenues in the GOA, by species group, from 2002-2006. Note, that skates were first allocated a separate TAC in 2004 due to an emerging target fishery. Overall, GOA first wholesale revenues are estimated to have increased from 2002-2004. However, projected GOA TACs result in estimated overall revenue declines of approximately $16 million and $32 million in 2005 and 2006 respectively. These declines result largely from declines in 2005 and 2006 GOA TACs for sablefish, while other species groups contribute smaller declines.

Interim first wholesale gross revenue estimates for the BSAI and GOA under the preferred alternative are summarized in Table 4.11-2. As noted in the table, the estimation methodology understates the true level of revenues under this alternative. In the absence of the interim specifications no fishing would take place. Thus, the proposed alternative has the smallest impact on small entities of the alternatives examined.

Recordkeeping and reporting requirements

The IRFA should include "a description of the projected reporting, record keeping and other compliance requirements of the proposed rule, including an estimate of the classes of small entities that will be subject to the requirement and the type of professional skills necessary for preparation of the report or record..."

This regulation does not impose new recordkeeping or reporting requirements on the regulated small entities.

Federal rules that may duplicate, overlap, or conflict with proposed action

An IRFA should include "An identification, to the extent practicable, of all relevant Federal rules that may duplicate, overlap or conflict with the proposed rule..."

This analysis did not reveal any Federal rules that duplicate, overlap or conflict with the proposed action.

Description of significant alternatives

An IRFA should include "A description of any significant alternatives to the proposed rule that accomplish the stated objectives of the proposed action, consistent with applicable statutes, and that would minimize any significant economic impact of the proposed rule on small entities."

There are no significant alternatives to the proposed rule that accomplish the stated objectives, are consistent with applicable statutes, and that would minimize the economic impact of the proposed rule on small entities. Alternative 1 of the action alternatives provides high revenues, however, it is precluded by optimum yield restrictions in the BSAI. Alternatives 3, 4, and 5 are associated with lower gross revenues and a greater impact on small entities.

For this preliminary analysis (September 2004) the Alternative 2 TAC for GOA pollock is the same as the 2004 TAC. Thus, no significant adverse effect is shown for the GOA in this preliminary analysis. If the GOA pollock TAC is revised downwards at the November GOA Plan Team meeting there may be adverse impacts in the GOA.

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Appendix A: BSAI Stock Assessment and Fishery Evaluation (SAFE) Reports

This document is included by reference. The 2004 versions for each species or species group may be found here: http://www.afsc.noaa.gov/refm/stocks/assessments.htm

Appendix B: GOA Stock Assessment and Fishery Evaluation (SAFE) Reports

This document is included by reference. The 2004 versions for each species or species group may be found here: http://www.afsc.noaa.gov/refm/stocks/assessments.htm

Appendix C: Ecosystem Considerations

This document is included by reference. The 2004 version may be found here: http://www.afsc.noaa.gov/refm/docs/2003/APPENDIX%20C%20Ecosystem%20Considerations%20Chapter.pdf

Appendix D: Economic Status Report

This document is included by reference. The 2004 version may be found here: http://www.afsc.noaa.gov/refm/docs/2003/Economic.pdf

Appendix E: Projected 2004 Fishing Mortality

By James Ianelli, Tom Pearson and Mary Furuness, NMFS

Introduction

The NMFS and Council continue to evaluate revising the harvest specification process (TAC setting process). The main motivation for this stems from a need to provide for adequate time for the rulemaking process and to accommodate the mandatory public comment periods (on the TACs). In the interim (prior to the approval and implementation of any changes to the process), preliminary 2005 TACs need to be implemented. The first step in setting a TAC is to provide reasonable estimates of ABC. Rather than simply rolling over the 2004 ABC values as was done in the past, projections of 2005 ABCs based on estimates from the 2003 SAFE are provided. This will be an improvement over the earlier practice as the proposed values will be based on better estimates of the actual 2004 catch levels. This in turn provides a better approximation of the 2005 ABC level and thus enhances the public review and comment process. Only species in Tiers 1-3 (age structured assessments) have projections, ABC levels for the other species will be the same as the 2003 values.

At the September 2002 NPFMC Plan Team meetings preliminary TACs for 2003 were presented for TAC setting purposes. The SSC subsequently requested that further documentation on the rationale and methods used for projecting the anticipated catch for the latter third of 2002 (based on assessments conducted in 2001). The purpose of this document is to detail the rationale and method for doing these projections. As before (incremented by one year), these projections are based on age-structured stock assessments published in 2003 and estimated catches expected for 2004 to provide preliminary ABC projections for 2005.

Methods

This analysis is a simple update of the methods used in each assessment chapter of the SAFE for EA specifications and MSST determinations. The age-structured projection model (requiring inputs on 2004 estimates of numbers at age, a time series of recruitment estimates (since 1978) and age-specific schedules of average weight, maturity, natural mortality, and selectivity) is used with the following modification: the catch for 2004 is based on the estimates (presented below) rather than expected based on harvest control rules as specified in the SAFE.

2004 catch projection of BSAI groundfish as of May 22, 2004

In 2003, a catch projection for the 2003 fishing year was made in mid August to assist in the preparation of the 2003 SAFE report. This year, the 2004 catch projection was made in late May to facilitate the preparation of the EA for the proposed 2005 harvest specification. Clearly, these estimates of projected catch for 2004 are preliminary and will be revised as actual data are collected and normal editing procedures take place.

This catch projection estimate is based on the year-to-date catch of groundfish through May 22, 2004 plus the average catch for the years 2001, 2002, 2003 from late May to December 31 (week ending dates 5/24/03, 5/25/02, and 5/26/01 through 12/31). At this time many of the fisheries have not yet concluded for the year but the TACs for these fisheries are fully utilized, so the entire TAC amount was used as a logical upper limit for the catch. This adds some conservative elements to the estimates for next years OFLs and ABCs. This was done for pollock, Pacific cod,

Pacific ocean perch, and Atka mackerel. For some species the projection is more than the 2004 TAC and in these cases the 2004 TAC is used (Alaska plaice, arrowtooth flounder, Greenland turbot, "other flatfish," "other species," rock sole, squid, and yellowfin sole).

