DRAFT

ENVIRONMENTAL ASSESSMENT/INITIAL 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
and
Amendment 63 to the Fishery Management Plan for Groundfish of the Gulf of Alaska for Skates Management

AND

DRAFT REGULATORY IMPACT REVIEW

for Amendment 63 to the Fishery Management Plan for Groundfish of the Gulf of Alaska for Skates Management

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Abstract: This document contains an Environmental Assessment (EA), Regulatory Impact Review (RIR), and Initial Regulatory Flexibility Analysis (IRFA) for two actions. The EA and IRFA analyze the impacts of the Federal actions to: 1) establishing the 2004 harvest specifications for groundfish target species in the groundfish fisheries of the Bering Sea, Aleutian Islands, and Gulf of Alaska fishery management areas and 2) the impacts of Amendment 63 to the Fishery Management Plan for Groundfish of the Gulf of Alaska to manage skates as a separate species group from the “other species” complex. The RIR analyzes the significance of Amendment 63. The analyses in this document address the requirements of the National Environmental Policy Act (NEPA), Presidential Executive Order 12866 (E.O. 12866) and the Regulatory Flexibility Act (RFA).

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Executive Summary

The actions evaluated in this document

This document provides environmental and socio-economic analysis for these related actions:

- publication of proposed specifications for the Bering Sea and Aleutian Islands (BSAI)
- publication of proposed specifications for the Gulf of Alaska (GOA)
- publication of interim specifications for the BSAI
- publication of interim specifications for the GOA
- GOA Fishery Management Plan (FMP) Amendment 63 to move skate species from the "other species" complex to the target species list in the GOA
- Specification management methods for skate harvest in the GOA

Purpose and Need

The implementation of the 2004 harvest specifications, and Amendment 63, are necessary for the management of the groundfish fisheries and the conservation of marine resources, as required by the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act). 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 of Alaska waters. The specifications are renewed annually based on the latest stock assessment information, ensuring the fisheries are managed on the best available science.

Amendment 63 to the GOA FMP is necessary to conserve skate species in the GOA. A directed skate fishery developed rapidly in 2003 and concerns exist for potential overfishing of skates by directed fishing or by incidental catch in other fisheries. Placing skates in the target species category will allow specifications to be developed for skates providing the means to NMFS to control the harvest of skates in the GOA.

Environmental Assessment

An Environmental Assessment (EA) was prepared for the 2004 Specifications and Amendment 63 (GOA skates) 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 and implementation of Amendment 63 will be significant. If the predicted impacts from the preferred alternatives are insignificant, and those alternatives are chosen, no further analysis is necessary to comply with the requirements of the 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 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 for the proposed and interim harvest specifications 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.

Amendment 63 Alternatives

This EA/RIR/IRFA evaluates two FMP-level alternatives for moving GOA skates out of the "other species" grouping and placing skates in the target species category, setting OFL, ABC, and TAC levels separately for skates.[1] It also evaluates three specifications-level alternatives for incorporating skates into specifications, contingent on an FMP level decision to break them out of the GOA "other species" category.

FMP Amendment 63 Alternatives

Two alternatives are considered for removing skates from the "other species" category in the GOA FMP. These are:

(A) the status quo, no action alternative, under which skates would continue to be managed as a part of the "other species" category, and

(B) an action alternative under which Section 3.1 of the GOA FMP would be amended to remove skates from the "other species" category and add them to the "target species" category.

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[1]The action discussed in this section does not change the BSAI FMP. It does not change the management of skates in the BSAI.

Skate specifications

Three alternatives are considered for skate specifications, contingent on an FMP-level decision to treat skates as a target species: (1) a single GOA wide OFL for the skate group, and management area ABCs for the skate group, (2) a single GOA wide OFL for skates, and ABCs for key skate species in each management area, (3) management area OFLs and ABCs for each key skate species.

Environmental Analysis

The EA evaluated the specifications alternatives and the Amendment 63 (GOA skates) 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 consequences.

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), duration of impact.

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 impacts of alternative TAC levels are assessed in section 4 of this EA. The Table below provides a summary of the impacts of the proposed and interim harvest specifications alternatives on the human environment.

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

Coding: I = Insignificant, S = Significant, + = beneficial, - = adverse, U = Unknown					
Issue	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5
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+

Coding: I = Insignificant, S = Significant, + = beneficial, - = adverse, U = Unknown					
Issue	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5
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+
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+
Northern Fulmar					
Incidental take–BSAI	U	U	U	U	U(S+)
Incidental take–GOA	I	I	I	I	I
Prey availability	I	I	I	I	I
Benthic habitat	I	I	I	I	I
Proc. waste & offal	U	U	U	U	U(S-)
Short-tailed Albatross					
Incidental take	U	U	U	U	U(S+)
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	U(S+)
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

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	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 HAPC by biota by bottom trawl gear	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	S+
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	S-	I	S-
Sablefish PWS and SEI	I	I	I	I	I
Parallel seasons BSAI and 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
Economic Indicators					
First wholesale gross revenues	S+	I	S-	S-	S-
Operating cost impacts	S-	I	S+	S+	S+
Net returns to industry	S+	I	S-	S-	S-
Safety and health impacts	U	I	U	U	S-
Impacts on related fisheries	U	I	U	U	S-
Consumer effects	S+	I	S-	S-	S-
Management and enforcement	S-	I	I	I	S+
Excess capacity	S+	I	S-	S-	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

The proposed action for Amendment 63 is limited in scope and will not likely affect all environmental components of the GOA. The effects discussion for Amendment 63 is limited to groundfish target species impacts (including skates, other species and Pacific cod), Pacific halibut, and social and economic impacts. FMP Alternative B, which provides more protection to the skate stock biomass, has been given an insignificant designation for effects on skate species. The other species TAC will increase with the creation of a new target species TAC because the other species TAC is a percentage of the combined GOA TACs for groundfish target species. Additional Pacific cod and Pacific halibut may also be taken in the skate fishery as incidental catch, reducing the amount of TAC or halibut PSC available for a directed Pacific cod fishery or the shallow water complex fisheries. The effects of increased harvest of other species, Pacific cod, and Pacific halibut is expected to have insignificant effects because of harvest limits for these prohibited and target species and target complex.

The economic impacts of Amendment 63 are discussed in the Initial Regulatory Flexibility Analysis (small entity analysis) in Chapter 7, and in the Regulatory Impact Review (RIR) in chapter 8. The impacts will depend on decisions made by the Council in setting a skate TAC. The purpose of the FMP amendment is to give managers more control over skate harvests in the GOA to constrain harvests if necessary to protect the skate biomass. This action may lead to limits of the gross revenues from fishing in the short run, but as a result of protecting the biomass, may lead to greater gross revenues from a sustainable fishery. Consideration must also be given to the impacts on the Pacific cod fisheries and the shallow water complex fisheries of the GOA which are limited by available halibut PSC. The taking of Pacific cod and halibut in the skate directed fishery may reduce the amount of directed fishing allowed in the Pacific cod directed fishery and in the shallow water complex fisheries. Skate specifications Alternatives 2 and 3 may result in a change in fishing gear or vessels. Given the uncertainties about future Council TAC setting, and with respect to industry's valuation of the trade off between potential short run restrictions and long run sustainability, the significance of socio-economic impacts has been designated, "unknown."

Initial Regulatory Flexibility Analysis

Separate Initial Regulatory Flexibility Analyses (IRFA) were performed for the 2004 Specifications and Amendment 63 (GOA skates) to address the statutory requirements of the Regulatory Flexibility Act of 1980, as amended by the Small Business Regulatory Fairness Act of 1996. These acts require an analysis of the adverse economic impacts of regulatory actions subject to the notice and comment provisions of the Administrative Procedures Act on directly regulated small entities.

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. The IRFA for this action determined that 1,353 small catcher vessels, 33 small catcher processors, and six small CDQ groups would be directly regulated by this action. In the BSAI, overall first wholesale revenues under the preferred alternative would be very similar to those in 2003. There do not seem to have been large shifts in the revenues form the different species that might be masked by the overall BSAI totals. On this basis, the proposed specifications are not expected to adversely affect the cash flow or profitability of small entities operating in the BSAI. A similar situation appears in the GOA. 2004 gross revenues are projected to be very similar to those in 2003. Large changes in revenues from changes in relative species harvests are not apparent. The proposed specifications are not expected to adversely affect the cash flow or profitability of small entities operating in the GOA. 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.

Amendment 63 amends the GOA FMP so as to separate skate species from the "other species" category in the GOA, and add it to the "target species" category. Skates would receive their own OFL, ABC, and TAC. Three alternative ways of incorporating a skate OFL, ABC, and TAC in specifications are under consideration. This action is proposed in order to give fishery managers more power to protect the skate biomass in the face of a fishery that developed rapidly in 2003. The IRFA for this action ascertained that 933 small hook-and-line vessels, 15 small hook-and-line catcher-processors, 117 small trawl catcher vessels, and 4 small catcher processors, might be directly regulated by this action. This action has the potential to limit harvests, and fishery gross revenues, in the short run in order to protect the biomass and preserve the fishery for the long term. The actual impacts would depend on the way the Council chooses to incorporate skates into the specifications, and on the annual specifications recommendations made by the Council. Alternative 3 is likely to be the most burdensome of the specifications alternatives for small entities, since it provides for skate species and area specific OFLs and is most likely to lead to operational constraints on fishing vessels. Alternative 2, which provides for a GOA-wide OFL, and species and area specific ABCs would be less burdensome. Alternative 1 which provides for a GOA OFL and area specific (not species specific) ABCs would be the least burdensome. Alternatives that require species specific ABCs or OFLs will impose new recordkeeping or reporting requirements on the directly regulated small entities. Currently fishermen only report to the skate "group." The analysis did not reveal any Federal rules that duplicate, overlap, or conflict with the proposed action.

Regulatory Impact Review

A Regulatory Impact Review was performed for Amendment 63 (GOA skates) to address the requirements of Presidential Executive Order 12866 (EO 12866). EO 12866 requires a cost-benefit analysis for certain Federal actions. As noted above, this action involves an FMP-level decision (whether or not to move skates from the GOA FMP "other species" category to its "target species" category) and a decision on how to incorporate the skates into the annual specifications process.

Under the status quo (FMP-level Alternative A) the Council does not have the ability to protect the skate species. In 2003, the “other species” complex TAC is larger than the OFL for skates. Harvest by the new targeted skate fishery could drive down the skate biomass and reduce its reproductive potential. This is particularly problematic since there is great uncertainty about the biology and population dynamics of skates. Skate species are believed to have low fecundity, and low growth rates, which would lead to slow recoveries if stocks were fished down. While revenues from the fishery would be higher in the short run, while the biomass was being driven down, they would be lower in the longer run as a reduced biomass supports a smaller skate fishery. Fishing costs might be higher if the biomass were fished down due to lower catch per unit of effort.

This key tradeoff, between the cost of constraints on the fishery in the short run, and the long-run benefits from protection of the stock, with possibly higher harvests and revenues in the long run, will be affected by the way the Council chooses to incorporate the skates into the specifications. Alternative 3 may be the most costly of the specifications alternatives for small entities, since it provides for skate species and area specific OFLs and may be most likely to lead to operational constraints on fishing vessels. However, Alternative 3 is also believed to provide the most protection to the skate stocks. Alternative 2, which provides for a GOA-wide OFL, and species and area specific ABCs would be less burdensome than Alternative 3, but would also provide somewhat less protection for the stocks. Because the management of skates under Alternatives 2 and 3 would be to the area TAC level, the addition of area specific OFLs under Alternative 3 may not add much more protection. Alternative 1 which provides for a GOA OFL and area specific (not species specific) ABCs would be the least burdensome, but creates the possibility of overharvesting of individual skate stocks within the skate group.

The benefits and costs of these alternatives will depend in part on the annual ABC and TAC recommendations made by the Council. They would also depend on future fishing activity in the absence of the action, the impact of the activity on skate biomass, and the choice of a discount rate used to facilitate a comparison of current and future revenues.

Both alternatives do give fishery managers considerably greater control over skate harvests in the face of future uncertainty. Alternative 3 gives more control than Alternative 2. This control may be important as a rapidly expanding fishery begins to harvest this species with relatively low fecundity and relatively low growth rates.

Preferred Alternatives

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 being 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 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.

Amendment 63

The FMP level alternatives are status quo or move skates from the other species category to the target species category in the GOA FMP. The status quo alternative may have negative impacts on skate stocks by limiting the ability of NMFS to control skate fishing. Because of the potential of a developing skate fishery to harvest at levels too high for the available skate biomass, Alternative B is the preferred alternative. Alternative B will allow NMFS to directly manage the skate group or groups and control directed fishing activities on skates in the GOA.

The skate specification alternatives include a range of levels of management depending on species and area application of ABCs and OFLs. Alternative 1 would manage skates with a single GOA wide OFL and area specific ABCs. This alternative would still allow for a disproportionately high level of harvest of a single species within a narrow geographic range. Alternative 3 is the most protective alternative for the skate stocks by establishing species and area specific ABCs and OFLs. The resultant OFLs would be smaller than a GOA wide OFL, leading to a greater likelihood of closure of other directed species fisheries that take skate as incidental catch if OFL levels were reached. Alternative 2 manages skates with both species and area level ABCs, as does Alternative 3, but with a single GOA wide OFL. The best method for the management of a targeted stock is at the TAC (sometime equal to the ABC) level. The skate fishery or fisheries would be managed to the TAC level so the likelihood of exceeding the OFL level would be reduced. In September 2003, the Groundfish Plan Teams recommended Alternative 2 and the stock assessment author recommended Alternative 3. Additional stock assessment information will be available after the 2003 November Plan Team meeting. A preferred skate specification alternative has not been chosen at this time.

1.0 Purpose and Need

1.1 Introduction

This document addresses two distinct but related issues. It contains an Environmental Assessment and Initial Regulatory Flexibility Review (EA/IRFA) analyzing proposed and interim 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), including seasonal apportionments and allocations, and prohibited species catch (PSC) limits with seasonal apportionments and allocations. These documents address the statutory requirements of the National Environmental Policy Act (NEPA) and the Regulatory Flexibility Act (RFA).

The EA/IRFA, and a Regulatory Impact Review (RIR) also analyze a proposal (GOA FMP Amendment 63) to modify the GOA harvest specifications by removing skates from the other species complex and managing the skate species as a separate group, including a TAC limit for the skate species group. The establishment of a separate TAC for the skate species group will allow better control over the harvest of skates. The GOA skate fishery grew rapidly in 2003. In addition to addressing the requirements of NEPA and the RFA for this action, the RIR addresses the requirements of Presidential Executive Order 12866 (EO 12866), which mandates a cost-benefit analysis.

Table 1.1-1 Actions and analyses in this document

	Environmental Assessment (EA) (NEPA)	Regulatory Impact Review (RIR) (E.O. 12866)	Initial Regulatory Flexibility Analysis (IRFA) (Reg Flex Act small entity analysis)
2004 Annual Specifications	Joint analysis	Not applicable	Joint analysis
2004 Interim Specifications	Joint analysis	Not applicable	Not applicable
Amend 63 - skates	Joint analysis	Amend 63 only	Joint analysis
Note: “Joint” means that the indicated document covers one or more actions.			

The purpose of the environmental assessment (EA) is to predict whether the impacts to the human environment resulting from setting the 2004 proposed and interim harvest specifications and implementation of Amendment 63 will be significant. See sections 7.0 and 8.0 for the purpose and need of the IRFA and RIR, respectively. If the predicted impacts from the preferred alternatives are insignificant, and those alternatives are chosen, no further analysis is necessary to comply with the requirements of the NEPA.

The implementation of the 2004 harvest specifications, and Amendment 63, are necessary for the management of the groundfish fisheries and the conservation of marine resources, as required by the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act).

1.2 The Annual Specifications Process

Fishing areas and the fishing year

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 fishery management plan (FMP) amendments. For particular target fisheries, TAC specifications are further allocated within management areas (Eastern, Central, Western Aleutian Islands; Bering Sea; Western, Central, and Eastern Gulf of Alaska), among management programs (open access or community development quota program), processing components (inshore or offshore), specific gear types (trawl, non-trawl, hook-and-line, pot, jig), and seasons, according to regulations § 679.20, § 679.23, and § 679.30. TAC can be sub-allocated to the various gear groups, management areas, and seasons according to pre-determined regulatory actions and for regulatory announcements by NMFS management authorities opening and closing the fisheries accordingly. No foreign fisheries are conducted in the Alaska exclusive economic zone (EEZ) 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 the most important 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 to December 31 (§ 679.2 and 679.23). Depending on the target species' spatial allocation, additional specifications are made to particular seasons (defined portions of the year or combinations of defined portions of the year) within the fishing year. 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 packages the recommendations into specification documents and forwards them to the Secretary of Commerce for approval.

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. A Plan Team meeting is held in September to review potential model changes and is 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.

Proposed, interim, and final specifications

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.

Specification of the upcoming year's harvest levels is currently a three-step process. First, proposed harvest specifications including ABCs, TACs, and PSC limits[2] are recommended by the Council at its October meeting and published in November or December in the Federal Register for public review and comment. In October, most stock assessments are not yet available. Since 2002, the proposed harvest specifications for a number of target species are based on projections from the current SAFE reports, rather than rollovers of the current year's harvest specifications used for species with little stock assessment information. This provided for a more scientifically based proposed harvest level for those species with enough information available to allow for projections.

Second, NMFS annually 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 initial TAC (ITAC) and apportionment thereof, one-fourth of each proposed PSC allowance, and the first seasonal allowance of GOA and BSAI pollock, Pacific cod, and BSAI Atka mackerel. These interim specifications are in effect on January 1 and remain in effect until superceded by final specifications. For most BSAI target species, the ITAC is calculated as 85 percent of the previous year's 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.

[2]BSAI crab, halibut, salmon and herring limits are set 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.

The interim PSC limits are one quarter of the annual limit and PSC reserves. A PSC reserve of 7.5 percent is set aside to establish the prohibited species quota (PSQ) for the CDQ program (50 C FR § 679.21(e)(1)(i)). For interim specifications PSQ reserves are subtracted from the previous year's PSC limit and 25 percent of the remaining 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. Retention of sablefish in the BSAI with fixed gear is not currently authorized under interim specifications. Further, existing regulations do not provide for an interim specification for the CDQ non-trawl sablefish reserve or for an interim specification for sablefish managed under the IFQ program. This means that retention of sablefish in the BSAI taken with hook-and-line or pot gear is prohibited prior to the effective date of the final harvest specifications.

Third, 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, 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 mid to late February and replace the interim specifications as soon as they are in effect.

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 Headquarters, the NMFS Office of Sustainable Fisheries in Silver Spring, Maryland, where it undergoes reviews within NMFS before forwarding 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. Since 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 preliminary SAFE Reports. Council Plan Teams meeting. Initiation of informal Section 7 Consultation.	Open Public Meetings. *Federal Register* Notice of Plan Teams' Meetings.	Stock assessment teams fully scope out work necessary to complete stock chapter, models to run, emerging ecosystem issues
September	Staff draft proposed and interim harvest specifications notices and EA/IRFA based on current year's specifications or current SAFE projections.	None	Proposed 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 preliminary SAFE, highlights of differences seen in recent surveys and ecosystem from past years.	Open Public Meeting *Federal Register* Notice of initial action on next year's Harvest specifications as an agenda item	Council recommends interim and proposed Harvest specifications.
Late October	NMFS submits interim and proposed specifications package to HDQs.	None	Secretarial review of Council recommendation
November	November Plan Teams' Meetings EA/IRFA for final specs. drafted prior to and during Plan Team meetings. Finalize SAFE Reports.	Open Public Meetings *Federal Register* Notice of Plan Teams' Meetings	Plan Team makes its ABC recommendations. Determination of whether Section 7 Consultation has to be formal or informal.

Time	Activity	Opportunity for Public Involvement	Decision Points
November - December	File interim and proposed specification rule with *Federal Register*	Written comments accepted on 15-60 day (usually 30) comment period for proposed and interim rule. 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 publication. 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 2-10	December Council Meeting. Release and present Draft EA containing Final SAFE Reports, Ecosystem information, Economic SAFE	Open Public Meeting *Federal Register* notice of next year's harvest specifications as an agenda item. Last **meaningful** opportunity for comments on the next year's quotas.	Determine amount to nearest mt of next year's TAC and PSC quotas. Determination of no effect to Essential Fish Habitat. ESA Section 7 consultation concluded.
December 11-25	NMFS staff draft final harvest specifications rule	Comments related to information released prior to and during Council meeting may still be trickling in. Those comments are given consideration in final edits of the EA.	No original thinking occurs
December 25-31	Harvest specifications EA/IRFA finalized.	No public comment period. Notices of intent to sue should be filed within 60 days of FONSI	FONSI determination
February of **subject fishing year**	Submit final rule to Secretary for filing with Office of Federal Register.	None	Secretarial approval of 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 is usually waived.	Final harvest specifications replace interim specifications on date of publication.

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 Regulatory Flexibility Act) 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	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. (These recommendations are used for establishing interim specifications.)
October	Recommendations from the Council on ABCs and TACs for Alternative 2.	Secretarial decision-making on interim specifications.
November	SAFE reports finalized; November Plan Team recommendations	December AP, SSC, and Council deliberations on recommended specifications.
December/January	Council December recommendations.	Secretarial decision-making on final specifications.

1.3 Amendment 63 (GOA skates)

This Environmental Assessment/Regulatory Impact Review/Initial Regulatory Flexibility Analysis (EA/RIR/IRFA) for Amendment 63 to the Gulf of Alaska (GOA) Groundfish Fishery Management Plan (FMP) is proposed to enhance conservation of skates in the GOA. The policy objective for this action is to prevent overfishing and maintain healthy stocks of skate species.

The observed problem in the fishery is the development of a targeted fishery on skate species that are managed under a TAC for five very different groups of groundfish species. As directed in the GOA Groundfish FMP, an ABC is not determined for the “other species” complex, which includes skates, sharks, squids, sculpins, and octopi. Instead, an “other species” TAC is calculated each year as 5 percent of the total TAC for all of the combined GOA species. This offers minimal protection to individual species or groups. Removing GOA skates from the “other species” complex would allow individual specifications (OFLs, ABCs, and TACs) to be adopted for these skate species. Observers are currently being trained to identify skates to the species level to monitor their harvest.

Additional problems with current management stems from:

- Targeting in the new fishery on one or two of approximately 14 skate species
- Lack of observers (small vessels and low volume plants) in the new fishery
- Problems with identifying skate species by processors
- Lack of life history information on skates in Alaska
- Knowledge that skates are relatively long lived, late maturing, low fecundity as a group

GOA Plan Amendment 63 (and BSAI Plan Amendment 63 which is not part of this proposed action) originally was initiated by the Council in 1998 to examine a proposal by the Alaska Board of Fisheries (Board). In 1998, the ADF&G, on behalf of the Board, requested complementary federal action to a change in State management which prohibited directed commercial fishing of sharks, skates, and rays in territorial waters of Alaska. Since 1998, NMFS Alaska Fisheries Science Center and Alaska Department of Fish and Game stock assessment authors, the BSAI and GOA Groundfish Plan Teams, SSC, and Council have been moving towards revising management of non-target species. However, a targeted fishery for skates in Western and Central GOA around Kodiak Islands developed in 2003, without the protective measures in place that still are under development.

1998 Alternatives to prohibit directed fishing of sharks and skates

Alternative 1:	No action.
Alternative 2:	Separate sharks and/or skates from the "other species" category through the annual specifications process and enact federal regulations to prohibit directed fishing of those species.
Alternative 3:	Amend the BSAI and GOA groundfish FMPs to separate sharks and/or skates from the "other groundfish" species category and defer management to the State of Alaska.
Alternative 4:	Amend the BSAI and GOA groundfish FMPs to delete sharks and/or skates from the BSAI and GOA groundfish FMPs.

