Finding of No Significant Impact

Environmental Assessment/Final Regulatory Flexibility Analysis (EA/FRFA) for the Total Allowable Catch Specifications for the Year 2004 Alaska Groundfish Fisheries.
December 2003

The action analyzed is the final harvest specifications for the 2004 Alaska groundfish fisheries off Alaska. One of the purposes of an EA is to provide the evidence and analysis necessary to decide whether an agency must prepare an environmental impact statement (EIS). This Finding of No Significant Impact (FONSI) is the decision maker's determination that the proposed action will not result in significant impacts to the human environment and therefore further analysis in an EIS is not needed. Council on Environmental Quality regulations define significance in terms of context and intensity (40 CFR 1508.27). An action must be evaluated at different spatial scales and settings to determine the context of the action. Intensity is evaluated with respect to the nature of impacts and the resources or environmental components affected by the action. NOAA Administrative Order 216-6 provides guidance on NEPA specific to line agencies within NOAA. It further specifies the definition of significance in the fishery management context by listing factors that should be used to test the significance of fishery management actions (NAO 216-6 § 6.01 and 6.02). These factors form the basis of the analysis presented in Section 4.0 of the attached EA/FRFA, Environmental and Economic Consequences. The results of that analysis are summarized here for each factor with references contained in the EA/FRFA.

Context and Intensity as required by NEPA

Context: For the 2004 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 2004 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 federal groundfish fisheries harvest specifications for 2004 are summarized in Table 6.0-1 and in section 4.12. No significant adverse impacts were identified for the preferred alternative (Alternative 2). The EFH consultation for the interim and annual harvest specifications was completed on November 10, 2003, with a finding that the preferred alternative minimizes adverse effects, and no additional conservation recommendations were provided.

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 contains cultural resources and ecologically critical areas. The marine waters where the fisheries occur contain ecologically critical areas. Effects on the unique characteristics of these areas are not anticipated to occur with these actions and mitigation measures such as a bottom trawling ban in specified portions of the Bering Sea are part of fisheries management measures.

Controversiality: These actions deal 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. Beyond the analysis documented in the revised Draft PSEIS (NMFS 2003b) and the Steller Sea Lion Protection Measures SEIS (NMFS 2001b), no additional controversy has been identified that would accrue from the 2004 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 revised Draft PSEIS (NMFS 2003b). Because of the mitigation measures implemented with every past action, no significant adverse impacts to the human environment beyond those disclosed in the Draft PSEIS (NMFS 2003b) or the Steller Sea Lion Protection Measures SEIS (NMFS 2001b) will occur. No significant adverse impacts were identified for the preferred alternatives (Alternative 2) for the harvest specification.

Future actions related to this action may result in impacts. NMFS is required to establish fishing harvest levels on an annual basis 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 to implement mitigation measures to avoid significant adverse impacts.

Cumulatively significant effects, **including those on target and nontarget species:** Beyond the cumulative impacts analysis documented in the revised Draft PSEIS (NMFS 2003b) and the Steller Sea Lion Protection Measures SEIS (NMFS 2001b), no additional past, present, or reasonably foreseeable cumulative impact issues have been identified that would accrue from the 2004 harvest specifications. The 2004 harvest specifications are, therefore, determined to have no cumulative impacts other than those impacts evaluated in the most recent environmental impact statements prepared for the groundfish fisheries. See section 5.0 of this EA for more information.

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. Because this action is 3 to 200 nm at sea, 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. This document 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 BiOp (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 the 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, Supplement June 19, 2003). 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 2004 harvest specifications at this time because based on the best available information, 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 Draft PSEIS under each ESA listed species' management overview (NMFS 2003b).

These actions pose **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.

This action poses **no effect on the introduction or spread of nonindigenous species** into the BSAI and GOA beyond those previously identified, because it does not change fishing, processing or shipping practices that may lead to the introduction of nonindigenous species.

Comparison of Alternatives and Selection of a Preferred Alternative

Alternatives 1-4 were developed to use the current harvest strategy allowed in the FMPs and provide a range of TAC amounts for comparison purposed. Alternative 5 would result in no groundfish fishing and is therefore the no action alternative which is required in NEPA analyses. Alternative 1 would set TACs in the BSAI above the upper limit of 2,000,000 mt for OY. Alternative 5 would set TACs in both the BSAI and GOA equal to zero. Neither Alternative 3 nor 4 use the best and most recent scientific information on status of groundfish stocks nor take into account socioeconomic benefits to the nation.

Alternative 2 was chosen as 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 sets TACs which, in the aggregate, fall within the specified range of OY for both the BSAI and GOA, and 4) it is consistent with the Endangered Species Act, the Magnuson-Stevens Act (including the national standards), and other applicable law.

Based on the information contained in the Environmental Assessment/Final Regulatory Flexibility Analysis for the Total Allowable Catch Specifications for the Year 2004 Alaska Groundfish Fisheries, December 2003, and summarized here, I have determined that the proposed alternative would not significantly affect the quality of the human environment, and therefore, preparation of an environmental impact statement is not required under section 102(2)(c)) of the National Environmental Policy Act or its implementing regulations. Therefore, a FONSI is appropriate.

William T. Hogarth
Assistant Administrator
for Fisheries, NOAA

Date

ENVIRONMENTAL ASSESSMENT/FINAL REGULATORY FLEXIBILITY ANALYSIS

for the Harvest Specifications for the Year 2004
Alaska Groundfish Fisheries Implemented Under the Authority of the Fishery Management Plans for the Groundfish Fishery of the Bering Sea and Aleutian Islands Area and Groundfish of the Gulf of Alaska

January 2004

Lead Agency National Oceanic and Atmospheric Administration
National Marine Fisheries Service
Alaska Regional Office
Juneau, Alaska

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Abstract: This document contains an Environmental Assessment (EA) and Final Regulatory Flexibility Analysis (FRFA) that analyze the potential impacts of the 2004 harvest specifications for the groundfish fisheries of the Bering Sea and Aleutian Islands management area and Gulf of Alaska. 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 Flexibilty 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
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
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 final specifications for the Bering Sea and Aleutian Islands (BSAI)
- publication of final specifications for the Gulf of Alaska (GOA)

Purpose and Need

The implementation of the 2004 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, 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 2004 Specifications to address the statutory requirements of the National Environmental Policy Act (NEPA). The purpose of the environmental assessment (EA) is to predict whether the impacts to the human environment resulting from setting the 2004 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.

2004 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 2004 specifications alternatives represents alternative amounts of total allowable catch that could be set for managed species and species groups for the fishing year 2004. 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 Table below provides a summary of the impacts of the final 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					
Fishing mortality	I	I	I	I	S+
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+
Incidental Catch of non-specified species					
Incidental catch of non-specified species	U	I	U	U	S+
Forage Fish					
Incidental catch of forage fish	U	I	U	U	S+
Prohibited Species Management					
Incidental Catch of prohibited species stocks	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					
Incidental take/entanglement in marine debris	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
Spatial/temporal concentration of fishery	I	I	I	I	S+
Global Harvest of prey species	I	I	I	I	U
Disturbance	I	I	I	I	S+
Northern Fulmar					
Incidental take	U	U	U	U	I
Prey availability	I	I	I	I	I
Benthic habitat	I	I	I	I	I
Proc. waste & offal	U	U	U	U	U
Short-tailed Albatross					
Incidental take	U	U	U	U	I
Prey Availability	I	I	I	I	I
Benthic Habitat	I	I	I	I	I
Proc. Waste & Offal	I	I	I	I	U
Other Albatrosses & Shearwaters					
Incidental Take	U	U	U	U	I
Prey Availability	I	I	I	I	I
Benthic Habitat	I	I	I	I	I
Proc. Waste & Offal	I	I	I	I	U
Piscivorus Seabirds (Also Breeding in Alaska)					
Incidental Take	I	I	I	I	I
Prey Availability	U	U	U	U	U
Benthic Habitat	I	I	I	I	I
Proc. Waste & Offal	I	I	I	I	I
Eiders (Spectacled and Sealers)					
Incidental Take	I	I	I	I	I
Prey Availability	I	I	U	U	U
Benthic Habitat	U	U	U	U	U
Proc. Waste & Offal	I	I	I	I	I
Other Seabird Species					
Incidental Take	I	I	I	I	I
Prey Availability	I	I	U	I	I
Benthic Habitat	I	I	U	I	I
Proc. Waste & Offal	I	I	I	I	U

Coding: I = Insignificant, S = Significant, + = beneficial, - = adverse, U = Unknown					
Issue	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5
Marine Benthic Habitat					
Mortality and damage to HAPC	S-	I	I	I	S+
Modification of Benthic Community Structure	S-	I	I	I	S+
Changes in Distribution of Fishing Effort	BS and GOA = S- AI = I	I	I	I	NE
Ecosystem Considerations					
Predator-Prey Relationships	U	I	U	U	U
Energy Flow and Balance	U	I	U	U	U
Diversity	U	I	U	U	U
State waters seasons					
Pollock PWS	I	I	I	I	I
Pacific cod GOA	I	I	I	I	S-
Sailfish PWS and SEI	I	I	I	I	I
Parallel seasons BSAI and GOA	I	I	I	I	S-
Economic Indicators					
First wholesale gross revenues	S+	I	I	I	S-
Operating cost impacts	S-	I	I	I	S+
Net returns to industry	S+	I	I	I	S-
Safety and health impacts	U	I	U	U	U
Impacts on related fisheries	U	I	U	U	S-
Consumer effects	S+	I	I	I	S-
Management and enforcement	S-	I	I	I	S+
Excess capacity	S+	I	I	I	S-
Bycatch and discards	I	I	I	I	S+
Passive use values	U	I	U	U	U
Non-market use values	U	I	U	U	U
Non-consumptive use values	U	I	U	U	U

Codes: S+ is "significant beneficial", I is "insignificant", S- is "significant adverse, U is "unknown", and NE is "no effect"

The impact of prohibited species was determined to be insignificant and socioeconomic impacts were determined to be unknown. The groundfish impacts are summarized in the following table.

Final Regulatory Flexibility Analysis

The proposed rule for the BSAI specifications was published in the *Federal Register* on December 2, 2003 (68 *FR* 67642). The proposed rule for the GOA specifications was published in the *Federal Register* on December 5, 2003 (68 *FR* 68002). An Initial Regulatory Flexibility Analysis (IRFA) was prepared for these proposed rules, and was described in the classifications sections of each proposed rule. The IRFA is available on the NMFS Alaska Region web site at "http://www.fakr.noaa.gov/sustainablefisheries/specs04/GOA63earirirfa1003.pdf." The public comment period for the BSAI specifications rule ended on January 2, 2004, while the public comment period for the GOA rule ended on January 5, 2004. No comments were received on the IRFA.

A Final Regulatory Flexibility Analysis (FRFA) was prepared for the 2004 Specifications to address the statutory requirements of the Regulatory Flexibility Act of 1980, as amended by the Small Business Regulatory Fairness Act of 1996.

The 2004 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 2004. From 832 to 838 small catcher vessels, 30 to 33 small catcher-processors, and six small CDQ groups may be directly regulated by the 2004 Specifications.

Adverse impacts were identified for five classes of entities: (1) in the BSAI, 105 small catcher vessels, and 19 small catcher-processors would experience small adverse impacts (estimated to be a fraction of a percent of entity gross revenues) from reductions in Greenland turbot harvests; (2) in the BSAI, six small catcher-processors operating as head-and-gut trawlers would experience reductions in Pacific ocean perch, flathead sole, and rock sole, estimated to be 3% to 4% of entity gross revenues; (3) in the BSAI, 188 small catcher vessels and 43 small catcher-processors would experience small adverse impacts (estimated to be a fraction of a percent of entity gross revenues) from reductions in other species harvests; (4) in the BSAI, six CDQ groups would have small revenue reductions (estimated to be a small fraction of a percent) in fisheries for certain species (although these would be more than offset by revenue increases from other fisheries for CDQ groups); (5) in the GOA, 96 non-pelagic trawlers would experience reductions in rockfish, shallow water flatfish, and flathead sole, estimated to be about 2% of overall gross revenues. This identification of adverse impacts does not take account of offsetting revenue increases some of these fleets may experience from increased TACs. There may be overlap among these categories; for example, many vessels catching other species would also have harvested Greenland turbot.

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.

<u>Preferred Alternatives</u>

2004 Harvest Specifications

Alternative 1 would set TACs in the BSAI above the upper limit of 2,000,000 mt for OY. Alternative 5 would set TACs in both the BSAI and GOA equal to zero. Neither Alternative 3 or 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 Act.

1.0 Purpose and Need

1.1 Introduction

This document contains an Environmental Assessment and a Final Regulatory Flexibility Analysis (EA/FRFA) of final harvest specifications for the Bering Sea and Aleutian Islands (BSAI) and the Gulf of Alaska (GOA) groundfish fisheries for 2004. Harvest specifications include the setting of overfishing levels (OFLs), acceptable biological catches (ABCs), total allowable catches (TACs), and prohibited species catch (PSC). Specifications also include the setting of seasonal apportionments and allocations for TACs and PSCs.

These documents address 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 impacts to the human environment resulting from setting the 2004 final harvest specifications will be significant. See section 7.0 for the purpose and need of the FRFA. 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.

The implementation of the 2004 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).

1.2 The Annual 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-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, 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, representing the Eastern Aleutian Islands, Central Aleutian Islands, and Western Aleutian Islands, respectively. 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 BSAI and GOA regions, with most management areas, are shown in Figures 1-1 and 1-2 at the end of this chapter.

The fishing year coincides with the calendar year, January 1 through December 31 (§ 679.2 and 679.23). Depending on the target species' spatial 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 annually. The process includes review of the annual Stock Assessment and Fishery Evaluation (SAFE) 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 specifications.

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 that are open to harvest of groundfish. 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 actual 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[1] 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. 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 makes 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

[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, fishery, and seasonal apportionments.

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 Teams' Meetings.	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 SAFE 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.

Time	Activity	Opportunity for Public Involvement	Decision Points
November - December	File proposed and interim specification rules with *Federal Register*. Interim specs. EA completed.	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 of 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 EA/FRFA finalized.	Comments related to information released prior to and during December Council 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.	ESA Section 7 and EFH consultation concluded on final specifications. FONSI 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.

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 1.2-2 summarizes the four versions.

Table 1.2-2 2004 EA/IRFA/FRFA Versions

Version	New information on ABCs and TACs	Decision-making audience
September EA/IRFA	No new data on alternatives. Alternative 1, 3, 4, and 5 TACs equal final 2003 Alternative ABCs. Alternative 2 ABCs reflect plan team recommendations from September plan team meetings and TACs from 2003.	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.

The current document is the January version. The earlier versions may be found on the National Marine Fisheries Service, Alaska Region, web page at http://www.fakr.noaa.gov/analyses/list.htm#gf . The earlier versions are:

- September Draft EA/IRFA and Errata Sheet (updated 10/05/03) for the 2004 Alaska Groundfish Harvest Specifications and EA/RIR/IRFA for GOA FMP Amendment 63 to move skates from the "other species" category to the "target species" category. Evaluates OFL and ABC recommendations from September 2003 GOA and BSAI plan team meetings. (For Council review).

- October Draft EA/IRFA for the 2004 Alaska Groundfish Harvest Specifications and EA/RIR/IRFA for GOA FMP Amendment 63. (Updated in response to Council's proposed specification recommendations at its October 2003 meeting). Public review and comment version to support the proposed specifications.

- November Draft EA/IRFA for the 2004 Alaska Groundfish Harvest Specifications. (Updated in response to GOA and BSAI Plan Team OFL and ABC recommendations at their November meetings). Prepared for Council use at its December meetings.

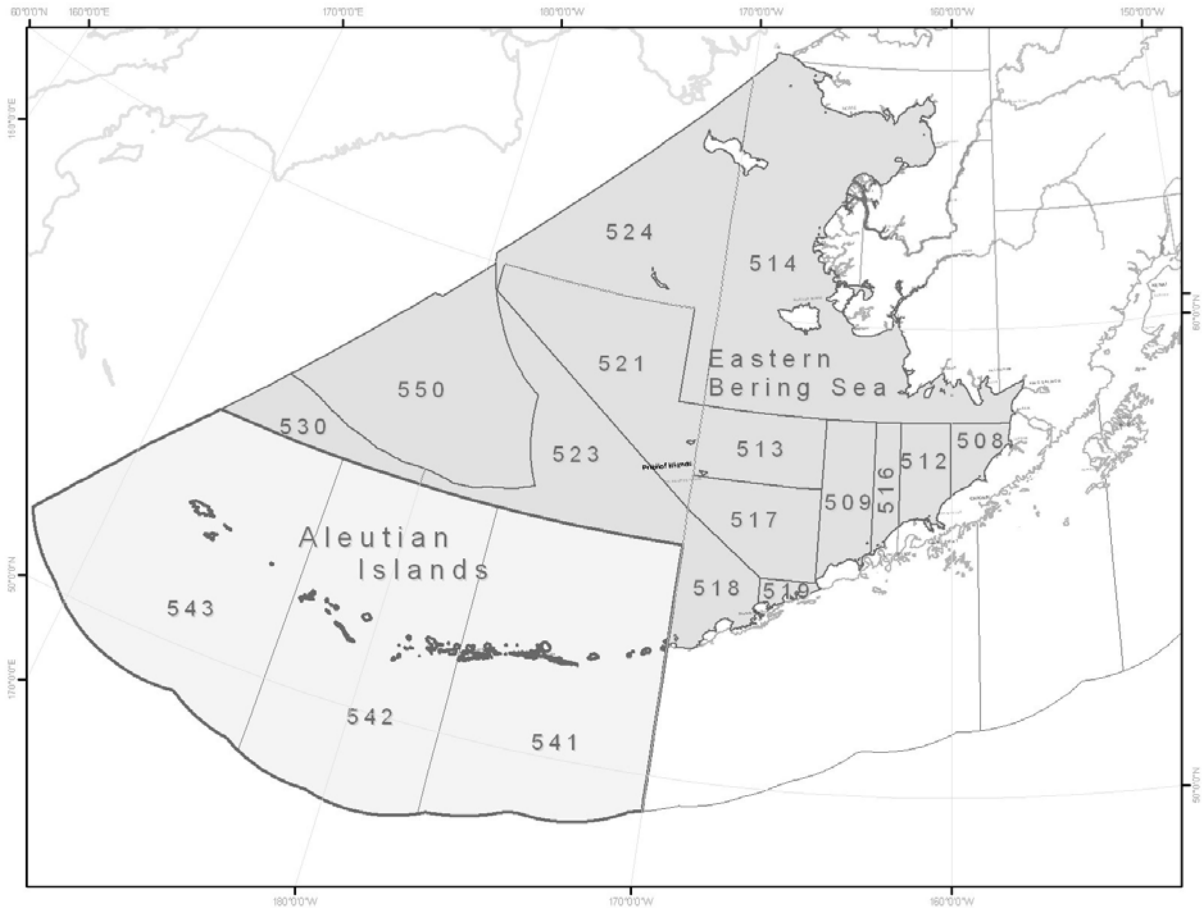
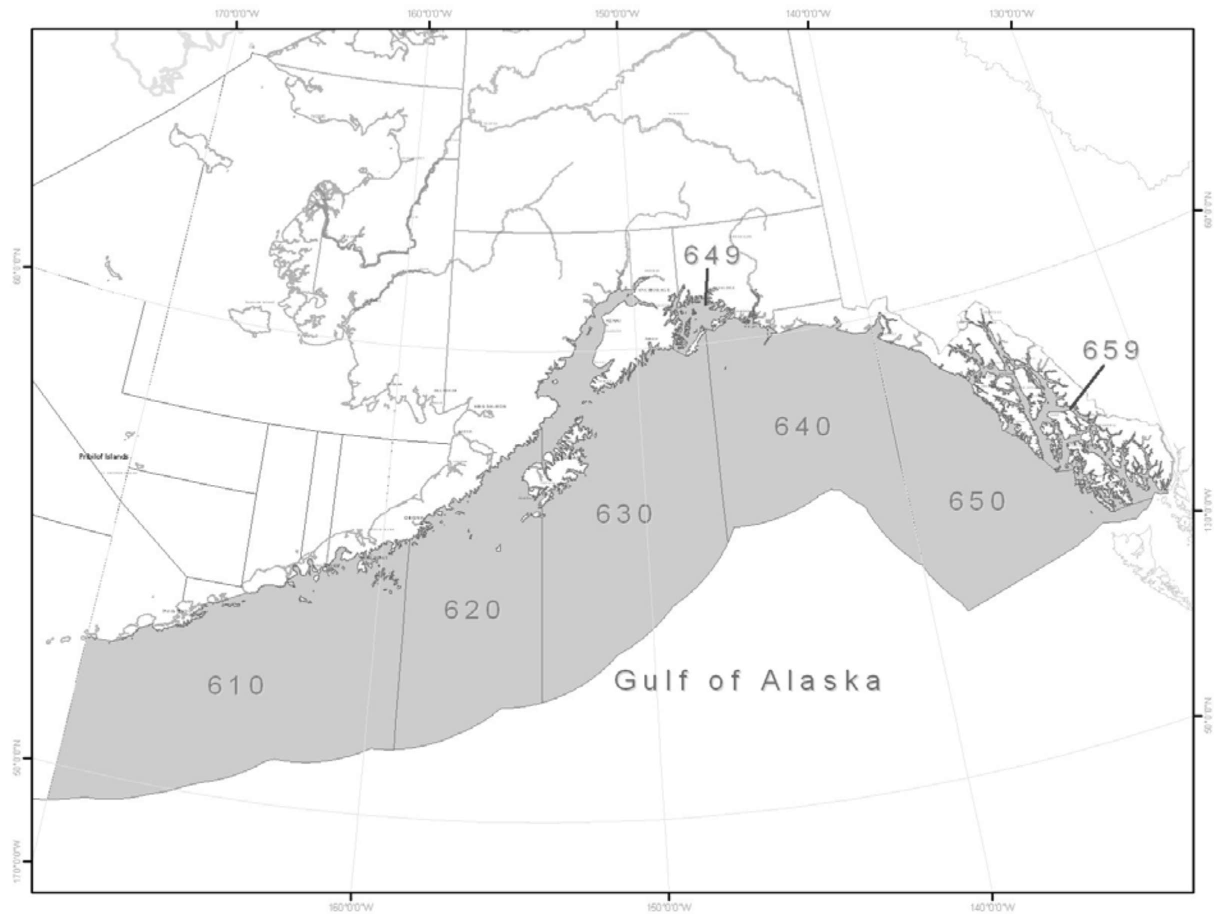