During 2001 through 2003, a large amount of the shortraker and rougheye rockfish catch was reported using a combined species code. The amounts of shortraker and rougheye in Table 13.1 of the 2003 SAFE report are used to calculate the separate catch amounts of shortraker and rougheye for 2001 through 2003.

Data used to make these projections came from the NMFS blend reports for 2001 and 2002, from the NMFS catch accounting system for 2003 and 2004. Catch estimates for the BSAI region are presented in Table 1.

2004 catch projection of GOA groundfish as of May 22, 2004

In 2003 a catch projection for the 2003 fishing year was made in mid August to assist in the preparation of the 2003 SAFE report. As with the approach detailed for the BSAI region, these catch projection estimates were made in late May to facilitate the preparation of the EA for the proposed 2005 harvest specification. These estimates will be updated when more harvest information becomes available later in the year.

This catch projection is based on the year to date harvest of groundfish through May 22, 2004 plus the average harvest for the years 2001, 2002, 2003 from late May to December 31 (week ending dates 5/24/03, 5/25/02, and 5/26/01 through 12/31). At this time many of the fisheries have not yet concluded for the year and so the entire TAC (or ABC in the case of P cod) amount was used as a logical upper limit for the catch. This adds some conservative elements to the estimates for next years OFLs and ABCs. This was done for pollock and Pacific cod in the Western and Central GOA, for all rockfish targets gulfwide except for POP and pelagic shelf rockfish in the SEO District, for sablefish gulfwide, and for big and longnose skates in the Central GOA. Projections were made for all flatfish targets, other skates, Atka mackerel, and other species gulfwide. These species are predominately harvested by trawl gear which is usually limited by halibut PSC limitations rather than TAC amounts. The annual amount of halibut in the PSC allowance (2,000 mt in the GOA) has not changed in recent years.

Information on the pollock harvest in state waters fishery in Prince William Sound is also available and the stock assessment authors may wish to use it since it has not been demonstrated that the pollock in PWS constitutes a stock separate from the W/C/WYK stock. In all other cases the catch of groundfish in Areas 649 and 659 has been omitted (unlike last year). This was done because NMFS believes these state waters lie outside the area surveyed by NMFS and the harvest of groundfish in these areas is no longer subtracted from the federal TACs.

Very little information is available on the previous catch of big and longnose skates in the Central GOA in the blend catch reports prepared by NMFS. In 2001 they were largely reported as other species (species reporting code 100), in 2002 and 2003 they were largely reported as skates (species reporting code 700). Information on incidental catch in previous years is also extremely limited. To be conservative this projection assumes the entire TAC will be harvested. Projections for other skates and other species used this years catch to date plus average catch after mid May for the years 2002 and 2003 only.

Data used to make these projections came from the NMFS blend reports for 2001 and 2002, from the NMFS catch accounting system for 2003 and 2004, and from the 1999 and 2003 SAFE reports for the GOA. Catch estimates for the GOA are presented in Table 2.

These values were then submitted to the 2003 configuration of the projection model and the fishing mortality rate for the 2004 catches (as estimated below) were used to determine projected numbers at age in 2004 for subsequent ABC estimates. These projections were computed for the Plan Team during the September 2003 meeting and presented in their report to the Council.

Tables

1.1.1.1.1 Table 1. Estimated 2004 GOA catch projections year-to-date though 5/22/04 + 2000-2003 average catch after 5/22/2004.*

Area	WGOA	CGOA		EGOA		Gulfwide	
Target	610	620	630	WYK**	SEO***		PWS
Pollock****	22,930	26,490	14,040	136	0	64,652	1,056
Pacific cod	22,610	35,800		154		58,564	
Deep-water flatfish	22	748		55	4	829	
Rex sole	567	1,253				1,820	
Flathead sole	1,023	1,724		0	0	2,747	
Shallow-water flatfish	205	4,930		1	1	5,137	
Arrowtooth flounder	5,434	16,806		112	84	22,436	
Sablefish	2,930	7,300		2,500	3,770	16,500	
Pacific ocean perch	2,520	8,390		830	0	11,740	
SR/RE	254	656		408		1,318	
Other slope rockfish	40	300		130	200	670	
Northern rockfish	770	4,100		0		4,870	
Pelagic shelf rockfish	370	3,010		210	10	3,600	
Thornyhead	410	1,010		540		1,960	
Demersal shelf rockfish					450	450	
Big & longnose skates		3,284				3,284	
Other skates						1,379	
Atka mackerel						230	
Other species						1,667	

* PWS pollock - In previous years the GHL established by the State for PWS has been deducted from the W/C/WYK ABC. This years harvest comes from both a commercial fishery and a test fishery conducted by ADF&G. The 2005 GHL for PWS is 923 mt.

** P cod - ABCs were used rather than TACs to include removals from the state managed fisheries in the Western and Central GOA.

*** Northern Rockfish E GOA - In the E GOA northern rockfish are included in the other rockfish assemblage. Annual harvests are on the order of 10 mt.

Table 2. Estimated 2004 BSAI catch projections year-to-date though 8/9/03 + 2000-2004 average catch after 5/31/2004.