At their September 2003 meeting, the Joint BSAI and GOA Groundfish Plan Teams identified that the GOA skate complex is of immediate concern regarding the rapid development of the skate fishery in the Gulf, and the need to have this fishery develop in a sustainable manner. The Joint Plan Teams recommended setting a gulfwide OFL and separate ABCs for areas 610, 620, and 630 for: (1) big skate; (2) longnose skate; and (3) the other skates to afford the greatest level of protection possible based on the best available data on these species. However, setting specifications would afford a greater level of protection from overfishing compared with the status quo, although not as much as setting them at the individual species level.

The teams deferred final determination of the OFL and ABCs to the analysts to allow for incorporation of the most current 2003 landings data. However, the teams reviewed a draft OFL recommendation of 7,519 mt, based on Tier 6 (average catch between 1978 and 1995). The ABCs are determined as equal to or less than 75 percent of OFL. For development of area ABCs, the Joint Plan Team recommended that the analysts consider using weighted averages, including information on catchability as data allowed, and examining the halibut surveys to look at the skate bycatch information in the halibut fishery to determine distribution and target fishery information. A complete review of the methodology and the specifications for GOA skates will be provided in the public review draft of this analysis and will undergo rigorous review a the November 2003 Plan Team meeting and by the SSC at its December 2003 meeting.

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

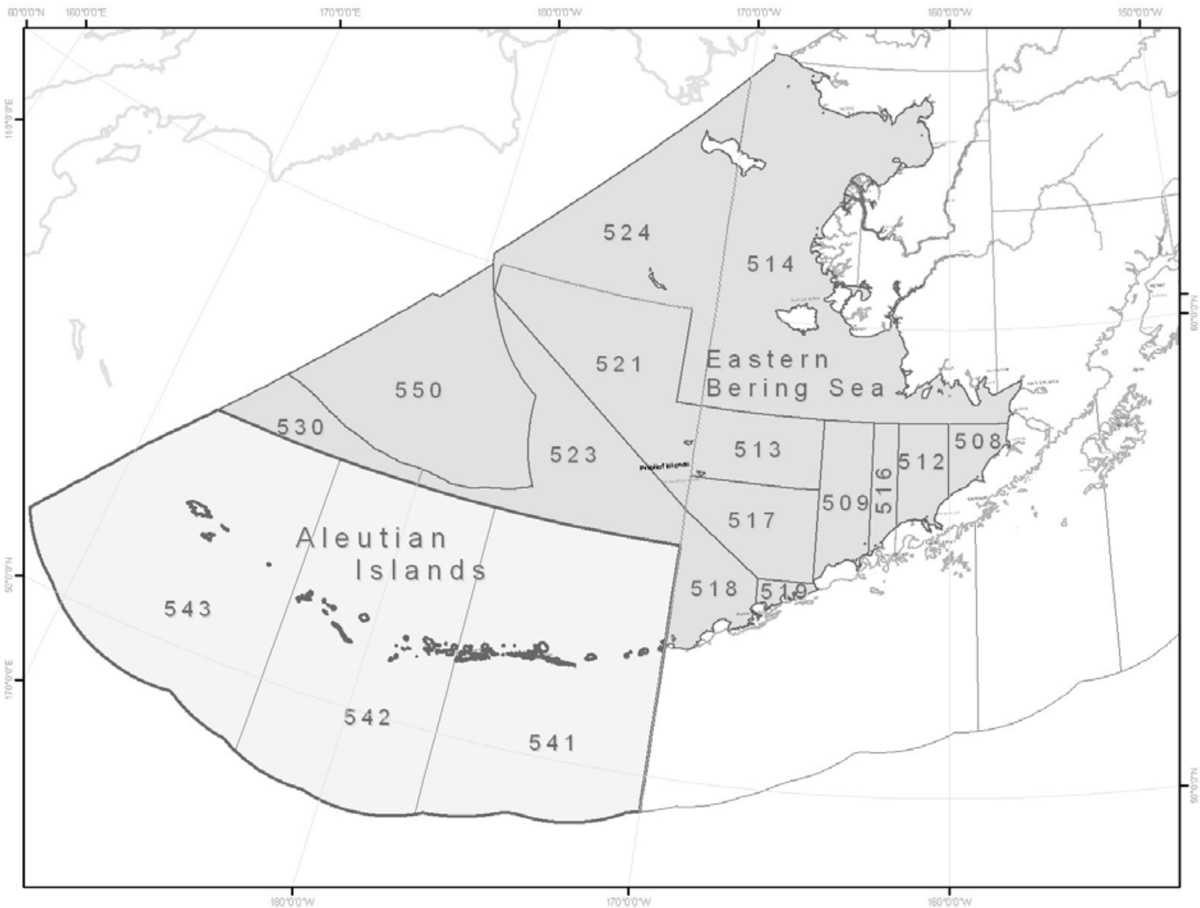
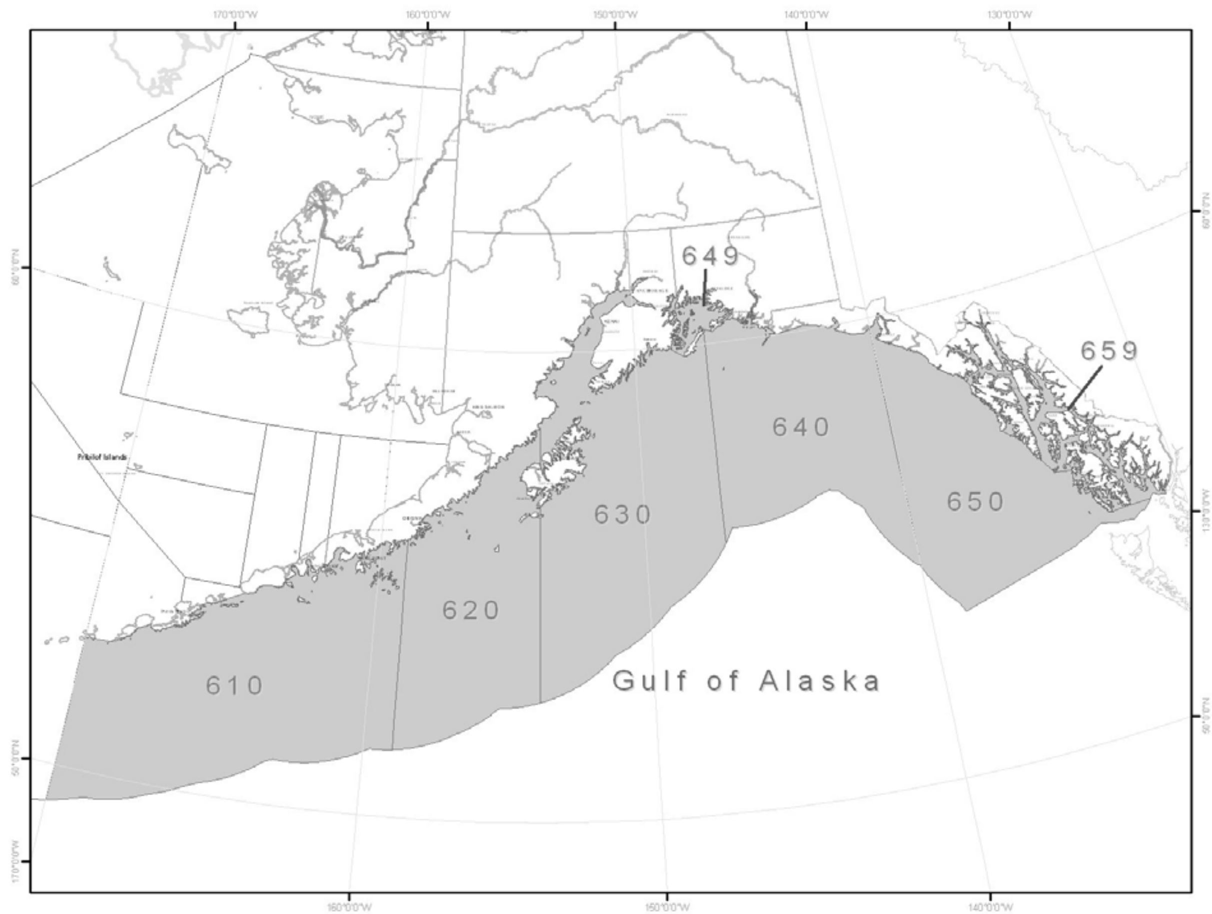


Figure 1-2 Gulf of Alaska (GOA) management area



2.0 Descriptions of Alternatives

This chapter describes the 2004 harvest specifications alternatives, and the Amendment 63 (skate breakout) alternatives. There are five specifications alternatives, and five Amendment 63 alternatives.

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 fishing sector allocations. 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 full potential of the sector to harvest the Pacific cod and not be closed based on reaching the 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 TAC.

Each of the five 2004 proposed and interim 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 (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.

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. Substantive, but 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.

So that fishing may begin January 1, interim TAC specifications are set based upon the proposed specifications. The interim specification authorize the release of one-fourth of each proposed TAC and apportionment thereof, one-fourth of each PSC and apportionment thereof and the first seasonal allowance of pollock, Atka mackerel, and Pacific cod. Interim specifications are published in the *Federal Register* in December and are superceded by the final specifications. The interim TACs for fishing year 2004 are detailed in Section 2.4 of this document. The Council's October 2003 motion on these specifications will constitute their final recommendation on interim specifications.

The measurable impacts of an alternative TAC specification (harvest quota) accrue to the target resources themselves, other species in the ecosystem, the state fisheries that occur in adjacent marine waters, and those that benefit both from consumptive and non-consumptive users of living marine resources.

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

- A summary of the 2004 ABC specifications recommendations made by the GOA and BSAI plan teams at their September 2003 meetings.
- A summary of ABCs for each of the five alternatives
- A summary of TACs for each of the five alternatives
- A summary of interim TACs for each of the five alternatives
- A description of the Amendment 63 alternatives for breaking skates out from the "other species" grouping in the GOA

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 constrained by ABC, so this alternative provides a likely upper limit for setting TAC within the limits established by the fishery management plan.	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.

2.1 2003 September plan team meetings

Establishing harvest specifications involves the gathering and analysis of fisheries data. The groups responsible for reviewing stock assessments, recommending OFLs and ABCs, and preparing the SAFE reports for Council consideration are the BSAI and GOA Groundfish Plan Teams (Plan Teams). These teams include NMFS scientists and managers, Alaska, Oregon, and Washington fisheries management agencies scientists, university faculty, and Council staff. Using stock assessments prepared annually by NMFS and by the Alaska Department of Fish and Game (ADF&G), Plan Teams recommend 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. A Plan Team meeting is held in September to review potential model changes, ecosystem consideration, and other related management issues, and is used for proposed ABC recommendations.

The plan team proposed ABC recommendations are reviewed by the Council and its SSC and AP at the October Council meeting. Proposed ABCs, TACs, and PSC limits[3] are recommended by the Council at this meeting and published by mid-December in the Federal Register for public review and comment.

When the plan teams meet in September, most stock assessments are not yet available. Prior to 2002 the teams' proposed specifications were set equal to the current year's specifications (rollover). In 2002, the proposed 2003 harvest specifications for a number of target species were based on projections from the 2001 SAFE reports, rather than rollovers of the 2002 harvest specifications. This provided for a more scientifically based proposed harvest level for those species with enough information available to allow for projections. The plan teams continued to use this approach in September 2003 for the 2004 proposed ABC recommendations. The plan teams' recommendations are summarized in Tables 2.1-1 and 2.1-2.

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

Table 2.1-1 BSAI ABC/OFL Plan Team Recommendations for 2004

					Projected		
		2003	**2003**	**2003**	**2004**	**2004**	
Species	**Area**	**ABC**	**OFL**	**TAC**	**ABC**	**OFL**	
Pollock	EBS	2,330,000	3,530,000	1,491,760	2,127,700	2,636,000	
	AI	39,400	52,600	1,000	*39,400*	*52,600*	*
	Bogoslof	4,070	45,300	50	*4,070*	*45,300*	*
Pacific cod	**BSAI**	223,000	324,000	207,500	245,000	359,000	
Yellowfin sole	**BSAI**	114,000	136,000	83,750	109,600	130,000	
Greenland turbot	**BSAI**	5,880	17,800	4,000	6,900	16,755	
	BS	3,920		2,680	4,600		
	AI	1,960		1,320	2,300		
Arrowtooth flounder	**BSAI**	112,000	139,000	12,000	142,200	175,800	
Rock sole	**BSAI**	110,000	132,000	44,000	99,900	119,400	
Flathead sole	**BSAI**	66,000	81,000	20,000	61,100	74,100	
Alaska Plaice	**BSAI**	137,000	165,000	10,000	138,200	166,300	
Other flatfish	**BSAI**	16,000	21,400	3,000	*16,000*	*21,400*	*
Sablefish	EBS	2,900	4,290	2,900	2,658	3,818	
	AI	3,100	4,590	3,100	2,842	4,082	
True POP	**BSAI**	15,100	18,000	14,100	14,900	17,600	
	EBS	2,410		1,410	2,378		
	Eastern	3,500		3,500	3,454		
	Central	3,340		3,340	3,296		
	Western	5,850		5,850	5,773		
Northern RF	**BSAI**	7,101	9,468	6,000	*7,101*	*9,468*	*
	EBS			121			
	AI			5,879			
Short/Rougheye	**BSAI**	967	1,289	967	*967*	*1,289*	*
	BS			137			
	AI			830			
Other rockfish (incl. sharpchin)	**BS**	960	1,280	960	*960*	*1,280*	*
	AI	634	846	634	*634*	*846*	*
Atka mackerel	**AI**	63,000	99,700	60,000	61,600	104,100	
	Eastern	10,650		10,650	10,413		
	Central	29,360		29,360	28,708		
	Western	22,990		19,990	22,479		
Squid	**BSAI**	1,970	2,620	1,970	*1,970*	*2,620*	*
Other species	**BSAI**	43,300	81,100	32,309	*43,300*	*81,100*	*
BS/AI	TOTAL	3,298,792	4,867,309	2,000,000	3,210,402	4,022,858	

* Indicates rollover from previous year (no age-structured projection data available)

Table 2.1-2 GOA Groundfish Plan Team Recommendations for 2004

					Projected		
		ABC (mt)	**TAC**	**OFL**	**ABC (mt)**	**OFL**	
SPECIES		**2003**	**2003**	**2003**	**2004**	**2004**	
Pollock	W (61)	16,788	16,788		16,788		
	C (62)	19,685	19,685		19,685		
	C (63)	10,339	10,339		10,339		
	WYAK	1,078	1,078	69,410	1,078		
	SubTotal	47,890	47,890	69,410	47,890	47,890	
	EYAK/SEO	6,460	6,460	8,610	6,460	6,460	
	TOTAL	54,350	54,350	78,020	**54,350**	54,350	
Pacific Cod	W	20,600	15,450		18,649		
	C	29,000	22,690		26,254		
	E	3,200	2,400		2,897		
	TOTAL	52,800	40,540	70,100	47,800	63,700	
Deep water flatfish1	W	180	180		180		
	C	2,220	2,220		2,220		
	WYAK	1,330	1,330		1,330		
	EYAK/SEO	1,150	1,150		1,150		
	TOTAL	4,880	4,880	6,430	4,880	6,430	*
Rex sole	W	1,280	1,280		1,280		
	C	5,540	5,540		5,540		
	WYAK	1,600	1,600		1,600		
	EYAK/SEO	1,050	1,050		1,050		
	TOTAL	9,470	9,470	12,320	9,470	12,320	*
Shallow water flatfish2	W	23,480	4,500		23,480		
	C	21,740	13,000		21,740		
	WYAK	1,160	1,160		1,160		
	EYAK/SEO	2,960	2,960		2,960		
	TOTAL	49,340	21,620	61,810	49,340	61,810	*
Flathead sole	W	16,420	2,000		14,916		
	C	20,820	5,000		18,914		
	WYAK	2,900	2,900		2,634		
	EYAK/SEO	1,250	1,250		1,136		
	TOTAL	41,390	11,150	51,560	37,600	46,600	
Arrowtooth flounder	W	17,990	8,000		18,670		
	C	113,050	25,000		117,320		
	WYAK	18,190	2,500		18,877		
	EYAK/SEO	5,910	2,500		6,133		
	TOTAL	155,140	38,000	181,390	161,000	188,300	
Sablefish	W	2,570	2,570		1,968		
	C	6,440	6,440		4,931		
	WYAK	2,320	2,320		1,776		
	SEO	3,560	3,560		2,726		
	TOTAL	14,890	14,890	20,020	11,400	16,500	
Other Slope rockfish	W	90	90		90		
	C	550	550		550		
	WYAK	270	150		270		
	EYAK/SEO	4,140	200		4,140		
	TOTAL	5,050	990	6,610	5,050	6,610	*
Northern rockfish	W	890	890		789		
	C	4,640	4,640		4,111		
	E	0	0		0		
	TOTAL	5,530	5,530	6,560 [3]	4,900	5,800	

SPECIES		ABC (mt) 2003	TAC 2003	OFL 2003	*Projected* ABC (mt) 2004	OFL 2004	
Pacific ocean perch		W 2,700	2,700	3,220	2,728		
	C	8,510	8,510	10,120	8,597		
	WYAK	810	810		818		
	SEO	1,640	1,640	2,900	1,657		
	TOTAL	13,660	13,660	16,240	13,800	16,400	
Shortraker/rougheye		W 220	220		220		
	C	840	840		840		
	E	560	560		560		
	TOTAL	1,620	1,620	2,340	1,620	2,340	*
Pelagic shelf rockfish		W 510	510		510		
	C	3,480	3,480		3,480		
	WYAK	640	640		640		
	EYAK/SEO	860	860		860		
	TOTAL	5,490	5,490	8,220	5,490	8,220	*
Demersal Shelf Rockfish		390	390	540	390	540	*
Atka Mackerel		GW 600	600	6,200	600	6,200	*
Thornyhead rockfish		360	360		360		
		840	840		840		
		800	800		800		
	TOTAL	2,000	2,000	3,050	2,000	3,050	
Other Species		GW NA	11,260	NA	NA	NA	
TOTAL		416,600	236,440	531,410	409,690	544,330	

1/ Deep water flatfish includes dover sole, Greenland turbot and deepsea sole.
2/ "Shallow water flatfish" includes rock sole, yellowfin sole, butter sole, starry flounder, English sole, Alaska plaice, and sand sole.
3/ The EGOA ABC of 5 mt for northern rockfish has been included in the WYAK ABC for other slope rockfish.
* Indicates rollover from previous year (no age-structured projection data available)
NOTE:
ABCs and TACs are rounded to nearest 10 mt.
GW means Gulfwide.
Catch data source: NMFS Blend Reports.

2.2 2004 Proposed ABCs

Tables 2.2-1 and 2.2-2 below, summarize the ABCs associated with each of the alternatives. The Alternative 2 ABCs are those recommended by the GOA and BSAI plan teams in their September 2003 meetings. These have been highlighted in the tables. The plan teams did not make any ABC recommendations for the other alternatives (Alts. 1, 3. 4, and 5). In the absence of new information, these ABCs have been set equal to the final ABC estimates in the EA/IRFA for the 2003 specifications.

Table 2.2-1 2004 BSAI ABCs for Alternatives 1 through 5

Species	Area	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5
Pollock	EBS	2,330,000	2,127,700	1,258,000	1,123,000	0
	Aleutian Islands	39,400	39,400	19,700	5,223	0
	Bogoslof District	4,000	4,070	2,000	30	0
Pacific cod	BSAI	278,000	245,000	147,000	168,200	0
Sablefish	BS	3,500	2,658	1,750	2,200	0
	AI	3,800	2,842	1,900	2,300	0
Atka mackerel	Total	82,800	61,600	45,400	51,000	0
	WAI	30,300	22,479	16,600	18,600	0
	EAI/BS	13,900	10,413	7,600	8,600	0
	CAI	38,600	28,708	21,200	23,800	0
Yellowfin sole	BSAI	114,000	109,600	58,200	92,600	0
Rock sole	BSAI	110,000	99,900	57,300	34,800	0
Greenland turbot	Total	14,700	6,900	7,700	5,880	0
	BS	9,849	4,600	5,159	3,940	0
	AI	4,851	2,300	2,541	1,940	0
Arrowtooth flounder	BSAI	112,000	142,200	59,800	7,300	0
Flathead sole	BSAI	66,000	61,100	34,800	14,700	0
Alaska Plaice	BSAI	137,000	138,200	72,600	14,200	0
Other flatfish	BSAI	23,700	16,000	12,600	11,902	0
Pacific ocean perch	BSAI	15,085	14,900	7,600	10,800	0
	BS	1,041	2,378	521	745	0
	AI total	14,029	12,523	7,015	10,044	0
	WAI	6,467	5,773	3,237	4,630	0
	CAI	3,690	3,296	1,847	2,642	0
	EAI	3,872	3,454	1,938	2,772	0
Northern rockfish	BSAI	6,998	7,101	3,499	3,713	0
	BS	18	143	9	112	0
	AI	6,980	6958	3,490	3,601	0
Shortraker/Rougheye	BSAI	967	967	484	655	0
	BS	137	137	69	104	0
	AI	830	830	415	551	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	19,320	43,300	9,660	23,972	0
Total		3,364,834	3,127,002	1,801,775	1,573,958	0

Table 2.2-2 2004 GOA ABCs for Alternatives 1 through 5.

Species	Area	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5
Pollock (1)	610	20,756	16,788	10,655	27,201	0
	620	24,337	19,685	12,494	31,895	0
	630	12,782	10,339	6,562	16,752	0
	640	1,333	1,078	684	1,747	0
Subtotal WYK/C/W		59,208	47,890	30,395	77,595	0
	650	6,460	6,460	3,230	10	0
Total GOA		65,668	54,350	33,625	77,605	0
Pacific cod (2)	GOA	59,900	47,800	31,600	45,000	0
	W	23,360	18,649	12,320	17,550	0
	C	32,945	26,254	17,380	24,750	0
	E	3,595	2,897	1,900	2,700	0
Flatfish	GOA	53,263	49,340	27,668	5,264	0
Shallow water	W	25,347	23,480	13,167	313	0
	C	23,469	21,740	12,191	4,938	0
	WYK	1,252	1,160	650	12	0
	SEO	3,195	2,960	1,660	1	0
Rex sole	GOA	9,470	9,470	4,774	3,053	0
	W	1,280	1,280	645	552	0
	C	5,540	5,540	2,793	2,483	0
	WYK	1,600	1,600	807	12	0
	SEO	1,050	1,050	529	6	0
Flathead sole	GOA	41,402	37,600	22,464	2,103	0
	W	16,425	14,916	8,912	834	0
	C	20,825	18,914	11,300	1,058	0
	WYK	2,902	2,634	1,574	147	0
	SEO	1,250	1,136	678	64	0
Flatfish	GOA	4,880	4,880	2,149	1,400	0
Deep water	W	180	180	79	20	0
	C	2,220	2,220	978	1,213	0
	WYK	1,330	1,330	586	156	0
	SEO	1,150	1,150	506	11	0
Arrowtooth flounder	GOA	155,140	161,000	79,719	12,820	0
	W	17,990	18,670	9,244	1,487	0
	C	113,050	117,320	58,091	9,342	0
	WYK	18,190	18,877	9,347	1,503	0
	SEO	5,910	6,133	3,037	488	0
Sablefish (3)	GOA	18,034	11,400	9,301	11,148	0
	W	3,109	1,968	1,603	1,922	0
	C	7,800	4,931	4,023	4,821	0
	WYK	2,813	1,776	1,451	1,739	0
	SEO	4,312	2,726	2,224	2,666	0
Pacific ocean perch	GOA	13,663	13,800	6,913	8,188	0
	W	2,701	2,728	1,366	1,618	0
	C	8,512	8,597	4,307	5,101	0
	WYK	810	818	410	486	0
	SEO	1,640	1,657	830	983	0
Shortraker/rougheye	GOA	1,895	1,620	949	1,619	0
	W	257	220	129	170	0
	C	983	840	492	793	0
	E	655	560	328	656	0
Other rockfish	GOA	5,158	5,050	2,618	724	0
	W	92	90	47	77	0
	C	562	550	285	500	0

Species	Area	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5
	WYK	276	270	140	90	0
	SEO	4,229	4,140	2,146	57	0
Northern rockfish	GOA	5,530	4,900	2,673	2,264	0
	W	890	789	430	364	0
	C	4,640	4,111	2,243	1,900	0
	E	0	0	0	0	0
Pelagic shelf rockfish	GOA	6,612	5,490	3,306	3,554	0
	W	614	510	307	137	0
	C	4,191	3,480	2,096	2,900	0
	WYK	771	640	385	501	0
	SEO	1,036	860	518	16	0
Thornyhead rockfish	GOA	2,500	2,000	1,250	1,260	0
	W	450	360	225	230	0
	C	1,050	840	525	530	0
	E	1,000	800	500	500	0
Demersal shelf rockfish	SEO	473	390	236	347	0
Atka mackerel	GW	4,700	600	2,350	182	0
Subtotal						0
Other species (4)	GW					0
Total		448,288	409,690	231,595	176,531	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 are based on the September 2003 plan teams ABC recommendations, and the Council's 2003 TAC recommendations, as described below. The Alternative 2 TACs are highlighted in the tables. The TACs for Alternatives 1, 3, 4, and 5, have been set equal to the ABCs for those alternatives.