Figure 1-1 Bering Sea and Aleutian Islands (BSAI) management area

Figure 1-2 Gulf of Alaska (GOA) management area



2.0 Descriptions of Alternatives

2.1 Introduction

This chapter describes the five 2004 harvest specifications alternatives. As described in more detail in Section 1.2 of this EA, harvest specifications are a complex set of management measures used to control groundfish fishing. These measures include TAC and PSC limits and the seasonal and area apportionments and allocations of these limits. OFLs and 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 PSC limits, apportionments, and allocations. TAC seasonal apportionments and allocations are specified in the regulations at 50 CFR 679.

PSC limits are mostly set in regulation or are a result of the action of an international governing body, in the case of halibut and the International Pacific Halibut Commission. The Council does have discretion in how the PSC is apportioned and allocated, but these decisions are primarily driven by the available TAC to a sector. For instance, the Council will recommend an allocation of halibut PSC to the Pacific cod hook-and-line sector, based on the amount of Pacific cod TAC allocated to the sector, allowing for the potential full harvest of the available Pacific cod, while avoiding a fishery closure based on having reached the sector's halibut PSC limit. Because the harvest specifications are driven by the available TAC amounts and these amount are under the discretion of the Council for recommendations to NMFS, the alternatives in this analysis are based on a range of TACs.

Each of the five 2004 final harvest specifications alternatives represents alternative amounts of total allowable catch that could be set for managed species and species groups for fishing year 2004. The alternatives have been selected to display a wide range of ABCs and TACs, and their impacts to the environment. Fishing mortality rate (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 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 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 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.

These alternatives have been changed somewhat from the alternatives used in earlier years. Changes to Alternatives 1, 2, and 5 involve wording changes meant to make the alternatives clearer. These alternatives have not been substantively changed. Minor changes have been made to Alternatives 3 and 4, in order to make it possible to project ABCs for all species under all alternatives. The 2004 alternatives are compared to the 2003 alternatives in Table 2.0-1.

The remainder of this chapter is organized into the following sections:

- Section 2.2: ABCs for each of the five alternatives as recommended by the plan teams during their November 2003 meetings
- Section 2.3: Estimated TACs for each of the five alternatives
- Section 2.4: BSAI and GOA OFLs, ABCs, and TACs as recommended by the Council in December 2003

Table 2.0-1 Changes in Specifications Alternatives from 2003 to 2004

Alternative	2003 Alternatives	2004 Alternatives	Comments
1	**Set F 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.	**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 set at or below ABC, so this alternative provides a likely upper limit for setting TAC within the limits of ABC.	The Council may recommend TAC above ABC but historically has not done this. This alternative is rephrased for increased clarity, but its substance is not changed. This alternative will generate BSAI TACs that, taken together, would violate OY - significantly.
2	**Preferred Alternative. Set F within the range of ABCs recommended by the Plan Team's and TACs recommended by the Council**. Under this scenario, F is set equal to a constant fraction of $maxF_{ABC}$, where this fraction is equal to the ratio of the F_{ABC} value recommended in the assessment to the $maxF_{ABC}$. The recommended fractions of $maxF_{ABC}$ may vary among species or stocks, based on other considerations unique to individual species or stocks.	**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.	This alternative is rephrased for increased clarity, but its substance is unchanged. Proposed specifications under this alternative would be developed based on SAFE report biomass and ABC projections for those species which have enough information to allow projections of allowable harvest. (In contrast to the practice, before 2002, of simply rolling over the current year's TACs for the following year's proposed TACs.) Final specifications would be based on December Council recommendations.
3	**Set F equal to 50% of $maxF_{ABC}$**. 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.	**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.	These are substantive changes. In 2003, estimates of ABC according to Alternative 3 and 4 definitions were not available for species classified as Tier 4, 5 or 6. In the absence of long-term biomass projections for those categories, no estimates could be made. These changes are meant to address this problem.
4	**Set F equal to the most recent five year average actual F**. 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}.	**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}.	
5	**Set F 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. Alternative 5, effectively, "set all TACs equal to zero," has been chosen as the baseline alternative, against which the impacts of the other alternatives have been measured. This has been done to simplify the comparison of the alternatives and does not imply any preference among them.	**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.	This alternative is rephrased for increased clarity, but its substance is unchanged. This alternative is no longer identified as the baseline for analysis.
Note: The **status quo**, and the **baseline** against which the alternatives are to be evaluated, is the specifications for the preceding year. Alternative 5 is the **no action** alternative. Alternative 2 is the **preferred** alternative.			

2.2 2004 Proposed ABCs

The annual specifications process begins with ABC determinations for each alternative by assessment authors and plan teams. The Council rarely sets TACs greater than ABCs. The Plan Team ABCs will therefore, as a practical matter, represent the maximum potential TAC associated with an alternative. The Plan Teams use the formulas described in section 2.0 for alternatives 1, 3, 4, and 5 to develop ABCs, providing guidance to the Council on the range of harvest levels within which TACs may be set.

Tables 2.2-1 and 2.2-2, below, summarize the ABCs associated with each of the alternatives. The ABCs for Alternatives 1, 3, 4 and 5, are those developed by the BSAI and GOA Plan Teams during their November 2003 meetings. Alternative 2 ABCs (which are highlighted in the tables) are the Council's December 2003 recommendations for 2004.

Table 2.2-1 2004 BSAI ABCs for Alternatives 1 through 5 (metric tons)

Species	Area	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5
Pollock	EBS	2,560,000	2,560,000	1,400,000	1,240,000	0
	Aleutian Islands	67,400	39,400	36,000	900	0
	Bogoslof District	29,700	2,570	14,850	30	0
Pacific cod	BSAI	297,000	223,000	157,000	160,000	0
Sablefish	BS	3,300	3,000	1,700	2,000	0
	AI	3,810	3,450	1,970	2,310	0
Atka mackerel	Total	66,700	66,700	36,400	53,000	0
	WAI	24,400	24,360	13,316	19,388	0
	EAI/BS	11,240	11,240	6,112	8,900	0
	CAI	31,100	31,100	16,972	24,712	0
Yellowfin sole	BSAI	114,000	114,000	58,200	73,300	0
Rock sole	BSAI	139,000	139,000	72,400	31,000	0
Greenland turbot	Total	15,700	4,740	8,200	4,740	0
	BS	10,466	3,162	5,466	3,162	0
	AI	5,234	1,578	2,734	1,787	0
Arrowtooth flounder	BSAI	115,000	115,000	66,837	6,777	0
Flathead sole	BSAI	61,900	61,900	32,500	13,500	0
Alaska Plaice	BSAI	203,000	203,000	113,000	13,200	0
Other flatfish	BSAI	13,500	13,500	6,800	11,902	0
Pacific ocean perch	BSAI	13,300	13,300	6,700	10,300	0
	BS	2,128	2,128	1,072	1,648	0
	AI total	11,172	11,172	5,628	8,652	0
	WAI	5,150	5,187	2,595	3,989	0
	CAI	2,938	2,926	1,480	2,275	0
	EAI	3,083	3,059	1,553	2,388	0
Northern rockfish	BSAI	6,880	6,880	3,490	4,440	0
Shortraker	BSAI	526	526	263	479	0
Rougheye	BSAI	195	195	98	178	0
Other rockfish	BS	960	960	480	250	0
	AI	634	634	317	534	0
Squid	BSAI	1,970	1,970	985	699	0
Other species	BSAI	63,200	46,810	31,600	25,614	
Total		3,777,675	3,620,535	2,049,790	1,655,153	0

Notes
1. Shortraker rockfish, rougheye rockfish, sharks, skates, sculpins, and octopi were reported using species group codes prior to 2004 and separate species catch is not available. Alternative 4 is calculated based on the ratio of individual species to the group total from Alternative 2.

Table 2.2-2, below, summarizes the GOA Plan Team's ABCs developed for Alternatives 1 to 5. In this table, skates have been included in the "other species" category.

Table 2.2-2 2004 GOA ABCs for Alternatives 1 through 5. (metric tons)

Species	Area	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5
Pollock (1)	610	41,608	22,930	21,547	40,148	0
	620	48,061	26,490	24,889	46,374	0
	630	25,471	14,040	13,190	24,577	0
	640	2,326	1,280	1,205	2,244	0
Subtotal WYK/C/W		117,466	64,740	60,831	113,343	0
	650	6,520	6,520	3,260	4	0
Total GOA		123,986	71,260	64,091	113,347	0
Pacific cod (2)	GOA	71,200	62,810	37,500	48,000	0
	W	25,632	22,610	13,500	17,280	0
	C	40,584	35,800	21,375	27,360	0
	E	4,984	4,400	2,625	3,360	0
Flatfish	GOA	52,070	52,070	26,035	5,290	0
Shallow water	W	21,580	21,580	10,790	2,192	0
	C	27,250	27,250	13,625	2,768	0
	WYK	2,030	2,030	1,015	207	0
	SEO	1,210	1,210	605	123	0
Rex sole	GOA	12,650	12,650	6,325	3,055	0
	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
Flathead sole	GOA	51,720	51,720	28,130	2,085	0
	W	13,410	13,410	7,340	541	0
	C	34,430	34,430	18,846	1,388	0
	WYK	3,430	3,430	1,877	138	0
	SEO	450	450	246	18	0
Flatfish	GOA	6,070	6,070	3,035	1,384	0
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
Arrowtooth flounder	GOA	194,930	194,930	100,136	14,962	0
	W	23,590	23,590	12,118	1,811	0
	C	151,840	151,840	77,999	11,654	0
	WYK	10,590	10,590	5,440	813	0
	SEO	8,910	8,910	4,577	684	0
Sablefish (3)	GOA	18,272	16,550	13,100	15,400	0
	W	3,235	2,930	2,319	2,726	0
	C	8,060	7,300	5,778	6,795	0
	WYK	2,815	2,550	2,018	2,373	0
	SEO	4,162	3,770	2,984	3,510	0
Pacific ocean perch	GOA	13,340	13,340	6,761	10,756	0
	W	2,520	2,520	1,285	2,044	0
	C	8,390	8,390	4,279	6,776	0
	WYK	830	830	416	661	0
	SEO	1,600	1,600	801	1,275	0
Shortraker/rougheye	GOA	2,040	1,318	1,014	1,825	0
	W	388	254	193	347	0
	C	1,014	656	504	908	0
	E	638	408	317	570	0
Other rockfish	GOA	3,900	3900	2,007	875	0
	W	40	40	21	9	0
	C	300	300	156	68	0
	WYK	128	130	66	29	0

Species	Area	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5
	SEO	3,430	3,430	1,764	769	0
Northern rockfish	GOA	4,870	4,870	2,468	2,542	0
	W	770	770	2,076	2,138	0
	C	4,100	4,100	392	404	0
	E	0	0	0	0	0
Pelagic shelf rockfish	GOA	4,470	4,470	2,264	3,562	0
	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
Thornyhead rockfish	GOA	2,818	1,940	1,431	1,359	0
	W	592	410	301	285	0
	C	1,465	1,010	744	707	0
	E	761	520	386	367	0
Demersal shelf rockfish	SEO	560	450	280	450	0
Atka mackerel	GW	4,700	600	2,350	232	0
Total			498,948			0

Notes

1. WYK/C/W ABC is reduced by the GHL established for the PWS 2003 pollock fishery.
2. Pacific cod apportionments are reduced by the GHLs established for the 2003 state waters seasons Pacific cod fisheries in the GOA.
3. Sablefish ABCs in the Eastern GOA reflect a subtraction of 5% of the ABC apportionment from SEO District added to the WYK District so that 5 % of the combined ABC for the Eastern GOA may be allocated to trawl gear in the WYK District without affecting the 95% allocation to hook-and-line gear in the WYK and SEO Districts.
4. ABC for the other species assemblage is not specified, rather TAC is set at 5% of the combined total of other groundfish TACs.

2.3 2004 Proposed TACs

Tables 2.3-1 and 2.3-2, below, summarize proposed TACs associated with each of the five alternatives. The Alternative 2 TACs (highlighted in the tables) are the Council's December 2003 recommendations for 2004. The TACs for Alternatives 1, 3, 4, and 5, have been set equal to the ABCs for those alternatives. This is the intent of the alternative language. While the sum of the Alternative 1 ABCs exceeds the BSAI annual optimal yield (OY), NEPA alternatives do not have to be currently authorized by law to be included in the analysis. Setting the TACs equal to ABCs is consistent with the language of the alternatives, and provides for a high-TAC alternative.

Table 2.3-1 2004 BSAI TACs for Alternatives 1 through 5 (metric tons)

Species	Area	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5
Pollock	EBS	2,560,000	1,492,000	1,400,000	1,240,000	0
	Aleutian Islands	67,400	1,000	36,000	900	0
	Bogoslof District	29,700	50	14,850	30	0
Pacific cod	BSAI	297,000	215,500	157,000	160,000	0
Sablefish	BS	3,300	2,900	1,700	2,000	0
	AI	3,810	3,100	1,970	2,310	0
Atka mackerel	Total	66,700	63,000	36,400	53,000	0
	WAI	24,400	20,660	13,316	19,388	0
	EAI/BS	11,200	11,240	6,112	8,900	0
	CAI	31,100	31,100	16,972	24,712	0
Yellowfin sole	BSAI	114,000	86,075	58,200	73,300	0
Rock sole	BSAI	139,000	41,000	72,400	31,000	0
Greenland turbot	Total	15,700	3,500	8,200	4,740	0
	BS	10,466	2,700	5,466	3,162	0
	AI	5,234	800	2,734	1,787	0
Arrowtooth flounder	BSAI	115,000	12,000	66,837	6,777	0
Flathead sole	BSAI	61,900	19,000	32,500	13,500	0
Alaska Plaice	BSAI	203,000	10,000	113,000	13,200	0
Other flatfish	BSAI	13,500	3,000	6,800	11,902	0
Pacific ocean perch	BSAI	13,300	12,580	6,700	10,300	0
	BS	2,128	1,408	1,072	1,648	0
	AI total	11,172	11,172	5,628	8,652	0
	WAI	5,150	5,187	2,595	3,989	0
	CAI	2,938	2,926	1,480	2,275	0
	EAI	3,083	3,059	1,553	2,388	0
Northern rockfish	BSAI	6,880	5,000	3,490	4,440	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		3,777,675	2,000,000	2,049,790	1,655,153	0

Notes
1. Shortraker rockfish, rougheye rockfish, sharks, skates, sculpins, and octopi were reported using species group codes prior to 2004 and separate species catch is not available. Alternative 4 is calculated based on the ratio of individual species to the group total from Alternative 2.