	TAC	YTD Catch	CDQ catch	Remaining TAC	Average Catch (May-Dec)**	Projected Catch*
Bering Sea						
Other Rockfish	460	136	1	323	246	383
Pacific ocean perch	1,408	54	1	1,353	700	755
Sablefish	2,900	228	82	2,590	719	1,029
Greenland Turbot	2,700	164	7	2,529	2,596	2,700
Pollock	1,492,000	545,993	59,738	886,269	870,530	1,492,000
Pollock, Bogoslof***	50	0		50	22	22
Aleutian Islands						
Other Rockfish	634	142	2	490	341	485
Pacific ocean perch (E)	3,059	202	94	2,763	2,660	3,059
Pacific ocean perch (C)	2,926	271	0	2,655	2,732	2,926
Pacific ocean perch (W)	5,187	188	0	4,999	4,781	5,187
Pacific ocean perch (all AI)	*11,172*	*661*	*94*	*10,417*	*10,173*	*11,172*
Atka mackerel (E)	11,240	4,341	388	6,511	3,953	11,240
Atka mackerel (C)	31,100	13,918	70	17,112	14,024	31,100
Atka mackerel (W)	20,660	3,543	0	17,117	11,459	20,660
Atka mackerel (All AI)	*63,000*	*21,802*	*458*	*40,740*	*29,436*	*63,000*
Sablefish	3,100	500	0	2,600	759	1,259
Greenland Turbot	800	221	0	579	677	800
Pollock, ICA***	1,000	620	0	380	538	1,000
Bering Sea Aleutian Islands						
Alaska Plaice	10,000	6,971	1	3,028	3,839	10,000
Arrowtooth Flounder	12,000	4,762	52	7,186	7,948	12,000
Flathead Sole	19,000	7,991	190	10,819	9,381	17,562
Other Flatfish	3,000	2,498	9	493	2,049	3,000
Other Species	27,205	13,140	1,821	12,244	14,883	27,205
Pacific Cod	215,500	126,329	8,374	80,797	74,155	215,500
Rock Sole	41,000	41,243	312	-555	9,427	41,000
Squid	1,275	202		1,073	1,223	1,275
Yellowfin Sole	86,075	57,369	45	28,661	42,969	86,075
Northern Rockfish	5,000	1,473	5	3,522	3,431	4,909
Rougheye Rockfish	195	21	2	172	289	195
Shortraker Rockfish	526	77	4	445	168	249
Total	2,000,000	832,597	71,198	1,096,205	1,086,499	1,993,575

*Projected catch is either:

** 2001 5/26 - 12/31, 2002 5/25 - 12/31, 2000 5/24 - 12/31 source NMFS Blend Estimates and Catch Accounting System

1. 2004 TAC amount-highlighted. TAC amounts are used for these species because they are fully utilized or the 2004 projection exceeds the TAC.

*** Pollock ICA CDQ is included in open access pollock ICA

2. 2004 open access/CDQ catch through 5/22/04 plus 2001-2003 average catch from May 23 - December 31 (includes CDQ).

Appendix F: Detailed Analysis of 2004 Gross Value Impacts

Prices used to calculate gross values

The gross value analysis provides estimates of gross revenues received for products at the first wholesale level, or "first wholesale gross revenues." First wholesale gross revenues are used as a measure of gross value for two reasons. First, they provide the first market transaction common to two major sectors of the industry: (1) the "inshore sector," comprised of catcher vessels that harvest fish and deliver them for processing to shoreside or at-sea processors, and these same processors; and (2) catcher/processor vessels that process their own harvest. Ex-vessel revenues for catcher vessels would not be comparable to the revenues received in the first commercial transaction of a catcher/processor, because the latter transaction involves a value added product, while the former involves raw catch. The second reason first wholesale gross revenues were used, was to capture impacts on the combined fishing and fish processing sectors.

The prices are defined as "first wholesale price per metric ton of retained catch." First wholesale prices are necessary for calculating gross revenues at the first wholesale level. Prices are measured in metric tons of retained catch by the fishermen. Retained catch differs from total catch because fishermen often discard parts of their total catch.

Price projections are not available for 2004, nor are observed prices available for 2003 at present. The most recent year for which relatively complete price data are available is 2002. The first wholesale price per metric ton of retained catch was calculated by dividing an estimate of gross first wholesale revenues by an estimate of retained catch for seven species groupings. These groupings were pollock, sablefish, Pacific cod, flatfish, rockfish, Atka mackerel, and "other" species.[1] The prices estimates are "Alaska-wide" and are based on data in the 2003 Economic SAFE.[2]

How first wholesale revenues were estimated

The volumes of fish harvested under the different alternatives were estimated as follows: (a) species ABCs for each alternative were obtained from the Council plan teams following their September 2004

meeting (these are summarized in EA Tables 2.1-1 (BSAI) and 2.1-2 (GOA);(b) the species ABCs were grouped using the groupings in Tables 6 and 7 of the Economic SAFE;[3]

[1]2002 price estimates per metric ton were: $653 for pollock, $5,619 for sablefish, $1,061 for Pacific cod, $667 for flatfish, $729 for rockfish, $659 for Atka mackerel, and $1,127 for other species.

[2]Retained catch was calculated using Tables 4 and 5 which contains information on catch and discards. Total first wholesale revenues were estimated from Table 36. The species groupings used were determined by the groupings used in the 2003 Economic SAFE.

[3]These tables report on fishery discards. In the BSAI the species groupings were pollock, sablefish, Pacific cod, Arrowtooth flounder, Flathead sole, rock sole, Greenland turbot, yellowfin sole, other flatfish, rockfish, Atka mackerel, and other species. In the GOA the species groupings were pollock, sablefish, Pacific cod, arrowtooth, flathead sole, rex sole, deep water flatfish, shallow water flatfish rockfish, Atka mackerel, and other species.

(c) TACs were projected for each species group (using a procedure discussed below) in the BSAI and GOA; (d) BSAI TACs were divided into the CDQ reserve and the ITAC plus unspecified reserves using formulas from the regulations; (e) an estimate of the proportion of the projected TAC for the species group taken on average in the years 1998-2002, was used to estimate total catch (separate proportions were used in the BSAI and GOA, and for CDQ and other fishing in the BSAI); (f) an estimate of the average proportion of the total catch that was discarded in 1998 to 2002, was used to estimate the proportions of catch that were discarded and retained.[4]

For this analysis, 2004 TACs and interim TACs were estimated by the groundfish plan team in September and are used for all alternatives. Note, however, that projections of revenues for Alternatives that monetize ABCs could be seriously misleading. Alternative 1 essentially uses ABC values as an upper bound harvest limit, where the sum of ABCs is 177% of the optimum yield (OY). There were also some 2005 ABCs that were smaller than the 2004 TACs, which leads to overall total fishery yields that were less than they might be in the Council process. No effort was made to anticipate how the Council might reallocate these "spare" metric tonnages to other species. This may create a downward bias in the final gross revenue estimates.