The ABCs recommended by the plan team's sum to more than the OY in the BSAI. This would not be a legal alternative. A NEPA alternative need not be authorized by law. However in this instance Alternative 2 is expected to be the Council's preferred alternative and to be adopted without statutory changes. Moreover, in the past the Council has often set TACs below ABC, even if it was not necessary to reach OY. It would be desirable for the analysis to reflect typical Council decision making. Gross revenue estiamtes for harvests associated with this alternative are contained in Chapter 4 as a part of the discussion of the impact on the human environment. These revenue estimates require estimates of potential harvests and TAC estimates are helpful in setting analytical constraints on potential harvests. Finally, the proposed specifications imply interim specifications. Evaluation of potential interim specifications makes it necessary to estimate potential TACs associated with the plan team's ABC recommendations.

In the BSAI, the estimations of proposed TACs under Alternative 2 for 2004 are based largely on the Council's recommendations for the 2003 final TACs at its December 2003 meeting. Provided that the Council's 2003 TAC recommendations do not exceed the Plan Teams proposed ABCs for 2004 the Council's final 2003 TAC recommendations were rolled over. If the Council's final 2003 TAC recommendation exceed the Plan Teams proposed 2004 ABC then the lower value (the proposed ABC) was used for the proposed 2004 TAC under Alternative 2. This may better estimate what the proposed TACs might look like under the 1.4 to 2.0 million mt OY permissible range rather than setting the proposed TAC at the Plan Teams proposed ABC levels for 2004 which would exceed the 2.0 million mt OY cap.

The estimations of proposed TACs under Alternative 2 for 2004 are based largely on the Council's recommendations for the 2003 final TACs at its December 2003 meeting. For pollock, deep water flatfish, rex sole, sablefish, northern rockfish, Pacific Ocean perch, Shortraker and rougheye rockfish, pelagic shelf rockfish, demersal shelf rockfish, Atka mackerel, and thornyhead rockfish along with shallow water flatfish, flathead sole, in the Eastern GOA and other slope rockfish in the Central and Western GOA the Council has recommended recently that TACs be set at ABC levels. Where the Council has recommended that TACs be set at levels lower that the ABCs for the proposed 2004 specifications we have rolled over the Council's final 2003 TAC recommendations, these include Pacific cod, shallow water flatfish and flathead sole in the Central and Western GOA, and arrowtooth flounder. The Pacific cod TACs are reduced from ABC levels by the anticipated levels of the GHLs in the state managed Pacific cod fisheries of 10%, 23% and 25% in the Eastern, Central, and Western GOA respectively. For the other species assembly the proposed TAC is 5% of the sum of all other TACs in the GOA. Initial TACs for groundfish are not established in the proposed specifications for the GOA.

The TAC estimates for Alternatives 1, 3, 4, and 5 are set equal to the ABCs summarized in Tables 2.3-1 and 2.3-2. This is the intent of the alternative language. While the sum of the Alternative 1 ABCs exceeds the OY, as noted above, NEPA alternatives do not have to be currently authorized by law. Setting the TACs equal to ABCs is consistent with the language of the alternatives, and provides for a high-TAC alternative.

Regulations at 50 CFR §679.20(a) specify that the annual optimal yield (OY) for groundfish in the BSAI is 1.4 million to 2.0 million metric tons. The optimal yield in the GOA is 116,000 to 800,000 metric tons. The sum of the annual TACs in each year cannot be greater than the optimal yield in that area. While the sum of TACs in the GOA implied by the different alternatives does not approach the upper end of the OY range in 2003, the BSAI Alternative 1 total exceeds the OY. Before a decision on TAC specifications is made, however, individual target species or species groups TACs will be reduced to bring the overall total within bounds specified by the FMPs.

Table 2.3-1 2004 BSAI TACs for Alternatives 1 through 5

Species	Area	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5
Pollock	EBS	2,330,000	1,491,760	1,258,000	1,123,000	0
	Aleutian Islands	39,400	1,000	19,700	5,223	0
	Bogoslof District	4,000	50	2,000	30	0
Pacific cod	BSAI	278,000	207,500	147,000	168,200	0
Sablefish	BS	3,500	2,658	1,750	2,200	0
	AI	3,800	2,842	1,900	2,300	0
Atka mackerel	Total	82,800	59,111	45,400	51,000	0
	WAI	30,300	19,990	16,600	18,600	0
	EAI/BS	13,900	10,413	7,600	8,600	0
	CAI	38,600	28,708	21,200	23,800	0
Yellowfin sole	BSAI	114,000	83,750	58,200	92,600	0
Rock sole	BSAI	110,000	44,000	57,300	34,800	0
Greenland turbot	Total	14,700	4,000	7,700	5,880	0
	BS	9,849	2,680	5,159	3,940	0
	AI	4,851	1,320	2,541	1,940	0
Arrowtooth flounder	BSAI	112,000	12,000	59,800	7,300	0
Flathead sole	BSAI	66,000	20,000	34,800	14,700	0
Alaska Plaice	BSAI	137,000	10,000	72,600	14,200	0
Other flatfish	BSAI	23,700	3,000	12,600	11,902	0
Pacific ocean perch	BSAI	15,085	13,932	7,600	10,800	0
	BS	1,041	1,410	521	745	0
	AI total	14,043		7,022	10,044	0
	WAI	6,474	5,773	3,237	4,630	0
	CAI	3,693	3,296	1,847	2,642	0
	EAI	3,876	3,454	1,938	2,772	0
Northern rockfish	BSAI	6,998	6,000	3,499	3,713	0
	BS	18	121	9	112	0
	AI	6,980	5,879	3,490	3,601	0
Shortraker/Rougheye	BSAI	967	967	484	655	0
	BS	137	137	69	104	0
	AI	830	830	415	551	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	19,320	32,309	9,660	23,972	0
Total		3,364,834	1,998,443	1,801,775	1,573,958	0

Table 2.3-2 2004 GOA TACs for Alternatives 1 through 5.

Species	Area	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5
Pollock (1)	610	20,756	16,788	10,655	27,201	0
	620	24,337	19,685	12,494	31,895	0
	630	12,782	10,339	6,562	16,752	0
	640	1,333	1,078	684	1,747	0
Subtotal WYK/C/W		59,208	47,890	30,395	77,595	0
	650	6,460	6,460	3,230	10	0
Total GOA		65,668	54,350	33,625	77,605	0
Pacific cod (2)	GOA	59,900	36,809	31,600	45,000	0
	W	23,360	13,987	12,320	17,550	0
	C	32,945	20,215	17,380	24,750	0
	E	3,595	2,607	1,900	2,700	0
Flatfish	GOA	53,263	21,620	27,668	5,264	0
Shallow water	W	25,347	4,500	13,167	313	0
	C	23,469	13,000	12,191	4,938	0
	WYK	1,252	1,160	650	12	0
	SEO	3,195	2,960	1,660	1	0
Rex sole	GOA	9,470	9,470	4,774	3,052	0
	W	1,280	1,280	645	552	0
	C	5,540	5,540	2,793	2,483	0
	WYK	1,600	1,600	807	12	0
	SEO	1,050	1,050	529	6	0
Flathead sole	GOA	41,402	10,770	22,464	2,103	0
	W	16,425	2,000	8,912	834	0
	C	20,825	5,000	11,300	1,058	0
	WYK	2,902	2,634	1,574	147	0
	SEO	1,250	1,136	678	64	0
Flatfish	GOA	4,880	4,880	2,149	1,400	0
Deep water	W	180	180	79	20	0
	C	2,220	2,220	978	1,213	0
	WYK	1,330	1,330	586	156	0
	SEO	1,150	1,150	506	11	0
Arrowtooth flounder	GOA	155,140	38,000	79,719	12,820	0
	W	17,990	8,000	9,244	1,487	0
	C	113,050	25,000	58,091	9,342	0
	WYK	18,190	2,500	9,347	1,503	0
	SEO	5,910	2,500	3,037	488	0
Sablefish (3)	GOA	18,034	11,400	9,301	11,148	0
	W	3,109	1,968	1,603	1,922	0
	C	7,800	4,931	4,023	4,821	0
	WYK	2,813	1,776	1,451	1,739	0
	SEO	4,312	2,726	2,224	2,666	0
Pacific ocean perch	GOA	13,663	13,800	6,913	8,188	0
	W	2,701	2,728	1,366	1,618	0
	C	8,512	8,597	4,307	5,101	0
	WYK	810	818	410	486	0
	SEO	1,640	1,657	830	983	0
Shortraker/rougheye	GOA	1,895	1,620	949	1,618	0
	W	257	220	129	170	0
	C	983	840	492	793	0
	E	655	560	328	656	0
Other rockfish	GOA	5,158	990	2,618	723	0
	W	92	90	47	77	0
	C	562	550	285	500	0

Species	Area	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5
	WYK	276	150	140	90	0
	SEO	4,229	200	2,146	57	0
Northern rockfish	GOA	5,530	4,900	2,673	2,264	0
	W	890	789	430	364	0
	C	4,640	4,111	2,243	1,900	0
	E	0	0	0	0	0
Pelagic shelf rockfish	GOA	6,612	5,490	3,306	3,555	0
	W	614	510	307	137	0
	C	4,191	3,480	2,096	2,900	0
	WYK	771	640	385	501	0
	SEO	1,036	860	518	16	0
Thornyhead rockfish	GOA	2,500	2,000	1,250	1,260	0
	W	450	360	225	230	0
	C	1,050	840	525	530	0
	E	1,000	800	500	500	0
Demersal shelf rockfish	SEO	473	390	236	347	0
Atka mackerel	GW	4,700	600	2,350	182	0
Subtotal		448,288		231,595	176,529	0
Other species (4)	GW	22,414	10,854	11,580	8,826	0
Total		470,703	227,943	243,175	185,358	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 2004 Interim specifications

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

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

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

In the accompanying table neither CDQ nor gear apportionments of TAC are presented.

For pollock the ITAC is based on 90% of the proposed annual TAC and the interim TAC is based on 40% of the proposed annual TAC.

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

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

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

In the GOA, the estimations of proposed TACs under Alternative 2 for 2004 are based largely on the Council's recommendations for the 2003 final TACs at its December 2003 meeting. For pollock, deep water flatfish, rex sole, sablefish, northern rockfish, Pacific Ocean perch, Shortraker and rougheye rockfish, pelagic shelf rockfish, demersal shelf rockfish, Atka mackerel, and thornyhead rockfish along with shallow water flatfish, flathead sole, in the Eastern GOA and other slope rockfish in the Central and Western GOA the Council has recommended recently that TACs be set at ABC levels. Where the Council has recommended that TACs be set at levels lower that the ABCs for the proposed 2004 specifications we have rolled over the Council's final 2003 TAC recommendations, these include Pacific cod, shallow water flatfish and flathead sole in the Central and Western GOA, and arrowtooth flounder. The Pacific cod TACs are reduced from ABC levels by the anticipated levels of the GHLs in the state managed Pacific cod fisheries of 10%, 23% and 25% in the Eastern, Central, and Western GOA respectively. For the other species assembly the proposed TAC is 5% of the sum of all other TACs in the GOA. Initial TACs for groundfish are not established in the proposed specifications for the GOA.

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

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

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

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

The interim TACs are summarized in Tables 2.4-1 and 2.4-2.

Table 2.4-1 2003 BSAI Interim TACs for Alternatives 1 through 5

Species	Area	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5
Pollock	EBS	932,000	596,704	503,200	449,200	0
	Aleutian Islands	15,760	400	7,880	2,089	0
	Bogoslof District	1,600	20	800	12	0
Pacific cod	BSAI	142,725	106,534	75,470	86,354	0
Sablefish	BS	372	283	186	234	0
	AI	202	151	101	122	0
Atka mackerel	Total	35,190	25,122	19,295	21,675	0
	WAI	12,878	8,496	7,055	7,905	0
	EAI/BS	5,908	4,426	3,230	3,655	0
	CAI	16,405	12,201	9,010	10,115	0
Yellowfin sole	BSAI	24,225	17,797	12,368	19,678	0
Rock sole	BSAI	23,375	9,350	12,176	7,395	0
Greenland turbot	Total	3,124	850	1,636	1,250	0
	BS	2,093	570	1,096	837	0
	AI	1,031	280	540	412	0
Arrowtooth flounder	BSAI	23,800	2,550	12,708	1,551	0
Flathead sole	BSAI	14,025	4,250	7,395	3,124	0
Alaska Plaice	BSAI	29,113	2,125	15,428	3,018	0
Other flatfish	BSAI	5,036	638	2,678	2,529	0
Pacific ocean perch	BSAI	3,206	2,961	1,615	2,295	0
	BS	221	300	111	158	0
	AI total	2,985		1,492	2,134	0
	WAI	1,376	1,227	688	984	0
	CAI	785	700	392	561	0
	EAI	824	734	412	589	0
Northern rockfish	BSAI	1,487	1,275	744	789	0
	BS	4	26	2	24	0
	AI	1,483	1,249	742	765	0
Shortraker/Rougheye	BSAI	205	205	103	139	0
	BS	29	29	15	22	0
	AI	176	176	88	117	0
Other rockfish	BS	204	204	102	53	0
	AI	135	135	68	113	0
Squid	BSAI	419	419	210	148	0
Other species	BSAI	4,106	6,866	2,053	5,094	0
Total		1,260,307	778,837	676,212	606,862	0

Table 2.4-2 2004 GOA Interim TACs for Alternatives 1 through 5.

Species	Area	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5
Pollock (1)	610	3,578	2,894	1,837	4,698	0
	620	8,079	6,535	4,148	10,588	0
	630	2,811	2,274	1,443	3,684	0
	640	333	270	171	437	0
Subtotal WYK/C/W		14,802	11,973	7,599	19,399	0
	650	1,615	1,615	808	3	0
Total GOA		16,417	13,588	8,406	19,401	0
Pacific cod (2)	GOA	34,682	21,173	18,295	26,055	0
	W	14,016	8,392	7,392	10,530	0
	C	19,767	12,129	10,428	14,850	0
	E	899	652	475	675	0
Flatfish	GOA	13,316	5,405	6,917	1,316	0
Shallow water	W	6,337	1,125	3,292	78	0
	C	5,867	3,250	3,048	1,234	0
	WYK	313	290	163	3	0
	SEO	799	740	415	0	0
Rex sole	GOA	2,368	2,367	1,194	763	0
	W	320	320	161	138	0
	C	1,385	1,385	698	621	0
	WYK	400	400	202	3	0
	SEO	263	262	132	1	0
Flathead sole	GOA	10,351	2,693	5,616	526	0
	W	4,106	500	2,228	209	0
	C	5,206	1,250	2,825	265	0
	WYK	726	659	394	37	0
	SEO	313	284	170	16	0
Flatfish	GOA	1,220	1,220	537	350	0
Deep water	W	45	45	20	5	0
	C	555	555	245	303	0
	WYK	333	332	147	39	0
	SEO	288	288	127	3	0
Arrowtooth flounder	GOA	38,785	9,500	19,930	3,205	0
	W	4,498	2,000	2,311	372	0
	C	28,263	6,250	14,523	2,336	0
	WYK	4,548	625	2,337	376	0
	SEO	1,478	625	759	122	0
Sablefish (3)	GOA	4,509	2,851	2,325	2,787	0
	W	777	492	401	481	0
	C	1,950	1,233	1,006	1,205	0
	WYK	703	444	363	435	0
	SEO	1,078	682	556	667	0
Pacific ocean perch	GOA	3,416	3,450	1,730	2,047	0
	W	675	682	342	405	0
	C	2,128	2,149	1,077	1,275	0
	WYK	203	205	103	122	0
	SEO	410	414	208	246	0
Shortraker/rougheye	GOA	474	405	237	405	0
	W	64	55	32	42	0
	C	246	210	123	198	0
	E	164	140	82	164	0

Species	Area	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5
Other rockfish	GOA	1,290	248	655	181	0
	W	23	23	12	19	0
	C	141	138	71	125	0
	WYK	69	38	35	22	0
	SEO	1,057	50	537	14	0
Northern rockfish	GOA	1,383	1,225	668	566	0
	W	223	197	108	91	0
	C	1,160	1,028	561	475	0
	E	0	0	0	0	0
Pelagic shelf rockfish	GOA	1,653	1,373	827	889	0
	W	154	128	77	34	0
	C	1,048	870	524	725	0
	WYK	193	160	96	125	0
	SEO	259	215	130	4	0
Thornyhead rockfish	GOA	625	500	313	312	0
	W	113	90	56	58	0
	C	263	210	131	133	0
	E	250	200	125	125	0
Demersal shelf rockfish	SEO	118	98	59	87	0
Atka mackerel	GW	1,175	150	588	45	0
Subtotal		112,072		57,899	59,934	0
Other species (4)	GW	5,604	2,714	2,895	2,207	0
Total		137,382	68,957	71,193	61,141	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.

2.5 Amendment 63 (GOA skates)

This EA/RIR/IRFA evaluates two FMP-level alternatives for moving GOA skates out of the “other species” grouping and placing them in the target species list, allowing for setting OFL, ABC, and TAC levels separately for skates.[4] It also evaluates three specifications-level alternatives for incorporating skates into specifications, contingent on an FMP level decision to break them out of the GOA “other species” category. The FMP-level, and the specifications-level, decisions are discussed separately in this section.

Amendment 63

Two alternatives are considered for removing skates from the “other species” category in the GOA FMP. These are:

(A) the status quo, no action alternative, under which skates would continue to be managed as a part of the “other species” category, and

[4]The action discussed in this section does not change the BSAI FMP. It does not change the management of skates in the BSAI.

(B) an action alternative under which Section 3.1 of the GOA FMP would be amended to remove skates from the “other species” category and add them to the “target species” category.

The GOA FMP does not provide detailed guidance on the details of target species specifications (how to group target species, whether to set OFL or ABC at the FMP region level or at sub-area levels, etc.) These details are incorporated into the annual specifications. The skate specifications alternatives are discussed below.

Skate specifications

Three alternatives are considered for skate specifications, contingent on an FMP-level decision to treat skates as a target species: (1) a single GOA wide OFL for the skate group, and management area ABCs for the skate group, (2) a single GOA wide OFL for skates, and ABCs for key skate species in each management area, (3) management area OFLs and ABCs for each key skate species.

<u>1 A single GOA wide OFL for the skate group, and management area ABCs for the skate group</u> An OFL and ABC would be adopted for the entire GOA, and ABCs and TACs would be adopted by GOA management area (Western, Central, and Eastern). Based on 2001 biomass for skate species, the 2004 OFL would be set at 10,322 mt. The ABC would be set at 7,741 mt, and is divided among the management areas within the GOA as shown in Table 2.5-1. The TAC would be set at equal to or less than the ABC. This specifications alternative provides less protection for individual species than either of the other two specifications alternatives. In September 2003, the BSAI and GOA Groundfish Plan Teams considered and rejected this alternative in favor of an alternative that created a separate OFL GOA-wide and ABCs for the longnose and big skate species, and left other skate species grouped together.

Table 2.5-1 Alternative 1 skate OFL and ABC for 2004 (values in mt) From S. Gaichas, AFSC 9/22/03

	OFL	**ABC**
Skates	**2001 biomass*M (0.10)**	**OFL*0.75**
Western		3,599
Central		2,717
Eastern		1,425
Total	10,322	7,741

<u>2 A single GOA wide OFL for skates, and ABCs for skate species in each management area</u> Sufficient data is available upon which to base species-level specifications for the longnose and big skate species in the directed fishery. An OFL would be adopted for the entire GOA, and ABCs and TACs would be adopted by GOA management area (Western, Central, and Eastern) for each species. Based on 2001 biomass for skate species, the 2004 OFL would be set at 10,322 mt. The ABC would be set at 7,741 mt. The TAC would be set at equal to or less than the ABC. This alternative provides more protection than specifications alternative 1 for individual species. In September 2003, the BSAI and GOA Groundfish Plan Teams recommended adoption of this alternative. Table 2.5-2 also provides the area specific ABCs (these are the same under specifications-level Alternatives 2 and 3).

Table 2.5-2 Alternative 2: A single GOA wide OFL for skates, and ABCs for key skate species in each management area 2004 (values in mt) From S. Gaichas, AFSC 9/22/03

	Western	Central	Eastern
	ABC	**ABC**	**ABC**
Skates	**OFL*0.75**	**OFL*0.75**	**OFL*0.75**
big skate	1,942	1,212	720
longnose skate	890	1,169	579
Other skates	767	336	126
Total	3,599	2,717	1,425
GOA wide OFL		10,322	

3 Management area OFLs and ABCs for each key skate species: Creates separate OFLs, ABCs, and TACs for the longnose and big skate species and an other species group, as does alternative 2. However, this alternative increases the protection from overfishing provided to species, by creating separate OFLs for each of these species in each of the three major management areas in the GOA (Western, Central and Eastern). Table 2.5-3 shows the proposed area OFLs and ABCs under this alternative.

Table 2.5-3 Alternative 3: Management area OFLs and ABCs for each key skate species for 2004 (values in mt) From S. Gaichas, AFSC 9/22/03.

	Western		Central		Eastern	
	OFL	**ABC**	**OFL**	**ABC**	**OFL**	**ABC**
Skates	**2001 biomass*M (0.10)**	**OFL*0.75**	**2001 biomass*M (0.10)**	**OFL*0.75**	**2001 biomass*M (0.10)**	**OFL*0.75**
big skate	2,590	1,942	1,617	1,212	961	720
longnose skate	1,186	890	1,558	1,169	771	579
Other skates	1,023	767	448	336	168	126
Total	4,799	3,599	3,623	2,717	1,900	1,425

Other alternatives considered and rejected

The GOA Groundfish Plan Team recognized that the current TAC-setting formula in the GOA Groundfish FMP was not designed to prevent overfishing at the group or species level. In November 2000, the team adopted an approach for partitioning the combined other species TAC to the group level based on the draft 1999 assessment estimates of assemblage ABCs. The subgroup ABCs were based on apportioning the recommended ABC for each major taxa by its proportionate share of the sum of ABCs for the major taxa in the assemblage (11,890 mt). The Plan Team endorsed this approach as an interim measure until an FMP amendment could be considered by the Council. The Team considered it an interim approach to prevent overfishing of a particular component, in the event that a particular subtaxa became a fishery target. The team identified the following reasons for recommending this interim constraint of TAC for each other species group. This approach was adopted by the Council in December 2000, but was not implemented by NMFS because it required a plan amendment.

Octopus and squid have been identified as preferred prey items of Steller sea lions. Changes to the distribution of groundfish fisheries as a result of Steller sea lion reasonable and prudent measures result in very different distributions of bycatch than previously observed in the GOA. This may result both from directed fishing on new species to replace lost opportunities for traditional target species, and from inadvertent bycatch due to fishing in nontraditional areas.

The Council also considered another approach to separate sharks and skates into an elasmobranch category, separate squid and octopus into a cephalopod category, and include sculpins and grenadiers as separate categories. This was proposed under a previous draft of GOA Plan Amendment 63).