Table 2.3-2 2004 GOA TACs for Alternatives 1 through 5. (Metric tons)

Species	Area	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5
Pollock (1)	610	41,608	22,930	21,547	40,148	0
	620	48,061	26,490	24,889	46,374	0
	630	25,471	14,040	13,190	24,577	0
	640	2,326	1,280	1,205	2,244	0
Subtotal WYK/C/W		117,466	64,740	60,831	113,343	0
	650	6,520	6,520	3,260	4	0
Total GOA		123,986	71,260	64,091	113,347	0
Pacific cod (2)	GOA	71,200	48,033	37,500	48,000	0
	W	25,632	16,957	13,500	17,280	0
	C	40,584	27,116	21,375	27,360	0
	E	4,984	3,960	2,625	3,360	0
Flatfish	GOA	52,070	20,740	26,035	5,290	0
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
Rex sole	GOA	12,650	12,650	6,325	3,055	0
	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
Flathead sole	GOA	51,720	10,880	28,130	2,085	0
	W	13,410	2,000	7,340	541	0
	C	34,430	5,000	18,846	1,388	0
	WYK	3,430	3,430	1,877	138	0
	SEO	450	450	246	18	0
Flatfish	GOA	6,070	6,070	3,035	1,384	0
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
Arrowtooth flounder	GOA	194,930	38,000	100,136	14,962	0
	W	23,590	8,000	12,118	1,811	0
	C	151,840	25,000	77,999	11,654	0
	WYK	10,590	2,500	5,440	813	0
	SEO	8,910	2,500	4,577	684	0
Sablefish (3)	GOA	18,272	16,550	13,100	15,400	0
	W	3,235	2,930	2,319	2,726	0
	C	8,060	7,300	5,778	6,795	0
	WYK	2,815	2,550	2,018	2,373	0
	SEO	4,162	3,770	2,984	3,510	0
Pacific ocean perch	GOA	13,340	13,340	6,761	10,756	0
	W	2,520	2,520	1,285	2,044	0
	C	8,390	8,390	4,279	6,776	0
	WYK	830	830	416	661	0
	SEO	1,600	1,600	801	1,275	0
Shortraker/rougheye	GOA	2,040	1,318	1,014	1,825	0
	W	388	254	193	347	0
	C	1,014	656	504	908	0
	E	638	408	317	570	0
Other rockfish	GOA	3,900	670	2,007	875	0
	W	40	40	21	9	0
	C	300	300	156	68	0
	WYK	128	130	66	29	0
	SEO	3,430	200	1,764	769	0
Northern rockfish	GOA	4,870	4,870	2,468	2,542	0

Species	Area	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5
	W	770	770	2,076	2,138	0
	C	4,100	4,100	392	404	0
	E	0	0	0	0	0
Pelagic shelf rockfish	GOA	4,470	4,470	2,264	3,562	0
	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
Thornyhead rockfish	GOA	2,818	1,940	1,431	1,359	0
	W	592	410	301	285	0
	C	1,465	1,010	744	707	0
	E	761	520	386	367	0
Demersal shelf rockfish	SEO	560	450	280	450	0
Atka mackerel	GW	4,700	600	2,350	232	0
Subtotal		567,596	251,841	296,927	225,124	0
Other species (4)	GW	28,380	12,592	14,846	11,256	0
Total		595,976	264,433	311,773	236,380	0

Notes

1. WYK/C/W ABC is reduced by the GHL established for the PWS 2003 pollock fishery.
2. Pacific cod apportionments are reduced by the GHLs established for the 2003 state waters seasons Pacific cod fisheries in the GOA.
3. Sablefish ABCs in the Eastern GOA reflect a subtraction of 5% of the ABC apportionment from SEO District added to the WYK District so that 5 % of the combined ABC for the Eastern GOA may be allocated to trawl gear in the WYK District without affecting the 95% allocation to hook-and-line gear in the WYK and SEO Districts.
4. ABC for the other species assemblage is not specified, rather TAC is set at 5% of the combined total of other groundfish TACs.

2.4 Council December 2003 Action

The North Pacific Fishery Management Council met in December 2003, and after hearing staff reports, the reports of its Advisory Panel (AP) and its Scientific and Statistical Committee (SSC), and public testimony, recommended the following OFL, ABC, and TAC levels for the groundfish species.

Table 2.4-1 Council's recommended BSAI OFLs, ABCs and TACs (in metric tons)

Species	Area	OFL	ABC	TAC	ITAC[2]	CDQ reserve[3]
Pollock[4]	Bering Sea (BS)	2,740,000	2,560,000	1,492,000	1,342,800	149,200
	Aleutian Islands (AI)	52,600	39,400	1,000	1,000	....
	Bogoslof District	39,600	2,570	50	50	....
Pacific cod	BSAI	350,000	223,000	215,500	183,175	16,163
Sablefish[5]	BS	4,020	3,000	2,900	2,393	399
	AI	4,620	3,450	3,100	2,519	523
Atka mackerel	Total	78,500	66,700	63,000	53,550	4,725
	Western AI	....	24,360	20,660	17,561	1,550
	Central AI	....	31,100	31,100	26,435	2,333
	Eastern AI/BS	....	11,240	11,240	9,554	843
Yellowfin sole	BSAI	135,000	114,000	86,075	73,164	6,456
Rock sole	BSAI	166,000	139,000	41,000	34,850	3,075
Greenland turbot	Total	19,300	4,740	3,500	2,975	263
	BS	....	3,162	2,700	2,295	203
	AI	....	1,578	800	680	60
Arrowtooth flounder	BSAI	142,000	115,000	12,000	10,200	900
Flathead sole	BSAI	75,200	61,900	19,000	16,150	1,425
Other flatfish[6]	BSAI	18,100	13,500	3,000	2,550	225
Alaska plaice	BSAI	258,000	203,000	10,000	8,500	750
Pacific ocean perch	BSAI	15,800	13,300	12,580	10,693	944
	BS	....	2,128	1,410	1,199	106
	AI Total	....	11,172	11,172	9,496	838
	Western AI	....	5,187	5,187	4,409	389
	Central AI	....	2,926	2,926	2,487	219
	Eastern AI	....	3,059	3,059	2,600	229
Northern rockfish	BSAI	8,140	6,880	5,000	4,250	375
Shortraker rockfish	BSAI	701	526	526	447	39
Rougheye rockfish	BSAI	259	195	195	166	15
Other rockfish[7]	BS	1,280	960	460	391	35
	AI	846	634	634	539	48
Squid	BSAI	2,620	1,970	1,275	1,084	96
Other species[8]	BSAI	81,150	46,810	27,205	23,124	2,040
TOTAL		4,193,736	3,620,535	2,000,000	1,774,570	187,696

1 These amounts apply to the entire BSAI management area unless otherwise specified. With the exception of pollock, and for the purpose of these specifications, the Bering Sea subarea includes the Bogoslof District.

2 Except for pollock and the portion of the sablefish TAC allocated to hook-and-line and pot gear, 15 percent of each TAC is put into a reserve. The ITAC for each species is the remainder of the TAC after the subtraction of these reserves.

3 Except for pollock, squid, and the hook-and-line or pot gear allocation of sablefish, one half of the amount of the TACs placed in reserve, or 7.5 percent of the TACs, is designated as a CDQ reserve for use by CDQ participants (see §§ 679.20(b)(1)(iii) and 679.31).

4 Under § 679.20(a)(5)(i)(A)(1), the annual Bering Sea pollock TAC, after subtraction for the CDQ reserve - 10 percent and the ICA - 3.0 percent, is further allocated by sector as directed fishing allowances as follows: inshore - 50 percent; catcher/processor - 40 percent; and motherships - 10 percent. The entire Aleutian Islands and Bogoslof District pollock ITAC is allocated as an incidental catch allowance.

5 The ITAC for sablefish reflected in Table 1 is for trawl gear only. Regulations at § 679.20(b)(1) do not provide for the establishment of an ITAC for the hook-and-line and pot gear allocation for sablefish. Twenty percent of the sablefish TAC allocated to hook-and-line gear or pot gear and 7.5 percent of the sablefish TAC allocated to trawl gear is reserved for use by CDQ participants (see § 679.20(b)(1)(iii)).

6 "Other flatfish" includes all flatfish species, except for halibut (a prohibited species), flathead sole, Greenland turbot, rock sole, yellowfin sole, arrowtooth flounder and Alaska plaice.

7 "Other rockfish" includes all Sebastes and Sebastolobus species except for Pacific ocean perch, northern, shortraker, and rougheye rockfish.

8 "Other species" includes sculpins, sharks, skates and octopus. Forage fish, as defined at § 679.2, are not included in the "other species" category.

Table 2.4-2 Council's recommended GOA OFLs, ABCs and TACs (in metric tons)

Species	Area[1]	ABC	TAC	Overfishing
Pollock[2]				
Shumagin	(610)	22,930	22,930	
Chirikof	(620)	26,490	26,490	
Kodiak	(630)	14,040	14,040	
WYK	(640)	1,280	1,280	
Subtotal	W/C/WYK	64,740	64,740	91,060
SEO	(650)	6,520	6,520	8,690
Total		71,260	71,260	99,750
Pacific cod[3]				
	W	22,610	16,957	
	C	35,800	27,116	
	E	4,400	3,960	
Total		62,810	48,033	102,000
Flatfish[4] (deep-water)	W	310	310	
	C	2,970	2,970	
	WYK	1,880	1,880	
	SEO	910	910	
Total		6,070	6,070	8,010
Rex sole	W	1,680	1,680	
	C	7,340	7,340	
	WYK	1,340	1,340	
	SEO	2,290	2,290	
Total		12,650	12,650	16,480
Flathead sole	W	13,410	2,000	
	C	34,430	5,000	
	WYK	3,430	3,430	
	SEO	450	450	
Total		51,720	10,880	64,750
Flatfish[5] (shallow-water)	W	21,580	4,500	
	C	27,250	13,000	
	WYK	2,030	2,030	
	SEO	1,210	1,210	
Total		52,070	20,740	63,840

Table 1. (continued)

Species	Area[1]	ABC	TAC	Overfishing
Arrowtooth	W	23,590	8,000	
flounder	C	151,840	25,000	
	WYK	10,590	2,500	
	SEO	8,910	2,500	
Total		194,930	38,000	228,130
Sablefish[6]	W	2,930	2,930	
	C	7,300	7,300	
	WYK	2,550	2,550	
	SEO	3,770	3,770	
Subtotal	E	6,320	6,320	
Total		16,550	16,550	22,160
Pacific[7]	W	2,520	2,520	2,990
ocean	C	8,390	8,390	9,960
perch	WYK	830	830	
	SEO	1,600	1,600	
Subtotal	E			2,890
Total		13,340	13,340	15,840
Short	W	254	254	
raker/	C	656	656	
rougheye[8]	E	408	408	
Total		1,318	1,318	2,510
Other	W	40	40	
rockfish	C	300	300	
[9,10]	WYK	130	130	
	SEO	3,430	200	
Total		3,900	670	6,610
Northern	W	770	770	
Rockfish[10,12,15]	C	4,100	4,100	
	E	N/A	N/A	
Total		4,870	4,870	5,790
Pelagic	W	370	370	
shelf	C	3,010	3,010	
rockfish[13]	WYK	210	210	
	SEO	880	880	
Total		4,470	4,470	5,570
Thornyhead	W	410	410	
rockfish	C	1,010	1,010	
	E	520	520	
Total		1,940	1,940	2,590

Table 1. (continued)

Species	Area[1]	ABC	TAC	Overfishing
Demersal shelf rockfish[11]	SEO	450	450	690
Atka mackerel	GW	600	600	6,200
Other[14] species	GW	N/A	12,592	N/A
TOTAL[16]		498,948	264,433	649,460

1. Regulatory areas and districts are defined at § 679.2.
2. Pollock is apportioned in the Western/Central Regulatory areas among three statistical areas. During the A season, the apportionment is based upon an adjusted estimate of relative distribution of pollock biomass at 23.62 percent, 56.9 percent, and 19.48 percent in Statistical Areas 610, 620, and 630, respectively. During the B season the apportionment is based on the relative distribution of pollock biomass at 23.62 percent, 64.47 percent, and 8.91 percent in Statistical Areas 610, 620, and 630, respectively. During the C and D seasons pollock is apportioned based on the relative distribution of pollock biomass at 48.64 percent, 21.3 percent, and 30.6 percent in Statistical Areas 610, 620, and 630, respectively. These seasonal apportionments are shown in Table 3. In the West Yakutat and Southeast Outside Districts of the Eastern Regulatory Area, pollock is not divided into seasonal allowances.
3. The annual Pacific cod TAC is apportioned 60 percent to an A season and 40 percent to a B season in the Western and Central Regulatory Areas of the GOA. Pacific cod is allocated 90 percent for processing by the inshore component and 10 percent for processing by the offshore component. Seasonal apportionments and component allocations of TAC are shown in Table 4.
4. "Deep water flatfish" means Dover sole, Greenland turbot, and deepsea sole.
5. "Shallow water flatfish" means flatfish not including "deep water flatfish," flathead sole, rex sole, or arrowtooth flounder.
6. Sablefish is allocated to trawl and hook-and-line gears (Table 2).
7. "Pacific ocean perch" means Sebastes alutus.
8. "Shortraker/rougheye rockfish" means Sebastes borealis (shortraker) and S. aleutianus (rougheye).
9. "Other rockfish" in the Western and Central Regulatory Areas and in the West Yakutat District means slope rockfish and demersal shelf rockfish. The category "other rockfish" in the Southeast Outside District means Slope rockfish.
10. "Slope rockfish" means Sebastes aurora (aurora), S. melanostomus (blackgill), S. paucispinis (bocaccio), S. goodei (chilipepper), S. crameri (darkblotch), S. elongatus (greenstriped), S. variegatus (harlequin), S. wilsoni (pygmy), S. babcocki (redbanded), S. proriger (redstripe), S. zacentrus (sharpchin), S. jordani (shortbelly), S. brevispinis (silvergrey), S. diploproa (splitnose), S. saxicola (stripetail), S. miniatus (vermilion), and S. reedi (yellowmouth). In the Eastern GOA only, “slope rockfish” also includes northern rockfish, S. polyspinous.
11. "Demersal shelf rockfish" means Sebastes pinniger (canary), S. nebulosus (china), S. caurinus (copper), S. maliger (quillback), S. helvomaculatus (rosethorn), S. nigrocinctus (tiger), and S. ruberrimus (yelloweye).
12. "Northern rockfish" means Sebastes polyspinis.
13. "Pelagic shelf rockfish" means Sebastes ciliatus (dusky), S. entomelas (widow), and S. flavidus (yellowtail).
14. "Other species" means sculpins, sharks, skates, squid, and octopus. The TAC for "other species" equals 5 percent of the TACs of assessed target species.
15. N/A means not applicable.
16. The total ABC and OFL is the sum of the ABCs and OFLs for assessed target species.

3.0 Affected Environment

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 2003 TAC specifications EA. The Record of Decision in that action was affirmation of the status quo alternative for TAC-setting which were 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. For more information see the www.fakr.noaa.gov/notice/seisgndf.PDF website.

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 were promulgated by 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). For more information see the www.fakr.noaa.gov/sustainablefisheries/ea/tac2003/EAFRFA013103.pdf website.

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 have been promulgated through proposed and final rulemakings in accordance with Magnuson-Stevens Act procedures. For more information see the www.fakr.noaa.gov/sustainablefisheries/seis/sslpm/default.htm website.

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. For more information see the www.fakr.noaa.gov/sustainablefisheries/afa/final_eis/executivesummary.pdf website.

Groundfish Programmatic EIS A programmatic SEIS is being prepared to evaluate the fishery management policies embedded in the BSAI and GOA groundfish FMPs against policy level alternatives. The Alaska Groundfish Fisheries Revised Draft Programmatic Supplemental Environmental Impact Statement (PSEIS) was made available for public review and comment from August 29-November 6, 2003 (NMFS 2003b). For more information see the http://www.fakr.noaa.gov/sustainablefisheries/seis/default.htm website.

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

The other NEPA documents listed above 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. Additionally, the Ecosystem Considerations section of the 2003 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 the alternatives.

4.0 Environmental Effects

4.1 Significance Criteria

This section forms the scientific and analytic basis for the comparisons across alternatives and options. Each alternative and option under consideration is perceived as having the potential to affect one or more components of the human environment. Significance of the effect is determined by considering the context in which the action will occur and the intensity of the action. The context in which the action will occur includes the specific resources, ecosystem, and the human environment affected. The intensity of the action includes the type of impact (beneficial versus adverse), duration of impact (short versus long term), magnitude of impact (minor versus major), and degree of risk (high versus low level of probability of an impact occurring). Further tests of intensity include: (1) the potential for compromising the sustainability of any target or non-target species; (2) substantial damage to marine habitats and/or essential fish habitat; (3) impacts on public health or safety; (4) impacts on endangered or threatened species, or critical habitat of listed species; (5) cumulative adverse effects; (6) impacts on biodiversity and ecosystem function; (7) significant social or economic impacts; and (8) degree of controversy (NAO 216-6, Section 6.02).

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

The intent of TAC setting deliberations is to strike an informed balance between amounts of fish taken by these fisheries during fishing year 2004, and amounts left swimming in the water. The effects of the alternatives are evaluated for all resources, species, and issues that may directly or indirectly interact with these fisheries within the action area as a result of TAC levels set. The direction of impact intensity applies to the particular resource, species, or issue being evaluated (as opposed to always applying to the target species).

Each section below contains an explanation of the significance criteria. The following ratings for significance are used; beneficial significance, adverse significance, insignificant, and unknown. Where sufficient information on direct and indirect effects is available, rating criteria are quantitative in nature. In other instances, where less information is available, the discussions and rating criteria used are qualitative in nature. In instances where criteria to determine an aspect of significance (significant adverse, insignificant, or significant beneficial) do not logically exist, no criteria are noted. These situations are termed “not applicable” in the criteria tables.

An example of an instance where criteria do not logically exist, is the evaluation of incidental take on a declining stock of marine mammals. In that situation, an increase in incidental take that caused a downward change in the population trajectory by greater than 10% is significant adverse. Any level below that which would have an effect on population trajectories is insignificant because the stock is continuing to decline regardless of fishery effects. There is no logical significant beneficial alternative (a reduction in take resulting in a beneficial effect on the population trajectory). Therefore, a criterion for significant beneficial is not applicable (NMFS 2003b).

The rating terminology used to determine significance is the same for each resource, species, or issue being treated, however, the basic “perspective” or “reference point” differs depending on the resource, species or issue being treated. Table 4.1-1 summarizes the reference points for the topics addressed in this analysis. The first four reference points relate to the biological environment, while the latter two are associated with the human environment. For each resource or issue evaluated, specific questions were considered in the analysis. In each case, the questions are fundamentally tied to the respective reference point. The generic definitions for the assigned ratings are as follows:

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

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

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

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

NE No effect is anticipated from implementation of the action.

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)

4.2 Effects on Target Species

Assessing the effects of each alternative on target commercial fish species was accomplished by asking the following questions with respect to each of the five alternatives for each target species or species group for which a TAC amount is being specified:

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).

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 (SAFE) 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 Table 4.2-1.

The general impacts of fishing mortality within FMP Amendment 56/56 ABC/OFL definitions are discussed in Section 4.1.3 of the Draft 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 and results in no directed fisheries when the spawning biomass is estimated to be less than 20% of the projected unfished spawning biomass. This new harvest control rule was evaluated in the Steller Sea Lion Protection Measures SEIS (NMFS 2001b).

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.

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 target species stocks that have calculated MSSTs (Tiers 1 through 3) are currently above their MSSTs and the expected changes that would result from harvest at the levels proposed are not substantial enough to change the genetic diversity or reproductive success of these stocks. None of the alternatives would allow overfishing of the spawning stock. Therefore the genetic integrity and reproductive potential of the stocks should be preserved.

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, because the following significance criteria are met: (1) they would not be expected to jeopardize the capacity of the stock to produce maximum sustainable yield on a continuing basis; (2) they would not 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) they would not alter harvest levels such that it jeopardizes the ability of the stock to sustain itself at or above the minimum stock size threshold; (4) they would not 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) they would not 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 groups stock assessments in the SAFE reports (Appendices A and B) for additional information and documentation of this year’s assessment process. Impacts of Alternative 5, under which no fishing is allowed, have been rated “positively significant.”

Table 4.2-1 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

Intensity of the Effects				
Direct Effects	Significant Adverse	Unknown	Insignificant Impact	Significant Beneficial
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

4.3 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 Draft PSEIS (NMFS 2003b)). 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 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 Draft PSEIS (NMFS 2003b).

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 a 2003 trajectory or rate. 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 bycatch amount 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 2004.”