In the BSAI, the TACs were divided into two categories. The fish available in the CDQ reserves, and the fish available for use by fishermen harvesting the ITAC and the unspecified reserves. The CDQ reserve was assigned 10% percent of the pollock TAC, 20% of the sablefish allocated to hook-and-line and pot fishermen, 7.5% of the sablefish allocated to trawl fishermen, and 7.5% of all other groundfish species. The CDQ reserve calculations were done for both the overall TACs and the interim TACs provided by the plan team in November.

The first wholesale value of the harvests under each alternative were estimated using the first wholesale price per metric ton of retained weight and the estimated retained harvests. Prior to this calculation, the species groupings were aggregated into larger groupings corresponding to the seven groups for which first wholesale prices were available. Values were estimated for each species grouping and then summed across groupings.

Estimates of gross revenues for actual TACs in 2003 and 2004 were also prepared using similar procedures. In each year, the actual TACs were adjusted by the average percentage of the TAC caught, and by the discard rate, and monetized with 2002 prices (just as the alternatives were). Thus, these revenue estimates are based on estimated, rather than actual, harvests in those years and incorporate 2002 prices. This was done for two reasons. The 2003 estimates were prepared to see if the procedure generated revenue estimates similar to those provided in the Economic SAFE. The 2004 estimates were prepared using assumed constant prices (using the 2002 prices as the base year) to provide a benchmark against which to compare the revenue estimates produced for the five alternatives.

There are several important conceptual problems with this approach. First, changes in the quantity of fish produced, might be expected to lead to changes in the price paid. However, in this analysis, a constant price, by species and product form, was used to value the different quantities that would be produced under the different alternatives. Since, all else equal, an increase in quantity should reduce price, while a decrease in quantity should increase price,

[4]The proportions of available harvest actually taken were obtained from the NOAA Fisheries Alaska Region web site. BSAI and GOA percentages caught were averaged over 1999-2003; CDQ percentages were averaged over 1999-2003. Separate discard rates for the GOA and BSAI were obtained from Economic SAFEs for various years; rates were averaged over the period 1999-2003.

leaving price changes out of the calculation may lead to an exaggeration of actual gross revenue changes across alternatives. The magnitude of this exaggeration is unknown. This is probably not a serious issue for Alternative 2, because TAC changes are relatively small. However, Alternative 1 increases TACs significantly, so the absence of a price effect may overstate revenue increases because prices would be expected to decline. In contrast, the method may cause the revenue reductions for Alternatives 3 and 4, which have moderate reductions in TACs of highly valued species, to be overstated, since the declines in TACs might be offset to some extent by increases in prices. It is not an issue for Alternative 5, since with no harvests, prices are undefined.

Second, many of the groundfish fisheries become limited by PSC catch constraints, rather than attainment of TAC. PSC constraints are not proportional to groundfish specifications and are likely to bind sooner, or impose greater costs on groundfish fishermen, given higher levels of TAC specifications. This suggests that gross revenues for alternatives with generally higher levels of TAC specifications will be biased upward. This may not be an issue for most alternatives in this instance, since TACs generally are the same as or lower than TACs in 2004. The exception could be Alternative 1, which increases TACs significantly.

Other assumptions incorporated into the model may affect the results in ways that are difficult to determine. These include (1) the use of first wholesale prices per metric ton of retained weight, implies that outputs at the wholesale level change in proportion to the production of the different species; (2) the use of broad species categories were used in the analysis implies that changes in specifications would result in proportional changes in the harvest by all the gear groups harvesting a species; (3) similarly, the lumping of species together in categories implies that changes in specifications would result in proportional changes in the harvest of all the species included in the category.

This discussion has pointed to several factors that tend to upwardly bias the revenue estimates associated with Alternative 1 and downwardly bias those associated with Alternatives 3 and 4. In the BSAI the method for projecting TACs leaves some ABC that might be assigned to TACs, given the ABCs and OY, unassigned. The procedures appear to underestimate revenues in the GOA (based on the estimate for 2003). Price impacts are not considered, and these might offset harvest reductions to some extent under Alternatives 3 and 4, while potentially offsetting harvest increases under Alternative 1.

Estimates of first wholesale gross revenues

Estimates of the projected TACs, by species group, are summarized for both the BSAI and for the GOA in Tables F-1a and F1-b for 2005 and 2006 respectively. Estimates of the percentage changes between 2004 ABCs and TACs and the 2005 and 2006 ABCs and projected TACs for the alternatives are summarized in Tables F-2a and F-2b. Estimates of the 2005 and 2006 first wholesale value of the BSAI ITAC and unspecified reserves are summarized in Table F-3a and F-3b. Estimates of the 2005 and 2006 value for the CDQ reserve are summarized in Table F-4a and F-4b. Estimates for the GOA are summarized in Table F-5a and F-5b.

Table F-1a 2005 Projected TACs in metric tons (based on plan team 2004 ABC recommendations)

Species	A1	A2	A3	A4	A5	2004
BSAI						
Pollock	2,393,700	1,493,449	1,310,950	1,133,930	0	1,493,050
Sablefish	6,076	5,208	3,108	3,976	0	6,000
Pacific cod	299,400	225,500	158,700	161,300	0	215,500
Arrowtooth	117,420	12,266	62,250	6,940	0	12,000
Flathead sole	56,860	19,000	29,850	12,380	0	19,000
Rock sole	128,370	41,910	66,710	28,600	0	41,000
Turbot	14,630	3,578	7,660	4,210	0	3,500
Yellowfin	109,300	87,985	56,040	70,550	0	86,075
Flats (other)	214,260	13,288	118,960	24,962	0	13,000
Rockfish	22,315	19,865	11,278	16,171	0	19,395
Atka	49,470	49,470	26,710	45,440	0	63,000
Other	65,170	28,480	32,585	26,313	0	28,480
Total	3,476,971	2,000,000	1,884,801	1,534,772	0	2,000,000
GOA						
Pollock	90,920	71,260	46,860	97,604	0	71,260
Sablefish	15,624	13,392	7,992	10,224	0	16,550
Pacific cod	51,087	48,033	26,920	34,491	0	48,033
Arrowtooth	216,900	38,000	111,400	16,600	0	38,000
Flathead sole	45,101	10,382	24,600	1,800	0	10,880
Rex sole	12,650	12,650	6,325	3,055	0	12,650
Flats deep	6,070	6,070	3,035	1,384	0	6,070
Flats shallow	52,070	20,740	26,035	5,290	0	20,740
Rockfish	31,488	26,547	15,896	21,071	0	27,058
Atka	4,700	600	2,350	232	0	600
Skates	8,144	6,993	4,072	2,332	0	6,993
Other	26,738	12,733	13,774	9,704	0	12,592
Totals	561,491	267,399	289,260	203,788	0	271,426