The January 2001 draft of the PSEIS (NMFS 2001d) also examined other management alternatives for non-target species. The following is summarized from that draft analysis. Although there were no directed skate fisheries in the North Pacific Ocean until 2003, skates support directed fisheries in other parts of the world (Agnew et al. 2000, NMFS 2000b, Martin and Zorzi 1993); therefore they could be a potentially important fishery resource in the future. However, skate life cycles are similar to those of sharks, with relatively low fecundity, slow growth to large body sizes, and dependence of population size on high survival rates of a few well-developed offspring. Although little specific life history information exists for most skate species, they are generally thought to have limited reproductive capacity relative to gadids, pleuronectids, and other exploited groundfish and, thus, vulnerable to overfishing (Sosebee 1998). Large skate species with late maturation (11 or more years) are most vulnerable to heavy fishing pressure, with cases of near extinction reported in the North Atlantic for the common skate *Raja batis* and the barndoor skate *Raja laevis* (Brander 1981,Casey and Myers 1998). The management of skate species within aggregate complexes coupled with the apparent population stability for skate species in aggregate has masked the decline of individual skate species in European fisheries (Dulvy et al. 2000). In the North Atlantic, declines in barndoor skate abundance were concurrent with an increase in the biomass of skates as a group (Sosebee 1998). Although we cannot determine if any skate species have declined in the North Pacific during the timeframe of the FMPs (see discussion of available data in the next section),it is believed that there is adequate evidence that fisheries can have an impact on skate populations and that stable or rising aggregate skate biomass does not necessarily indicate that no impact is occurring at the species level. In addition, skates are currently the highest non-target catch biomass in the eastern Bering Sea (Table 4.1-15 in NMFS 2001d). Therefore, skates were given highest priority for management under this alternative policy to increase protection to non-target species.

The January 2001 draft PSEIS (NMFS 2001d) also examined setting a rarer species aggregate TAC. However, as discussed in Section 4.1.3.2 of that document, there is a potential problem with an aggregate TAC if species within the aggregate complex have different levels of productivity and vulnerability to overfishing, or if the catch of those species is not in proportion to their biomass within the complex. The catch accounting for skates at the aggregate level might still allow the less productive skate species to be harvested at disproportionally high levels relative to their biomass so that some species might be subject to overfishing even when the overall TAC for the skate complex is not exceeded.

Ideally, TACs should be set for individual skate species to avoid the potential problems with aggregate TACs. There is enough information (species biomass and proxy *M*) to set individual-species TACs for two skate species in the Bering Sea, up to three species in the Aleutian Islands, and possibly four species in the GOA pending additional information. The biggest impediment to effective management using individual-species TACs is the lack of identification of skates (and many other non-target groups) to species in the fishery. This means that the individual species TACs, once set, cannot be monitored either inseason or postseason and, therefore, cannot be used to limit catch by species. It could simply be assumed that observers will be trained to identify skate species in catch, and this would solve the problem. Realistically, skate identification can be difficult, and the demands of the status quo management system on observers are already high. Therefore, it was attempted to develop an interim solution for skate management in aggregate that would allow adequate time for phase-in of skate identification within the inseason management system. Setting aggregate TACs for skates or other non-target species might be necessary initially due to difficulties with identification in catch; however, aggregate TAC setting can include measures to minimize the potential for overfishing less productive stocks within the complex. The draft SEIS described three options for setting a rarer species aggregate TAC that would afford more protection to rarer or less-productive species within the complex. These are described in more detail in that document.

- set the aggregate TAC for the complex at the level of the smallest individual-species TAC.
- use available information or assume relative catch rates for the species to establish an aggregate TAC.
- sum all single-species TACs to get the aggregate TAC.

More complex options for TAC setting were unable to be analyzed in the draft PSEIS. One would be to set TAC by area/depth or gear strata, corresponding to the distribution of the rare and common species. For example, a spatially distributed skate TAC could be based on the high biomass of Alaska skates in shallower areas of the Bering Sea where the Bering skate is not found, according to survey data. In areas and depths of species range overlap, the skate TAC would be based on the lower biomass of the Bering skate, to afford it more protection. This spatial distribution of TAC would be most effective if it could be monitored at a higher spatial resolution than is done with current system of in-season management. If monitoring TACs of individual species proves too complex for the management system, then spatial allocation of TAC for aggregate species complexes may be a more feasible alternative. This is further discussed in the next section with respect to grenadier management, because grenadier species have more distinct depth distributions than skates.

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.

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).

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.

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

Groundfish 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-October 15, 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 new analysis just 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.

Amendment 63 (GOA skates)

For purposes of analyzing the effects of Amendment 63, the PSEIS (NMFS 2003b) contains the following descriptions that are adopted by reference in this analysis:

Section 3.9.2.4 contains sector profiles including GOA trawl (Tables 3.9-11 and 3.9-12) and GOA longline (Tables 3.9-14, 3.9-15, and 3.9-16).

Section 3.9.3.2 contains descriptions of the regions and communities involved in the groundfish fisheries, including the Kodiak Island Region on page 3.9-65.

Section 3.5.3 contains descriptions of other species management, trophic interactions, past and present effects analysis, comparative baseline and cumulative effects analysis.

Section 3.5.3.4 contains skate life history and distribution, trophic interactions, management, past and present effects analysis, comparative baseline and cumulative effects analysis. (Tables 3.5-130 through 3.5-136)

Amendment 63 in this proposed action has also been analyzed in EA/RIR/IRFA for Amendments 63/63 to the Fishery Management Plans for the Groundfish Fisheries of the Bering Sea/Aleutian Islands and Gulf of Alaska to Revise Management of Sharks and Skates (NPFMC 1999). Amendment 63 to the GOA is modified with this action to apply only to the removal of skates from the other species complex for separate management. Further action to separate the remaining groups (sharks, sculpin, and octopi) from the GOA other species complex would be completed under a new amendment action. Amendment 63 to the BSAI is not part of this action.

3.2 Background for Amendment 63 (GOA skates)

Due to legal mandates combined with limitations on management resources, fisheries management has historically prioritized the protection and sustainability of economically important target species. In the North Pacific, management resources are focused on running a quota-based management system where TACs are set and catches are monitored in real time for target groundfish species, while simultaneously obtaining target species life history information and abundance estimates. This is an extensive and complex system, with which NMFS and the NPFMC have effectively managed over 20 species and species groups which are the targets of groundfish fisheries. While the catch of non-target species is monitored within this system, resources similar to those devoted to target species management have generally not been available to apply additional direct management to non-target species (with the notable exception of prohibited species).

Since the initial implementation of the FMPs, there has been an increasing recognition of the need to better understand and manage fishery impacts on species that are not targeted by fisheries. As more emphasis is placed on protecting biodiversity and ecosystem structure and function, managers will be challenged to cultivate a management system that maintains healthy non-target species stocks, protects these species from overfishing, and allows target fisheries on these species to develop only when sufficient information is available to provide sustainable populations. This will require a substantial investment of additional management resources, because to achieve these objectives such a system must be based on a better understanding of the life history, distribution, and abundance of non-target species, species groups, and assemblages. Considering that there are literally hundreds of different types of animals in the non-target species category, some of which are still being described in the scientific literature, this challenge to management appears formidable.

Commercial fisheries that land non-target species differ in regards to: target species, other incidental species caught, bycatch mortality, geographic location, gear used, season, weather, vessel characteristics, and non-target species present (NMFS 2001d). Consequently, each commercial fishery poses different levels of risk with regard to bycatch of non-target species. The level of risk to specific populations depends on the life history characteristics of each species and on the level of mortality in the fisheries capturing these species. These issues are further addressed in the RIR.

The potential for rapid growth in commercial fishing, and the potential for over-exploitation in combined state and federal managed fisheries, convinced the Alaska Board of Fisheries to close the directed commercial fishery for sharks and skates and require a Commissioner's permit to target these groups. On behalf of the Board, the Alaska Department of Fish and Game submitted a groundfish proposal to the Council in 1998 for similar action in the EEZ. The Council initiated a plan amendment to the BSAI and GOA Groundfish FMPs at its October 1998 meeting. The Council invoked the precautionary approach to manage these long-living, slow-growing, and low fecund fishes and other regional and international efforts to conserve sharks and skates. However, the GOA FMP constrains a more precautionary approach to manage this complex because it explicitly does not authorize an ABC for "other species" and directs that the TAC for this complex be set equal to 5% of the combined TACs for all other GOA species/assemblages.

Because fishing non-target species down to unsustainable levels may occur rapidly and recovery can take decades for many species, successful management should be based on the precautionary approach in which measures are implemented proactively before overfishing occurs. Little information exists regarding the stock structure or status of skate populations in Alaska, or the remaining groups in the "other species" category (shark, squid, sculpin, or octopus). Life history information, however, suggests that long-lived, slow-growing, low fecund species are easily over-exploited and, once overfished, recovery may take decades. Spiny dogfish and four skate species in the Atlantic are overfished. A precautionary approach to managing these groups in Alaska is warranted., since a targeted fishery for skates in Western and Central GOA developed in 2003, without the protective measures in place that still are under development.

Biology

Skates (family Rajidae) are cartilaginous fish that are related to sharks. They are dorso-ventrally compressed (flat) animals with large pectoral wings attached to the sides of the head, and long, narrow whiplike tails. At least 9 species of skates have been identified in the GOA (Table 3.2-1). Skate species are distributed throughout the North Pacific Ocean and are common from shallow inshore waters to very deep benthic habitats (Eschmeyer et al. 1984).

Skates are widely distributed and are caught as bycatch in both longline and trawl fisheries. They generally are discarded (and may survive depending upon catch handling practices), although skates caught incidentally are sometimes retained and processed. Markets for skate products are currently limited in the North Pacific, but skates are subject to directed fisheries in other areas (e.g., Martin and Zorzi 1993, Agnew et al. 1998).

Skates, as a group, represent the highest proportion of estimated non-target species catch weight (28 percent) during 1997 to 1999) in both the BSAI and GOA combined. The biomass of all skate species combined as estimated by the Alaska Fisheries Science Center (AFSC) bottom trawl surveys has generally increased in both areas over the past 15 to 20 years, although it has declined somewhat from the 1990 peak in the eastern Bering Sea (NMFS 1999).

Management

Skate species are part of the other species FMP management category, meaning that their catch is reported in aggregate as other along with the catch of shark, sculpin, octopus, and squid. In the GOA, the TAC of other species has been established as 5 percent of the sum of the TACs for all other assessed target species in the GOA (Gaichas et al. 1999). The other species TAC has never been exceeded. Until 2003, skates were taken only as bycatch in fisheries directed at target species. Future catches of skates are more dependent on the distribution and limitations placed on target fisheries as well as on any harvest level established for this category or group (as contained in this plan amendment).

Management of the skate species within aggregate complexes and the apparent population stability for skate species in aggregate has masked the decline of individual skate species in European fisheries (Dulvy et al. 2000). Although little specific life history information exists for most skate species, they are generally thought to have limited reproductive capacity relative to gadids, pleuronectids, and other exploited groundfish. Thus they tend to be vulnerable to overfishing (Sosebee 1998). Large skate species with late maturation (11+ years) are most vulnerable to heavy fishing pressure, with cases of near-extinction reported in the North Atlantic for the common skate *Raja batis* and the barndoor skate *Raja laevis* (Brander 1981, Casey and Myers 1998).

In the North Atlantic, declines in barndoor skate abundance were concurrent with an increase in the biomass of skates as a group (Sosebee 1998). NMFS surveys identified at least 11 species of skates in the FMP areas. Although it is not determined if any individual skate species have declined in the North Pacific during the timeframe of the FMPs (see discussion of available data in draft PSEIS, Section 4.5.1), it is determined that there is adequate evidence that fisheries can affect skate populations and that stable or rising aggregate skate biomass does not necessarily indicate that no impact is occurring at the species level.

Table 3.2-1 Skate Species Identified During 1999 Alaska Fisheries Science Center GOA Bottom Trawl Surveys

Species	Common Name
Raja binoculata	Big skate
Raja rhina	Longnose skate
Bathyraja interrupta	Bering skate
Bathyraja tanaretzi	Mud skate
Bathyraja trachura	Black skate
Bathyraja parmifera	Alaska skate
Bathyraja aleutica	Aleutian skate
Bathyraja lindberghi	Commander skate
Bathyraja maculata	Whiteblotched skate

Fishery Catch

Because observers were not trained to identify individual species of skates, the majority (99.6 percent) of skate catch is reported as skate unidentified. Therefore, all available catch information is for aggregated skate species, including annual catch and location of catch. Fishery data was examined from 1997–1999 to determine total skate catch, catch in different gear types and target fisheries (Table 3.2-2), and observed location and seasonality of skate catch (see later text regarding spatial analysis). Note that catch in the fishery does not necessarily imply mortality for skates; like halibut, skates may survive catch and discard depending on how they are handled. However, for the purposes of management under this alternative it is assumed that any skate that is caught, dies.

Between July 2002 and March 2003., the NMFS Observer Program conducted a special project to assess the feasibility of identifying skates and smelts to species, and some sculpins to genus (B. Karp, memo dated September 10, 2003). All observers deployed after January 1, 2004 have been instructed to identify all skates, along with smelts to species and sculpins of the genera *Hemilepidotus* (Irish lords), *Hemitripterus* (bigmouth sculpins)and *Myoxocephulus* (great sculpins) to genus.

Biomass in Aggregate and by Species

Bottom trawl surveys conducted by the AFSC provide reliable estimates of aggregate skate biomass within the timeframe of the FMPs (Table 3.2-3). Bottom trawl gear designed to assess flatfish and demersal groundfish is expected to catch skates at least as well as these target species. There are also longline surveys conducted by the International Pacific Halibut Commission (IPHC) and the AFSC for halibut and sablefish, respectively. These surveys are not used to index the abundance of skates at this time, because they are more specialized, being designed for individual target species, whereas the trawl surveys are designed to assess all groundfish species.

As opposed to aggregate skate biomass, biomass for each individual skate species is more difficult to assess. The knowledge of the number and identity of skate species in an area is developing concurrently with research. Skates as a group have been described as unique among Chondrichthyes for their relatively high species diversity combined with morphological conservatism; in other words, there are lots of species that look alike. For this reason, species identification was variable over the course of surveys, ranging from skate unidentified to identification of over 10 different species in each area. In addition, skate taxonomy has changed over the course of surveys, with new species described in the North Pacific (Ishihara and Ishiyama 1985). Therefore, any apparent trends in species abundance within the skate complex over the period of the surveys are not likely to be reliable. In recent years (approximately 1996 to present) training with increased emphasis on consistent skate species identification has improved this situation dramatically, so that individual skate species may be assessed in the future. Distribution data is also affected by species identification issues. For these reasons, we evaluate biomass and distribution of individual skate species only for recent years where survey scientists are confident of species identification.

Table 3.2-2 Estimated Catch (Metric Tons) of All Skate Species Combined by Gear and Target Fishery in the GOA

Gulf of Alaska				
Gear	**1997**	**1998**	**1999**	**Average**
Bottom trawl	2,247	1,166	926	1,446
Pelagic trawl	5	15	20	14
Pot	1	0	0	0
Longline	867	3,295	1,054	1,738
Total	**3,120**	**4,476**	**2,000**	**3,199**
Target	**1997**	**1998**	**1999**	**Average**
Arrowtooth	133	21	49	67
Cod	954	873	1,174	1,000
Deep water flats	42	31	17	30
Demersal shelf rockfish	200		22	111
Flathead sole	139	130		134
Northern rockfish	4	9	15	9
Other species	446	138	0	195
Pelagic shelf rockfish	8	15	11	11
Pacific ocean perch	52	15	44	37
Pollock B[a]	29	41	19	30
Pollock P[b]	2	11	5	6
Rex sole	489	172	331	331
Sablefish	166	2,834	243	1,081
Shallow water flats	427	186	70	228
Shortraker/ rougheye	28		1	14
Thornyheads	1			1
Total	**3,120**	**4,476**	**2,000**	**3,199**

Notes: [a]When pollock is majority of retained catch, but less than 95 percent of total catch.
[b]When catch of pollock is more than 95 percent of total catch.

Table 3.2-3 Estimated Aggregate Biomass (Metric Tons) of Skate Species Complex from GOA Bottom Trawl Surveys

Year	Biomass (mt)
1979	
1980	
1981	
1982	
1983	
1984	38,800
1985	
1986	
1987	36,400
1988	
1989	
1990	38,500
1991	
1992	
1993	63,200
1994	
1995	
1996	81,200
1997	
1998	
1999	112,900

The GOA skate complex is more diverse than that found on the Bering Sea shelf. Four skate species were considered common, with an additional five uncommon species. The big skate (*Raja binoculata*) composed nearly half of the aggregate skate biomass, followed by the longnose skate (*Raja rhina*) at about a third of aggregate biomass. Two Bathyraja species, the Aleutian skate (*B. aleutica*) and the Bering skate (*B. interrupta*) were next in abundance, representing about 10 percent, and 3 percent of the aggregate biomass, respectively. All five other skate species identified on the 1999 GOA survey made up about 3 percent of the aggregate skate complex biomass.

In comparison, the eastern Bering Sea skate complex is dominated by a single species, the Alaska skate (*Bathyraja parmifera*). This species accounted for about 91 percent of the aggregate skate biomass estimated in 1999. The Bering or sandpaper skate (*Bathyraja interrupta*) was the next most common species in the eastern Bering Sea, making up about 6 percent of the aggregate skate biomass. Another six skate species identified in the survey made up less than 3 percent of the aggregate skate complex biomass. The skate community in the Aleutian Islands appears to be different from that described for both the eastern Bering Sea and the GOA. In the Aleutian Islands, the most abundant species in the 1997 survey was the whiteblotched skate (*Bathyraja maculata*) making up 45 percent of aggregate biomass. Alaska and Aleutian skates were also common, composing about 30 percent and 15 percent of the aggregate biomass, respectively. The mud skate, (*Bathyraja tanaretzi*), was relatively common but represented a lower proportion of total biomass (approximately 3 percent) because it is a smaller skate.

All seven other skate species identified in the 1997 Aleutian Islands survey made up about 7 percent of the aggregate skate complex biomass.

Table 3.2-4 Estimated Biomass (mt) of Skate Species from 1999 GOA Bottom Trawl Surveys

Species	Biomass Estimate
Raja binoculata	54,612
Raja rhina	39,336
Bathyraja aleutica	11,290
Bathyraja interrupta	3,817
All (5) other skate	3,788

Spatial Aspects of Fishery Catch and Survey Distribution by Species

Because skate catch is not identified to species, the most recent survey information was combined on species distributions with 1997–1999 observed fishery catch locations in an attempt to determine which species are caught in the fisheries. Although surveys occur in the summer months and fishery catch of skates happens year round, it is believed that this approach can at least generate basic information useful for management.

There are at least four common skate species in the GOA, and there are no clear patterns of species distribution by area or depth. Fishery information is also more sparse in the GOA than in the eastern Bering Sea due to the observer coverage issues discussed previously; consequently, there is little information overlap between fishery catch of skates and survey observations of skate species distributions (Figure 3.2-1). Because no clear patterns can be discerned, we must assume that any fishery could be catching any of the skate species identified in the GOA.

Life History Information

The most important life history parameter for the purpose of this programmatic SEIS is the natural mortality rate (M). Natural mortality provides an approximation of the amount of fishing mortality a stock can withstand, so that fractions of M are often used to set upper limits on the fishing mortality rate (F) (Alverson and Pereyra 1969, Clark 1991). The natural mortality rate can be estimated from information on the maximum age attained by a species (in the absence of fishing mortality). A relationship developed from data on many marine species was used, including fish, mollusks, and marine mammals (Hoenig 1983), to estimate M for skates using all the information available. Admittedly, little is known about the life span of many shark and skate species, but some ichthyologists speculate that in larger chondrichhyan fish maximum ages of 70–100 years or more are likely. The estimate M was conservatively chosen at 10 percent, a low but reasonable number for larger skates (reflecting a potential maximum age of 40 years), in an attempt to account for the longer lived species within the complex. It is assumed the same natural mortality rate for all skate species in our area until better information is available.

Figure 3.2-1 Distribution of skate species (1999 survey) and skate catch in the GOA (1999)

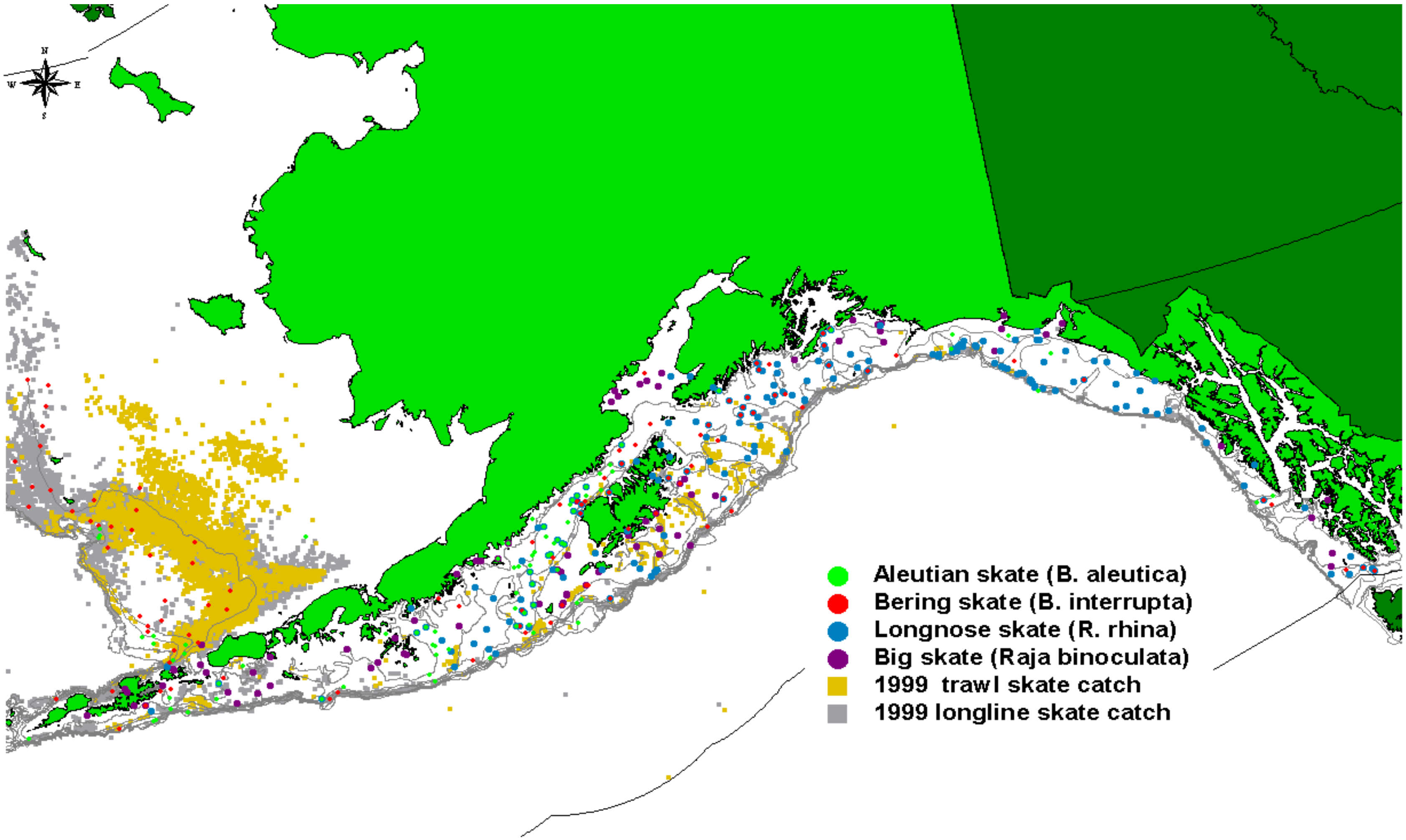


Table 3.2-5 Life History Information Available for GOA Skate Species

Species	Common Name	Maximum Length (cm)[1]	Maximum Age (years)	Age and Length at Maturity[2]	Feeding Mode[3]	No./ egg case[1]	Depth range (m)[4]	Estimated Natural Mortality Rate
Raja binoculata	Big skate	180–240	?	8–12 yrs 109–130 cm	Predatory[1]	1-7	3–800[5]	0.10
Raja rhina	Longnose skate	137	?	7–10 yrs 74–100 cm	?	1	25–675[5]	0.10
Bathyraja interrupta	Bering skate	86	?	?	Benthophagic	1	50–1380	0.10
Bathyraja tanaretzi	Mud skate	70[6]	?	?	?	1		0.10
Bathyraja trachura	Black skate	89	?	?	?	1	800–2,050	0.10
Bathyraja parmifera	Alaska skate	61–91, 113[6]	?	?	Predatory	1	25–300	0.10
Bathyraja aleutica	Aleutian skate	120–150	?	?	Predatory	1	300–950	0.10
Bathyraja lindberghi	Commander skate	93[6]	?	?	?	1	175–950	0.10
Bathyraja maculata	Whiteblotched skate	120[6]	?	?	Predatory	1	175–550	0.10

Notes: [1]Eschemeyer 1983 (assuming that B. kincaidii = B. interrupta)
[2]Zeiner and Wolf 1993
[3]Orlov 1998,1999 (benthophagic eats mainly amphipods and worms. Predatory diet primarily fish and cephalopods)
[4]McEachran and Miyake 1990b
[5]Allen and Smith 1988
[6]Species identification notes by Jay Orr (American Fisheries Science Center)

4.0 Environmental and Economic Consequences

This section forms the scientific and analytic basis for the issue comparisons across alternatives. As a starting point, each alternative under consideration is perceived as having the potential to significantly affect one or more components of the human environment. 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), 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 multiplier effects 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 2003 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 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 criteria used to establish significance and a determination of significance, insignificance or unknown for each resource, species, or issue being treated. The criteria for significance are summarized in each section. The following ratings for significance are used; significant (beneficial or adverse), insignificant, and unknown. Where sufficient information on direct and indirect effects is available, rating criteria are quantitative in nature. In other instances, where less information is available, the discussions and rating criteria used are qualitative in 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 undescribable situation is evaluating the impact vector of incidental take on marine mammals. In that situation, criteria to determine significant adverse and insignificant are describable (though with less precision than perhaps desired by decision makers), however, within the band of effects known to be insignificant the point of no incidental take impact is reached, therefore, a criterion for significant beneficial is not applicable.