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 which constrain target harvests relative to those in 2003 are assume to reduce non-specified species harvests relative to 2003, 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 2003. Alternatives 3 and 4 are associated with lower harvests than in 2003, 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. 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.

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, 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. 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 2003 are assumed to reduce forage fish harvests relative to 2003, 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 2003. Alternatives 3 and 4 are associated with lower harvests than in 2003, 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. 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

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

target harvests is assumed to end forage fish harvests as well, and has been given a “positively significant” rating.

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, Tanner, and snow crab. The most recent review of the status of crab stocks may be found in the 2002 Crab SAFE report (Council 2002).

Based on this most recent survey NMFS has determined that the Pribilof Islands stock of blue king crab is below the MSST for this stock of 2,994 mt of total mature biomass and is thus overfished. NMFS, as required by section 304(e), notified the Council by letter September 23, 2002, that the Pribilof Islands blue king crab stock is overfished and that the Council must develop a rebuilding plan within one year (67 *FR* 62212, October 4, 2002). The Council took final action on the Pribilof Blue King Crab Rebuilding Plan, Amendment 17 to the BSAI King and Tanner Crab FMP, in October 2003. The Council’s preferred alternative would not allow for commercial fishing prior to the stock being completely rebuilt to B_{MSY} (5,987 mt). The most recent review of the status for the other prohibited species is in Section 3.5 of the Steller Sea Lion Protection Measures SEIS (NMFS 2001b) and in the Draft PSEIS (NMFS 2003b).

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 Section 3.5 of the Steller Sea Lion SEIS (NMFS 2001b) and in a review paper by Witherell and Pautzke (1997).

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.

Criteria used to estimate effects on stocks of prohibited species in the BSAI and GOA.

These criteria are summarized in Table 4.5-1.

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 ensure long term sustainable yields. When escapement levels are low, commercial fishing activities are curtailed; when 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 benchmark used to determine the significance of effects under each alternative on salmon stocks was whether or not salmon minimum escapement needs would reasonably be 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; and where insufficient information exists to make such conclusions, the alternative’s effects were rated unknown.

The impact of the groundfish fisheries on 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). No new information is available on the effects of the groundfish fisheries on listed salmon beyond that used for the FMP level Biop. (NMFS 2000a). The 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 December 6, 2003 in the BSAI was 44,767 fish. Chinook salmon incidental catch in the GOA fisheries through December 6, 2003 was 15,435 fish. Incidental catch in both areas are well below the amounts authorized. Similar levels of incidental take of salmon during the groundfish fisheries are expected for the 2004 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 was initiated on salmon because these actions fall within the scope of previously analyzed actions and no additional adverse effects are expected and no new information is available or environmental changes have occurred.

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 personal 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 long term reproductive potential of the halibut stock, this impact on average is estimated to reduce the reproductive potential of the halibut stock by 1.7 pounds for each 1 pound of halibut mortality in the groundfish fisheries. These impacts are discussed by Sullivan *et. al.* (1994).

The benchmark used to determine the significance of effects under each alternative on the halibut stock was whether or not incidental catch of halibut in the groundfish fisheries would reasonably be expected to lower the total CEY of the halibut stock below the long term estimated yield of 36,287 mt. If the alternative was reasonably not expected to decrease the total CEY of the halibut stock below the long term estimated yield of 36,287 mt 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 36,287 mt it was rated significantly adverse, and where insufficient information exists to make such conclusions the alternative’s effects were rated unknown.

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 inseason based on additional survey information to insure long term sustainable yields. The ADF&G have established minimum spawning biomass thresholds for herring stocks that must be met before a commercial fishery may occur.

The benchmark used to determine the significance of effects under each alternative on herring stocks was whether minimum spawning biomass threshold levels could 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; and where insufficient information exists to make such conclusions the alternative’s effects were rated unknown.

Alaska king, Tanner, and snow crab stocks in the BSAI are protected by area trawl closures and PSC limitations. Minimum stock size thresholds (MSST) have been established for these crab species stocks to help prevent overfishing. The benchmark used to determine the significance of effects under each alternative on crab stocks was whether MSST levels would reasonably be expected to be maintained. 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, and where insufficient information exists to make such conclusions the alternative's effects were rated unknown.

Criteria used to estimate effects 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 2002 levels the effect was rated significantly beneficial or adverse respectively. 2002 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 2002 are similar to those for 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 2002 levels (Table 4.5-4), 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 4.5-2.

Criteria used to estimate effects 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. Under the Magnuson-Stevens Act, National Standard 9 directs that when a regional council prepares an FMP or FMP amendment 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.

In section 4.5 of the Steller Sea Lion Protection Measures SEIS (NMFS 2001b), the effects of alternatives designed to provide protection to the endangered western population Steller sea lions on prohibited species incidental catch levels in the pollock, Pacific cod, and Atka mackerel fisheries were examined using average catch for the period 1997 through 1999. The authors noted that in the BSAI pollock fishery the 1997 and 1999 average catch of halibut and crab was not expected to continue due to additional management measures to protect prohibited species that became effective in 1999. For this reason 2002 prohibited species incidental catch and directed groundfish catch is presented in this analysis for comparison to the groundfish TAC alternatives in Table 4.5-4.

Levels of incidental catch of prohibited species in each fishery in 2002 (Table 4.5-4) 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. 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 2002 levels (chosen as the benchmark year for purpose of comparison) 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 2002 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. These criteria are summarized in Table 4.5-3.

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 592,584 mt, which falls within the optimum yield range of 116,000 mt to 800,000. However, in the BSAI this would amount to 3,777,675 mt, which exceed 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 2004, 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. With these PSC limits unchanged from 2003 levels, incidental catch of prohibited species with PSC limitations would be not be expected to increase in 2004 from expected 2002 levels (Table 4.5-4).

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, which empty into the Bering Sea. However, for 2003, ADF&G has estimated that at least minimum escapement goals for these stocks will be met. 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. The most recent review of the effects of Alaska groundfish fisheries on Pacific salmon stocks in contained in the Draft PSEIS (2003b).

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% of current biomass estimates in the BSAI, and the low volume of herring bycatch in the GOA (1997 through 1999 average 13 mt (NMFS 2003b)), 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. Incidental catch in 2002 was a total of 48 red king crab and 185,220 Tanner crab (Table 4.5-4)). Information on the abundance of red king crab in the GOA is limited by the lack of survey information. The 2001 survey of Tanner crab in the GOA yielded an estimate of 175.9 million crab (NMFS 2003b). The incidental catch of 185,220 Tanner crab in 2002 represents approximately 0.1% of this amount. 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 adverse 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.

Due to the low numbers of salmon incidentally taken 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, see 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 of 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 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 2003 assessment of Pacific halibut for the 2004 fishing year, the IPHC staff made a preliminary commercial catch recommendation for Alaska of 37,413 mt, round weight. If the combined halibut PSC limits in Alaska, totaling 6,825 mt, were reached (6,337 mt in 2002 Table 4.5-4) this would represent a reduction in the amount of the total CEY available to the directed fishery of about 18%, and as such 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.

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.

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 groundfish 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. Similarly, 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 2004 are similar to 2002 levels in the BSAI and GOA (Table 4.5-4), for TAC levels under Alternative 1 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 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

Under Alternative 2, TACs would be set at levels recommended by the Council at its December 2003 meeting. In the BSAI this would amount to 2,000,000 mt and in the GOA to 264,433 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. 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.

In section 3.5.2 of the Draft PSEIS (NMFS 2003b) anticipated changes in the incidental catch of prohibited species under each alternative considered in the Draft PSEIS are discussed. In section 4.5.1.4 the Steller sea lion Protection Measures SEIS (NMFS 2001b), the effects of the preferred alternative in the Steller sea lion Protection Measures SEIS 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 decline by 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 2004 are similar to 2002 levels in the BSAI (Table 4.5-4), for 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 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 2004 are similar to 2002 levels in the GOA (Table 4.5-4), for 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

Under Alternative 3, catch quotas would be set for 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 the $maxF_{abc}$ level for stocks at or below the Tier 4 level. In the BSAI this would amount to 2,049,790 mt, and in the GOA to 311,773 mt, very close to the current 2003 total catch. 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. 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 that are permitted to target prohibited species.

Assuming incidental catch rates of prohibited species in 2004 are similar to 2002 levels in the BSAI (Table 4.5-4), for 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 section 4.5.2.4 of 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 was estimated to range from an increase of up to 15% (Tanner crab in the pollock fishery), to a decease of 11% (other salmon in the pollock fishery) for TACs set at 2000 levels.

In combination with TAC recommendations, annual halibut PSC limits, seasonal and fishery specific PSC apportionments, and incidental catch rates unchanged from 2002 in the different fisheries (Table 4.5-4), 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

Under Alternative 4, catch quotas would be set at levels equal to 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. This distinction between stocks at different tiers is necessary since fishing rates are not available for stocks in Tier 4 or below. In the BSAI this would amount to 1,655,153 mt and in the GOA to 236,380 mt, and the BSAI amount is below and the GOA amount is above current total catch in 2003. 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. 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.

In combination with TAC recommendations and seasonal and fishery specific PSC apportionments, and assuming incidental catch rates in the different fisheries unchanged from 2002 (Table 4.5-4), the total incidental catch of each prohibited species group would not be expected to increase or decrease by more than 50%. In section 4.5.2.4 of 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 was 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. The effect of the preferred alternative in this analysis on levels of incidental catch of prohibited species in the groundfish fisheries is, therefore, rated insignificant (Table 6-1) 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; the effect of this alternative would be to close directed fishing for groundfish for the 2004 year. Alternative 5 would 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 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 beneficial (Table 6.0-1).

Table 4.5-1 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

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.

Table 4.5-2 Criteria used to estimate the significance of effects on of harvest levels in state managed directed fisheries targeting stocks of prohibited species in the BSAI and GOA

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

Table 4.5-3 Criteria used to estimate the significance of effects on bycatch levels of prohibited species in directed groundfish fisheries in the BSAI and GOA

Effect	Significantly Adverse	Insignificant	Significant Beneficial	Unknown
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

Table 4.5-4 Catch of Groundfish and Prohibited Species in the Groundfish Fisheries in the BSAI and GOA in 2002 by Target, Area, and Gear Type

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	43,759	49	7	229	800	10
Pacific cod	86,381	1,128	270,263	20,253	3,267	921
Other flatfish	1,318	25	1,569	0	0	15
Flathead sole	21,298	227	210,167	243	0	121
Rock sole	41,474	723	366,394	62,870	675	31
Greenland turbot	436	1	731	0	0	0
Arrowtooth	2,799	47	7,222	0	90	25
Yellowfin sole	114,607	1,017	272,175	22,692	321	445
Rockfish	11,547	68	199	0	0	0
Sablefish	0	0	0	0	0	0
Other species	82	1	210	0	0	19
Pollock (bottom)	5,374	11	1,461	11	131	66
Pollock (midwater)	1,298,094	127	653	6	32,271	77,111
Non-retained Groundfish	0	0	0	0	0	0
Total	1,627,169	3,424	1,101,051	106,304	37,555	78,764

Table 4.5-4 Catch of Groundfish and Prohibited Species in the Groundfish Fisheries in the BSAI and GOA in 2002 by Target, Area, and Gear Type (Continued)

Target	Total Catch[1] (mt)	Numbers of Snow crab[2]	Herring (mt)
Rock sole, flathead sole, and other flatfish	64,090	106,763	4
Pacific cod	86,381	93,923	3
Pollock, Atka mackerel, and other species	1,347,309	1,636	108
Yellowfin sole	99,213	680,476	19
Rockfish	9,713	0	0
Greenland turbot, sablefish, and arrowtooth	4,233	170	0
Total	1,627,169	882,967	134

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	110,635	585	17,386	26,497	23	54
Greenland turbot	2,493	49	64	7	3	45
Sablefish	2,534	Not Available	6	0	0	0
Rockfish	18	1	0	0	0	0
Other species	29	6	0	0	0	0
Arrowtooth	43	0	0	0	0	0
Non-retained groundfish	1	0	0	0	0	0
Total	115,753	641	17,456	26,504	26	105

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	15,879	5	81,297	973	0	0
Sablefish	252	3	95	0	0	6
Total	16,131	8	81,392	973	0	6

Table 4.5-4 Catch of Groundfish and Prohibited Species in the Groundfish Fisheries in the BSAI and GOA in 2002 by Target, Area, and Gear Type (Continued)

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	1,759,053	4,073	1,229,899	133,781	37,581	78,875

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	15,222	193	4,907	0	4,065	29
Deep water flatfish	543	24	185	0	0	0
Rex sole	7,923	310	7,198	0	1,593	64
Flathead sole	2,719	56	26,924	17	0	75
Shallow water flatfish	13,867	842	33,914	3	462	555
Arrowtooth	13,349	323	14,626	0	388	807
Rockfish	20,785	242	905	0	1,250	894
Other species	7	1	0	0	0	0
Sablefish	157	1	0	0	0	0
Pollock (bottom)	10,252	25	774	0	1,198	374
Pollock (midwater)	41,857	0	0	0	3,964	421
Total	126,681	2,017	89,433	20	12,920	3,219

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	15,557	239	18	18	0	0
Rockfish	421	4	0	0	0	0
Other species	20	2	3	0	0	0
Deep water flatfish	3	0	0	0	0	0
Total[4]	16,001	245	21	18	0	0

Table 4.5-4 Catch of Groundfish and Prohibited Species in the Groundfish Fisheries in the BSAI and GOA in 2002 by Target, Area, and Gear Type

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	7,929	2	95,766	0	0	0
Other species	59	0	0	0	0	0
Total	7,988	2	95,766	0	0	0

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	150,670	2,264	185,220	48	12,920	3,225

Source: NMFS 2001 Blend Data
Notes:
1 Total catch includes all groundfish harvested, the targeted species as well as incidental catch of all other groundfish.
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 total catch for hook-and-line gear in the GOA does not include catch in the sablefish fishery as estimates of prohibited species catch are not available.

4.6 Effects on Marine Mammals and ESA Listed Marine Mammals

Marine mammals were considered in groups that include: ESA listed Steller sea lions, ESA listed great whales, other cetaceans, northern fur seals, harbor seals, other pinnipeds, and sea otters. Direct and indirect interactions between marine mammals and groundfish harvest 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 2004 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. Criteria for determining significance are contained in Table 4.1-1. Significance ratings for each question are summarized in Table 4.6-1.

ESA listed Steller sea lions also have further significance criteria based on the Steller sea lion protection measures. These measures require the global 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 is also specified for these prey species at 50 CFR 679.20(a)(5), (a)(7) and (a)(8). 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 consultation would be required. The level of significance will depend on the result of the consultation. A determination of the action being not likely to cause jeopardy or adverse modification of critical habitat would result in an insignificant impact determination in this analysis.

For ESA listed marine mammals, the western distinct population segment (DPS) of Steller sea lions were the only species that were determined to potentially be adversely affected by the groundfish fisheries. (FMP BiOp, NMFS 2000a). 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 consultations on Steller sea lions. Steller sea lion protection measures are implemented as part of the harvest specifications so that no adverse effects on ESA listed mammals are expected with the final 2004 harvest specifications beyond those effects previously analyzed.

Direct Effects - 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 catch disproportionate with fishing effort. It is, therefore, appropriate to estimate catch ratios based on estimated TAC. The projected level of take under all proposed TAC alternatives is below that which would have an effect on marine mammal population trajectories. Under Alternative 5, the no fishing alternative, incidental take will not occur, but marine debris may still be present posing an entanglement risk even with the fisheries not operating. Therefore, incidental bycatch frequencies are determined to be insignificant under all alternatives proposed.

Indirect Effects - Spatial and Temporal Concentration of Fishery

Spatial and temporal concentration effects by these fisheries have just been analyzed and modified to comply with Endangered Species Act (ESA) considerations for Steller sea lions (NMFS 2001b). The criteria for insignificant effect determination is based on the assumption of the Steller sea lion protection measures analysis and section 7 biological opinion that the fishery as modified by Steller Sea Lion Protection Measures mitigates the impacts (Table 6.0-1). That determination applies to all marine mammal species in the affected management areas. Alternatives 1-4 would be conducted according to these protection measures and the impacts are expected to be insignificant. Alternative 5 would cease fishing, removing temporal and spatial concentration of fishing and would therefore have a significantly beneficial effect.

Proposed changes to the seasonal management of Western and Central GOA Pacific cod were recommended by NMFS to the Steller sea lion Mitigation Committee in 2003. The management of GOA Pacific cod is seasonally apportioned with 60 percent available in the A season (January -June 10) and 40 percent in the B season (Sept. 1-Nov. 1). Regulations require the incidental catch of Pacific cod taken between the A season and the B season to be taken from the B season apportionment (50 CFR 679.20(a)(11)(iii)). In 2003, the incidental and discard catch of Pacific cod between the closure of the directed fishery in the A season (March) and the opening of the B season (Sept. 1) directed fishery was deducted from the B season TAC. This resulted in very little TAC available for a B season directed fishery and more than 70 percent of the TAC taken before June 10.

For 2004, NMFS proposes to establish an A season directed fishing allowance (DFA) for the Pacific cod fisheries in the GOA based on the management area TACs less the recent average A season incidental catch of Pacific cod in each management area before June 10. The DFA and incidental catch before June 10 will be managed such that harvest in the A season will be no more than 60 percent of the annual TAC. Incidental catch taken after June 10 will continue to be taken from the B season TAC. NMFS believes that this action would better reflect the intention of the Steller Sea Lion Protection Measures. NMFS believes that this action would reduce the likelihood of harvest exceeding 60% of the annual TAC in the A season (January 1 through June 10). The Council will continue to explore and analyze management alternatives for the Pacific cod fisheries through its Steller Sea Lion Mitigation Committee and in the development of its Gulf Rationalization Plan.

Indirect Effect- 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 analysis of the harvest control rule is in the Steller sea lion protection measures SEIS (NMFS 2001b). Alternatives 1-4 do not allow directed fishing if the spawning biomass of pollock, Pacific cod, or Atka mackerel fall below 20 % of the unfished spawning biomass, and therefore, would have insignificant impacts on the global availability of prey species. Concerns regarding GOA pollock biomass is further explained below. Even with no fishing under Alternative 5, it is unknown if the reduction in harvest would lead to increased availability of prey overall so the effect from Alternative 5 is unknown.

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 was provided to the GOA Plan Team at its September 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. Overall, the total GOA biomass is estimated to be similar to last year with mixed results found at the various survey locations.

Indirect Effects - 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, 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, 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, we assume at least some protection is provided from these disturbance effects.

The criterion set for insignificant impacts is a similar level of disturbance as that which was occurring in 2001. Thus, the effect under alternatives 1-4 is insignificant according to the criteria set for significance (Table 4.6-1). 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.

Because of the recent 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). Funding has not been available to develop proposed rule making for listing the sea otter under the ESA. 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. The USFWS is continuing to evaluate the sea otter under both the ESA and MMPA. 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. All alternatives for setting 2004 TAC specifications will have insignificant impacts on northern sea otter.

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

Table 4.6-1 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	Spatial concentration of fishery as modified by SSL Protection Measures	Much less temporal and spatial concentration of fishery in all key areas	Insufficient information as to what constitutes a key area
Global harvest of prey species**	Harvest level exceeds harvest control rule likely to cause JAM* determination.	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)	Similar level of disturbance as that which was occurring in 2001	Much less disturbance by groundfish fishery.	Insufficient information as to what constitutes disturbance

*jeopardy of extinction or adverse modification or destruction of critical habitat
** applies to western DPS of Steller sea lions.