Notes: TACs were projected on the basis of 2004 Plan Team ABC recommendations. Actual TACs will be prepared by the NPFMC at its December 2004 meeting. BSAI TAC estimates have been constrained to meet the two million metric ton optimum yield constraint for Alternatives 2-4 but not for Alternative 1. BSAI 2005 projected TACs are equal to 2004 TACs for Alternative 2 (unless the 2004 TAC was greater than the proposed 2005 ABC) and equal to proposed 2005 ABCs for Alternatives 1, 3, and 4.

Table F-1b 2006 Projected TACs in metric tons (based on plan team 2004 ABC recommendations)

Species	A1	A2	A3	A4	A5	2004
BSAI						
Pollock	1,730,300	1,494,559	1,201,850	1,062,930	0	1,493,050
Sablefish	5,488	4,833	3,108	3,920	0	6,000
Pacific cod	270,500	220,500	163,000	165,400	0	215,500
Arrowthooth	95,500	13,006	56,790	7,030	0	12,000
Flathead sole	45,540	19,000	26,310	11,570	0	19,000
Rock sole	102,690	44,436	57,640	25,850	0	41,000
Turbot	11,160	3,793	6,970	3,990	0	3,500
Yellowfin	103,570	93,289	55,740	69,270	0	86,075
Flats (other)	145,480	14,090	97,450	24,742	0	13,000
Rockfish	22,135	19,835	11,578	16,271	0	19,395
Atka	44,180	44,180	29,200	43,040	0	63,000
Other	65,170	28,480	32,585	26,313	0	28,480
Total	2,641,713	2,000,000	1,742,221	1,460,326	0	2,000,000
GOA						
Pollock	97,420	71,260	56,160	99,904	0	71,260
Sablefish	14,112	12,428	7,992	10,079	0	16,550
Pacific cod	51,087	36,977	26,920	34,491	0	48,033
Arrowtooth	216,900	38,000	111,400	16,600	0	38,000
Flathead sole	45,100	10,213	24,600	1,800	0	10,880
Rex sole	12,650	12,650	6,325	3,055	0	12,650
Flats deep	6,070	6,070	3,035	1,384	0	6,070
Flats shallow	52,070	20,740	26,035	5,290	0	20,740
Rockfish	31,487	25,847	15,895	21,070	0	27,058
Atka	4,700	600	2,350	232	0	600
Skates	8,144	6,993	4,072	2,332	0	6,993
Other	26,987	12,089	14,239	9,812	0	12,592
Totals	566,727	253,866	299,024	206,050	0	271,426

Notes: TACs were projected on the basis of 2004 Plan Team ABC recommendations. Actual TACs will be prepared by the NPFMC at its December 2004 meeting. BSAI TAC estimates have been constrained to meet the two million metric ton optimum yield constraint for Alternatives 2-4 but not for Alternative 1. BSAI 2006 projected TACs are equal to 2004 TACs for Alternative 2 (unless the 2004 TAC was greater than the proposed 2006 ABC) and equal to proposed 2006 ABCs for Alternatives 1, 3, and 4.

Table F-2a: Percent differences between 2005 BSAI ABCs and TACs for the Alternatives, and 2004 BSAI ABCs and TACs

Species	2004 mt	Alt. 1 %	Alt. 2 %	Alt. 3 %	Alt. 4 %
ABCs					
Pollock	2,404,970	2%	0%	-44%	-52%
Sablefish	5,208	17%	0%	-40%	-24%
Pacific cod	225,500	33%	0%	-30%	-28%
Arrowtooth	96,140	22%	0%	-35%	-93%
Flathead sole	56,860	0%	0%	-48%	-78%
Rock sole	128,370	0%	0%	-48%	-78%
Turbot	11,230	30%	0%	-32%	-63%
Yellowfin	109,300	0%	0%	-49%	-35%
Flats (other)	172,540	24%	0%	-31%	-86%
Rockfish	20,365	10%	0%	-45%	-21%
Atka	49,470	0%	0%	-46%	-8%
Other	48,780	34%	0%	-33%	-46%
TACs (2004)					
Pollock	1,493,050	60%	0%	-12%	-24%
Sablefish	6,000	1%	-13%	-48%	-34%
Pacific cod	215,500	39%	5%	-26%	-25%
Arrowtooth	12,000	879%	2%	419%	-42%
Flathead sole	19,000	199%	0%	57%	-35%
Rex sole	41,000	213%	2%	63%	-30%
Flats deep	3,500	318%	2%	119%	20%
Flats shallow	86,075	27%	2%	-35%	-18%
Rockfish	13,000	1548%	2%	815%	92%
Atka	19,395	15%	2%	-42%	-17%
Skates	63,000	-21%	-21%	-58%	-28%
Other	28,480	129%	0%	14%	-8%

Table F-2b: Percent differences between 2006 BSAI ABCs and TACs for the Alternatives, and 2004 BSAI ABCs and TACs