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 4.0-1 summarizes the reference points for the topics addressed in this analysis. The first three 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.

Table 4.0-1 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)

The interim harvest specifications are a portion of the annual harvest specifications and have only an effect for the first part of the year. The only environmental components that are likely to be affected by the interim harvest specifications beyond those effects identified for the harvest specifications are those that have a sensitivity to fishing activities in the first part of the year. The Steller sea lion protection measures require the temporal dispersion of harvest of prey species (pollock, Pacific cod and Atka mackerel), and therefore, Steller sea lions may be impacted by the interim specifications. The first part of the year is also a critical time for some fisheries that have higher value product during the January through March spawning season. The analysis of the interim specifications impacts will be limited to the effects on temporal dispersion of harvest of prey species for Steller sea lion and socioeconomic effects.

4.1 Effects on Target Species

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

Assessing the effects of each alternative on target commercial fish species was accomplished by asking the following questions of 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?
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 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 6.0-1. The ratings utilize a minimum stock size threshold (MSST) as a basis for positive or negative impacts of each alternative. A thorough description of the rationale for the MSST can be found in the National Standard Guidelines 50 CFR Part 600 (Federal Register Vol. 63, No. 84, 24212 - 24237). Under all alternatives, the spawning stock biomass of all target species that have calculated spawning stock biomasses are expected to be above their MSST. The probability that overfishing would occur is low for all of the stocks. The target species stocks that have calculated MSSTs are currently above their MSSTs and the expected changes that would result from harvest at the levels proposed are not substantial enough to expect that the genetic diversity of reproductive success of these stocks would change. None of the alternatives would allow overfishing of the spawning stock. Therefore the genetic integrity and reproductive potential of the stocks should be preserved.

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 4.1.1-1 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: mean F2001-2006>FOFL	Unknown fishing mortality rate	Reasonably *not* expected to jeopardize the capacity of the stock to produce MSY on a continuing basis: mean F2001-2006<=FOFL	Action allows the stock to return to its unfished biomass
Spatial 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

Intensity of the Effects				
Direct Effects	Significant Adverse	Unknown	Insignificant Impact	Significant Beneficial
Change in reproduc-tive 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 reproduc-tive success such that it enhances the ability of the stock to sustain itself at or above MSST
Change in prey availability	Evidence that current harvest levels and distribution of harvest lead to a change prey availability such that it jeopardizes the ability of the stock to sustain itself at or above the MSST	MSST is unknown therefore no information that current harvest levels and distribution of harvest lead to a change in prey availability such that it enhances *or* jeopardizes the ability of the stock to sustain itself at or above the MSST	Evidence that current harvest levels and distribution of harvest do *not* lead to a change in prey availability such that it jeopardizes the ability of the stock to sustain itself at or above the MSST	Evidence that current harvest levels and distribution of harvest lead to a change 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

4.2 Effects on Incidental Catch of Non-specified Species

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. Predictions of impacts from different levels of harvest are therefore qualitatively described. Management concerns, data limitations, research in progress, and planned research to address these concerns are discussed in Section 5.1.2.6 of the PSEIS (NMFS 2003b). Direct effects include the removal of non-specified species from the environment as incidental catch in the groundfish fisheries. One question was asked: Would each alternative induce a different level of non-specified species bycatch as compared to average levels of bycatch between 1997 and 1999? In the Steller Sea Lion Protection Measures SEIS the reference point against which the question was assessed was the current population trajectory or harvest rate of the subject target fish species (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."

4.3 Effects on Forage Fish Species

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. 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 PSEIS (NMFS 2003b) and the Ecosystems Considerations for 2003 (NMFS 2003a, Appendix C). Estimates of biomass and seasonal distribution of biomass are unavailable for forage fish species, therefore the effects of different levels of target species harvest on forage fish species cannot be quantitatively described. Bottom trawl surveys of groundfish conducted by NMFS are not designed to assess the biomass of forage fish species, however forage fish are taken incidentally in the groundfish surveys and analysis of the incidental catch may lead to a relative abundance index which might be helpful in determining biomass abundance trends. 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 is assessed is the current population trajectory or harvest rate of the subject target fish species (Table 4.0-1). The criterion for evaluating significance was substantial difference 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 48 mt and in the GOA of 77 mt (1997 to 2000) is not likely to affect stocks (abundance) of forage fish species by more than 20%. 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 a table at the start of Appendix C to this EA, on "Ecosystems Considerations for 2004."

4.4 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 (NPFMC 2002). Based 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 is scheduled to make its final recommendations for a rebuilding plan at its October 2003 meeting. The most recent review of the status for the other prohibited species in Section 3.5 of the Steller Sea Lion Protection Measures SEIS (NMFS 2001b). 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 alternatives on three aspects of prohibited species management measures; 1) effects of PSC limitations and other management measures in the groundfish fisheries on the stocks of prohibited species; 2) effects of PSC limitations and other management measures in the groundfish fisheries on harvest levels in the directed fisheries for salmon, halibut, herring, and crab managed by the state; and 3) effects of PSC limitations and other management measures on recent levels of incidental catch of prohibited species in the groundfish fisheries.

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

Pacific salmon are managed by the State of Alaska on a sustained yield principal. Predetermined escapement goals for each salmon stock are monitored on an inseason basis to insure long term sustainable yields. When escapement levels are low commercial fishing activities are curtailed, if escapement levels exceed goals commercial fishing activities are enhanced by longer open seasons. In instances where minimum escapement goals are not met, sport and subsistence fishing activities may also be curtailed. The benchmark used to determine the significance of effects under each alternative on salmon stocks was whether or not salmon minimum escapement needs would reasonably expected to be met. If the alternative was reasonably not expected to jeopardize the capacity of the salmon stocks to produce long term sustainable yields it was deemed insignificant, if the alternative was reasonably expected to jeopardize the capacity of the salmon stocks to produce long term sustainable yields it was deemed significantly adverse, it is rated unknown where insufficient information exists to make such conclusions the alternative's effects are 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 August 16, 2003 in the BSAI was 35,024 fish. Chinook salmon incidental catch in the GOA fisheries through August 16, 2003 was 11,144 fish. Incidental catch in both areas are well below the amounts authorized. Similar levels of incidental take of salmon during the groundfish fisheries is expected for the 2003 groundfish fisheries. Informal consultation for ESA listed salmon was completed on November 26, 2002 for the 2003 groundfish fisheries with a finding of not likely to adversely affect ESA listed salmon species. No consultation is initiated with this action because these actions fall within the scope of previously analyzed actions and no additional adverse effects are expected.

The International Pacific Halibut Commission (IPHC) is responsible for the conservation of Pacific halibut resource. The IPHC uses a policy of harvest management based on a 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 expected to lower the total CEY of the halibut stock below the long term estimated yield of 80 million pounds. If the alternative was reasonably not expected to decrease the total CEY of the halibut stock below the long term estimated yield of 80 million pounds it was rated insignificant, if the alternative was reasonably expected to lower the total CEY of the halibut stock below the long term estimated yield of 80 million pounds it was rated significantly adverse, where insufficient information exists to make such conclusions the alternative's effects are 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 which 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 would reasonably expected to be met. If the alternative was reasonably not expected to jeopardize the capacity of the herring stocks to reach minimum spawning biomass, threshold levels it was deemed insignificant, if the alternative was reasonably expected to jeopardize the capacity of the herring stocks to reach minimum spawning biomass threshold levels it was rated significantly adverse, where insufficient information exists to make such conclusions the alternative's effects are 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 expected to occur. If the alternative was reasonably not expected to jeopardize the capacity of the crab stocks to maintain MSST levels it was rated insignificant, if the alternative was reasonably expected to jeopardize the capacity of the crab stocks to reach or maintain MSST levels it was rated significantly negative, where insufficient information exists to make such conclusions the alternative's effects are rated unknown. These criteria are summarized in Table 4.4-1.

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

For all prohibited species, if under the alternative considered the catch in the directed fisheries for those species was expected to increase or decrease by more than 20 % from 2001 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 4.4-4), 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 4.4-2.

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

The establishment by the Council of annual halibut PSC limits in the directed fisheries of the GOA and the annual and seasonal apportionments thereof of all PSC limits to gear types and targets in the BSAI and GOA is of critical importance each year in both minimizing the incidental catch of prohibited species and in maximizing the optimum yield from the groundfish resources to the fishing industry. In section 4.5 of the Steller Sea Lion Protection Measures SEIS (NMFS 2001b) the effects of alternatives 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 however 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 became effective in 1999. For this reason in this analysis 2002 prohibited species incidental catch and directed groundfish catch is presented for comparison to the groundfish TAC alternatives in Table 4.4-4.

Under the Magnuson-Stevens Act, National Standard 9 directs that when a regional council prepares and FMP they shall to the extent practicable minimize bycatch and to the extent bycatch cannot be avoided, minimize the mortality of such bycatch. Over the years since the enactment of the Magnuson-Stevens Act in 1976, over 30 FMP amendments designed to help minimize the incidental catch and mortality of prohibited species have been implemented. Levels of incidental catch of prohibited species in each fishery in 2002 (Table 4.4-4) 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. For all prohibited species if under the alternative considered the incidental catch of prohibited species in the directed fisheries for groundfish was expected to increase or decrease by more than 50% from 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 4.4-3.

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 470,702 mt which falls within the optimum yield range of 116,000 mt to 800,000 however in the BSAI this would amount to 3,327,249 mt which would be constrained by the upper limit established for optimum yield of 2,000,000 mt for the BSAI (50 CFR § 679.20(a)). Alternative 1 sets catch quotas at the highest levels considered, even so PSC limits established for the BSAI by regulation and halibut PSC limitations recommended by the Council for the GOA in 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, and that in the GOA for prohibited species without PSC limits, incidental catch rates would be similar to those in 2002. For Pacific salmon these PSC numerical limits are very low compared to recent average returns and would not be expected to prevent salmon returns from reaching escapement goals. In recent years there have been concerns for several chinook and chum stocks in the Yukon and Kuskokwim Rivers, tributaries to the Bering Sea. However for 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. Because incidental catch of halibut in the groundfish fisheries, as well as all other removals, is accounted for in setting the directed hook-and-line fishery CEY for halibut and the total CEY for the fishery is above the estimated long term CEY of 80 million pounds, the effect of incidental catch of halibut on the halibut stock under Alternative 1 is rated insignificant. The PSC limitation for herring of 1% current biomass estimates in the BSAI and the low volume of herring bycatch in the GOA (1997 through 1999 average 15 mt (NMFS 2001b)) would not be expected to reduce herring stocks below minimum spawning biomass thresholds under Alternative 1 and the effects are rated insignificant. In the BSAI PSC limits for crab are set at a proportion of the estimated number of animals with upper limits approximately 0.5% for red king crab, 1.2% for Tanner crab, and 0.1 % for snow crab. Given these low levels, even if crab PSC limits were reached it is unlikely that any effects on crab stocks could be detected. Incidental catch of crab in the GOA is very low, in 2002 a total of 48 red king crab and185,220 Tanner crab (Table 4.4-4). Because incidental catch is small relative to other sources of mortality, time and area closures for trawl gear in the BSAI and GOA are thought to be more effective in reducing effects on crab stocks (Witherell and

Harrington 1996) and the effect of Alternative 1 on all crab stocks in the BSAI and GOA is rated insignificant.

Due to the low numbers of salmon incidental take in the GOA and salmon PSC limitations for chum and chinook salmon in the BSAI, present levels of salmon incidental catch are not likely to affect escapement totals. For those western stocks of chinook salmon of concern in the EA prepared for Amendment 21b to the BSAI FMP, a reduction in incidental catch of 40,000 chinook was estimated to increase commercial catches on average by 2,700 chinook in the Nushagak and 2,200 chinook in the Yukon Rivers. This amount represents 2.5% of the average commercial catch of 194,000 chinook in these drainages. Similar estimates on effects on chum salmon are not available. As an increase or decrease of less than 20% to the commercial salmon fisheries would not be expected given the reduced chinook PSC cap of 29,000 fish for 2004 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 2002 assessment of Pacific halibut for the 2003 fishing year the total CEY for Alaska was 50,585 mt. If the combined halibut PSC limits in Alaska totaling 6,825 mt were reached (6,337 mt in 2002 Table 4.4-4) this would represent a reduction in the amount of the total CEY available to the directed fishery of about 13% 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 in the future. Due 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 grounding fishing closures due to reaching PSC limits each year. Where PSC limits can be expected to constrain the groundfish fisheries, apportionments are based primarily on socioeconomic concerns. One such example is in the trawl fisheries in the GOA. During the first quarter of the year when incidental catch of halibut in the Pacific cod fishery is at its lowest a greater proportion of the annual halibut allowance is apportioned to the shallow water targets (which include Pacific cod) than at other times of the year and during the summer months when the incidental catch of halibut in the rockfish fisheries is at its lowest a greater proportion of the annual halibut allowance is apportioned to the deep water targets (which include rockfish). With such apportionments the intent is to maximize, up to TAC levels, the harvest of the most valuable species.

Assuming incidental catch rates of prohibited species in 2004 similar to 2002 levels in the BSAI and GOA (Table 4.4-4) 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 catch quotas (TACs) for the proposed and interim specifications would be set at levels recommended by the Council at its October 2003 meeting. It the BSAI this would amount to 2,000,000 mt and in the GOA 435,561 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 4.5.1.4 the Steller sea lion Protection Measures SEIS (NMFS 2001b) the effects of the preferred alternative on the incidental catch levels of prohibited species were estimated to result in an increase of herring and other salmon incidental catch in the pollock fisheries of 16% and 7% respectively while the incidental catch of chinook salmon was estimated to result in a reduction of 9%. In the Pacific cod fisheries reductions of incidental catch of halibut (11%), Tanner crab (30%), chinook (25%) and other salmon (8%) were expected. Assuming incidental catch rates of prohibited species in 2004 similar to 2002 levels in the BSAI (Table 4.4-4) 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 similar to 2002 levels in the GOA (Table 4.4-4) 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 TACs to produce F equal to 50% of the $maxF_{abc}$ level for stock at or above Tier 3 and set TACs equal to 50% of the $maxF_{abc}$ level for stocks at or below the Tier level.. In the BSAI this would amount to 1,764,650 mt and in the GOA 243,175 mt. 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 which are permitted to target prohibited species.

Assuming incidental catch rates of prohibited species in 2004 similar to 2002 levels in the BSAI (Table 4.4-4) 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 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 and seasonal and fishery specific PSC apportionments, and incidental catch rates in the different fisheries unchanged from 2002 (Table 4.4-4), 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 the most recent 5 year average actual *F* for stocks at a Tier 3 level and above and at the recent 5 year average actual catch for stocks at a Tier 4 level and below. In the BSAI this would amount to 1,526,980 mt and in the GOA 187,959 mt. Alternative 4 sets TAC at levels that fall within the range of 1,400,000 to 2,000,000 mt in the BSAI and 116,000 mt to 800,000 mt in the GOA established for optimum yield. For the reasons discussed under Alternative 1 the effect of Alternative 4 on stocks of prohibited species is rated insignificant (Table 6.0-1) because PSC limits, even if reached, would not have a significant impact on stocks of prohibited species. 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 incidental catch rates in the different fisheries unchanged from 2002 (Table 4.4-4), 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 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, and if adopted the effect of this alternative would be to close directed fishing for groundfish for the 2004 year. The adoption of this alternative is considered unlikely as harvest levels would be set at levels below the lower limits established for optimum yield in the BSAI of 1,400,000 mt and in the GOA of 116,000 mt. Another effect of Alternative 5 would be to reduce incidental catch of prohibited species in the groundfish fisheries to zero. However for the reasons discussed under Alternative 1, even if incidental catch were reduced to zero, the effect on stocks of prohibited species and harvest levels in the directed fisheries for these prohibited species would be insignificant (Table 6.0-1). A 100% reduction in harvest levels of groundfish (to zero) would reduce the incidental catch level of prohibited species in the groundfish fisheries also to zero (>50%) and is rated significantly positive (Table 6.0-1).

Table 4.4-1 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	NA	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 4.4-2 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 4.4-3 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 4.4-4 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

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

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

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.

4.5 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 4.0-1 Significance ratings for each question are summarized in Table 4.5-1.

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 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, 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 which comprise Appendices A and B of this analysis, 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 no adverse effects on ESA listed mammals are expected with the 2004 interim or final harvest specifications beyond those effects previously analyzed. Informal ESA consultation for the interim and final specifications will be completed once the Council recommendations are available.

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 these 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.

The seasonal management of Western and Central GOA Pacific cod was recommended by NMFS to the Steller sea lion Mitigation Committee in 2003 for proposed changes. 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 2001 Stellar Sea Lion Protection Measures SEIS. 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.

The interim specifications for pollock, Pacific cod and Atka mackerel are equal to the first seasonal apportionments based on the proposed TAC specifications. If the annual specifications are finalized such that the annual TAC is lower than the proposed annual TAC, it is possible that the amount of harvest in the first part of the year under the interim specifications may exceed the seasonal apportionment specified in regulations. This may have an impact on Steller sea lions depending on the amount of difference between the proposed and final annual TAC. The harvest specifications will continue to be reviewed each year, comparing the interim TACs with the final TAC and seasonal apportionments. Adjustments may be made to the interim TAC by emergency rule if a serious conservation concern exists. It is not possible to predict the potential differences between the proposed and final annual TACs and therefore the significance of impacts of the interim TACs on Steller sea lions is unknown.

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, 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 would be implemented within the Steller sea lion protection measures, 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.

<u>Gulf of Alaska Pollock</u> 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 and Middleton islands 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.

Because the echo integration-trawl survey results were lower than last year's model predictions, the Plan Team recommended setting the 2004 ABC by rolling over the 2003 TAC amount. For most tier 1-3 species, the Plan Teams used projections for recommending a proposed 2004 ABC. An exception was made for GOA pollock because of the lack of information available and the condition of the stock. The rollover was more conservative than the projected value. The final ABC will depend on the additional survey information that will be analyzed for the Plan Team meeting in November and Council recommendations in December. If the GOA pollock spawning biomass is estimated to be below 20 percent of the unfished spawning biomass, directed fishing will not be authorized in 2004. This will ensure that the harvest specifications will be in compliance with Steller sea lion protection measures and that there will be no effects due to the global harvest of prey species as a consequence of the interim or final specifications.

Indirect Effects - Disturbance Effects

Vessel traffic, nets moving through the water column, or underwater sound production may all represent perturbations, which 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 4.5-1). 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 were designated by the US Fish and Wildlife Service (FWS) as candidate species under the ESA on August 22, 2000, in the Aleutian Islands (from Unimak Pass to Attu Island) (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 FWS 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 FWS 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 FWS 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 northern sea otter. The significance determinations for analysis performed in this EA are summarized in Table 6.0-1.

Table 4.5-1 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 by >25%	Level of take below that which would have an effect on population trajectories	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 resulting in 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 or adverse modification or destruction of critical habitat
** applies to western DPS of Steller sea lions.

4.6 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, and is considered the no action alternative. 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 PSEIS, (Section 3.7) and was followed by a description of the comparative baseline to be used for analysis (Sections 3.7.1 and 4.4). An analysis of the effects of each PSEIS alternative on seabirds is provided in sections 4.5 through 4.8, followed by an analysis of the preliminary preferred alternative effects on seabirds (Section 4.9.7, NMFS 2003b). The significance determinations of analysis performed in this EA is 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 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 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 PSEIS (NMFS 2003b). Although new regulations have not yet been implemented, 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 have 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 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 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.) (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 4.6-1 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 $max\mathrm{F}_{ABC}$, it has the potential to increase interactions with those seabird species prone to incidental bycatch. The 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.

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

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 $F_{50\%}$., 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 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 affect 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 is lower than other alternatives (with the exception of Alternative 5, no take). However, important exceptions are the pollock and Pacific cod fisheries in the GOA, which under Alternative 4 are equivalent to those of Alternative 1, the $max F_{ABC}$. Given the current levels of incidental take, the existing measures in place to reduce incidental take of seabirds, and all of the above considerations, Alternative 4 is considered to have an unknown effect on fulmars, albatrosses and shearwaters. See NMFS 2001b for the analysis of the effect of incidental take on these species.

Indirect Effects - Prey (forage fish) abundance and availability For the reasons noted in the PSEIS and summarized in NMFS 2001b, the potential indirect fishery effects on prey abundance and availability resulting from Alternative 4 are considered 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 Alternative4 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 or greatly reduces fishing effort. 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 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 Based on the assumptions noted in NMFS 2001b, the availability of fishery processing wastes could have a conditionally significant beneficial effect on northern fulmars, thus, a complete reduction of fishing could reduce offal availability to fulmars. Similar effects might occur for albatrosses, shearwaters, and gulls. The degree to which these populations are dependent on offal are not known, and thus the effect is considered unknown for fulmars, albatrosses, shearwaters, and gulls, and is insignificant for other seabird species.

Table 4.6-1 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.
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.

4.7 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 serves as an EFH (Essential Fish Habitat) assessment, which is required by the Magnuson-Stevens Act for any action that may adversely affect EFH.

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

The 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 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 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 4-7.1 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 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 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 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 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 4.7-2.

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 conclusion of the preliminary draft EFH EIS (NMFS 2003c) is that the fishery as conducted does not have a more than minimal effect on EFH such that the effect on habitat is affecting the productivity of commercial fisheries as defined by MSST thresholds, although there may be regional effects that are long lasting. Alternatives 2, 3 and 4, judged by our three criteria, are therefore rated as having an insignificant impact on EFH.

In other words, except for setting the TACs at zero (Alternative 5), or very aggressively (Alternative 1) none of the alternatives specified under these alternatives would have impacts beyond those evaluated in previous analyses of the effects of these groundfish fisheries on marine benthic habitat.

In conclusion, the 2004 TAC specifications may result in adverse impacts to EFH, but based on the analysis in the preliminary draft EFH EIS, such effects will be minimal, in terms of affecting the productivity of the commercial fisheries, and no additional conservation measures are necessary. Therefore, no further EFH consultation is required under Section 305(b)(2) of the Magnuson-Stevens Act.