4.7 Effects on Seabirds

The five alternatives in this EA set the catch quota, by target species and region, equal to variably defined levels of fishing mortality rates used to set the ABC. Alternative 5 sets harvest equal to zero. Impacts of fishery management on seabirds are difficult to predict due to the lack of information for many aspects of seabird ecology. A summary of known information, both general and species-specific, was presented in the Draft 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 Draft PSEIS alternative on seabirds is provided in sections 4.5 through 4.8, followed by an analysis of the preliminary preferred alternative effects on seabirds (Section 4.9.7, NMFS 2003b). The significance determinations of analysis performed in this EA are summarized in Table 6.0-1.

Seabird Groups and Effects to Consider: Given the sparse information, it is not likely that the fishery effects on most individual bird species are discernable. 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.

Direct Effects - Incidental take The effects of incidental take of seabirds (from fishing gear and vessel strikes) are described in Section 3.7.1 of the Draft PSEIS (NMFS 2003b). 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 Draft PSEIS (NMFS 2003b), 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 2003b). 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 Draft PSEIS (NMFS 2003b). 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.

Indirect Effects - 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 Draft PSEIS (NMFS 2003b). 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 2003b; 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.

Indirect Effects - Benthic habitat The fishery effects on benthic habitat are described in Section 3.6.4 of the Draft PSEIS (NMFS 2003b). 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 2003b). 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.

Indirect Effects - 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 4.7-1 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.

Effects of Alternative 1 on Seabirds

Direct Effects - Incidental take In as much as Alternative 1 could increase fishing effort by setting the quota for harvest to $maxF_{ABC}$, it has the potential to increase interactions with those seabird species prone to incidental bycatch. The Draft PSEIS (NMFS 2003b) 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 conditionally significant negative 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, the effect 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. Other seabird species are not likely to be affected significantly by this amount fishing effort since they are not subject to incidental take in the groundfish fisheries.

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 analysis and modeling necessary to make a determination in future EA on TAC alternatives on these three species.

Indirect Effects - Prey (forage fish) abundance and availability The Draft 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 2003b). 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.

Indirect Effects - Benthic habitat Increased disturbance of the benthic habitat could potentially affect those seabirds that are primarily benthic feeders, including the eiders. The eider's dependence on benthic crustacea, which could be affected by greater trawling effort, could result in a conditionally significant negative affect on eiders. However, spatial overlap between fisheries and eider forage areas are limited, and the population level effects are unknown. Other seabirds that also utilize demersal fish or small invertebrates and crustacea include cormorants and guillemots. These latter seabird groups are generalists and can utilize a variety of other fish species, thus the application of Alternative 1 is not likely to affect populations greater than current standards.

Indirect Effects - 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 conditionally 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

Direct Effects - 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 less than or equal to those of Alternative 1. 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.

Indirect Effects - 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.

Indirect Effects - Benthic habitat For benthic feeders, the impact of Alternative 2 on eiders is unknown, and for remaining seabirds, is considered insignificant.

Indirect Effects - 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

Direct Effects - 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 $F_{50\%}$ strategy., 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.

Indirect Effects - Prey (forage fish) abundance and availability For the reasons noted in the Draft PSEIS and summarized in NMFS 2001b, the potential indirect fishery effects on prey abundance and availability of Alternative 3 are considered insignificant or 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.

Indirect Effects - Benthic habitat A reduction of fishing effort could have a localized beneficial affect on some benthic habitats, but the level of reduction and areas affected are not likely to alter current population trends of seabirds. A possible exception are the exclusively benthic feeders, such as eiders and other seaducks, and thus the effect for this species group is unknown.

Indirect Effects - 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

Direct Effects - 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 produces a TAC that is lower than other alternatives (with the exception of Alternative 5). However, an important exception is the pollock fishery in the GOA, which under Alternative 4 is almost 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.

Indirect Effects - Prey (forage fish) abundance and availability For the reasons noted in the Draft PSEIS and summarized in the Steller Sea Lion Protectio Measures SEIS (NMFS 2001b), the potential indirect fishery effects on prey abundance and availability resulting from Alternative 4 are considered insignificant or unknown at the population level for all seabirds.

Indirect Effects - Benthic habitat The promulgation of fisheries under Alternative 4 could result in high fishing pressure in the pollock fishery in the GOA, thus potentially affecting benthic habitats. The population level effects of this level of fishing effort are unknown for those birds most dependent on benthic habitats, such as eiders and other seaducks.

Indirect Effects - 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

Direct Effects - 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 fishing activity. Thus, this alternative could have a conditionally 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 2003b). 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 draft Programmatic SEIS, the effect of the no fishing alternative for this Environmental Assessment 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 mitigation measures currently being deployed by a large portion of the groundfish longline fleet become a regulatory requirement, and 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.

Indirect Effects - Prey (forage fish) abundance and availability For the reasons noted in the Draft 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.

Indirect Effects - Benthic habitat Seabirds dependent on the benthic habitat, such as eiders and other seaducks, could potentially benefit from lack of fishing under Alternative 5. Because the population level effects of this action remain unknown, the effects of this alternative on eiders and seaducks is unknown.

Indirect Effects - Processing waste and offal Offal attracts birds to fishing operations and increases the possibility of takes by contact with the vessel and fishing gear. The elimination of fishery processing wastes could have a conditionally significant beneficial effect on northern fulmars by reducing takes. Similar effects might occur for albatrosses, shearwaters, and gulls. The degree to which these populations may benefit from reduced takes is not known since some bird populations may benefit from the food supply provided by offal and processing waste. This effect is rated unknown for fulmars, albatrosses, shearwaters, and gulls, and is insignificant for other seabird species.

Table 4.7-1 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.

Effects	Rating		
	Significant	Insignificant	Unknown
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.

4.8 Effects on Marine Benthic Habitat and Essential Fish Habitat Assessment

This section focuses on the effects of fishing on benthic habitat important to commercial fish species and their prey, for alternative TAC levels considered in the EA. This analysis also provides the information to support the assessment for the EFH (Essential Fish Habitat) consultation, which is required by the Magnuson-Stevens Act for any action that may adversely affect EFH. EFH consultation was initiated for the interim and final harvest specifications on October 22, 2003 (Salveson 2003).

Thorough information on marine habitat concerns and on the effects of fishing on benthic habitat is available in two analyses which have been prepared recently by NMFS. One is the Revised Draft Programmatic SEIS (Draft PSEIS) (NMFS 2003b), which is available online through the NMFS Alaska region homepage at http://www.fakr.noaa.gov/ and is also available in a CD which can be requested from NMFS. Several sections of the Draft PSEIS deal with EFH. Section 3.6 identifies EFH, 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. Section 4.1.1.2 explains the criteria for evaluating impacts. Table 4.1-4 summarizes these criteria. A habitat impacts model is presented in Section 4.1.6, and discussions of the Draft PSEIS' alternatives' probable effects on EFH is contained within the individual sections of Chapter 4 that are devoted to each alternative. Appendix A contains tables summarizing the effects of each alternative on habitat.

NMFS has also prepared a preliminary draft EIS for the EFH amendments to the Alaska region's FMPs. This draft EIS contains different alternatives for describing EFH and alternative approaches for HAPC identification, and presents several alternative management regimes designed to minimize the effects of fishing on EFH. The preliminary draft EIS for public review is available online, at http://www.fakr.noaa.gov, and on CD. It contains an analysis of the expected effects of each of these alternatives on EFH as well as on other facets of the environment and the human community.

The preliminary draft EFH EIS uses a somewhat different approach from the Draft PSEIS, and the differences are explained in Section 4.1.1.2 of the Draft PSEIS. Because of the way the alternatives in the PSEIS are structured, it seemed most relevant to follow the Draft PSEIS approach here and to predict effects based on rough equivalences between the Draft PSEIS alternatives and those in the 2004 TAC EA. However, our conclusion draws on the draft preliminary EFH EIS analysis as well.

The Draft PSEIS takes a precautionary approach to its analysis. The more common approach used in scientific research rigorously tests the null hypothesis of no effect, and only rejects that hypothesis if there is a very low probability of it being true (Type I error). The Draft PSEIS analysis on the other hand took the approach of decreasing the chance of accepting a hypothesis of no effect to habitat which might in fact be false (Type II error). This was considered more appropriate because very little data is available to detect fishing effects. A complete evaluation of effects requires detailed information on the distribution and abundance of habitat types, the life history of living habitat, habitat recovery rates, and the natural disturbance regime. Specific impacts for specific TAC levels and management approaches are very difficult to predict, given the limitations in our data.

The Draft 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.

These are summarized in Table 4.8-1 together with the criteria used for evaluating them.

The reference point, or baseline, against which the criteria are applied is the current size and quality of marine benthic habitat and other essential fish habitat.

The Draft PSEIS concludes that under Alternative 1, which would continue the current management regime, the direct/indirect effect of fishing would be insignificant, but the cumulative effects would be conditionally significant. Under Alternative 2, which would “establish a more aggressive harvest strategy while still preventing overfishing of target groundfish stocks,” the Draft PSEIS determined that some of the direct/indirect effects would be significantly adverse (in the case of changes to living habitat and benthic community structure) or conditionally significant adverse. Alternative 3 of the Draft PSEIS, which would adopt a more precautionary policy, is predicted to have a mixture of direct/indirect effects ranging from insignificant to significantly beneficial, although some of the cumulative effects are predicted to be conditionally significant adverse. Under Alternative 4, which would adopt a highly precautionary management policy, most of the direct/indirect effects on habitat are predicted to be significantly beneficial, but some of the cumulative effects are again predicted to be potentially adverse.

For the purpose of the TAC-setting analysis, we have set the TAC Alternative 1, the most aggressive management alternative, equivalent to Alternative 2.1 in the Draft PSEIS. Alternatives 2, 3, and 4 in the TAC-setting EA are treated as variations of the baseline alternative, as they fall within NMFS’ traditional management approach. Alternative 5, which sets the TAC equal to zero, is set equivalent to the DPEIS Alternative 4, the most precautionary alternative. It must be stressed that this is a qualitative, relative comparison and that the alternatives compared are not identical. The results are shown in Table 4.8-2.

NMFS Views Regarding the Effects of the Action on EFH

The approach taken here allows us to make rough distinctions between the TAC alternatives offered, although more subtle distinctions are not possible given the limitations of information. Inasmuch as bottom-tending gear is used, particularly in areas with corals, sponges, and other living substrates that are vulnerable to damage, presumably the more passes are made in these areas, and the greater the areas covered, the greater the intensity of impacts. Varying harvest levels in and of itself would not have greater or lesser adverse impacts unless the variations were very large. To the extent that fishing has adverse impacts on EFH, Alternative 1, which sets a likely upper limit for the TACs, well above baseline, has been rated as significant negative for all three criteria used. Alternative 5, the no fishing alternative, would eliminate any fishing impacts and therefore has been rated as significant positive for the three criteria.

The preliminary draft EFH EIS (NMFS 2003c) concludes that the fishery as conducted may have an effect that is "more than temporary," but does not have an effect that is "more than minimal." This conclusion is based on a definition under which a "more than minimal" effect is one which would affect the productivity of commercial fisheries as defined by MSST thresholds. Alternatives 2, 3 and 4, judged by our three criteria, and by the preliminary conclusions of the EFH EIS, are therefore rated as having an insignificant impact on EFH. However, regional adverse impacts may occur, and NMFS prefers to take a risk adverse approach. Therefore, NMFS conducted an EFH consultation on the 2004 TAC specifications, under Section 305(b)(2) of the Magnuson-Stevens Act. The consultation was concluded on November 10, 2003, for the 2004 groundfish harvest specifications, including interim and annual specifications (Kurland 2003). The Habitat Conservation Division concluded that "the groundfish fisheries incorporating the 2004 harvest specifications continue to minimize to the extent practicable the adverse effects of fishing on EFH" and offered no additional conservation recommendations.

Table 4.8-1 Significance Criteria for Habitat

Effect	S-/CS-	I	S+/CS+	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

Notes: CS- – Conditionally significant adverse
CS+ – Conditionally significant beneficial
I – Insignificant
S- – Significant adverse
S+ – Significant beneficial
U – Unknown
NE - No effect

Table 4.8-2 Direct/Indirect Effects Analysis

Direct/Indirect Effects	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5
Changes to Living Habitat Direct Mortality of Benthic Organisms	S-	I	I	I	S+
Changes to Benthic Community Structure	S-	I	I	I	S+
Changes in Distribution of Fishing Effort Geographic Diversity of Management Measures	CS- for Bering Sea and Gulf of Alaska I for Aleutian Islands	I	I	I	NE

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 (the ways mass and energy move among the groups). To interpret and predict the effects of the BSAI and GOA groundfish fisheries on the ecosystem, different indicators of ecosystem function were used and are listed in Table 4.9-1. The indicators were separated into categories relating to key ecosystem attributes of predator/prey relationships, energy flow/removal, and diversity. Background information specific to the North Pacific ecosystem is contained in the ecosystem consideration section of this document (Appendix C).

Fishing has the potential to influence ecosystems in several ways. Certain forage species, such as walleye pollock and Atka mackerel, are at a central position in the food web and their abundance is an indicator of prey availability for many species. Removal of top level predators is another potential effect of fishing, contributing to a fishing-down the food web effect. Introduction of non-native species may occur through emptying of ballast water in ships from other regions. These species introductions have the potential to cause large changes in community dynamics. Fishing may alter the amount and flow of energy in an ecosystem by removing energy and altering energetic pathways though the return of discards and fish processing offal back into the sea. The recipients, locations, and forms of this returned biomass may differ from those in an unfished system. Selective removal of species and/or sizes of organisms has the potential to change predator/prey relationships and community structure. Fishing can alter different measures of diversity. Species level diversity, or the number of species, can be altered if fishing essentially removes a species from the system. Fishing can alter functional or trophic diversity if it selectively removes a structural living habitat group or trophic guild member and changes the evenness with which biomass is distributed among a functional or trophic guild. Fishing can alter genetic level diversity by selectively removing faster growing fish or removing spawning aggregations that might have different genetic characteristics than other spawning aggregations. Fishing gear may alter bottom habitat and damage benthic organisms and communities.

Quantitative predictions of changes in some of the indicators mentioned above are made for the TAC EA alternatives using the multispecies bycatch model employed in the Draft PSEIS (NMFS 2003b). We will address the possible impacts on 1) predator/prey relationships, including introduction of non-native species, 2) energy flow and redirection (through fishing removals and return of discards to the sea), and 3) diversity.

Pelagic forage biomass in the GOA and BSAI in the form of walleye pollock and Atka mackerel biomass is projected to increase for the preferred alternative in both regions. Bycatch of pelagic forage species (squid, herring, other forage species) is projected to increase in the GOA and decrease in the BSAI for the preferred alternative. However, the level of bycatch of these species is relatively low and would likely not contribute to a population level impact for any of the alternatives. Bycatch of top predator species (sharks and birds) is producing unknown impacts for all alternatives due to lack of population level estimates for sharks. There does not appear to be any changes in the alternatives from the baseline with respect to spatial/temporal concentration of the catch on forage species, so that factor will likely not cause any changes from the baseline condition. Similarly, fishing effort changes in the preferred alternative are likely not sufficient to lead to an increase in probability of invasive species introductions. Thus, there are mainly insignificant impacts of the preferred alternative with respect to predator/prey relationships.

Energy redirection in the form of discards and energy removals in terms of retained catch amounts are not of sufficient magnitude in any of the alternatives to cause large impacts on ecosystem energy flow relative to the baseline. Scavenger population changes due to offal and discarding practices, are not expected in any of the alternatives. Thus, there is an insignificant impact of the preferred alternative with respect to ecosystem energy removal/redirection.

Functional diversity impacts via effects on structural habitat biota (HAPC biota) or on trophic guild biomass are not expected to differ from the baseline for the preferred alternative. Effects on species level diversity are unknown in the baseline for fishing effects on lesser studied species such as sharks. These effects would remain unknown in the alternatives. Genetic diversity impacts are not expected to differ from the baseline for the preferred alternative. Thus, there is an insignificant but sometimes unknown effect of the alternatives on various measures of diversity.

There would be no fishing under Alternative 5, and therefore no fishing impact on the ecosystem. This impact has been treated as unknown, however, because ecosystem complexity makes the ultimate impact unclear.

Table 4.9-1 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, nonresource 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 re-direction	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, structural habitat) diversity	Catch removals high enough to cause a change in functional diversity outside the range of natural variability observed for the system	Guild diversity or size diversity 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

Beginning with this year's SAFE reports (Appendices A and B), individual groundfish stock assessment chapters included an ecosystem assessment. Within each section are three subsections: 1) Ecosystem effects on stock, 2) Fishery effects on the ecosystem and 3) Data gaps and research priorities. These provide information on how various ecosystem factors might be influencing the subject stock or how the specific stock fishery might be affecting the ecosystem and what data gaps might exist that prevent assessing certain effects. Ecosystem indicators coupled with these individual stock ecosystem evaluations effects are interpretations aggregated to effects of all groundfish fisheries on the ecosystem.

Determinations of significance of impacts on the ecosystem issues of predator-prey relationships, energy flow and balance, and diversity are made from these individual groundfish stock assessment chapters. The overall interpretations are insignificant impact determinations for the three questions (predator prey relationships, energy flow and balance, and diversity) comparing proposed action using application of principles of ecosystem management (summarized in Table 6.0-1).

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 criteria used in estimating the effects are outlined below in Table 4.10-1. 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. The authors felt that a change of 50% or more in either direction was clearly a significant change and that a change of less than 50% in either direction was clearly insignificant as stocks of groundfish frequently change over the short term within this range. The authors acknowledge that 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% level. The year 2003 was used as a benchmark for comparison. These effects are discussed in Section 4.10 Social and Economic Consequences in this EA. The effects on other state managed fisheries (salmon, herring, and crab) are discussed in Section 4.4 Effects on Prohibited Species in this EA.

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. Therefore 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 2003 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 2003 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.

Table 4.10-1 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

4.11 Social and Economic Effects

Section 4.11 describes the social and economic consequences of the alternatives. Appendix E provides a detailed discussion of the approach to making the gross revenue estimates.

Section 3.1 of the EA lists NEPA documents providing detailed background information on the groundfish fisheries off of Alaska. Detailed descriptions of the social and economic characteristics of the GOA groundfish fisheries may be found in the following reports:

Alaska Groundfish Fisheries. Revised Draft Programmatic Supplemental Environmental Impact Statement (NMFS, 2003b). This report contains detailed fishery descriptions and statistics in Section 3.9, "Social and Economic Conditions."

"Economic Status of the Groundfish Fisheries off Alaska, 2002" (NMFS, 2003a, Appendix C), also known as the "2002 Economic SAFE Report." This document is produced by NMFS and updated annually. The 2003 edition contains 49 historical tables summarizing a wide range of fishery information through the year 2002.

List of 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."[3] 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 2003. 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 Costs
Excess Capacity
Bycatch and Discard Considerations

[3]"Harvest Levels and Fish Prices" addressed changes in fish prices associated with the specifications. This was taken out due to the ambiguity of the indicator - an increase in prices might be bad for consumers and good for fishermen and processors. The impacts on these groups are covered under other headings.