Species	2004 mt	Alt. 1 %	Alt. 2 %	Alt. 3 %	Alt. 4 %
ABCs					
Pollock	2,129,770	-15.64%	0.00%	-41.93%	-49.25%
Sablefish	4,833	13.55%	0.00%	-35.69%	-18.89%
Pacific cod	220,500	22.68%	0.00%	-26.08%	-24.99%
Arrowtooth	96,300	-0.83%	0.00%	-41.03%	-92.70%
Flathead sole	53,380	-14.69%	0.00%	-50.71%	-78.33%
Rock sole	114,060	-9.97%	0.00%	-49.47%	-77.34%
Turbot	10,430	7.00%	0.00%	-33.17%	-61.74%
Yellowfin	105,250	-1.60%	0.00%	-47.04%	-34.19%
Flats (other)	172,730	-15.78%	0.00%	-43.58%	-85.68%
Rockfish	20,335	8.85%	0.00%	-43.06%	-19.99%
Atka	44,180	0.00%	0.00%	-33.91%	-2.58%
Other	48,780	33.60%	0.00%	-33.20%	-46.06%
TACs (2004)					
Pollock	1,493,050	15.89%	0.10%	-19.50%	-28.81%
Sablefish	6,000	-8.53%	-19.45%	-48.20%	-34.67%
Pacific cod	215,500	25.52%	2.32%	-24.36%	-23.25%
Arrowtooth	12,000	695.83%	8.38%	373.25%	-41.42%
Flathead sole	19,000	139.68%	0.00%	38.47%	-39.11%
Rex sole	41,000	150.46%	8.38%	40.59%	-36.95%
Flats deep	3,500	218.86%	8.38%	99.14%	14.00%
Flats shallow	86,075	20.33%	8.38%	-35.24%	-19.52%
Rockfish	13,000	1019.08%	8.38%	649.62%	90.32%
Atka	19,395	14.13%	2.27%	-40.30%	-16.11%
Skates	63,000	-29.87%	-29.87%	-53.65%	-31.68%
Other	28,480	128.83%	0.00%	14.41%	-7.61%

Table F-3a Percent differences between 2005 GOA ABCs and TACs for Alternatives, and 2004 GOA ABCs and TACs

Species	2004 mt	Alt. 1 %	Alt. 2 %	Alt. 3 %	Alt. 4 %
ABCs					
Pollock	71,260	28%	0%	-34%	37%
Sablefish	13,392	17%	0%	-40%	-24%
Pacific cod	58,900	13%	0%	-40%	-23%
Arrowtooth	216,900	0%	0%	-49%	-92%
Flathead sole	45,101	0%	0%	-45%	-96%
Rock sole	12,650	0%	0%	-50%	-76%
Turbot	6,070	0%	0%	-50%	-77%
Yellowfin	52,070	0%	0%	-50%	-90%
Flats (other)	29,778	6%	0%	-47%	-29%
Rockfish	600	683%	0%	292%	-61%
Atka	8,144	0%	0%	-50%	-71%
Other	n.a.	n.a.	n.a.	n.a.	n.a.
TACs (2004)					
Pollock	71,260	28%	0%	-34%	37%
Sablefish	16,550	-6%	-19%	-52%	-38%
Pacific cod	48,033	6%	0%	-44%	-28%
Arrowtooth	38,000	471%	0%	193%	-56%
Flathead sole	10,880	315%	-5%	126%	-83%
Rex sole	12,650	0%	0%	-50%	-76%
Flats deep	6,070	0%	0%	-50%	-77%
Flats shallow	20,740	151%	0%	26%	-74%
Rockfish	27,058	16%	-2%	-41%	-22%
Atka	600	683%	0%	292%	-61%
Skates	6,993	16%	0%	-42%	-67%
Other	12,592	112%	1%	9%	-23%

Table F-3a Percent differences between 2006 GAO ABCs and TACs for Alternatives, and 2004 GOA ABCs and TACs

Species	2004 mt	Alt. 1 %	Alt. 2 %	Alt. 3 %	Alt. 4 %
ABCs					
Pollock	71,260	37%	0%	-21%	40%
Sablefish	12,428	14%	0%	-36%	-19%
Pacific cod	48,350	38%	0%	-27%	-7%
Arrowtooth	230,740	-6%	0%	-52%	-93%
Flathead sole	42,850	5%	0%	-43%	-96%
Rock sole	12,650	0%	0%	-50%	-76%
Turbot	6,070	0%	0%	-50%	-77%
Yellowfin	52,070	0%	0%	-50%	-90%
Flats (other)	29,078	8%	0%	-45%	-28%
Rockfish	600	683%	0%	292%	-61%
Atka	8,144	0%	0%	-50%	-71%
Other	n.a.	n.a.	n.a.	n.a.	n.a.
TACs (2004)					
Pollock	71,260	37%	0%	-21%	40%
Sablefish	16,550	-15%	-25%	-52%	-39%
Pacific cod	48,033	6%	-23%	-44%	-28%
Arrowtooth	38,000	471%	0%	193%	-56%
Flathead sole	10,880	315%	-6%	126%	-83%
Rex sole	12,650	0%	0%	-50%	-76%
Flats deep	6,070	0%	0%	-50%	-77%
Flats shallow	20,740	151%	0%	26%	-74%
Rockfish	27,058	16%	-4%	-41%	-22%
Atka	600	683%	0%	292%	-61%
Skates	6,993	16%	0%	-42%	-67%
Other	12,592	114%	-4%	13%	-22%

Table F-4a Estimates of First Wholesale Value of 2005 ITAC and Unspecified Reserves in the BSAI (millions of dollars)

Species Group	First Wholesale Value by Alternative (millions of dollars)				
	A1	A2	A3	A4	A5
Pollock	1,373	857	752	650	0
Sablefish	13	11	7	8	0
Pacific cod	285	215	151	154	0
Flatfish	86	44	45	35	0
Rockfish	8	7	4	6	0
Atka mackerel	23	23	13	21	0
Other	8	3	4	3	0
Total	1,796	1,160	975	877	0

Notes: All estimates have been rounded to the nearest million dollars. This causes some cells to read "0" when actual value is non-zero. Cells may not sum to totals due to rounding.

Table F-4b Estimates of First Wholesale Value of 2006 ITAC and Unspecified Reserves in the BSAI (millions of dollars)

Species Group	First Wholesale Value by Alternative (millions of dollars)				
	A1	A2	A3	A4	A5
Pollock	993	857	689	610	0
Sablefish	12	10	7	8	0
Pacific cod	258	210	155	158	0
Flatfish	74	46	41	33	0
Rockfish	8	7	4	6	0
Atka mackerel	21	21	14	20	0
Other	8	3	4	3	0
Total	1,372	1,155	914	838	0

Notes: All estimates have been rounded to the nearest million dollars. This causes some cells to read "0" when actual value is non-zero. Cells may not sum to totals due to rounding.