Table 4.7-1 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 longlived slow growing specis	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

Table 4.7-2 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

4.8 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 4.8-1. 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 aggregrations 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 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 status quo. 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 4.8-1 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 comparing proposed action using application of principles of ecosystem management. Three questions are posed yielding three insignificant determinations: Predator prey relationships, energy flow and balance, and diversity (summarized in Table 6.0-1).

4.9 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 is outlined below in Table 4.9-1. If an alternative was deemed by NMFS to likely result in a decrease in harvest levels in these fisheries of more than 50%, it was rated significantly adverse. If the alternative was deemed 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% in either direction was clearly a significant change and that a change of less than 20% 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.

Amendment 63 will have no affects on the State fishery. The state currently manages a skate fishery parallel to the Federal fishery, under the same management measures as the Federal fishery.

Table 4.9-1 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

4.10 Social and Economic Consequences

Section 4.10 describes the social and economic consequences of the alternatives. Sub-section 4.10.1 describes the fishery, Sub-section 4.10.2 analyses the significance of the alternatives for twelve economic criteria, and Sub-section 4.10.3 provides evaluates the interim specifications. Appendix H provides a detailed discussion of the approach to making the gross revenue estimates.

4.10.1 Description of the Fishery

Section 3.1 of the EA lists NEPA documents providing detailed background information on the groundfish fisheries off of Alaska.

Gross revenues from the groundfish fisheries off of Alaska[5]

In 2001, the fishing fleets off Alaska produced an estimated $542.8 million in ex-vessel gross revenues from the groundfish resources of the Bering Sea and Gulf of Alaska.[6] In 2001, groundfish accounted for about 56% of the $974.2 million in ex-vessel gross revenues generated off Alaska by all fisheries (Hiatt, *et al.*2002, Table 2.1, page 18).

The two most economically important groundfish species are pollock and Pacific cod. In 2001, pollock catches generated estimated ex-vessel revenues of $295.2 million and accounted for about 54 percent of all groundfish ex-vessel revenues.[7] Pacific cod was the next most important groundfish species, measured by the size of gross revenues. Pacific cod generated an estimated $124.7 million in ex-vessel gross revenues and accounted for about 23 percent of all groundfish ex-vessel gross revenues. (Hiatt, *et al.* 2002, Table 21, pg 53).

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[5]Net returns cannot be estimated because there is little public information on fishing and processing costs.

[6]The ex-vessel revenue estimates from the Economic SAFE document reflect estimated catcher vessel gross revenues and ex-vessel revenues imputed to catcher-processors. See Hiatt, *et al.*, the footnote to Table 18 on page 48.

[7]As noted below, a large proportion of pollock is taken by catcher processors and ex-vessel prices are not generated. Ex-vessel prices have been inferred for these operations.

Other groundfish species were economically important as well. These included sablefish ($62.7 million in estimated ex-vessel gross revenues), flatfishes (as a group of species generated $31.4 million in estimated ex-vessel gross revenues), rockfishes (as a group generated $7.9 million), and Atka mackerel generating $21.1 million. (Hiatt, *et al*. 2002, Table 21, pg 53).

At the first wholesale level, the gross revenue generated by the groundfish fisheries off of Alaska was estimated to be in excess $1.39 billion. Over half of this, $755.3 million, came from catcher/processors and motherships operating in the Bering Sea and Aleutian Islands (BSAI). Another $432.6 million was generated by catcher vessels and shoreside processors operating in the BSAI. In the Gulf of Alaska (GOA) $26.9 million was generated by catcher/processors and $176.9 million was generated by catcher vessels and shoreside processors. (Hiatt, *et al*. 2002, Table 23, pg 55).

Catcher/Processors

Catcher/processors carry the equipment and personnel they need to process the fish that they 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.

Pollock catcher/processors in the BSAI. These vessels (which use trawl gear) are referred to as the "AFA catcher/processors" because of the role played by the American Fisheries Act (AFA) of 1998 in structuring the fishing sector. The AFA: (1) recognized pollock trawl catcher/processors as a distinct industry segment, (2) limited access to the fleet, (3) modified the historical allocation of the overall pollock TAC that the fleet had received, and (4) created a legal structure that facilitated the formation of a catcher/processor cooperative. The pollock at-sea processing fleet has two fairly distinct components - the fillet fleet, which concentrates on fillet product, and the surimi fleet, which produces a combination of surimi products and fillets. Both of these sectors also produce pollock roe, mince, and to varying degrees fish meal.

Trawl Head And Gut (H&G) catcher/processors. These factory trawlers do not process more than an incidental amount of fillets. Generally they are limited to headed and gutted products or kirimi. In general, they focus their efforts on flatfish, Pacific cod, and Atka mackerel. Trawl H&G catcher/processors are generally smaller than AFA catcher/processors and operate for longer periods than the surimi and fillet catcher/processor vessels that focus on pollock. A fishing rotation in this sector might include Atka mackerel in January; rock sole in February; rock sole, Pacific cod, and flatfish in March; rex sole in April; yellowfin sole and turbot in May; yellowfin sole in June; rockfish in July; and yellowfin sole and some Atka mackerel from August to December. The target fisheries of this sector are usually limited by bycatch regulations or by market constraints and only rarely are they able to catch the entire TAC of the target fisheries available to them. Between 1992 and 2000, the number of vessels operating in this fleet ranged between 23 and 32. From 1998 to 2000 there were either 23 or 24 active vessels. In 2000, the most important species were Pacific cod (about 25% of gross revenues) and other flatfish (about 23% of gross revenues). Yellowfin sole (14%), Atka mackerel (13%), rock sole (10%), rockfish (7%) and pollock (5%) were also significant. These were the important species from 1992 to 2000, but their relative importance varied through time. Pacific cod was one of the less important species before 1998, while yellowfin sole was much more important prior to 1998. (Northern Economics 2002, pages 25-26).

Pot catcher/processors. These vessels have been used primarily in the crab fisheries of the North Pacific, and Bering Sea, but increasingly are participating in the Pacific cod fisheries. They generally use pot gear, but may also use longline gear. They produce whole or headed and gutted groundfish products, some of which may be frozen in brine rather than blast frozen. The number of vessels in this sector has ranged between two and 14 between 1992 and 2000; ten vessels were active in 2000. Almost all the groundfish revenues from the vessels in this sector come from Pacific cod. (Northern Economics 2002, pages 34-35).

Longline catcher/processor. These vessels, also known as freezer longliners, use longline gear to harvest groundfish. Most longline catcher/processors are limited to headed and gutted products, and in general are smaller than trawl H&G catcher/processors. Longline catcher/processor vessels are able to produce relatively high-value products that compensate for the relatively low catch volumes associated with longline gear. These vessels target Pacific cod, with sablefish and certain species of flatfish (especially Greenland turbot) as important secondary target species. In 2000, the 41 vessels operating in this sector grossed about $141 million. Most of this, about 86%, came from Pacific cod, about 7% came from sablefish, and about 5% from other flatfish. Gross revenues were derived from these species in similar proportions over the period from 1992 to 2000, although sablefish was somewhat more important, and Pacific cod somewhat less so, prior to 1998. (Northern Economics 2002, pages 37-3) Most harvesting activity has occurred in the Bering Sea, but longline catcher/processor vessels operate both the BSAI and GOA.

Motherships

Motherships are defined as vessels that process, but do not harvest, fish. The three motherships currently eligible to participate in the BSAI pollock fishery range in length from 305 feet to 688 feet LOA. Motherships contract with a fleet of catcher vessels that deliver raw fish to them. As of June 2000, 20 catcher vessels were permitted to make BSAI pollock deliveries to these motherships. Substantial harvesting and processing power exists in this sector, but is not as great as either the inshore or catcher/processor sectors.

Motherships are dependent on BSAI pollock for most of their income, though small amounts of income are also derived from the Pacific cod and flatfish fisheries in Alaska. In 1999, over 99 percent of the total groundfish delivered to motherships was pollock. About $30 million worth of surimi, $6 million of roe, and $3 million of meal and other products was produced from that fish. These figures exclude any additional income generated from the whiting fishery off the Oregon and Washington coasts in the summer. In 1996, whiting accounted for about 12 percent of the mothership's total revenue. Only one of the three motherships participated in the GOA during 1999, and GOA participation in previous years was also spotty. This is likely due to the Inshore/Offshore restriction that prohibits pollock from being delivered to at-sea processors in the GOA.

Catcher vessels

Catcher vessels harvest fish, but are not themselves equipped to process it. They deliver their fish to an inshore processor, or to a mothership or catcher/processor at sea. There are a wide variety of catcher vessels.

AFA-qualified trawl catcher vessels Vessels harvesting BSAI pollock deliver their catch to shore plants in western Alaska, large floating (mothership) processors, and to the offshore catcher/processor fleet. These vessels are relatively homogenous, most are long-time, consistent participants in a variety of BSAI fisheries, including pollock, Pacific cod, and crab, as well as GOA fisheries for pollock and Pacific cod. The AFA established, through minimum recent landings criteria, the list of trawl catcher vessels eligible to participate in the BSAI pollock fisheries. There is significant, and recently increasing, ownership of this fleet (about a third) by onshore processing plants.

Non-AFA trawl catcher vessel This category includes vessels that used trawl gear for the majority of their catch but are not qualified to fish for pollock under the AFA. An important distinction within this class is between vessels greater than and less than 60 feet. Vessels less than 60 feet are not required to have observer coverage, but more importantly, vessels 58 feet and under meet the length limit for participation in Alaska's salmon seine fisheries. Many of these smaller vessels have dual salmon seine - groundfish trawl capabilities. Many of them are also used to participate in halibut-sablefish longline fisheries, and harvest crab. Between 1992 and 2000, these smaller trawlers earned between about 38% and 77% of their gross revenues from groundfish fishing; the relative importance of groundfish fishing grew over time as salmon markets deteriorated. Non-AFA trawl catcher vessels greater than or equal to 60 feet tend to concentrate their efforts on groundfish. Harvests of pollock by these vessels are substantially lower than those of the AFA qualified vessels, because they have not participated in the BSAI fisheries in recent years. These vessels are too large to be active in the salmon fisheries, but do have some presence in crab and halibut longline fisheries. As noted, these larger trawlers are less diversified and more dependent on groundfish harvests; from 1992 to 2000, they earned between 79% and 96% of their gross revenues from groundfish harvests (Northern Economics 2002 sector profiles, pages 103-106, 130-131)

Pot catcher vessel These vessels rely on pot gear for participation in both crab and groundfish fisheries. Some of these vessels use longline gear in groundfish fisheries. Pot catcher vessels traditionally have focused on crab fisheries, but several factors, including diminished king and Tanner crab stocks, led crabbers to begin to harvest Pacific cod with pots in the 1990s. Catcher vessels fishing Pacific cod with pots grossed $15.4 million in 2001; $8.4 million was earned in the GOA, and $6.9 million in the BSAI. (Hiatt *et al.* 2002, Table 19, page 49).

Longline catcher vessels These vessels fish groundfish and halibut and some may also enter other high-value fisheries such as the albacore fisheries on the high seas. Catcher vessels fishing with longline gear grossed $59.4 million in 2001. Most of this came from the GOA where longline operations harvested $53.9 million; $5.6 million came from the BSAI. Sablefish was the most important groundfish species for these vessels in both regions, it accounted for $46.9 million in the GOA, and $4.4 million in the BSAI. These operations also harvested significant amounts of Pacific cod and rockfish. These species generated $7 million in the GOA, and $1.1 million in the BSAI. (Hiatt, *et al.* 2002, Table 19, page 49).

Shoreside Processors

AFA inshore processors Six shoreside processors and two floating processors are eligible to participate in the inshore sector of the BSAI pollock fishery under the AFA. The shoreside plants are located in Dutch Harbor/Unalaska, Akutan, Sand Point, and King Cove. The two floating processors in the inshore sector are required to operate in a single BSAI location, within Alaska state waters, each year, and they usually anchor in Beaver Inlet in Unalaska. However, one floating processor has relocated to Akutan. Pollock is, by far, the most important groundfish species for these plants, followed by Pacific cod. Pollock accounted for between 79% and about 88% of the wholesale value of groundfish production between 1992 and 2000. Pacific cod accounted for most of the rest of the value, between 9.6% and abut 18% depending on the year, over the same period. These plants only processed small amounts of other species. (Northern Economics 2002, pages 44-45)

Groundfish products were extremely important for these plants. In 2001, groundfish with an ex-vessel value of $157.6 million were delivered to the processors in this sector. This groundfish accounted for about 85%of the ex-vessel value of all species delivered to this processing group. The group produced products with a gross first wholesale value of $421.8 million dollars. These groundfish products accounted for about 89% of the gross value of all products produced by this group. (Hiatt *et al.* 2002, Tables 22, 22.1, 25, and 25.1).

Non-AFA inshore processors Inshore plants include shore-based plants that process Alaska groundfish and several floating processors that moor nearshore in protected bays and harbors. Four groups of non-AFA inshore processors are described below. The groupings are primarily based on the regional location of the facilities: (1) Alaska Peninsula and Aleutian Islands, (2) Kodiak Island, (3) Southcentral Alaska, and (4) Southeast Alaska.

Alaska Peninsula and Aleutian Islands Inshore Plants. These plants receive product from the BSAI and the Western GOA. Between 1992 and 2000, from six to eight plants operated in this sector. In terms of value, their most important products appear to be Pacific cod, pollock, and sablefish. The median yearly percentage of wholesale revenues generated by Pacific cod was 52.6%. Information on the value of pollock production for these operations can't be published for most years due to confidentiality restrictions. It did account for about 17% of wholesale revenues in 1992, and about 42% in 1994. Sablefish also contributed significant wholesale revenues, accounting for between 3.3% and 10% in the eight years for which the information is not confidential. (Northern Economics 2002, pages 51-52)

In 2001, groundfish with an ex-vessel value of $25.7 million were delivered to the processors in this sector. This groundfish accounted for about 22% of the ex-vessel value of all species delivered to this processing group. The group produced products with a gross first wholesale value of $49.6 million dollars. Groundfish products accounted for about 20% of the gross value of all products produced by this group. (Hiatt *et al.* 2002, Tables 22, 22.1, 25, and 25.1).

Kodiak Island inshore plants Between 11 and 14 plants processed groundfish in Kodiak between 1992 and 2000. The number of plants trended down over this period, falling in seven of the eight inter-year periods. These plants were somewhat more diversified than the Alaska-Peninsula plants, processing significant amounts of a wider range of species. The value of Pacific cod and pollock production has dominated that of other species in recent years. Between 1997 and 2000, Pacific cod accounted for between about 37% and about 53% of production value and pollock has accounted for between about 26% and 38% of production value. Sablefish has also been important, contributing between about 8% and about 14% of production value during those years. "Other flatfish," rockfish, rock sole, and shallow water flatfish, all contributed more than 3% of gross earnings in at least two of those years.(Northern Economics 2002, pages 59-61).

Groundfish products were very important for these firms. In 2001, groundfish with an ex-vessel value of $30.9 million were delivered to the processors in this sector. Groundfish accounted for about 45% of the ex-vessel value of all species delivered to this processing group. The group produced products with a gross first wholesale value of $69.1 million dollars. Groundfish products accounted for about 45% of the gross value of all products produced by this group. (Hiatt *et al.* 2002, Tables 22, 22.1, 25, and 25.1).

Southcentral Alaska inshore plants. This group includes plants that border the (east of Kodiak Island), Cook Inlet, and Prince William Sound. Between 1992 and 2000, there were between 15 and 21 plants participating in given year. These plants were somewhat less diversified that those in Kodiak. Sablefish and Pacific cod dominate the value of their groundfish production. Sablefish accounted for between about 54% and about 81% of the value of groundfish production output, depending on the year. Pacific cod accounted for between about 12% and about 21% depending on the year. Rockfish ranked third in importance, accounting for from 1.6% to 3.3% of the value of groundfish output, depending on the year. (Northern Economics 2002, pages 65-67)

Groundfish were a relatively less important product for these firms. In 2001, groundfish with an ex-vessel value of $18.1 million were delivered to the processors in this sector. Groundfish accounted for about 20% of the ex-vessel value of all species delivered to this processing group. The group produced products with a gross first wholesale value of $28.0 million dollars. Groundfish products accounted for about 15% of the gross value of all products produced by this group. (Hiatt *et al.* 2002, Tables 22, 22.1, 25, and 25.1).

Southeast Alaska inshore plants. This group includes all shore plants in Southeast Alaska, from Yakutat to Ketchikan. Between 12 and 16 plants processed groundfish in this region from 1992 to 2000, depending on the year. Sablefish was by far the most important of these groundfish species, measured in terms of the value of processed output. Sablefish gross revenues accounted for from about 95% to about 98.5% of the value of groundfish production, depending on the year. Most of the rest of the groundfish product revenues were generated with rockfish products; these accounted for between about 1.5% to about 4.4% of groundfish revenues, depending on the year.(Northern Economics 2002, pages 70-71)

Groundfish were a relatively less important product for these firms. In 2001, groundfish with an ex-vessel value of $30.9 million were delivered to the processors in this sector. Groundfish accounted for about 19% of the ex-vessel value of all species delivered to this processing group. The group produced products with a gross first wholesale value of $41.1 million dollars. Groundfish products accounted for about 13% of the gross value of all products produced by this group. (Hiatt *et al.* 2002, Tables 22, 22.1, 25, and 25.1).

Markets

Markets for three of the most important species, pollock, Pacific cod, and Atka mackerel, have been described in detail in Appendix D of the SSL SEIS (NMFS 2001c). The reader is referred to that document for a more detailed report on these markets. The following discussion abstracts Section 5.3.2 ("Prices") of that appendix. This discussion focuses on pollock, Pacific cod and Atka mackerel because (a) the recent research for Appendix D has made information on these species relatively more available than information for other species, and (b) these three species together account for about 89% of groundfish first wholesale revenues in 2001 (Hiatt *et al.* 2002, Table 36, pages 85-86).

The three most important pollock products are surimi, fillets, and roe. Alaska surimi is primarily consumed in Japan where it is considered to be a premium product; available substitutes for it are relatively limited. The prices received for pollock surimi will probably be relatively responsive to the quantity supplied to the market, so that there would be noticeable price increases if supply was reduced, and price decreases if supply was increased. These shifts should moderate or offset the revenue increases and decreases associated with changes in the numbers of metric tons of product supplied. Similar conditions exist in the Japanese market for pollock roe.

Conditions are different in the market for fillets. Fillets tend to be sold into the relatively competitive U.S. market where there are relatively closer substitutes. Prices received for pollock fillets in that market may be relatively less responsive to changes in the quantity supplied. In this market, price changes would not tend to offset the revenue impacts of quantity changes.[8]

Pacific cod has a relatively close substitute in Atlantic cod and its price is unlikely to be strongly responsive to quantity changes. Atka mackerel from Alaska is a popular product in Japan and South Korea where most

[8]Technically, the demands for surimi and roe are described as relatively "inelastic," while the demand for fillets is described as relatively "elastic."

of it is consumed, and has relatively few strong substitutes. Its price is likely to be responsive to quantity changes.

Safety

Commercial fishing is a dangerous occupation. Lincoln and Conway of the National Institute of Occupational Safety and Health (NIOSH) estimate that, from 1991 to 1998, the occupational fatality rate in commercial fishing off Alaska was 116/100,000 (persons/full time equivalent jobs), or about 26 times the national average of 4.4/100,000.[9] Fatality rates were highest for the Bering Sea crab fisheries. Groundfish fatality rates, at about 46/100,000 were the lowest for the major fisheries identified by Lincoln and Conway. Even this relatively lower rate was about ten times the national average.(Lincoln and Conway 1999, page 692-693).[10]

However, during most of the 1990s commercial fishing appeared to become safer. While annual vessel accident rates remained relatively stable, annual fatality per incident rates (case fatality rates) dropped. The result was an apparent decline in the annual occupational fatality rate.[11] From 1991 to 1994, the case fatality rate averaged 17.5% a year; from 1995 to 1998 the rate averaged 7.25% a year. Lincoln and Conway report that "The reduction of deaths related to fishing since 1991 has been associated primarily with events that involve a vessel operating in any type of fishery other than crab." (Lincoln and Conway 1999, page 693.) Lincoln and Conway described their view of the source of the improvement in the following quotation.

> The impressive progress made during the 1990s in reducing mortality from incidents related to fishing in Alaska has occurred largely by reducing deaths after an event has occurred, primarily by keeping fishermen who have evacuated capsized (sic.)or sinking vessels afloat and warm (using immersion suits and life rafts), and by being able to locate them readily, through electronic position indicating radio beacons. (Lincoln and Conway 1999, page 694).

There could be many causes for this improvement. Lincoln and Conway point to improvements in gear and training, flowing from provisions of the Commercial Fishing Industry Vessel Safety Act of 1988, that were implemented in the early 1990s. Other causes may be improvements in technology and in fisheries management. The Lincoln-Conway study implies that safety can be affected by management changes that affect the vulnerability of fishing boats, and thus the number of incidents, and by management changes that affect the case fatality rate. These may include changes that affect the speed of response by other vessels and the U.S. Coast Guard.

Nevertheless, despite these implications, the exact determinants of incident rates, fatality rates, and other measures of fishing risk, remain poorly understood. In the current instance, reductions in the TAC would

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[9]To make accident rates easier to read and to compare across industries, all rates have been standardized in terms of the hypothetical numbers of accidents per 100,000 full time equivalent jobs in the business. The numerator, 116, is not the number of actual deaths; the denominator, 100,000, is probably at least five times the total number of full time equivalent jobs each year. In decimal form, this is a rate of .00116.

[10]The NIOSH study does not cover 1999-2001. The rates are based on an estimate of 17,400 full time employees active in the fisheries. This estimate of the employment base was assumed constant over the time period. However, various factors may have affected this base, including reductions in the size of the halibut and sablefish fleets due to the introduction of individual quotas. These estimates must therefore be treated as rough guides.

[11]This result is based on an examination of the years from 1991-1998. It does not reflect the losses in the winter of 2001.

reduce fishing operation profitability and could lead fishermen to skimp on safety expenditures and procedures. Conversely, reduced profitability may reduce the number of active fishing operations and the numbers of vessel and fishermen placed at risk. The net impacts are difficult to untangle with our existing state of knowledge.[12]

CDQ Groups

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. Revenues from the operations of the CDQ groups are used for fisheries-related economic development in the region.

The CDQ program began in 1992 with the allocation of 7.5% of the BSAI pollock TAC. The size of the pollock allocation, and the number of species CDQ allocations have increased through time. Currently, the CDQ program receives 10% of the pollock allocation, 20% of the sablefish TAC set aside hook-and-line and pot vessels, 7.5% of the sablefish TAC set aside for trawl operations, 7.5% of the remaining groundfish TACs, 7.5% of the prohibited species catch limits, and 7.5% of the crab guidelines harvest levels.

4.10.2 Direct and Indirect Impacts of the Alternatives

Impacts

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

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[12]A more detailed discussion of safety issues may be found in Section 1.3.3.4 of Appendix C to the SSL SEIS (NMFS 2001b).

[13]"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.

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.

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 H. 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 revenues 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 2001 prices were used for all alternatives and for 2003. These issues, and others, are discussed in more detail in Appendix H.

The results of this analysis are summarized in Figures 4.10-1, 4.10-2, and 4.10-3. Each of these figures show 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 4.10-1, 4.10-2, and 4.10-3 show that in each case, the total of first wholesale revenues under Alternative 1are significantly larger than those in 2003. Therefore, the significance rating for the 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 the status quo alternative, show "insignificant" change as would be expected of maintaining the status quo. In each case Alternative 5, which sets all ABCs to zero, eliminates all revenues from the fishery. This alternative has been given a significance rating of "negatively significant."