Passive Use Values
Non-market Use Value (e.g., subsistence)
Non-Consumptive Use Value (e.g., eco-tourism)

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

Data on groundfish fishing costs are not available, making a quantitative net impact analysis impossible. The following section utilizes the best available information and quantitative data where available, in combination with accepted economic theory and practice, to assess the potential social and economic impacts attributable to each alternative action.

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 E. 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, 2003 gross revenues were also estimated for the BSAI and GOA. The gross revenue impacts of the alternatives and their significance are defined with respect to the change between the alternative and the year 2003 estimates. The 2003 estimates were generated through the same estimation process used to produce the estimates for the alternatives - in other words the 2003 gross revenues estimates were produced, treating the 2003 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 2003. These issues, and others, are discussed in more detail in Appendix E.

The results of this analysis are summarized in Figures 4.11-1, 4.11-2, and 4.11-3. Each of these figures shows the difference between 2003 first wholesale revenue estimates, and the first wholesale revenue estimates for one of the alternatives. If the revenues associated with the alternative are greater than the 2003 estimated revenues, the appropriate bar in the figure is positive, if they are less than the 2003 estimated revenues, the bar is negative.

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.

Figures 4.11-1, 4.11-2, and 4.11-3 show that in each case, the total first wholesale revenues under Alternative 1 are significantly larger than those in 2003. Therefore, the significance rating for "Gross Revenues", under alternatives 1, is "positively significant." 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. Alternative 2, which is usually the preferred alternative, shows "insignificant" change. In each case Alternative 5, which sets all ABCs to zero, eliminates all revenues from the fishery. This alternative has been given a rating of "negatively significant."

Alternatives 3 and 4 have a greater negative impact on gross revenues than Alternative 2, but a significantly smaller negative impact than Alternative 5. The gross revenue estimates in this analysis may have an upward bias (for the reasons discussed in Appendix E), and they have a large, and unknown, error. A 20% threshold was adopted to determine significance (although it may be possible to justify a larger threshold). In other words, only a decline in gross revenues of 20% or more from 2003 levels will be described as significant.

Estimated BSAI ITAC 2003 revenues were about $1.14 billion, BSAI CDQ revenues were about $116 million, and GOA revenues were about $170 million. The corresponding significance thresholds are changes of $228 million, $23 million, and $34 million, respectively. Neither Alternative 3 or 4 for BSAI ITAC, BSAI CDQ or GOA revenues exceeded these thresholds. Thus, these alternatives have been given a rating of "insignificant" for impacts on gross revenue.

Figure 4.11-1 BSAI First Wholesale Value of the ITAC and Unspecified Reserves: Difference Between Estimated 2003 First Wholesale Value and First Wholesale Value of Each Alternative (in millions of dollars)

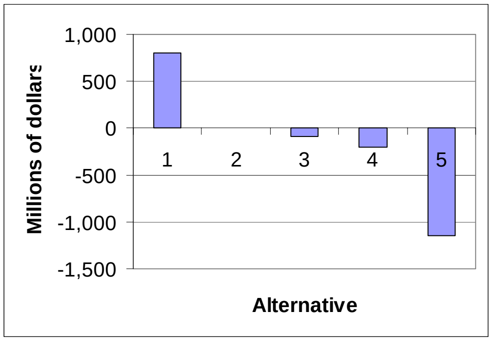


Figure 4.11-2 BSAI First Wholesale Value Estimates for CDQ reserve: Difference Between Estimated 2003 First Wholesale Value and First Wholesale Value of Each Alternative (in millions of dollars)[4]

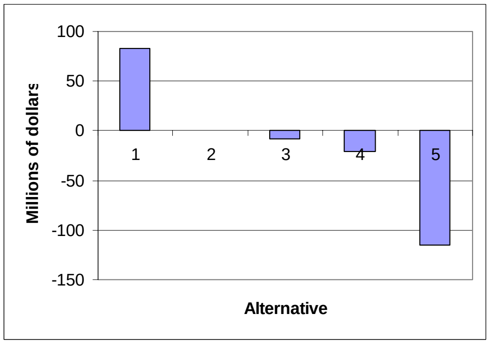
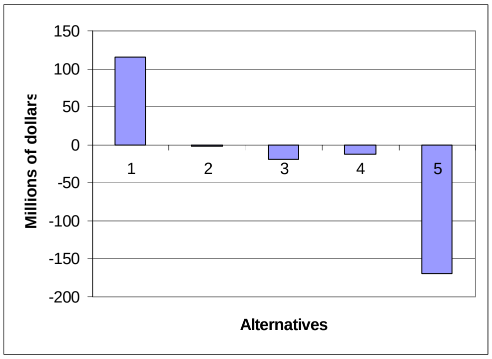


Figure 4.11-3 GOA Gross Revenue Estimates: Difference Between Estimated 2003 First Wholesale Value and First Wholesale Value of Alternatives (millions of dollars)



[4]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.

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 numerical estimates of cost impacts associated with these behavioral changes are not available. It is therefore impossible to provide quantitative 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 due to the likelihood of increased costs with significant increases in harvest. Since the Alternative 2 specifications are similar to the 2003 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. However, as discussed previously, these alternatives did not reduce gross revenues enough to exceed the 20 percent of gross revenues threshold and were consequently rated as insignificant. Similarly, these alternatives are not expected to create significant changes in operating costs and have been given "insignificant" operating cost significance ratings.

Under Alternative 5, no groundfish fishing would be allowed during 2004. In these circumstances, no variable costs would be incurred for active fishing operations. 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.

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 numerical estimates of net returns to industry.

In general, net returns should be larger in parts of the fishery that have been subject to rationalization. This would be expected to be the case in the BSAI pollock fisheries, where the American Fisheries Act (AFA) allowed fishing operations to rationalize through the use of fishing cooperatives; it also may be the case in the portions of BSAI fisheries conducted under the auspices of the Community Development Quota program, and it is likely to be the case in the sablefish fisheries which operate under an IFQ program. Each of these programs 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 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, all other things equal, while specifications associated with lower gross revenues would increase the constraints on fishermen and processors, and would likely result in lower profits to the sector.

Alternative 1, which had positively significant impacts on gross revenue is assumed to have positively significant impacts on net returns. Alternative 2, which had insignificant impacts on gross revenues and costs is assumed to have insignificant impacts on net returns. Alternatives 3 and 4 were rated as having insignificant impacts on revenues and costs, and have thus been given a similar "insignificant" rating for net returns.

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.

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 directly correlate changes in the harvests expected under these alternatives with changes in different categories and levels of risk, 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 these 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.

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 2003.[5] Because of this, alternative 2 has been given an “insignificant” safety and health rating. Alternatives 3 and 4 generally involve cuts in 2003 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.”

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[5]The TACs in this EA were prepared by the Council at its December 2003 meeting. These TACs are based on the ABCs specified by the Council Plan Team during its November 2003 meeting, which consider fishery optimum yields, and past Council decisions - particularly those incorporated in the 2003 specifications. For more details on the methods used to make the TAC projections incorporated here, (see Section 4.10.3).

Impacts on Related Fisheries[6]

Many of the operations active in groundfish fishing are diversified, participating in and economically dependent on 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" (i.e., distributing "risk" across a wider range of economic activities). Moreover, Pacific cod pot fishermen often fish for crab, as well, and catches of Pacific cod often 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.

CDQ groups use their revenues, either from royalty payments or from their CDQ operations, to invest in new fishery related 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, in addition, 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 quantitatively. CDQ groups may have smaller revenues to invest in other fishing related activities, however, they also may be compelled by these changes to accelerate their diversification (a potentially desirable action to distribute economic risk more widely) into other non-groundfish fishing activities, in order to offset the potential adverse impacts associated with lower groundfish harvests.

Changes in Alaska groundfish TACs may also affect other fisheries through market impacts. Alaska groundfish are substitutes for groundfish products produced elsewhere. For example, the rise in demand for Pacific cod came when it was recognized as a relatively close substitute for Atlantic cod, when world supplies of the latter species were declining. Subsequently, Alaska pollock has emerged as a substitute for both Atlantic and Pacific cod in some segments of the whitefish fillet market. Reductions in Pacific cod harvests, and consequent price increases for Pacific cod, may shift demand curves for substitute species outward, 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 (and other) substitute species. Because some of this additional production is likely to come from other than U. S. sources (e.g., Russia, Korea, Iceland), there may be associated implications for U. S. trade and market share considerations, as well as American consumers (treated in greater detail below).

The projected TACs under Alternative 2 are very similar to those in place in 2003. 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.

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

Consumer Effects

Consumer effects of changes in production will be 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, above that which they actually must pay. 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.[7] A decrease in consumers' surplus is not a total loss to society, since some of that decrease is transferred to producers/suppliers (e.g., fishermen) in the form of higher prices. However, this transfer is still a loss to consumers and if the producer gains accrue to non-U. S. fishermen and processors, there is a net welfare loss to the nation.

For pollock, Pacific cod, and Atka mackerel, the impact on domestic consumers of moderate increases or decreases in production might be fairly modest. Pollock surimi and roe and Atka mackerel were described as being principally sold overseas. Pacific cod and pollock fillets were described as being sold into domestic markets in which there were many relatively close substitutes. Under these circumstances, consumers would be unlikely to gain or lose much from "moderate" changes in supply.

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 2003. 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 consumers is rates as "insignificant."

Alternative 5 would close Alaska's federal groundfish fisheries in 2004, 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[8].

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 to TAC size. Over a wide range of possible specifications, in-season management expenses are largely fixed. For example, increases in TACs from 50% above 2003 levels to 50%

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[7]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 market clearing price of the good.

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

below 2002 levels could probably be handled with existing in-season management resources[9] (Tromble, pers. comm[10].).

Alternative 1 increases TACs more than 50 % above 2003 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 2004, 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 no fishing in 2004, 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 and would be caught by fishermen (given existing technological and economic constraints, and assuming the limitations imposed by TACs were removed), and the actual amounts harvested in 2001. This study used two methodologies to address this question.[11] 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). These estimates apply to the catcher vessel and catcher-processor components of the fleet. Corresponding data are not available for on-shore processors. Excess capacity in the pollock fleets may have been reduced since 2001 as fishing operations have taken advantage of cooperative fishing arrangements, provided for under the American Fisheries Act (AFA).

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 2003 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 2004, and would increase "excess capacity" in 2004, by an even greater amount. These three alternatives have been rated "negatively significant."

Bycatch and Discards

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[9]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.).

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

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

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, the 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, by 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 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 4.5. 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").

Passive Use Values

Passive use is also called "non-use" value, because a person need never actually use a resource in order to derive value from it.[12] 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 which 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 (largely indirectly) 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; and (d) three species of sea birds (Table 6-2 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, and information on the ways in which passive use values would change as these probabilities change is not available.

Section 4.4 of the EA described the effects of the alternatives on prohibited species. Section 4.5 described the effects on Marine Mammals (including, ESA listed marine mammals). Section 4.6 described the effects on

[12]"Passive use" has also been referred to in the literature as "existence value", because it accounts for the value people place on the mere existence of a resource, even though they never expect to have anything to do with it.

seabirds. The significance ratings for these impacts are summarized in Table 6.0-1 in Section 6.0 ("Conclusions"). All alternatives were given "insignificant" ratings for impacts on marine mammals. All alternatives were given "insignificant" ratings for impacts on prohibited species (including Pacific Northwest salmon). The one exception to this was a positively significant rating for bycatch levels of prohibited species in directed groundfish fisheries, under Alternative 5. The impacts on endangered seabirds under Alternatives 1 to 4 were either "insignificant" or "unknown." Alternative 5 had some positively significant, and one negatively significant impacts.

Alternative 2 involved little change in the ways the fisheries are conducted. This alternative has been rated "insignificant." Alternative 1 involves a large increase in TACs and fishing activity; Alternatives 3 and 4 involve moderate reductions in TACs and fishing activity; and Alternative 5 involves large reductions. These have been rated as "unknown" significance reflecting the Table 6.0-1 summary of some impacts on seabirds.

Non-Market Consumptive Use Value (e.g., subsistence)

While some persons use small amounts of groundfish for subsistence purposes, groundfish are not one of the more important subsistence resources (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; and (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 through 4 would 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, to commercial fishermen targeting bycaught species, and to natural mortality.

TACs projected under Alternative 2 are not expected to change much from those in 2003. 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.

Non-Consumptive Use Value (e.g., eco-tourism)

Groundfish, themselves, are not known to support non-consumptive eco-tourism uses in the EEZ off Alaska. Groundfish are preyed upon by marine mammals and birds that may themselves be the object of eco-tourism, and gear used in groundfish fishing may impose direct mortality on sea birds and marine mammals. Models describing how changes in specifications and fishing activity will impact marine mammals and seabirds, and relating eco-tourism values to the sizes and distribution of marine mammal and seabird populations, are not available.

Given the similarity of considerations for this criterion and the passive use value criterion, the passive use ratings have been adopted here: Alternative 2 is "insignificant, and Alternatives 1, 3, 4, and 5 are "unknown."

Summary of the significance analysis

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

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

Economic Indicators	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5
First wholesale gross revenues	S+	I	I	I	S-
Operating cost impacts	S-	I	I	I	S+
Net returns to industry	S+	I	I	I	S-
Safety and health impacts	U	I	U	U	U
Impacts on related fisheries	U	I	U	U	S-
Consumer effects	S+	I	I	I	S-
Management and enforcement costs	S-	I	I	I	S+
Excess capacity	S+	I	I	I	S-
Bycatch and discards	I	I	I	I	S+
Passive use values	U	I	U	U	U
Non-market use values	U	I	U	U	U
Non-consumptive use values	U	I	U	U	U

S = Significant, I = Insignificant, U = Unknown, + = positive, - = negative

5.0 Cumulative Effects

Analysis of the potential cumulative effects of a proposed action and its alternatives is a requirement of the NEPA. An environmental assessment or environmental impact statement must consider cumulative effects when determining whether an action significantly affects environmental quality. The 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 are thoroughly analyzed for the groundfish fisheries in the revised Draft PSEIS in Chapter 4.0 (NMFS 2003b). Section 4.1.4 describes the methodology used to do the cumulative effects analysis. In section 4.5 and the accompanying tables in Appendix A, the current groundfish management regime is analyzed for effects on the environment, including cumulative effects for each component of the environment. A summary of the cumulative effects of Alternative 1 of the Draft PSEIS are in Table 5.0-1. See section 4.5 of the Draft PSEIS for further details on the cumulative effects.

Table 5.0-1 Cumulative Effects Summary for Alternative 1 from Draft PSEIS

Environmental Component	Cumulative Effects
Target Species	I and U
Prohibited Species	CS-, U, and I
Forage Species	CS-, U, and I
Nonspecified species	U
Habitat	CS-
Seabirds	CS-, I, S-, none, U
Steller sea lions	CS -, I
Other marine mammals	CS- and I
Socioeconomic	I and CS-
Ecosystems	I and CS-

I = insignificant effect
U = unknown significance of effect
S = significant
CS= conditionally significant
- = adverse
+ = beneficial

Alternative 2 in the Draft PSEIS is a more aggressive harvest strategy that may be compared to Alternative 1 in this EA. An increase in the occurrence of significantly adverse cumulative effects on the environment is seen for Alternative 2 in the Draft PSEIS compared to Alternative 1 in the Draft PSEIS. Alternative 2 in this EA is comparable to Alternative 1 in the Draft PSEIS, which continues the current management regime. Alternative 3 in the Draft PSEIS is a more precautionary harvest strategy which is considered to be "similar" to Alternative 3 in this EA. Alternative 4 in this EA is considered to likely have similar cumulative effects as those seen for Alternative 1 in the Draft PSEIS, because it is an average of the levels of fishing under a similar fishing regime. Alternative 5 in this EA is most comparable to Alternative 4 in the Draft PSEIS (the most precautionary of the Draft PSEIS alternatives). The action to set harvest specifications analyzed in this EA is within the scope of alternatives analyzed in the Draft PSEIS, and therefore, the cumulative effects analysis in the Draft PSEIS is adopted in this EA by reference.

The SEIS prepared on Steller sea lion protection measures (NMFS 2001b) presents an assessment of cumulative effects of alternative protection measures in its Section 4.13. The SEIS assesses cumulative effects of environmental factors; external factors and consequences; incidental take/entanglements of Steller sea lions, other marine mammals and birds; spatial/temporal harvest of prey; and disturbance of prey by fishing activities.

The 2004 harvest specifications are developed under and managed according to the preferred alternative developed in the Steller Sea Lion Protection Measures SEIS. As such, the cumulative effects associated with the preferred alternative for Steller sea lion protection measures and the 2004 TACs are expected to be similar, as well. In both cases, the TAC levels are consistent with the harvest control rule developed for pollock, Pacific cod, and Atka mackerel under the SEIS and total about 1.8 million mt.

The temporal distributions of major fisheries are governed by the seasonal apportionments of pollock, Pacific cod, and Atka mackerel TACs, as well as by the seasonal apportionments of prohibited species bycatch allowances. In addition, the 2004 harvest specifications maintain spatial distribution of harvest as envisioned by new Steller sea lion protection measures through the implementation of groundfish directed fishery closures around rookeries, haulouts, and other critical habitat areas, as well as critical habitat harvest limits for Atka mackerel in the Aleutian Islands and for pollock in the Bering Sea. The application of new management measures for the Aleutian Islands Atka mackerel fishery also will reduce area specific harvest rates by 50 percent by dividing the fleet in half and assigning each half to different geographical areas in the Aleutian Islands Subarea.

Beyond the cumulative impacts analysis documented in the revised Draft PSEIS and the Steller Sea Lion Protection Measures SEIS, no additional past, present, or reasonably foreseeable cumulative impact issues have been identified that would accrue from the 2004 harvest specifications. The 2004 harvest specifications therefore have no cumulative impacts other than those impacts evaluated in the most recent environmental impact statements prepared for these fisheries.

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 2004 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 direct, indirect, and cumulative impacts of alternative TAC levels are assessed in Chapters 4 and 5 of this EA.

In addition to the Draft PSEIS and Steller Sea Lion Protection Measures SEIS, 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 2004 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 2004 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.

6.1 **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 federal groundfish fisheries harvest specifications for 2004 are summarized in Table 6.0-1 and in section 4.12. No significant adverse impacts were identified for the preferred alternative (Alternative 2). The EFH consultation for the interim and annual harvest specifications was completed on November 10, 2003 with a finding that the preferred alternative continues to minimize adverse effects, and no additional conservation recommendations were provided.

6.2 **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.

6.3 **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 contains cultural resources and ecologically critical areas. The marine waters where the fisheries occur contain ecologically critical areas. Effects on the unique characteristics of these areas are not anticipated to occur with these actions and mitigation measures such as a bottom trawling ban in specified portions of the Bering Sea are part of fisheries management measures.

6.4 **Controversiality**: These actions deal 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. Beyond the analysis documented in the revised Draft PSEIS (NMFS 2003b) and the Steller Sea Lion Protection Measures SEIS (NMFS 2001b), no additional controversy has been identified that would accrue from the 2004 harvest specifications.

6.5 **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 revised Draft PSEIS (NMFS 2003b). Because of the mitigation measures implemented with every past action, it is anticipated that there will be no significant adverse impacts to the human environment beyond that disclosed in the Draft 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.