Table F-5a Estimates of First Wholesale Value of 2005 CDQ Reserve in the BSAI (millions of dollars)

Species Group	First Wholesale Value by Alternative (millions of dollars)				
	A1	A2	A3	A4	A5
Pollock	153	95	84	72	0
Sablefish	1	1	1	1	0
Pacific cod	22	16	11	12	0
Flatfish	3	1	1	1	0
Rockfish	0	0	0	0	0
Atka mackerel	2	2	1	2	0
Other	1	0	0	0	0
Total	182	117	99	88	0

Notes: All estimates have been rounded to the nearest million dollars. This causes some cells to read "0" when actual value is non-zero. Cells may not sum to totals due to rounding.

Table F-5b Estimates of First Wholesale Value of 2006 CDQ Reserve in the BSAI (millions of dollars)

Species Group	First Wholesale Value by Alternative (millions of dollars)				
	A1	A2	A3	A4	A5
Pollock	111	96	77	68	0
Sablefish	1	1	1	1	0
Pacific cod	20	16	12	12	0
Flatfish	2	1	1	1	0
Rockfish	0	0	0	0	0
Atka mackerel	2	2	1	2	0
Other	1	0	0	0	0
Total	136	116	92	84	0

Notes: All estimates have been rounded to the nearest million dollars. This causes some cells to read "0" when actual value is non-zero. Cells may not sum to totals due to rounding.

Table F-6a Estimates of 2005 First Wholesale Value in the GOA

Species Group	First Wholesale Value by Alternative (millions of dollars)				
	A1	A2	A3	A4	A5
Pollock	50	39	26	54	0
Sablefish	79	68	41	52	0
Pacific cod	49	46	26	33	0
Flatfish	46	13	23	4	0
Rockfish	14	12	7	10	0
Atka mackerel	1	0	0	0	0
Other	7	6	4	2	0
Total	247	184	127	155	0

Notes: All estimates have been rounded to the nearest million dollars. This causes some cells to read "0" when actual value is non-zero. Cells may not sum to totals due to rounding.

Table F-6b Estimates of 2006 First Wholesale Value in the GOA

Species Group	First Wholesale Value by Alternative (millions of dollars)				
	A1	A2	A3	A4	A5
Pollock	54	39	31	55	0
Sablefish	72	63	41	51	0
Pacific cod	49	35	26	33	0
Flatfish	46	13	23	4	0
Rockfish	14	12	7	10	0
Atka mackerel	1	0	0	0	0
Other	7	6	4	2	0
Total	243	168	132	156	0

Notes: All estimates have been rounded to the nearest million dollars. This causes some cells to read "0" when actual value is non-zero. Cells may not sum to totals due to rounding.

Appendix G: Text of PSEIS Amendments 81 to BSAI FMP and 74 to GOA FMP

The policy, goals and objective texts for Amendments 81 and 74 are identical. Therefore, the text for Amendment 81 only is shown below.

AMENDMENT 81 to the Fishery Management Plan for Groundfish of the Bering Sea and Aleutian Islands Management Area

In Section 2.0, Executive Summary, revise the first heading and following text to read as follows:

Management Goal to be Attained

The fishery management goal is to provide sound conservation of the living marine resources; provide socially and economically viable fisheries and fishing communities; minimize human-caused threats to protected species; maintain a healthy marine resource habitat; and incorporate ecosystem-based considerations into management decisions.

Ecological, Economic and Social Impacts

(continue as written)

Revise Section 3.2 to read as follows:

3.2 Goals and Objectives for Management Plan

The productivity of the North Pacific ecosystem is acknowledged to be among the highest in the world. For the past 25 years, the Council's management approach has incorporated forward looking conservation measures that address differing levels of uncertainty. This management approach has, in recent years, been labeled the precautionary approach. The Council's precautionary approach applies judicious and responsible fisheries management practices, based on sound scientific research and analysis, proactively rather than reactively, to ensure the sustainability of fishery resources and associated ecosystems for the benefit of future and current generations. Recognizing that potential changes in productivity may be caused by fluctuations in natural oceanographic conditions, fisheries, and other non-fishing activities, the Council intends to continue to take appropriate measures to insure the continued sustainability of the managed species. It will carry out this objective by considering reasonable, adaptive management measures, as described in the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) and in conformance with the National Standards, the Endangered Species Act, the National Environmental Policy Act, and other applicable law. This management approach takes into account the National Academy of Science's recommendations on Sustainable Fisheries Policy.

As part of its policy, the Council intends to consider and adopt, as appropriate, measures that accelerate the Council's precautionary, adaptive management approach through community or rights-based management, ecosystem-based management principles that protect managed species from overfishing, and where appropriate and practicable, increase habitat protection and bycatch constraints. All management measures will be based on the best scientific information available. Given this intent, the fishery management goal is to provide sound conservation of the living marine resources; provide socially and economically viable fisheries and fishing communities;

minimize human-caused threats to protected species; maintain a healthy marine resource habitat; and incorporate ecosystem-based considerations into management decisions.

This management approach recognizes the need to balance many competing uses of marine resources and different social and economic goals for sustainable fishery management, including protection of the long-term health of the resource and the optimization of yield. This policy will utilize and improve upon the Council's existing open and transparent process to involve the public in decision-making.

Adaptive management requires regular and periodic review. Objectives identified in this policy statement will be reviewed annually by the Council. The Council will also review, modify, eliminate, or consider new issues, as appropriate to best carry out the goals and objectives of this management policy.

To meet the goals of this overall management approach, the Council and NMFS will use the PSEIS as a planning document. To help focus its consideration of potential management measures, it will use the following objectives as guideposts to be re-evaluated, as amendments to the FMP are considered over the life of the PSEIS.

Prevent Overfishing:

1. Adopt conservative harvest levels for multi-species and single species fisheries and specify optimum yield.
2. Continue to use the existing optimum yield cap for the BSAI (as stated in current law) groundfish fisheries.
3. Provide for adaptive management by continuing to specify optimum yield as a range.
4. Initiate a scientific review of the adequacy of F_{40} and adopt improvements, as appropriate.
5. Continue to improve the management of species through species categories.