Alternatives 3 and 4 have a more negative impact on gross revenues. The gross revenue estimates in this analysis may have an upward bias (for the reasons discussed in Appendix H), and they have a large, and unknown, error. A 20% threshold was adopted to determine significance (although it may be possible to justify a large threshold). In other words, only a decline in gross revenues of 20%from 2003 levels will be described as significant. Estimated BSAI ITAC 2003 revenues were about $1,138 million, BSAI CDQ revenues were about $115 million, and GOA revenues were about $150 million. The corresponding significance thresholds are changes of $228 million, $23 million, and $30 million, respectively. Alternative

4 triggered the threshold in the BSAI, alternatives 3 triggered the threshold in the GOA, and alternative 4 triggered the threshold for CDQ groups. Each of these triggering alternatives have been given a rating of "negatively significant."

Figure 4.10-1 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)

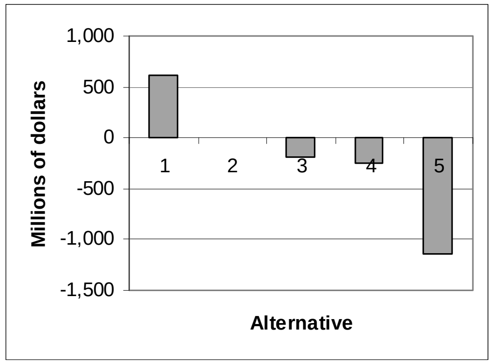


Figure 4.10-2 BSAI First Wholesale Value Estimates for CDQ reserve: Difference Between Estimated 2003 First Wholesale Value and First Wholesale Value of Each Alternative (in millions of dollars)[14]

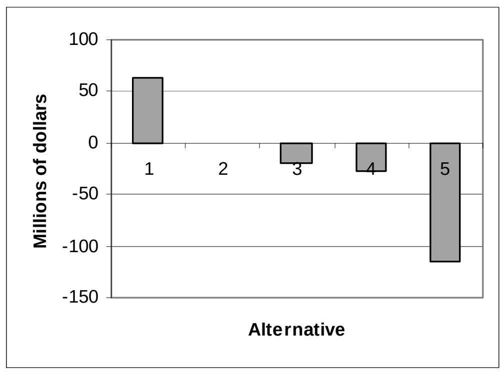
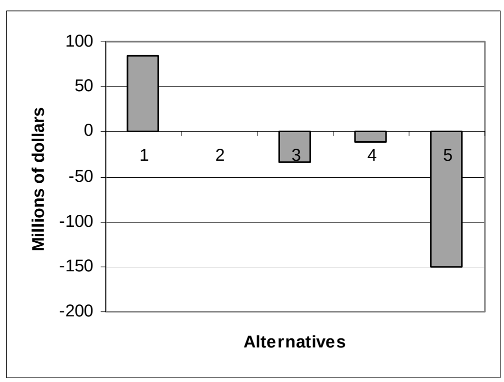


Figure 4.10-3 GOA Gross Revenue Estimates: Difference Between Estimated 2003First Wholesale Value and First Wholesale Value of Alternatives (millions of dollars)



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

Operating Cost Impacts

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

Harvest, delivery, 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, these alternatives have 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. These alternatives have been given cost significance ratings which are the inverse of those applied to revenues: "positively significant" (since a decrease in costs is a good thing).

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 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 estimates of net returns to industry. NMFS has little information on the value of capital investments or the operating costs in Alaska's groundfish fisheries. Voluntary surveys have been tried, but response rates have been very poor.

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

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

Alternative 1, which had positively significant impacts on gross revenue is assumed to have positively significant impacts on net returns. Alternative 2, which had insignificant impacts on gross revenues and costs are assumed to have insignificant impacts on net returns. Alternatives 3 and 4 had significantly negative impacts on revenues and positive impacts on costs, and have been given a "negatively significant" 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."

Safety and Health Impacts

As described in Section 4.10.1, groundfish fishing off Alaska is a dangerous occupation. However, little is known about the connection between fisheries management measures and accident, injury, or fatality rates. Moreover, little is known about risk aversion among fishermen, or the values they place on increases or decreases in different risks. There is no way to connect changes in the harvests expected under these alternatives with changes in different risks, and the costs or benefits of these changes to fishermen.

Increases in TACs may improve fishing profitability and lead to greater investments in fishing vessel safety and greater care by skippers. This may reduce the fatality rate (although this is conjecture). Conversely, increases in TACs may increase the number of operations, the average crew size per operation, and the average time at sea. These may increase the potential population at risk, and the length of time individuals may be exposed to the risks. The net impact of changes in TACs on accident rates and accident severity are thus difficult to determine. Shoreside stress and related health problems are probably associated with large negative changes in production and fishery revenues. The extent of stress related health problems associated with decreases in revenues is unknown.

Alternative 1 increases TAC's thereby likely increasing operations and time at sea and affecting safety and health negatively. However, if increased TAC's lead to greater net returns (as argued above) then safety and health may be negatively affected. Thus, it is not possible to unequivocally state what net effect alternative 1 will have on safety and health and this has resulted in an "unknown" ranking. Alternative 2 has essentially the same projected TACs as 2003.[15] Because of this, alternative 2 has been given an "insignificant" safety and health rating. Alternatives 3 and 4 generally involve cuts in 2003 TACs. 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, 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. The net impact of these various effects is unknown, however, because fishery closure for a year would be such an extraordinary event, the stress issue must be a concern. This alternative has thus been given a significance rating of "negatively significant."

[15]The TACs in this EA are projected on the basis of the ABCs in the alternatives, fishery optimum yields, and past Council decisions - particularly those incorporated in the 2003 specifications. The Council may adopt a different set of TACs at its December 2003 meetings. For more details on the methods used to make the TAC projections incorporated here, see Section 4.10.3)

Impacts on Related Fisheries[16]

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

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

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

Changes in Alaska groundfish TACs may also affect other fisheries through market impacts. As noted in Section 4.10.1, Alaska groundfish are substitutes for groundfish products produced elsewhere. For example, Pacific cod has a relatively close substitute in Atlantic cod. Reductions in Pacific cod harvests, and consequent price increases for Pacific cod, may shift demand curves for substitute species out, and lead to price increases for those species. Price increases and associated profit increases may lead to increased fishing effort in the fisheries for those species.

The projected TACs under Alternative 2 are very similar to those in place in 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, 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 related through substitution relationships in markets. For these reasons, this alternative has been given a "negatively significant" rating.

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

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. A decrease in quantity supplied and an associated increase in price will reduce consumer welfare as measured by consumers' surplus. An increase in quantity supplied and a consequent decrease in price will increase consumer welfare as measured by consumers' surplus.[17] A decrease in consumers' surplus is not a total loss to society, since some of that loss is usually transferred to industry in the form of higher prices. However, this transfer is still a loss to consumers.

The description of groundfish markets in Section 4.10.1 suggests that 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 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 These alternatives have therefore been given a consumer impact significance rating of "insignificant." Alternatives 3 and 4 lead to large reductions in a number of TACs. Alternative 5 would close Alaska's federal groundfish fisheries in 2004 creating large reductions in supplies to U.S. consumers. These alternatives would reduce (or in the case of Alternative 5, eliminate) the consumers' surplus from consumption of Alaska groundfish and lead to price increases in markets for substitute species. These alternatives have been given a "significantly negative" rating.

Management and Enforcement Costs

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

In-season management expenses are believed to be more closely related to the nature and complexity of the regulations governing the fishery (for example, on the number of separate quota categories that must be monitored and closed on time) than on TACs. Over a wide range of possible specifications, in-season management expenses are largely fixed. For example, increases in TACs from 50% above 2003 levels to

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

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

50% below 2002 levels could probably be handled with existing in-season management resources[19] (Tromble, pers. comm[20].).

Alternative 1 increases TACs significantly for several species and is therefore rated as "negatively significant." 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 2003, 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 if the limitations imposed by TACs were removed, and the amounts of fish harvested in 2001. This study used two methodologies to address this question, the results of the more conservative method are summarized here. The study estimated that, conservatively, there was about 17% excess capacity (as described above) in the Atka mackerel fleet, about 26% for flatfish, 35% for Pacific cod, 39% for pollock, 21% for rockfish, 24% for sablefish, and 30% for other groundfish. (Hiatt, *et al.* 2002, page 111).[21] These estimates apply to the catcher vessel and catcher-processor components of the fleet. Excess capacity for pollock may have been reduced since 2001 as fishing operations take advantage of cooperative fishing arrangements under the American Fisheries Act (AFA). Corresponding data are not available for on-shore processors.

Alternative 1 increases TACs significantly for several species. Significantly greater TACs can 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. This alternative has therefore been given a significance rating of "insignificant." Alternatives 3 and 4 would involve reduced amounts of fish available for harvest for a given fleet and would increase excess capacity

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

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

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

in 2004. 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

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

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

In the GOA bycatch rates are typically low. The only average bycatch amounts that are meaningful in terms of numbers or weight in the Gulf of Alaska are Pacific halibut in the Pacific cod fishery, chinook salmon in the pollock fishery, other salmon (primarily chums) in the pollock fishery, and small amounts of *C. bairdi* crab in the Pacific cod fishery. Halibut is the only prohibited species managed under a cap in the Gulf.

The impacts of the alternatives on the bycatch and discard of prohibited species are discussed in EA Section 4.4. The results of the analysis are summarized in Table 6-1. 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. 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.[22] That is, people enjoy a benefit (which can be measured in economic terms) from simply knowing that some given aspect of the environment exists. Survey research suggests that passive use values can be significant in at least some contexts. Because passive use values pertain to the continued existence of resources, the focus in this discussion is on classes of resources in the GOA and BSAI 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; (d) three species of sea birds (Table 6-2 lists the affected species).

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

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 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 were either "insignificant," "unknown," or "positively significant. The one exception was an unknown or negatively significant" impact due to processing waste and offal on norther fulmars under Alternative 5.

Alternative 2 involved little change in the ways the fisheries are conducted. This alternative has been rated "insignificant." Alternatives 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 given an "unknown significance" reflecting the Table 6.0-1 summary of some impacts on seabirds.

Non-Market 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 products (NMFS 2001b, page F3-109). Groundfish specifications, however, may affect subsistence harvests of other natural resources through two mechanisms: (1) they influence the levels of harvest of groundfish which may be used by other animals that are themselves used for subsistence purposes; (2) they influence the bycatch of prohibited species that have subsistence uses. Changes in groundfish harvests, for example, could affect the prey available to Steller sea lions and thus affect sea lion population status and sea lion availability to subsistence hunters. Alternatively, changes in bycatch of prohibited species, particularly salmon and herring, could directly affect subsistence use of these species.

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

TACs projected under Alternative 2 are not expected to change much from those in 2003. These alternatives have 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 do not support non-consumptive eco-tourism uses. 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 mortalities on sea birds. 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 4.10-1 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	S-	S-	S-
Operating cost impacts	S-	I	S+	S+	S+
Net returns to industry	S+	I	S-	S-	S-
Safety and health impacts	U	I	U	U	S-
Impacts on related fisheries	U	I	U	U	S-
Consumer effects	S+	I	S-	S-	S-
Management and enforcement	S-	I	I	I	S+
Excess capacity	S+	I	S-	S-	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

4.10.3 Interim Specifications Analysis

NMFS annually 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 initial TAC (ITAC) and apportionment thereof, one-fourth of each proposed PSC allowance, and the first seasonal allowance of GOA and BSAI pollock, Pacific cod, and BSAI Atka mackerel. These interim specifications are in effect on January 1 and remain in effect until superceded by final specifications. For most BSAI target species, the ITAC is calculated as 85 percent of the previous year's 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 proposed specifications (which may be found in Tables 2.3-1 and 2.3-2) were compared on the basis of the gross revenues associated with Alternatives 1, 3, 4, and 5. The gross revenues for the alternatives are summarized in Table 4.10-2. The gross revenues for Alternative 1 are approximately 50% larger than those for Alternative 2. The proposed specifications for Alternatives 1 and 2 were associated with higher gross revenues than the Alternatives 3, 4, and 5. The model was used to estimate gross revenues for the year 2003 as well as for the alternatives. Gross revenues in 2003 were estimated to be $1,138 for the BSAI ITAC, $115 for the BSAI CDQ program, and $150 for the GOA. These revenues are similar to those generated by Alternative 2, below those generated by Alternative 1, and above those generated by Alternatives 3, 4, and 5.

Table 4.10-2 Estimated Proposed Gross Revenues by Alternative (in millions of dollars)

Alternative	BSAI ITAC	BSAI CDQ	GOA
Alt 1	$1,755	$179	$235
Alt 2 (proposed)	$1,138	$115	$150
Alt 3	$942	$96	$116
Alt 4	$884	$89	$138
Alt 5	$0	$0	$0

The Council's recommended specifications for 2004 are made at the December 2003 Council meeting. It takes a period of months to publish a complicated rule like that necessary to implement the specifications; typically the final specifications publish in March of the year in which they become effective. Some of the most important fisheries of the year, however, take place in January, February, and March. Many of these fisheries harvest species in a spawning condition, and produce valuable roe in addition to other products. In order to ensure that fishing can take place during this early period, NMFS annually publishes interim specifications to manage the fisheries from January 1 until they are superceded by the final specifications.

As specified in 50 CFR § 679.20(c)(2), interim specifications are one-fourth of each proposed initial TAC (ITAC) and apportionment thereof, one-fourth of each proposed PSC allowance, and the first seasonal allowance of GOA and BSAI pollock and BSAI Atka mackerel. For most BSAI target species, the ITAC is calculated as 85 percent of the previous year's TACs (50 CFR § 679.20(b)). First seasonal allowances generally exceed one-fourth of the TAC. The first seasonal allowance of GOA and BSAI Pacific cod is 60% of the annual TAC, the first seasonal allowance for BSAI Atka mackerel is 50% of the TAC, the first seasonal allowance for BSAI pollock is 40% of the TAC, and the first seasonal allowance of GOA pollock is 25% of the TAC. Interim specifications apply to CDQ allocations as well as to TACs. In the GOA, interim specifications for fixed gear sablefish have been set equal to zero, since the sablefish IFQ fishery doesn't begin until mid-March, about the time the final specifications would become effective.

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

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

Table 4.10-3 summarizes estimates of gross revenues for interim specifications associated with each of the five alternatives analyzed in this EA. These were calculated using interim TACs provided by the Groundfish Plan Team in September of 2003. The calculation method is the same as that used for estimation of gross revenues presented in Table 4.10-2. In the case of the CDQ interim gross revenue calculation, this procedure represents a slight improvement over methods used previously (e.g. 2003 TAC setting EA). For this analysis, CDQ allotments were calculated from the actual interim TACs provided by the plan team and gross revenue was estimated using those interim allotments. In the past, this was done by applying interim TAC specifications to gross revenue estimates of the CDQ allotments of TACs.

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

Table 4.10-3 Estimated Interim Gross Revenues by Alternative (in millions of dollars)

Alternative	BSAI ITAC	BSAI CDQ	GOA
Alt 1	$790.5	$75.5	$73.4
Alt 2	$516.2	$49.2	$47.6
Alt 3	$424.4	$39.9	$39.4
Alt 4	$399.9	$37.7	$36.5
Alt 5	$0	$0	$0

Notes: These represent estimated gross revenues for interim TACs associated with the five alternatives. These were calculated interim TACs provided by the plan team in September of 2003. Note that annual prices were used to prepare these estimates. Since prices are often higher in the first half of the year, these gross revenue estimates are likely underestimates of actual interim revenues.

4.11 Amendment 63 (GOA skates) Analysis

The proposed action for Amendment 63 is limited in scope and will not likely affect all environmental components of the GOA. The effects discussion for Amendment 63 will be limited to only those components that may be affected. Table 4.11-1 shows the potentially affected components. Under groundfish, the effects are primarily limited to target species that may be taken in a skate directed fishery, such as skates and Pacific cod. The TAC for the other species complex is also affected by the action since this amount of harvest will increase based on the formula used for the other species TAC (5 % of the combined TAC amounts for target species, as specified in the FMP). Halibut prohibited species may be affected, as these are taken as bycatch in the skate fishery. The opening of a skate fishery may have socioeconomic effects on the participants in the skate fishery and participants in other target fisheries that include species that may be taken as incidental catch in the skate fishery. Overall fishing practices will not change with Amendment 63, so no effects are expected on the other environmental components listed in Table 4.11-1.

Table 4.11-1 Resources potentially affected by Alternative 2 and 3 beyond Status Quo

	Potentially Affected Component							
Alternative	Physical	Benthic Comm.	Groundfish	Marine Mammals	Seabirds	Non specified Species	Prohibited Species	Socioeco nomic
2	N	N	Y	N	N	N	Y	Y
3	N	N	Y	N	N	N	Y	Y

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

Table 4.11-1 suggests that there are three potential environmental impacts. These were:

- Groundfish target species impacts, including skates, other species and Pacific cod
- Halibut PSC
- Social and Economic

These classes of potential impacts are evaluated below. The significance criteria for each class is the same as that described above for the harvest specifications action.

Groundfish Target Species Impacts

The impacts of Amendment 63 on groundfish target species will likely be limited to skates, other species, and Pacific cod. The majority of the skate incidental take in the GOA is in the Pacific cod directed fishery (Gaichas and DiCosimo 2001). Likewise, a significant amount of bycatch taken in the other species directed fishery is Pacific cod, as fishers target skates in the other species complex. The "other species" management category comprises multiple non-target species groups: sharks, skates, smelts, squids, octopus, and sculpins. "Other species" are considered ecologically important and may have future economic potential; therefore an aggregate annual quota limits their catch. Information on distribution, stock structure, and life history characteristics is extremely limited for other species. There is currently very little (if any) directed fishing for species in this category in the Gulf of Alaska. Other species are taken incidentally in target fisheries for groundfish, and aggregate catches of other species are tracked inseason by the Alaska Regional Office.

Catches of other species have been very small compared to those of target species (Gaichas et al. 1999). It is unlikely that the observed bycatch of other species is having a negative effect on abundance at the species group level, according to the limited trawl survey data available. However, data limitations are severe, and further investigation is necessary to ensure that all species components are not adversely affected by groundfish fisheries. Furthermore, if target fisheries for shark and/or skates develop (under the status quo alternative), management will be difficult with the current limited information.

Groundfish target species impacts may occur if skate fishermen take advantage of their skate fishing activity to harvest their Pacific cod maximum retainable amounts (MRA)s. Skate fishermen would be able to retain Pacific cod up to 20% of the weight of their skate harvest. For example, if the skate TAC were 5,000 metric tons, and this was completely harvested by longliners and trawlers in directed skate fisheries, these fishermen could retain up to 1,000 metric tons of Pacific cod in aggregate. The additional harvest of Pacific cod will not have a significant impact on Pacific cod stocks because the harvest is conducted within the MRA limits and is subtracted from the annual TAC specified for Pacific cod.

Ironically, FMP Alternative B, which splits skates out of the "other species" complex, will lead to increases in the size of the "other species" complex TAC. Skates are part of the "other species" FMP management category, meaning that their catch is reported in aggregate along with catches of shark, sculpin, octopus, and squid. In the GOA FMP, the "other species" TAC has been established as 5 percent of the sum of the TACs for all other assessed target species in the GOA. If skates are taken out of the complex and given their own OFL, ABC, and TAC, their TAC will be added to the total TACs of all species for the purpose of calculating the "other species" TAC. For example, if the skate TAC were set at 5,000 metric tons, the increase in "other species" TAC would be 5 percent of that, or 250 metric tons. However, the other species complex TAC has been set over 10,000 metric tons in the last four years, and fishermen have not harvested 50% in any of those years. The highest harvest took place this year, 2003, when fishermen harvested almost 50% of the TAC. Approximately 63 percent of the other species harvest in 2003 was skates (NMFS inseason data). In light of this, all three alternatives have been given a "not significant" rating for "other species" impacts. This marginal increase in the other species TAC will (marginally) increase the potential for overfishing of the species in the remaining groups (sharks, squids, sculpins, and octopi) in the complex. This situation is intended to be temporary as the Council attempts to resolve biological and management issues of revising management of all non-target groundfish species.

The FMP Alternative B would give fishery managers more control over skate harvests. In 2003, the "other species" TAC was 11,600 metric tons. Under the current management regime, skate fishermen could conceivably harvest almost the entire TAC as skates. Section 2.5 of the Alternative chapter proposed a skate OFL of 10,322 metric tons. Thus, the TAC limiting the harvest of skates is currently larger than the OFL. This creates the potential for overfishing the stock. As noted in Section 3.2, which described the biology and management of the skate fishery, skates grow and reproduce slowly. If the stock were fished down, it would not be expected to rebound quickly. FMP Alternative A, which is the status quo, has been given a "not significant" designation. FMP Alternative B, which provides more protection to the stock biomass, has an insignificant effect on skate stocks because it is not expected to jeopardize the capacity of the stock to produce MSY on a continuing basis.

The skate specification alternatives include a range of levels of management depending on species and area application of ABCs and OFLs. Alternative 1 would manage skates with a single GOA wide OFL and area specific ABCs. This alternative would still allow for a disproportionately high level of harvest of a single species within a narrow geographic range. Alternative 3 is the most protective alternative for the skate stocks by establishing species and area specific ABCs and OFLs. The resultant OFLs would be smaller than a GOA wide OFL, leading to a greater likelihood of closure of other directed species fisheries that take skate as incidental catch if OFL levels were reached. Alternative 2 manages skates with both species and area level ABCs, as does Alternative 3, but with a single GOA wide OFL. The best method for the management of a targeted stock is at the TAC (sometimes equal to the ABC) level. The skate fishery or fisheries would be managed to the TAC level so the likelihood of exceeding the OFL level would be reduced.

Because Alternative 1 would not protect against the possibility of overfishing an individual species of skate, the impact of Alternative 1 may be significantly adverse for skate species. Alternatives 2 and 3 provide the ability to control skate harvest to avoid the likelihood of overfishing an individual species on a GOA wide level and Alternative 3 gives further protection to skate species by establishing the area specific OFLs. Because the management of skates under Alternatives 2 and 3 would be to the area TAC level, the addition of area specific OFLs under Alternative 3 is not likely to add much more protection. Alternatives 2 and 3 are not expected to jeopardize the capacity of the stock to produce MSY on a continuing basis and therefore the impacts of Alternatives 2 and 3 on skate stocks is insignificant.

Prohibited Species Impacts

The only PSC species that may be affected is halibut which likely will be taken in the skate fishery. Halibut is the only PSC species with a limit in the GOA. The annual halibut PSC limit is apportioned to trawl (2,000 mt) and hook-and-line (300 mt) gear by fishing period (reference tables). The trawl PSC apportionment is further divided between the shallow-water species complex and the deep-water species complex through September 30 each year. The “other species” complex is part of the shallow-water complex, and skates would be placed under that complex under skate specifications Alternatives 2 or 3. Halibut bycatch will occur on trawl and longline vessels targeting skates. Many of these vessels are less than 60 ft and are unobserved. Data from the 2003 skate fishery has not been quantified to determine the amount of halibut caught by vessels targeting skates. However, an industry member expressed concern that halibut catch in the skate fishery counted against the PSC limit may preempt the directed Pacific cod fishery, particularly in the latter half of the year[23].

Because the amount of halibut taken in a directed skate fishery will be limited by the annual harvest specifications PSC limits for the shallow water complex, the effects of the FMP and specifications alternatives on halibut PSC are insignificant.

Socioeconomic Impacts

The economic impacts of this action are discussed in the Initial Regulatory Flexibility Analysis (small entity analysis) in Chapter 7, and in the Regulatory Impact Review (RIR) in chapter 8. The impacts will depend on decisions made by the Council in setting a skate TAC. The purpose of the FMP amendment is to give managers more control over skate harvests in the GOA to constrain harvests if necessary to protect the skate biomass. This action may lead to limits of the gross revenues from fishing in the short run, but as a result of protecting the biomass, may lead to greater gross revenues from a sustainable fishery. Consideration must

[23]Gerry Merrigan, personal communication, September 18, 2003, Prowler Fisheries P.O. box 1364, Petersburg , AK 99883.

also be given to the impacts on the Pacific cod fisheries and the shallow water complex fisheries of the GOA which are limited by available halibut PSC. The taking of Pacific cod and halibut in the skate directed fishery may reduce the amount of directed fishing allowed in the Pacific cod directed fishery and in the shallow water complex fisheries. Skate specifications Alternatives 2 and 3 may result in a change in fishing gear or vessels. Given the uncertainties about future Council TAC setting, and with respect to industry's valuation of the trade off between potential short run restrictions and long run sustainability, the significance of socio-economic impacts of the FMP amendment alternatives and the skate specifications alternatives has been designated, "unknown."