6.6 **Future actions** related to this action may result in impacts. NMFS is required to establish fishing harvest levels on an annual basis 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 to implement mitigation measures to avoid significant adverse impacts.

6.7 **Cumulatively significant effects**, **including those on target and nontarget species:** Beyond the cumulative impacts analysis documented in the revised Draft PSEIS (NMFS 2003b) and the Steller Sea Lion Protection Measures SEIS (NMFS 2001b), no additional past, present, or reasonably foreseeable cumulative impact issues have been identified that would accrue from the 2004 harvest specifications. The 2004 harvest specifications are, therefore, determined to have no cumulative impacts other than those impacts evaluated in the most recent environmental impact statements prepared for the groundfish fisheries. See section 5.0 of this EA for more information.

6.8 **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. Because this action is 3 to 200 nm at sea, this consideration is not applicable to this action.

6.9 **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. This document 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 BiOp (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 the 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, Supplement June 19, 2003). 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 2004 harvest specifications at this time because based on the best available information, 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 Draft PSEIS under each ESA listed species' management overview (NMFS 2003b).

6.10 These actions pose **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.

6.11 This action poses **no effect on the introduction or spread of nonindigenous species** into the BSAI and GOA beyond those previously identified, because it does not change fishing, processing or shipping practices that may lead to the introduction of nonindigenous species.

6.12 Comparison of Alternatives and Selection of a Preferred Alternative

2004 Harvest Specifications

Alternatives 1-4 were developed to use the current harvest strategy allowed in the FMPs and provide a range of TAC amounts for comparison purposed. Alternative 5 would result in no groundfish fishing and is therefore the no action alternative which is required in NEPA analyses. Alternative 1 would set TACs in the BSAI above the upper limit of 2,000,000 mt for OY. Alternative 5 would set TACs in both the BSAI and GOA equal to zero. Neither Alternative 3 nor 4 use the best and most recent scientific information on status of groundfish stocks nor take into account socioeconomic benefits to the nation.

The Council adopted Alternative 2 as its preferred alternative at its December 2003 meeting. Alternative 2 was chosen as 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 sets TACs which, in the aggregate, fall within the specified range of OY for both the BSAI and GOA, and 4) it is consistent with the Endangered Species Act, the Magnuson-Stevens Act (including the national standards), and other applicable law.

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					
Fishing mortality	I	I	I	I	S+
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+
Incidental Catch of non-specified species					
Incidental catch of non-specified species	U	I	U	U	S+
Forage Fish					
Incidental catch of forage fish	U	I	U	U	S+
Prohibited Species Management					
Incidental Catch of prohibited species stocks	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					
Incidental take/entanglement in marine debris	I	I	I	I	I
Spatial/temporal concentration of fishery	I	I	I	I	S+
Global Harvest of prey species	I	I	I	I	U
Disturbance	I	I	I	I	S+
Northern Fulmar					
Incidental take	U	U	U	U	I
Prey availability	I	I	I	I	I
Benthic habitat	I	I	I	I	I
Proc. waste & offal	U	U	U	U	U
Short-tailed Albatross					
Incidental take	U	U	U	U	I
Prey Availability	I	I	I	I	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
Other Albatrosses & Shearwaters					
Incidental Take	U	U	U	U	I
Prey Availability	I	I	I	I	I
Benthic Habitat	I	I	I	I	I
Proc. Waste & Offal	I	I	I	I	U
Piscivorous Seabirds (Also Breeding in Alaska)					
Incidental Take	I	I	I	I	I
Prey Availability	U	U	U	U	U
Benthic Habitat	I	I	I	I	I
Proc. Waste & Offal	I	I	I	I	I
Eiders (Spectacled and Stellers)					
Incidental Take	I	I	I	I	I
Prey Availability	I	I	U	U	U
Benthic Habitat	U	U	U	U	U
Proc. Waste & Offal	I	I	I	I	I
Other Seabird Species					
Incidental Take	I	I	I	I	I
Prey Availability	I	I	U	I	I
Benthic Habitat	I	I	U	I	I
Proc. Waste & Offal	I	I	I	I	U
Marine Benthic Habitat					
Mortality and damage to	S-	I	I	I	S+
Modification of Benthic Community Structure	S-	I	I	I	S+
Changes in Distribution of Fishing Effort	BS and GOA = S- AI = I	I	I	I	NE
Ecosystem Considerations					
Predator-Prey Relationships	U	I	U	U	U
Energy Flow and Balance	U	I	U	U	U
Diversity	U	I	U	U	U
State waters seasons					
Pollock PWS	I	I	I	I	I
Pacific cod GOA	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
Sablefish PWS and SEI	I	I	I	I	I
Parallel seasons BSAI and GOA	I	I	I	I	S-
Economic Indicators					
First wholesale gross revenues	S+	I	I	I	S-
Operating cost impacts	S-	I	I	I	S+
Net returns to industry	S+	I	I	I	S-
Safety and health impacts	U	I	U	U	U
Impacts on related fisheries	U	I	U	U	S-
Consumer effects	S+	I	I	I	S-
Management and enforcement	S-	I	I	I	S+
Excess capacity	S+	I	I	I	S-
Bycatch and discards	I	I	I	I	S+
Passive use values	U	I	U	U	U
Non-market use values	U	I	U	U	U
Non-consumptive use values	U	I	U	U	U

*Information available in December 2003 to determine seasonal apportionment for 2004.

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

Common Name	Scientific Name	ESA Status
Steller's Eider [1]	*Polysticta stelleri*	Threatened
Short-tailed Albatross [1]	*Phoebaotria albatrus*	Endangered
Spectacled Eider[1]	*Somateria fishcheri*	Threatened
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 management 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 as a candidate species by USFWS (November 9, 2000; 65 FR 67343).

7.0 Final Regulatory Flexibility Analysis

7.1 Introduction

This Final Regulatory Flexibility Analysis (FRFA) evaluates the impacts of the proposed harvest level specifications for the groundfish fisheries in the BSAI and the GOA in 2004 on directly regulated small entities.

Sections 7.1 to 7.5 provide background on FRFA requirements. Section 7.6 evaluates the Regulatory Flexibility Act (RFA) implications of the proposed annual specifications. This FRFA meets the statutory requirements of the Regulatory Flexibility Act 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 a FRFA

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

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

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

7.3 What is required in a FRFA?

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

(1) a succinct statement of the need for, and objectives of, the rule;

(2) a summary of the significant issues raised by the public comments in response to the initial regulatory flexibility analysis, a summary of the assessment of the agency of such issues, and a statement of any changes made in the proposed rule as a result of such comments;

(3) a description of and an estimate of the number of small entities to which the rule will apply or an explanation of why no such estimate is available;

(4) a description of the projected reporting, recordkeeping and other compliance requirements of the rule, including an estimate of the classes of small entities which will be subject to the requirement and the type of professional skills necessary for preparation of the report or record; and

(5) a description of the steps the agency has taken to minimize the significant economic impact on small entities consistent with the stated objectives of applicable statutes, including a statement of the factual, policy, and legal reasons for selecting the alternative adopted in the final rule and why each one of the other significant alternatives to the rule considered by the agency which affect the impact on small entities was rejected.

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.

<u>Small businesses</u>. 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 fewer than 50,000.

7.5 Public Comments

The proposed rule for the BSAI specifications was published in the *Federal Register* on December 2, 2003 (68 *FR* 67642). The proposed rule for the GOA specifications was published in the *Federal Register* on December 5, 2003 (68 *FR* 68002). An Initial Regulatory Flexibility Analysis (IRFA) was prepared for these proposed rules, and was described in the classifications sections of each proposed rule. The IRFA is available on the NMFS Alaska Region web site at "http://www.fakr.noaa.gov/sustainablefisheries/specs04/GOA63earirirfa1003.pdf ." The public comment period for the BSAI specifications rule ended on January 2, 2004, while the public comment period for the GOA rule ended on January 5, 2004. No comments were received on the IRFA.

7.6 FRFA for 2004 Specifications

What is this action?

This action is adoption of the OFL, ABC, and TAC specifications recommended by the North Pacific Fishery Management Council at its December 2003 meetings. The details of these specifications may be found in Tables 2.4-1 to 2.4-2 of this EA/IRFA Also, detailed descriptions of each alternative analyzed in this EA/IRFA can be found in Section 2.0.

Reason for considering the proposed action

The reasons for the proposed action are discussed in detail in Section 1.0 of this EA/FRFA, and summarized below.

TAC specifications define upper retained harvest limits, or fishery removals, for a fishing year. TAC 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 (i.e., Eastern, Central, Western Aleutian Islands; Bering Sea; Western, Central, and Eastern Gulf of Alaska) among management programs (e.g., open access or community development quota program), processing components (i.e., inshore or offshore), specific gear types (e.g., 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 by regulatory announcements by NMFS management authorities opening and closing the fisheries accordingly. The entire TAC amount is available to the domestic fishery. Authorized gear 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.

The fishing year coincides with the calendar year, January 1 through 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 thereof) 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 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 of the SAFE reports (Appendices A, B, C, and D) by the North Pacific Fishery Management Council (Council), its Advisory Panel, and its Scientific and Statistical Committee. Using the information from the SAFE Reports, and the advice from Council committees, the Council makes both ABC and TAC recommendations for 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 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), passed in 1976 and amended in 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 that 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 provide technical support for the management actions recommended by the Council.

The Magnuson-Stevens Act requires that the FMPs must specify the optimum yield from each federally managed 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[13]

[13]This overview of the number and description of small commercial fishing entities in the BSAI and GOA groundfish fisheries uses the most complete and comprehensive available published summary data on small and large commercial fishing entities in the BSAI and GOA. These are the data in Table 26 of the 2002 Economic SAFE document (Appendix D to the EA/IRFA for the 2003 specifications (NMFS, 2003a)). This table is built from a data set using groundfish revenues in federal fisheries off of Alaska to distinguish between large and small entities. However, these revenues are also known to be an incomplete measure of gross revenues for distinguishing between

The entities regulated by this action are those that commercially harvest federally managed groundfish 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 7.5-1 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 7.5-1 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	832-838	7-13 (81-87 vessels)	839-925
Catcher processors	30-33	54-57	87
CDQ groups	6	0	6
Notes: In some cases, the number of entities is smaller than the number of vessels - indicating that at least some entities have multiple vessels. The estimated numbers of vessels have been placed in parentheses. Catcher vessel and catcher/processor estimates prepared from fish tickets, weekly processor reports, product price files, and intent-to-operate listing. The methodology used probably overstates the numbers of small entities. All CDQ groups are non-profits and are therefore treated as small.			

Fishing vessels, both catcher vessels and catcher/processors, are "small entities" if they gross less than $3.5 million in a year. Table 7.5-2 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.[14] Catcher-vessel gross revenues are measured at the ex-vessel level, catcher-processor revenues are the first wholesale value of the processed product. 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 7.5-3, provides similar information for catcher vessels and catcher/processors grossing more than $3.5 million.

Catcher-vessels

Table 7.5-2 indicates that, in 2002, there were 781 small catcher vessels active in groundfish harvesting in the GOA and 251 in the BSAI. There were 913 small groundfish catcher vessels in total. These numbers

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large and small entities. The distinction between small and large entities should be made using a comprehensive measure of revenues, including revenues from fisheries for other species, revenues from non-fishing activities, revenues from fishing activities outside of Alaska, and revenues from affiliated firms. A fully comprehensive data set is not currently available, and given the difficulties in measuring revenues for affiliated operations, may never be. However, a later section of this analysis utilizes a data set prepared by the Alaska Fisheries Information Network to look at directly regulated small entities that are adversely affected by this action. That data set does include other gross revenues from Alaskan fisheries other than the groundfish fisheries (i.e., fisheries for salmon, crab, herring and scallops).

[14]The tables tend to overstate the number of small catcher vessels and catcher/processors. One important reason is that the tables only consider revenues from groundfish fishing in Alaska. They do not consider revenues that these vessels may have earned from fishing for other species or from fishing in other areas. In addition, the SBA small entity criteria state an entities affiliations should be considered in determining whether or not an entity is small. In many cases vessels are owned by larger firms, or multiple vessels are owned by a single person or firm. These affiliation issues are not reflected in the counts in Tables 7.5-2 and 7.5-3 because data is not available on these affiliations. Catcher/processor affiliations are addressed in the text.

suggest that 119 vessels must have operated in both the BSAI and the GOA.[15] Table 7.5-2 implies that each of the small catcher vessels is treated as a separate small entity. This likely overstates the number of separate entities, since there is probably not a strict one-to-one correspondence between vessels and entities; (i.e., some persons or firms are known to own more than one vessel).

Table 7.5-3 indicates that there were six large catcher vessels in Alaska in 2002. All of these operated in the BSAI. In addition, seven inshore cooperatives, with 81 affiliated catcher vessels (in 2001), were permitted by NMFS Alaska Region in 2001. The six large catcher vessels (assuming they were not AFA vessels) and the seven inshore cooperatives, would have created 13 large catcher vessel entities representing 87 vessels.

Consideration of vessels affiliations with American Fisheries Act (AFA) pollock fishery cooperatives in the BSAI pollock fishery makes it possible to "fine tune" these estimates somewhat. In 2001, 81 catcher-vessels delivered AFA pollock through the cooperatives. If all 81 of these catcher vessels had gross groundfish revenues under $3.5 million, they would have been treated as small above, since their AFA affiliation was ignored. Since, after consideration of their AFA affiliation they must be considered large, the number of small entities estimated in the preceding paragraph is too large, and would have to be reduced by 81. The new estimate (reported in Table 7.5-1) is 832. On the other hand, there were six large catcher vessel trawlers in the BSAI in 2002; these might have been AFA vessels. If they were, the number of vessels grossing less than $3.5 million that were actually large because of their AFA affiliations was only 75, and the estimate of small entities would be 838.

Table 7.5-3 shows that there were six large trawl catcher vessels operating in the BSAI in 2002. One or more of these might have been AFA vessels. If the six catcher vessels grossing over $3.5 million had been affiliated with AFA cooperatives, the number of large catcher vessel entities might have been as low as 7 (instead of 13) with 81 vessels (instead of 87).

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[15]Table 7.5-2 duplicates data in Table 26.2 in the Economic SAFE document included as an appendix to this EA. The Economic SAFE notes that this year the Alaska Fisheries Science Center has improved its "estimates of the numbers of vessels participating in federally-managed groundfish fisheries by excluding those vessels that fished only under either sablefish permits in the inside waters of southeast Alaska or non-groundfish gear operator permits. This change affects Tables 26-33 and results in significant reductions in the numbers of vessels counted compared to the numbers published in last year's report." The data from last year's Economic SAFE report was used in the September and October versions of this document. The use of the newer information from this year's Economic SAFE in this version has led changes in estimates of large and small vessels, and especially to significant reductions in the estimates of catcher-vessels.

Catcher-processors

Table 7.5-2 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 7.5-2 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 (i.e., some persons or firms are known to own more than one vessel).

A consideration of AFA affiliations makes it possible to improve this small vessel estimate somewhat. Three of small BSAI catcher-processors were trawlers. Sixteen catcher-processors made deliveries to AFA cooperatives; given their affiliations, these operations must be considered large. Since, from Table 7.5-2, only three BSAI small catcher-processors were trawlers, no more than three of the sixteen might have been small without this affiliation. If these three were small, the total number of small catcher-processors would be 30. Thus, the number of small catcher-processors might range between 30 and 33 vessels.

Table 7.5-3 indicates that there were 54 large catcher-processors fishing in the EEZ off of Alaska in 2002. All of these operated in the BSAI. As noted above, up to three catcher-processor trawlers with revenues under $3.5 million in 2002 might have been large by affiliation with AFA cooperatives. Therefore, the number of large catcher-processors might range from 54 (from Table 7.5-3) up to 57 (if all of the six with revenues under $3.5 million are large by affiliation).

CDQ groups

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.

Table 7.5-2 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, 1997-2001.

	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 7.5-3 **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, 1997-2001.**

	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 7.5-4 and 7.5-5 provide estimates of average gross revenues from groundfish production in the BSAI and GOA for small and for large vessels.[16] 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 $1,070,000. The overall average gross revenues for all small vessels active in the GOA groundfish fisheries were $140,000, while the overall average gross revenues for all small vessels active in the BSAI groundfish fisheries was $600,000. Corresponding average gross revenues for large entities for these gear types and areas may be found in Table 7.5-5.

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 many types of catcher/processors operating in the BSAI and GOA groundfish fisheries. They are distinguished by target species, gear, types of products, and vessel size. The 44 small catcher/processor vessels had first wholesale gross revenues of about $78 million in 2001; average revenues were about $1.8 million. The 47 large catcher/processor vessels had first wholesale gross revenues of about $612 million in 2001; average revenues were about $13 million.

There were an estimated 36 small inshore processors receiving deliveries of groundfish from the fisheries of interest. These small processors averaged gross revenues of $902,000 from groundfish products; these processors also averaged $5.2 million from all fish products. The 13 large processors averaged $43.5 million from groundfish products, and $79.1 million from all fish products. (Hiatt T., pers. comm. 9-27-01)

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.

[16]These data are derived from the same source as the data used for the vessel count analysis: Appendix D to the 2003 Specifications EA/IRFA (NMFS 2003a). As noted earlier, this data set only include revenues vessels receive from groundfish fishing. Since these estimates only include information on gross revenues from groundfish fishing, these are low estimates of the total gross revenues for these entities., many of which are known to participate in non-groundfish harvesting, or other “fishing” activities, such as tendering for the salmon fisheries. Indeed, some operations participate in fisheries outside of the Alaska region (e.g., Pacific Northwest whiting). Revenues from all such activities should, ideally, be included in the decision as to whether an entity qualifies as “small”, under the RFA. At present, however, data limitations do not permit a full and complete accounting of activities beyond the Alaska groundfish fisheries.

Table 7.5-4 Average revenue of vessels that caught or caught and processed less than $3.5 million ex-vessel value or product value of groundfish by area, catcher type and gear, 1997-2001. ($ 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 7.5-5 Average revenue of vessels that caught or caught and processed more than $3.5 million ex-vessel value or product value of groundfish by area, catcher type and gear, 1997-2001. ($ 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 directly regulated small entities

Section 4.11.2 of the EA summarized the results of a simple model used to project the impacts each of the five alternatives considered in this action have on first wholesale gross revenues. The results are summarized in Figures 4.11-1 to 4.11-3. The first wholesale gross revenue estimates included the processed value of groundfish delivered shoreside by the catcher vessel fleet, and the value of processed groundfish received by catcher-processors. The same model can be used to project the changes in first wholesale value for fleet sectors defined by species, or species-group harvest (for example, changes in the value of pollock harvests).

This model is of limited use, however, in examining the impacts of specification changes on the small entities directly regulated by the action. The reason for this is that many of these are catcher vessels, and, in its current state, the model does not provide explicit estimates of ex-vessel revenue changes to catcher vessels. Moreover, for an RFA analysis, it would be desirable to consider small entity impacts in the context of the entities revenues from all sources, not just groundfish. It would also be desirable to obtain vessel counts for impacted sectors. The model used earlier does not provide these.