Promote Sustainable Fisheries and Communities:

6. Promote conservation while providing for optimum yield in terms of providing the greatest overall benefit to the nation with particular reference to food production, and sustainable opportunities for recreational, subsistence, and commercial fishing participants and fishing communities.
7. Promote management measures that, while meeting conservation objectives, are also designed to avoid significant disruption of existing social and economic structures.
8. Promote fair and equitable allocation of identified available resources in a manner such that no particular sector, group or entity acquires an excessive share of the privileges.
9. Promote increased safety at sea.

Preserve Food Web:

10. Develop indices of ecosystem health as targets for management.
11. Improve the procedure to adjust ABCs as necessary to account for uncertainty and ecosystem factors.
12. Continue to protect the integrity of the food web through limits on harvest of forage species.
13. Incorporate ecosystem-based considerations into fishery management decisions, as appropriate.

Manage Incidental Catch and Reduce Bycatch and Waste:

14. Continue and improve current incidental catch and bycatch management program.

15. Develop incentive programs for bycatch reduction including the development of mechanisms to facilitate the formation of bycatch pools, vessel bycatch allowances, or other bycatch incentive systems.
16. Encourage research programs to evaluate current population estimates for non-target species with a view to setting appropriate bycatch limits, as information becomes available.
17. Continue program to reduce discards by developing management measures that encourage the use of gear and fishing techniques that reduce bycatch which includes economic discards.
18. Continue to manage incidental catch and bycatch through seasonal distribution of TAC and geographical gear restrictions.
19. Continue to account for bycatch mortality in TAC accounting and improve the accuracy of mortality assessments for target, PSC bycatch, and non-commercial species.
20. Control the bycatch of prohibited species through PSC limits or other appropriate measures.
21. Reduce waste to biologically and socially acceptable levels.

Avoid Impacts to Seabirds and Marine Mammals:

22. Continue to cooperate with USFWS to protect ESA-listed seabird species, and if appropriate and practicable, other seabird species.
23. Maintain or adjust current protection measures as appropriate to avoid jeopardy of extinction or adverse modification to critical habitat for ESA-listed Steller sea lions.
24. Encourage programs to review status of endangered or threatened marine mammal stocks and fishing interactions and develop fishery management measures as appropriate.
25. Continue to cooperate with NMFS and USFWS to protect ESA-listed marine mammal species, and if appropriate and practicable, other marine mammal species.

Reduce and Avoid Impacts to Habitat:

26. Review and evaluate efficacy of existing habitat protection measures for managed species.
27. Identify and designate EFH and HAPC pursuant to Magnuson-Stevens Act rules, and mitigate fishery impacts as necessary and practicable to continue the sustainability of managed species.
28. Develop a Marine Protected Area policy in coordination with national and state policies.
29. Encourage development of a research program to identify regional baseline habitat information and mapping, subject to funding and staff availability.
30. Develop goals, objectives and criteria to evaluate the efficacy and suitable design of marine protected areas and no-take marine reserves as tools to maintain abundance, diversity, and productivity. Implement marine protected areas if and where appropriate.

Promote Equitable and Efficient Use of Fishery Resources:

31. Provide economic and community stability to harvesting and processing sectors through fair allocation of fishery resources.
32. Maintain LLP program and modify as necessary, and further decrease excess fishing capacity and overcapitalization by eliminating latent licences and extending programs such as community or rights-based management to some or all groundfish fisheries.
33. Provide for adaptive management by periodically evaluating the effectiveness of rationalization programs and the allocation of access rights based on performance.

34. Develop management measures that, when practicable, consider the efficient use of fishery resources taking into account the interest of harvesters, processors, and communities.

Increase Alaska Native Consultation:

35. Continue to incorporate local and traditional knowledge in fishery management.
36. Consider ways to enhance collection of local and traditional knowledge from communities, and incorporate such knowledge in fishery management where appropriate.
37. Increase Alaska Native participation and consultation in fishery management.

Improve Data Quality, Monitoring and Enforcement:

38. Increase the utility of groundfish fishery observer data for the conservation and management of living marine resources.
39. Improve the North Pacific Groundfish Observer Program, and consider ways to address the disproportionate costs associated with the current funding mechanism.
40. Improve community and regional economic impact costs and benefits through increased data reporting requirements.
41. Increase the quality of monitoring and enforcement data through improved technological means.
42. Encourage a coordinated, long-term ecosystem monitoring program to collect baseline information and compile existing information from a variety of ongoing research initiatives, subject to funding and staff availability.
43. Cooperate with research institutions such as the North Pacific Research Board (NPRB) in identifying research needs to address pressing fishery issues.
44. Promote enhanced enforceability.
45. Continue to cooperate and coordinate management and enforcement programs with the Alaska Board of Fish, Department of Fish and Game, and Alaska Fish and Wildlife Protection, the U.S. Coast Guard, NMFS Enforcement, IPHC, Federal agencies, and other organizations to meet conservation requirements; promote economically healthy and sustainable fisheries and fishing communities; and maximize efficiencies in management and enforcement programs through continued consultation, coordination, and cooperation.

Current Version	Which version is this?	**What is the new information on ABCs and TACs?**	**What is the decision-making audience?**
X	September EA/IRFA	$_{Max}F_{ABC}$ and TACs for different F rates updated by rerunning models based on projected 2004 and 2005 harvests, or by rolling over 2004 ABCs and TACs for species for which this was not possible.	October AP, SSC, and Council deliberations on recommendations for proposed harvest specifications. (Proposed specifications are used for interim specifications.)
	October EA/IRFA	Recommendations from the Council on ABCs and TACs for Alternative 2.	Secretarial decision-making on interim specifications.
	November EA/IRFA	SAFE reports finalized; November Plan Team recommendations.	December AP, SSC, and Council deliberations on recommended specifications.
	January EA/FRFA	Council December recommendations. Public comment on proposed specifications and IRFA.	Secretarial decision-making on final specifications.