A three-step approach is used to provide a more detailed RFA analysis, and examine the impacts of the preferred alternative on directly regulated small entities. In the first step, first wholesale gross revenue changes associated with the model used in the EA are reported for each of the major species groupings in the BSAI and GOA. In this first step, the first wholesale gross revenues are used as an “index” or indicator to, in effect “flag,” the fishing sectors that may be adversely affected by the action for more focused examination. In the second step, these sectors are aggregated into a smaller number of sectors on the basis of the expert knowledge of the fisheries of NMFS Alaska Region in-season managers. Particular attention is paid to identifying fleets that harvest one or more of the impacted “first-step sectors.”

In the third step, the directly regulated and potentially adversely affected small entities are described using data sets that have been especially prepared by the Alaska Fisheries Information Network (AKFIN) for this analysis. These data sets contain information on groundfish gross revenues at the ex-vessel level for catcher vessels and at the first wholesale level for catcher-processors.[17] The negative revenue impacts associated with the specifications are compared to operational revenues for small entities. In this step, potentially offsetting revenue increases are ignored; the focus is on an evaluation of the potential scope of adverse impacts on these entities. The discussion in this section will focus on adverse impacts on directly regulated small entities, and thus on specification changes that reduce entity revenues. The specifications also include increases in some TACs and there may be offsetting positive revenue changes for many vessels. These, however, are not considered. There may be some overlap between vessels in the different sectors. Thus, for example, some vessels harvesting other BSAI species may also be taking BSAI Greenland turbot. Each grouping, however, has been treated separately in order to examine the impact of the change under consideration.

The first wholesale revenue changes in different fishery sectors (used as the “step 1" indices) in these management areas, where the sectors are defined by species groups being harvested, are summarized in Tables 7.5-6 and 7.5-7, below.

[17]Gross revenues are not a good measure of the actual impact on small entities. Changes in profits would be a preferable measure. However, information on the costs of operating in the groundfish fisheries off of Alaska is not readily available and makes profit estimates impossible. This analysis therefore uses changes in gross revenues as the best available indicator of potential adverse impacts on small entities.

Table 7.5-6 Projected changes in first wholesale gross revenues from 2003 to 2004 by major species group in the BSAI

	BSAI		BSAI CDQ	
	Revenue change ($)	**Percent change (%)**	**Revenue change ($)**	**Percent change (%)**
Pollock	137,443	0.02	15,335	0.02
Sablefish	338	0	-207	-0.01
Pacific cod	7,587,831	3.86	577,391	3.86
Arrowtooth	0	0	0	0
Flathead sole	-173,788	-5.0	-5,192	-5.0
Rock sole	-424,532	-6.82	-5,096	-6.82
Turbot	-178,186	-12.5	-5,637	-12.50
Yellowfin	727,232	2.78	11,537	2.78
Other flatfish	0	0	0	0
Rockfish	-1,133,526	-14.41	-71,142	-14.41
Atka mackerel	1,398,359	5.0	109,235	5.0
Other	-720,735	-16.92	-1,188	-16.92
Notes: Revenues are first wholesale gross revenues. Percent change is change in 2004 from estimated 2003 levels if prices were unchanged.				

Table 7.5-7 Projected changes in first wholesale gross revenues from 2003 to 2004 by major species group in the GOA

	GOA	
	Revenue change ($)	**Percent change (%)**
Pollock	0	0
Sablefish	0	0
Pacific cod	0	0
Arrowtooth	0	0
Flathead sole	-26,306	-2.42
Rex sole	0	0
Flats deep	0	0
Flats shallow	-138,528	-4.07
Rockfish	-1,188,282	-8.83
Atka mackerel	0	0
Other species	0	0

Notes: Revenues are first wholesale gross revenues. Percent change is change in 2004 from estimated 2003 levels if prices were unchanged.

For analytical purposes, the species with estimated negative revenue changes have been aggregated into four fleet sectors defined by behavioral characteristics. The changes in the rockfish, rock sole, and flathead sole revenues in the BSAI, have been treated together as an adverse impact on the BSAI head-and-gut (H&G) catcher-processor fleet. Greenland turbot changes have been treated by themselves as an impact on all vessels, longline and trawl, harvesting turbot in the BSAI. The "other species" category has been treated by itself. Although they are not the subject of a target fishery, a very large proportion of the vessels in the fleet harvest and deliver at least some of these species in a typical year. Finally, the shallow water flatfish, rockfish and flathead sole groupings in the GOA have been treated as impacts imposed on the GOA non-pelagic (bottom) trawl fleet.

BSAI turbot are fished by catcher vessels and by catcher-processors, using both longline and trawl gear. There were 112 catcher vessels active in 2001, of which an estimated 105 were small entities.[18] Average gross revenues from all fisheries for these vessels were about $1,246,000. These were primarily groundfish vessels, although many also had significant revenue from fishing for halibut or crab. Relatively few had revenues from scallops, salmon, herring, or other species. There were 35 catcher-processors active in 2001, of which an estimated 19 were small entities. Average gross revenues from all fisheries for these vessels were about $2,333,000. These were primarily groundfish vessels, eight also had significant revenues from other fisheries; in five cases this was halibut. The estimated decline in total BSAI turbot revenues was about $178,000, or about $1,200 for each of the estimated 149 large and small vessels active in this fishery. Thus, changes in turbot revenues would have a minor adverse impact on small fishing operations.

Twenty-two catcher-processors were identified as head-and-gut vessels fishing for Pacific ocean perch, flathead sole and rock sole in 2001. None of these vessels had gross revenues from any Alaskan fishery other than the groundfish fisheries. Average first wholesale gross revenues for these vessels were estimated to be about $6.9 million. Six of these vessel had first wholesale gross revenues less than $3.5 million. These may be small vessels, however, these vessels may have had gross revenues from groundfish fishing outside of Alaska, for example, off the West Coast of the U.S., and some or all of these vessels may have had affiliations with other firms that would have made them large entities. The estimate of six small entities is therefore an upper bound estimate. Average gross revenues for these six small entities were estimated to be about $2.2 million. Table 7.5.6 indicates that the preferred alternative is associated with a first wholesale gross revenue reduction of about $1,732,000, or about $78,700 per vessel for each of the 22 large and small entities that deliver these species. If small entity revenues from these species have the same proportion to their revenues from all sources as they do for all entities, this change would involve a reduction of 3.6% in their revenues.

Some amount of BSAI "other species" were harvested by a large proportion of the BSAI fleet. An estimated 194 catcher vessels landed these species in 2001, of which an estimated 188 were small entities. These small entities had average ex-vessel gross revenues of about $1,011,000. An estimated 102 catcher-processors landed these species, of which an estimated 43 were small. These small catcher-processor entities had average first wholesale gross revenues of about $2,000,000. Table 7.5.6 indicates that the preferred alternative is associated with a first wholesale gross revenue reduction of about $721,000, or about $2,400 per vessel for each of the 296 large and small entities that deliver these species. Thus, changes in other species revenues would have a minor adverse impact on small fishing operations.

[18]Comprehensive Alaska gross revenue files were prepared for these vessels for this analysis by the staff of the Alaska Fisheries Information Network (AKFIN). The AKFIN data base could not provide this comprehensive information after 2001. The AKFIN data is the basis for the discussion in the next four paragraphs.

The GOA non-pelagic trawl fleet consisted of 96 vessels. These were all small entities. All operated as catcher vessels, although two appear to have operated in a catcher-processor capacity as well. Vessel revenues were mainly from groundfish; however, many vessels had significant revenues from other sources as well. Average groundfish revenues for these vessels were estimated to be about $542,000. In addition, many vessels had revenues from halibut (fleet average was about $56,000), salmon (fleet average was about $23,000), crab (fleet average about $9,000), and herring (fleet average about $2,000)[19]. For all species other than groundfish, median gross revenues were zero, indicating that no more than half the fleet participated in any these species. Average gross revenues, accounting for all species, were about $633,000. The potential impact of the 2004 revenue reduction for these vessels is suggested by a comparison of the average revenue reduction with the 2001 average revenue estimate. From Table 7.5-7, the average revenue reduction for 96 vessels would be about $14,000, or about 2% of average gross revenues from all fishing activity in Alaska.

The six CDQ groups are all small entities by virtue of their non-profit status. Table 7.5-6 indicates that these groups would incur adverse impacts of about $88,000. Estimated revenue increases to these groups actually exceed the losses, and the net revenue change from the specifications appear to be positive. These adverse impacts are small with respect to overall CDQ group revenues. In 2000, CDQ revenues were about $63,174,000, while CDQ net income was about $29,953,000. Thus the revenue loss would be a fraction of a percent, and these operations would experience a net revenue gain. (Alaska Department of Commerce and Economic Development, page 25).

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.

Description of significant alternatives

A FRFA should include “a description of the steps the agency has taken to minimize the significant economic impact on small entities consistent with the stated objectives of applicable statutes, including a statement of the factual, policy, and legal reasons for selecting the alternative adopted in the final rule and why each one of the other significant alternatives to the rule considered by the agency which affect the impact on small entities was rejected.”

Four alternatives to the rule were analyzed. These alternatives are described in detail in Section 2.0 of the EA that accompanies this FRFA. As noted in Section 4.11 of this EA, three of these, Alternatives 3, 4, and 5, involve lower overall gross revenues for fishing operations, and thus a likely greater adverse impact on small entities. One of these, Alternative 1, involves a higher level of gross revenues and thus may have a smaller adverse impact on small entities than the preferred alternative. However, the higher harvest levels associated with Alternative 1 exceed the optimal yield in BSAI, and exceed recommended ABCs for many species in both the GOA and the BSAI. None of the significant alternatives to the proposed rule accomplish the stated objectives, are consistent with applicable statutes, and that would minimize the economic impact of the proposed rule on small entities.

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[19]The trawlers wouldn’t have caught these additional species in their capacity as trawlers; however, many of these vessels use multiple gears over the course of a year.

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Appendix A: Stock Assessment and Fishery Evaluation Report for the Groundfish Resources of the Bering Sea and Aleutian Islands, November 2003

Appendix B: Stock Assessment and Fishery Evaluation Report for the Groundfish Resources of the Gulf of Alaska, November 2003

Appendix C: Ecosystem Considerations for 2003

Appendix D: Economic Status of the Groundfish Fisheries Off Alaska 2001, November 2003

Appendix E: 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.[20] The prices estimates are "Alaska-wide" and are based on data in the 2003 Economic SAFE.[21]

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 November 2003 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;[22](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

[20]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.

[21]Retained catch was calculated using Tables 4 and 5 of the 2003 Economic SAFE, 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.

[22]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.

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.[23]

For this analysis, 2004 TACs and interim TACs were estimated by the Council plan team in November and final ABCs and TACs were adopted by the Council in December 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 189% of the optimum yield (OY). There were also some 2003 ABCs that were smaller than the 2003 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 sailfish allocated to hook-and-line and pot fishermen, 7.5% of the sailfish 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 2002 and 2003 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 2001 prices. This was done for two reasons. The 2002 estimates were prepared to see if the procedure generated revenue estimates similar to those provided in the Economic SAFE. The 2003 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, 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

[23]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 1998-2002; CDQ percentages were averaged over 1999-2002. Separate discard rates for the GOA and BSAI were obtained from Economic SAFEs for various years; rates were averaged over the period 1998-2002.

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 2003. 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 2002). 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 in Table 4.10-2 for both the BSAI and GOA. The bottom two lines in each section of the table show (a) the potential maximum sum of the TACs (“potential max.”) under the alternatives (either two million metric tons in the BSAI, if the sum of ABCs is greater than the BSAI OY, or the sum of the ABCs for the different species groups), and (b) the difference between this potential maximum and the sum of the projected TACs (“Shortfall”).

This shortfall represents metric tonnages for which a species ABC was less than the 2003 TAC or in the case of Alternatives 1, 2, and 3 in the BSAI the “shortfall” is negative representing the amount that the total projected TAC is in excess of the two million metric ton potential maximum. These tonnages were not reassigned to another species and represent a potential source of upward bias for Alternatives 1, 2, and 3.

Estimates of the percentage changes between 2003 ABCs and TACs and the ABCs and projected TACs for the alternatives are summarized in Tables E-1 and E-2. Estimates of the first wholesale value of the BSAI ITAC and unspecified reserves are summarized in Table E-3, estimates of the value for the CDQ reserve are summarized in Table E-4, and estimates for the GOA are summarized in Table E-5.

Table E-1 Projected TACs in metric tons (based on plan team 2004 ABC recommendations)

Species group	A1	A2	A3	A4	A5	2003
BSAI						
Pollock	2,657,100	1,493,050	1,450,850	1,240,930	0	1,492,810

Sailfish	7,110	6000	3,670	4,310	0	6,000
Pacific cod	297,000	215,500	157,000	160,000	0	207,500
Arrowtooth	115,000	12,000	66,837	6,777	0	12,000
Flathead sole	61,900	19,000	32,500	13,500	0	20,000
Rock sole	139,000	41,000	72,400	31,000	0	44,000
Greenland turbot	15,700	3,500	8,200	4,740	0	4,000
Yellowfin sole	114,000	86,075	58,200	73,300	0	83,750
Flats (other)	216,500	13,000	119,800	25,102	0	13,000
Rockfish	22,495	19,395	11,348	16,179	0	22,661
Atka mackerel	66,700	60,000	36,400	53,000	0	60,000
Other	65,170	28,480	32,585	24,671	0	34,279
Total	3,777,675	2,000,000	2,049,790	1,653,509	0	2,000,000
Potenial max.	2,000,000	2,000,000	2,049,473	1,652,975	0	n.a.
Shortfall	-1,777,675	0	-317	-534	0	n.a.
GOA						
Pollock	123,896	71,260	64,091	113,347	0	54,350
Sailfish	18,272	16,550	13,100	15,400	0	14,890
Pacific cod	71,200	48,033	37,500	48,000	0	40,540
Arrowtooth	194,930	38,000	100,136	14,962	0	38,000
Flathead sole	51,720	10,880	28,130	2,085	0	11,150
Rex sole	12,650	12,650	6,325	3,055	0	9,470
Flats (deep)	6,070	6,070	3,035	1,384	0	4,880
Flats (shallow)	52,070	20,740	26,035	5,290	0	21,620
Rockfish	28,768	27,058	16,225	21,369	0	29,680
Atka mackerel	4,700	600	2,350	232	0	600
Other	28,218	12,592	14,846	11,256	0	11,260
Total	592,584	264,433	311,773	236,380	0	236,440
Notes: TACs were prepared by the Council at its December 2003 meeting. ABC's were prepared by the Council plan team at its November 2003 meeting.						

Table E-2 Percent differences between BSAI ABCs and TACs for the Alternatives, and 2003 BSAI ABCs and TACs

Species	2003 (mt)	Alt. 1 %	Alt 2%	Alt 3%	Alt 4%
ABCs					
Pollock	2,373,470	12%	10%	-39%	-48%
Sailfish	6,000	19%	8%	-39%	-28%
Pacific cod	223,000	33%	0%	-30%	-28%

Arrowtooth	112,000	3%	3%	-40%	-94%
Flathead sole	66,000	-6%	-6%	-51%	-80%
Rock sole	110,000	26%	26%	-34%	-72%
Turbot	5,880	167%	-19%	39%	-19%
Yellowfin	114,000	0%	0%	-49%	-36%
Flats (other)	153,000	42%	42%	-22%	-84%
Rockfish	24,762	-9%	-9%	-55%	-37%
Atka mackerel	63,000	6%	6%	-42%	-16%
Other	45,270	44%	8%	-28%	-46%
TACs (2003)					
Pollock	1,492,810	78%	0%	-3%	-17%
Sailfish	6,000	19%	0%	-39%	-28%
Pacific cod	207,500	43%	4%	-24%	-23%
Arrowtooth	12,000	858%	0%	457%	-44%
Flathead sole	20,000	210%	-5%	63%	-33%
Rock sole	44,000	216%	-7%	65%	-30%
Turbot	4,000	293%	-13%	105%	19%
Yellowfin	83,750	36%	3%	-31%	-12%
Flats (other)	13,000	1565%	0%	822%	93%
Rockfish	22,661	-1%	-14%	-50%	-29%
Atka mackerel	60,000	11%	5%	-39%	-12%
Other	34,279	90%	-17%	-5%	-28%
Notes: TACs were prepared by the Council at its December 2003 meeting. ABC’s were prepared by the Council plan team at its November 2003 meeting.					

Table E-3 Percent differences between GAO ABCs and TACs for Alternatives, and 2003 GOA ABCs and TACs

Species	2003 (mt)	Alt. 1 %	Alt 2%	Alt 3%	Alt 4%
ABCs (2003)					
Pollock	54,350	21%	31%	-38%	43%
Sailfish	14,890	21%	11%	-38%	-25%
Pacific cod	52,800	13%	19%	-40%	-15%
Arrowtooth	155,140	0%	26%	-49%	-92%
Flathead sole	41,390	0%	25%	-46%	-95%
Rex sole	9,470	0%	34%	-50%	-61%
Flats (deep)	4,880	0%	24%	-56%	-60%
Flats (shallow)	49,340	8%	6%	-44%	-87%
Rockfish	33,740	6%	-10%	-47%	-46%
Atka mackerel	600	683%	0%	292%	-62%
Other	0	n/a	n/a	n/a	n/a
TACs (2003)					
Pollock	54,350	128%	31%	18%	109%
Sailfish	14,890	23%	11%	-12%	3%
Pacific cod	40,540	76%	18%	-7%	18%
Arrowtooth	38,000	413%	0%	164%	-61%
Flathead sole	11,150	364%	-2%	152%	-81%
Rex sole	9,470	34%	34%	-33%	-68%
Flats (deep)	4,880	24%	24%	-38%	-72%
Flats (shallow)	21,620	141%	-4%	20%	-76%
Rockfish	29,680	-3%	-9%	-45%	-28%
Atka mackerel	600	683%	0%	292%	-61%
Other	11,260	151%	12%	32%	0%
Notes: TACs were prepared by the Council at its December 2003 meeting. ABC's were prepared by the Council plan team at its November 2003 meeting.					

Table E-4 Estimates of First Wholesale Value of ITAC and Unspecified Reserves in the BSAI (millions of dollars)

	First Wholesale Value by Alternative (millions of dollars)				
Species group	**1**	**2**	**3**	**4**	**5**
Pollock	1,522	855	831	711	0
Sailfish	16	14	8	10	0
Pacific cod	282	204	149	152	0
Flatfish	81	38	42	32	0
Rockfish	8	7	4	6	0
Atka mackerel	31	29	17	25	0
Other	8	4	4	3	0
Total	1,947	1,150	1,055	938	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 E-5 Estimates of First Wholesale Value of CDQ Reserve in the BSAI (millions of dollars)

	First Wholesale Value by Alternative (millions of dollars)				
Species group	**1**	**2**	**3**	**4**	**5**
Pollock	170	95	93	79	0
Sailfish	2	2	1	1	0
Pacific cod	21	16	11	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	198	116	108	95	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 E-6 Estimates of First Wholesale Value in the GOA (millions of dollars)

	Gross Revenue by Alternative (millions of dollars)				
	1	**2**	**3**	**4**	**5**
Pollock	71	31	31	31	0
Sailfish	92	75	66	75	0
Pacific cod	67	38	35	38	0
Flatfish	39	11	11	4	0
Rockfish	15	12	7	10	0
Atka	1	<1	<1	<1	0
Other	2	1	1	1	0
Total	286	169	151	158	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.					