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 PSEIS are in Table 5.0-1. See section 4.5 of the PSEIS for further details on the cumulative effects of the status quo.

Table 5.0-1 Cumulative Effects Summary for Alternative 1 from 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 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 PSEIS compared to Alternative 1 in the PSEIS. Alternative 3 in the PSEIS is a more precautionary harvest strategy which is considered 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 PSEIS because it is an average of the levels of fishing under the status quo fishing regime. The action to set harvest specifications analyzed in this EA is within the scope of alternatives analyzed in the PSEIS, and therefore, the cumulative effects analysis in the 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; spacial/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 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 distribution 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.

The cumulative effects of Amendment 63 will be similar to those seen for the harvest specifications under target species (other species and Pacific cod), prohibited species (halibut in the GOA), and socioeconomic effects. Forseeable future action includes further development of a skate fishery which is more likely to have socioeconomic cumulative impacts on the participants in the skate fishery and participants in other fisheries taken as incidental catch in a directed skate fishery or that rely on the same halibut PSC limits. No information is available to predict potential impacts. The biological impacts are limited by the groundfish management and PSC management strategies currently in place.

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 or from Amendment 63. The 2004 harvest specifications and Amendment 63 are therefore determined to have no cumulative impacts over and above 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 impacts of alternative TAC levels and Amendment 63 are assessed in section 4 and 5 of this EA.

In addition to the PSEIS and Steller sea lion 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. Amendment 63 applies to the GOA fisheries only. 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. The separation of skates in the GOA groundfish management has societal effects on individuals directly and indirectly participating in the skate and other groundfish fisheries and on those who use the ocean resources. Because this action continues groundfish fisheries in BSAI and GOA into the future and affects the method of managing skates in the GOA, 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 year 2004 federal groundfish fisheries harvest specifications and Amendment 63 are summarize in Table 6.0-1 and in section 4.11. No significant adverse impacts were identified for the preferred alternative (Alternative 2) for the harvest specification and for the FMP amendment Alternative B. The no action FMP alternative for Amendment 63 was identified as significantly adverse to skate stocks. Alternative 1 under the skate specifications does not prevent the likelihood of overfishing skate species and is therefore, identified as potentially significantly adverse to skate species.

6.2 **Public health and safety** will not be affected in any way not evaluated under previous actions or disproportionally. The harvest specifications and Amendment 63 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 contain cultural resources and ecologically critical areas. The marine waters where the fisheries occur contain ecologically critical area. Effects on the unique characteristics of these areas are not anticipated to occur with these actions and mitigation measures such as a bottom trawling ban in the Bering Sea are part of fisheries management measures.

6.4 **Controversiality**: These action deals with management of the groundfish fisheries. Differences of opinion exist among various industry, environmental, management, and scientific groups on the appropriate levels of TAC to set for various target species and in particular fishery management areas. Amendment 63 is not a controversial action. The State of Alaska and members of the fishing industry have encouraged the development of management measure for a skate directed fishery.

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 minimal or no risk to the human environment beyond that disclosed in the PSEIS (NMFS 2003b) or the Steller Sea Lion Protection Measures SEIS (NMFS 2001b). No significant adverse impacts were identified for the preferred alternatives (Alternative 2) for the harvest specification and Alternative B for the FMP amendment or for alternatives 2 and 3 for skate specifications, including socioeconomic effects.

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 will strive to implement mitigation measures to avoid significant adverse impacts. Impacts of a future developing skate fishery on other fisheries is unknown.

6.7 **Cumulatively significant effects, including those on target and nontarget species** Cumulatively significant impacts are possible with this action. Fisheries are regulated by federal and state agencies in marine waters. NMFS and the State of Alaska work closely in setting harvest levels and managing the nearshore and offshore fisheries of the state. In many instances, state fishing regulations are in addition to and more conservative than federal fishing regulations (Kruse *et al.* 2000). The state and federal fisheries are unlikely to cause cumulative effects beyond those described in the revised draft PSEIS (NMFS 2003b) or in the Steller sea lion protection measures SEIS (NMFS 2001b) for the biological component of the BSAI and GOA. 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. 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 (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). 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 specification or for Amendment 63 because the proposed actions will not modify the actions already analyzed in previous BiOps, are not likely to adversely affect ESA listed species beyond the effects already analyzed, and the incidental take statements of ESA species are not expected to be exceeded. Summaries of the ESA consultations on individual listed species are located in the section 3.0 and accompanying tables of the PSEIS under each ESA listed species' management overview (NMFS 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 and Amendment 63 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 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

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 being 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 falls within the specified range of OY for both the BSAI and GOA, and 4) it is consistent with the Endangered Species Act and the National Standards and other requirements of the Magunson Stevens Fishery Conservation and Management Act.

Amendment 63

The FMP level alternatives are status quo or move skates from the other species category to the target species category in the GOA FMP. The status quo alternative may have negative impacts on skate stocks by limiting the ability of NMFS to control skate fishing. Because of the potential of a developing skate fishery to harvest at levels too high for the available skate biomass, Alternative B is the preferred alternative. Alternative B will allow NMFS to directly manage the skate group or groups and control directed fishing activities on skates in the GOA.

The skate specification alternatives include a range of levels of management depending on species and area application of ABCs and OFLs. Alternative 1 would manage skates with a single GOA wide OFL and area specific ABCs. This alternative would still allow for a disproportionately high level of harvest of a single species within a narrow geographic range. Alternative 3 is the most protective alternative for the skate stocks by establishing species and area specific ABCs and OFLs. The resultant OFLs would be smaller than a GOA wide OFL, leading to a greater likelihood of closure of other directed species fisheries that take skate as incidental catch if OFL levels were reached. Alternative 2 manages skates with both species and area level ABCs, as does Alternative 3, but with a single GOA wide OFL. The best method for the management of a targeted stock is at the TAC (sometime equal to the ABC) level. The skate fishery or fisheries would be managed to the TAC level so the likelihood of exceeding the OFL level would be reduced. In September 2003, the Groundfish Plan Teams recommended Alternative 2 and the stock assessment author recommended Alternative 3. Additional stock assessment information will be available after the 2003 November Plan Team meeting. A preferred skate specification alternative has not been chosen at this time.

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
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+
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+
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+

Coding: I = Insignificant, S = Significant, + = beneficial, - = adverse, U = Unknown					
Issue	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5
Northern Fulmar					
Incidental take–BSAI	U	U	U	U	U(S+)
Incidental take–GOA	I	I	I	I	I
Prey availability	I	I	I	I	I
Benthic habitat	I	I	I	I	I
Proc. waste & offal	U	U	U	U	U(S-)
Short-tailed Albatross					
Incidental take	U	U	U	U	U(S+)
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	U(S+)
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

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	S+
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	S-	I	S-
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	S-	S-	S-
Operating cost impacts	S-	I	S+	S+	S+
Net returns to industry	S+	I	S-	S-	S-
Safety and health impacts	U	I	U	U	S-
Impacts on related fisheries	U	I	U	U	S-
Consumer effects	S+	I	S-	S-	S-
Management and enforcement	S-	I	I	I	S+
Excess capacity	S+	I	S-	S-	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

Table 6.0-2 ESA listed and candidate species that range into the BSAI or GOA groundfish management areas.

Common Name	Scientific Name	ESA Status
Blue Whale	*Balaenoptera musculus*	Endangered
Bowhead Whale	*Balaena mysticetus*	Endangered
Fin Whale	*Balaenoptera physalus*	Endangered
Humpback Whale	*Megaptera novaeangliae*	Endangered
Right Whale	*Balaena glacialis*	Endangered
Sei Whale	*Balaenoptera borealis*	Endangered
Sperm Whale	*Physeter macrocephalus*	Endangered
Steller Sea Lion (WesternPopulation)	*Eumetopias jubatus*	Endangered
Steller Sea Lion (Eastern Population)	*Eumetopias jubatus*	Threatened
Chinook Salmon (Puget Sound)	*Oncorhynchus tshawytscha*	Threatened
Chinook Salmon (Lower Columbia R.)	*Oncorhynchus tshawytscha*	Threatened
Chinook Salmon (Upper Columbia R. Spring)	*Oncorhynchus tshawytscha*	Endangered
Chinook Salmon (Upper Willamette .)	*Oncorhynchus tshawytscha*	Threatened
Chinook Salmon (Snake River Spring/Summer)	*Oncorhynchus tshawytscha*	Threatened
Chinook Salmon (Snake River Fall)	*Oncorhynchus tshawytscha*	Threatened
Sockeye Salmon (Snake River)	*Oncorhynchus nerka*	Endangered
Steelhead (Upper Columbia River)	*Onchorynchus mykiss*	Endangered
Steelhead (Middle Columbia River)	*Onchorynchus mykiss*	Threatened
Steelhead (Lower Columbia River)	*Onchorynchus mykiss*	Threatened
Steelhead (Upper Willamette River)	*Onchorynchus mykiss*	Threatened
Steelhead (Snake River Basin)	*Onchorynchus mykiss*	Threatened
Steller's Eider [1]	*Polysticta stelleri*	Threatened
Short-tailed Albatross [1]	*Phoebaotria albatrus*	Endangered
Spectacled Eider[1]	*Somateria fishcheri*	Threatened
Northern Sea Otter[1]	*Enhydra lutris*	Candidate

[1]The Steller's eider, short-tailed albatross, spectacled eider, and Northern sea otter are species under the jurisdiction of the U.S. Fish and Wildlife Service. For the bird species, critical habitat has been established for the Steller's eider (66 FR 8850, February 2, 2001) and for the spectacled eider (66 FR 9146, February 6, 2001). The northern sea otter has been proposed by USFWS as a candidate species (November 9, 2000; 65 FR 67343).

7.0 Initial Regulatory Flexibility Analysis

7.1 Introduction

This Initial Regulatory Flexibility Analysis (IRFA) evaluates the adverse impacts on small entities of the proposed harvest level specifications for the groundfish fisheries in the Bering Sea and Aleutian Islands and the Gulf of Alaska in 2004. It also evaluates the small entity impacts of a proposed GOA FMP Amendment 63 to remove skates from the GOA FMP other species category, and add them to the target species category. Sections 7.1 to 7.4 provide background on IRFA requirements. Section 7.5 evaluates the annual specifications, while Section 7.6 evaluates Amendment 63. This IRFA meets the statutory requirements of the Regulatory Flexibility Act (RFA) of 1980, as amended by the Small Business Regulatory Enforcement Fairness Act (SBREFA) of 1996 (5 U.S.C. 601-612).

7.2 The purpose of an IRFA

The Regulatory Flexibility Act (RFA), first enacted in 1980, was designed to place the burden on the government to review all regulations to ensure that, while accomplishing their intended purposes, they do not unduly inhibit the ability of small entities to compete. The RFA recognizes that the size of a business, unit of government, or nonprofit organization frequently has a bearing on its ability to comply with a Federal regulation. Major goals of the RFA are: (1) to increase agency awareness and understanding of the impact of their regulations on small business, (2) to require that agencies communicate and explain their findings to the public, and (3) to encourage agencies to use flexibility and to provide regulatory relief to small entities. The RFA emphasizes predicting impacts on small entities as a group distinct from other entities and on the consideration of alternatives that may minimize the impacts while still achieving the stated objective of the action.

On March 29, 1996, President Clinton signed the Small Business Regulatory Enforcement Fairness Act. Among other things, the new law amended the RFA to allow judicial review of an agency's compliance with the RFA. The 1996 amendments also updated the requirements for a final regulatory flexibility analysis, including a description of the steps an agency must take to minimize the significant economic impact on small entities. Finally, the 1996 amendments expanded the authority of the Chief Counsel for Advocacy of the Small Business Administration (SBA) to file *amicus* briefs in court proceedings involving an agency's violation of the RFA.

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

Data on cost structure, affiliation, and operational procedures and strategies in the fishing sectors subject to the proposed regulatory action are insufficient, at present, to permit preparation of a "factual basis" upon which to certify that the preferred alternative does not have the potential to result in "significant adverse impacts on a substantial number of small entities" (as those terms are defined under RFA). Because, based on all available information, it is not possible to 'certify' this outcome, should the proposed action be adopted, a formal IRFA has been prepared and is included in this package for Secretarial review.

7.3 What is required in an IRFA?

Under 5 U.S.C., Section 603(b) of the RFA, each IRFA is required to contain:

- A description of the reasons why action by the agency is being considered;
- A succinct statement of the objectives of, and the legal basis for, the proposed rule;
- A description of and, where feasible, an estimate of the number of small entities to which the proposed rule will apply (including a profile of the industry divided into industry segments, if appropriate);
- A description of the projected reporting, record keeping and other compliance requirements of the proposed rule, including an estimate of the classes of small entities that will be subject to the requirement and the type of professional skills necessary for preparation of the report or record;
- An identification, to the extent practicable, of all relevant Federal rules that may duplicate, overlap or conflict with the proposed rule;
- A description of any significant alternatives to the proposed rule that accomplish the stated objectives of the proposed action, consistent with applicable statutes, and that would minimize any significant economic impact of the proposed rule on small entities. Consistent with the stated objectives of applicable statutes, the analysis shall discuss significant alternatives, such as:

  1. The establishment of differing compliance or reporting requirements or timetables that take into account the resources available to small entities;

  2. The clarification, consolidation, or simplification of compliance and reporting requirements under the rule for such small entities;

  3. The use of performance rather than design standards;

  4. An exemption from coverage of the rule, or any part thereof, for such small entities.

7.4 What is a small entity?

The RFA recognizes and defines three kinds of small entities: (1) small businesses, (2) small non-profit organizations, and (3) and small government jurisdictions.

Small businesses. Section 601(3) of the RFA defines a 'small business' as having the same meaning as 'small business concern' which is defined under Section 3 of the Small Business Act. 'Small business' or 'small business concern' includes any firm that is independently owned and operated and not dominant in its field of operation. The SBA has further defined a "small business concern" as one "organized for profit, with a place of business located in the United States, and which operates primarily within the United States or which makes a significant contribution to the U.S. economy through payment of taxes or use of American products, materials or labor...A small business concern may be in the legal form of an individual proprietorship, partnership, limited liability company, corporation, joint venture, association, trust or cooperative, except that where the firm is a joint venture there can be no more than 49 percent participation by foreign business entities in the joint venture."

The SBA has established size criteria for all major industry sectors in the United States, including fish harvesting and fish processing businesses. A business involved in fish harvesting is a small business if it is independently owned and operated and not dominant in its field of operation (including its affiliates) and if it has combined annual receipts not in excess of $3.5 million for all its affiliated operations worldwide. A seafood processor is a small business if it is independently owned and operated, not dominant in its field of operation, and employs 500 or fewer persons on a full-time, part-time, temporary, or other basis, at all its affiliated operations worldwide. A business involved in both the harvesting and processing of seafood products is a small business if it meets the $3.5 million criterion for fish harvesting operations. Finally a wholesale business servicing the fishing industry is a small businesses if it employs 100 or fewer persons on a full-time, part-time, temporary, or other basis, at all its affiliated operations worldwide.

The SBA has established "principles of affiliation" to determine whether a business concern is "independently owned and operated." In general, business concerns are affiliates of each other when one concern controls or has the power to control the other, or a third party controls or has the power to control both. The SBA considers factors such as ownership, management, previous relationships with or ties to another concern, and contractual relationships, in determining whether affiliation exists. Individuals or firms that have identical or substantially identical business or economic interests, such as family members, persons with common investments, or firms that are economically dependent through contractual or other relationships, are treated as one party with such interests aggregated when measuring the size of the concern in question. The SBA counts the receipts or employees of the concern whose size is at issue and those of all its domestic and foreign affiliates, regardless of whether the affiliates are organized for profit, in determining the concern's size. However, business concerns owned and controlled by Indian Tribes, Alaska Regional or Village Corporations organized pursuant to the Alaska Native Claims Settlement Act (43 U.S.C. 1601), Native Hawaiian Organizations, or Community Development Corporations authorized by 42 U.S.C. 9805 are not considered affiliates of such entities, or with other concerns owned by these entities solely because of their common ownership.

Affiliation may be based on stock ownership when (1) A person is an affiliate of a concern if the person owns or controls, or has the power to control 50 percent or more of its voting stock, or a block of stock which affords control because it is large compared to other outstanding blocks of stock, or (2) If two or more persons each owns, controls or has the power to control less than 50 percent of the voting stock of a concern, with minority holdings that are equal or approximately equal in size, but the aggregate of these minority holdings is large as compared with any other stock holding, each such person is presumed to be an affiliate of the concern.

Affiliation may be based on common management or joint venture arrangements. Affiliation arises where one or more officers, directors or general partners controls the board of directors and/or the management of another concern. Parties to a joint venture also may be affiliates. A contractor and subcontractor are treated as joint venturers if the ostensible subcontractor will perform primary and vital requirements of a contract or if the prime contractor is unusually reliant upon the ostensible subcontractor. All requirements of the contract are considered in reviewing such relationship, including contract management, technical responsibilities, and the percentage of subcontracted work.

<u>Small organizations</u> The RFA defines "small organizations" as any not-for-profit enterprise that is independently owned and operated and is not dominant in its field.

<u>Small governmental jurisdictions</u> The RFA defines small governmental jurisdictions as governments of cities, counties, towns, townships, villages, school districts, or special districts with populations of less than 50,000.

7.5 2004 Specifications

What is this action?

Detailed descriptions of each alternative analyzed in this EA/IRFA can be found in Section 2.0. The proposed action is adoption of specifications based on the ABCs recommended by the BSAI and GOA plan teams during their September 2003 meetings. The details of these specifications may be found in Tables 2.1-1 and 2.1-2 of this EA/IRFA

Reason for considering the proposed action

The reasons for the proposed action are discussed in detail in Sections 1.0 of this EA/IRFA.

TAC specifications define upper retained harvest limits, or fishery removals, for the subject fishing year. Catch specifications are made for each managed species or species group, and in some cases, by species and sub-area. Sub-allocations of TAC are made for biological and socio-economic reasons according to percentage formulas established through fishery management plan (FMP) amendments. For particular target fisheries, TAC specifications are further allocated within management areas (Eastern, Central, Western Aleutian Islands; Bering Sea; Western, Central, and Eastern Gulf of Alaska) among management programs (open access or community development quota program), processing components (inshore or offshore), specific gear types (trawl, non-trawl, hook-and-line, pot, jig), and seasons according to regulations § 679.20, § 679.23, and § 679.31. TAC can be sub-allocated to the various gear groups, management areas, and seasons according to pre-determined regulatory actions and for regulatory announcements by NMFS management authorities opening and closing the fisheries accordingly. The entire TAC amount is available to the domestic fishery. The gear authorized in the Federally managed groundfish fisheries off Alaska includes trawl, hook-and-line, longline pot, pot, and jig (50 CFR 679.2).

Fishing areas correspond to the defined regulatory areas within the fishery management units. The BSAI is divided into nineteen reporting areas, some of which are combined for TAC specifications purposes. The Aleutian Islands group comprises regulatory Areas 541, 542, and 543. When the Aleutian Islands are referred to individually, 541 represents the Eastern Aleutian Islands, 542 the Central Aleutian Islands, and 543 the Western Aleutian Islands. The GOA is divided into eight reporting areas. The Western Gulf is Area 610, the Central Gulf includes Areas 620 and 630, and the Eastern Gulf includes Areas 640 and 650. State waters in Prince William Sound is Area 649. State waters in southeast Alaska is Area 659.

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

TAC specifications for the federal groundfish fisheries are set annually. The process includes review by the North Pacific Fishery Management Council (Council), its Advisory Panel, and its Scientific and Statistical Committee of the SAFE reports (Appendices A, B, C, and D). Using the information from the SAFE Reports and the advice from Council committees, the Council makes both ABC and TAC recommendations toward the next year's TAC specifications. NMFS packages the recommendations into specification documents and forwards them to the Secretary of Commerce for approval.

Objectives of, and legal basis for, the proposed action

The objectives of the proposed action (publication of specifications) are to (1) allow commercial fishing for the groundfish stocks in the BSAI and GOA, (2) while protecting the long run health of the fish stocks and the social and ecological values that those fish stocks provide.

Under the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) of 1996, the United States has exclusive fishery management authority over all living marine resources, except for marine mammals and birds, found within the exclusive economic zone (EEZ) between 3 and 200 nautical miles from the baseline used to measure the territorial sea. The management of these marine resources is vested in the Secretary of Commerce (Secretary) and in Regional Fishery Management Councils. In the Alaska region, the North Pacific Fishery Management Council (Council) has the responsibility to prepare fishery management plans (FMPs) for the marine resources it finds require conservation and management. The National Marine Fisheries Service (NMFS) is charged with carrying out the federal mandates of the Department of Commerce with regard to marine fish. The Alaska Regional Office of NMFS and Alaska Fisheries Science Center (AFSC), research, draft, and support the management actions recommended by the Council.

The Magnuson-Stevens Act requires that the FMPs must specify the optimum yield from each fishery to provide the greatest benefit to the Nation, and must state how much of that optimum yield may be harvested in U.S. waters. The FMPs must also specify the level of fishing that would constitute overfishing. Using the framework of the FMPs and current information about the marine ecosystem (stock status, natural mortality rates, and oceanographic conditions), the Council annually recommends to the Secretary total allowable catch (TAC) specifications and prohibited species catch (PSC) limits and/or fishery bycatch allowances based on biological and economic information provided by NMFS. The information includes determinations of acceptable biological catch (ABC) and overfishing level (OFL) amounts for each of the FMP established target species or species groups.

Number and description of small entities regulated by the proposed action

This action will change the process by which the annual ABC, OFL, and TAC levels will be determined. The entities regulated by this action are those entities that harvest fish in the BSAI and GOA. These entities include the groundfish catcher vessels and catcher/processor vessels active in these areas. It also includes organizations to whom direct allocations of groundfish are made. In the BSAI, this includes the CDQ groups and the AFA fishing cooperatives.

Table 7.8-1 shows the estimated numbers of small and large entities in the BSAI and GOA groundfish fisheries. The reasoning behind these estimates is summarized in the paragraphs which follow the table.

Table 7.8-1 Estimated numbers of regulated entities in the BSAI and GOA groundfish fisheries

Fleet segment	Number small entities	Number large entities	Total number of entities
Catcher vessels	1,353	13 (70 vessels)	1,366
Catcher processors	33	46 (57 vessels)	79
Motherships	0	3	3
CDQ groups	6	0	6
Notes: In some cases, the number of entities is smaller than the number of vessels or shoreplants - indicating that at least some entities have multiple vessels or plants. The estimated numbers of vessels and plants have been placed in parentheses. Catcher vessel and catcher/processor estimates prepared from fishtickets, weekly processor reports, product price files, and intent-to-operate listing. The methodology used probably overstates the numbers of small entities. Shoreside processors prepared by comparing a list of processors producing groundfish in 2000 with data on monthly employment by processing firm in 2000 obtained from Alaska Department of Labor. All CDQ groups are non-profits and are therefore treated as small.			

Fishing vessels, both catcher vessels and catcher/processors, are small if they gross less than $3.5 million in a year. Table 7.8-2 provides estimates of the numbers of catcher vessels and catcher/processors with less than $3.5 million in gross revenues from groundfish fishing in the BSAI and GOA.[24] Estimates of the numbers of vessels are provided by year and gear type from 1997 to 2001. Estimates are also broken out for the GOA, the BSAI, and for all of Alaska. Table 7.8-3, provides similar information for catcher vessels and catcher/processors grossing more than $3.5 million.

Table 7.8-2 indicates that, in 2001, there were 1,115 small catcher vessels in the GOA and 303 in the BSAI. There were 1,324 small vessels in total. These numbers suggest that 94 vessels must have operated in both the BSAI and the GOA. Table 7.8-2 implies that each of the small catcher vessels is treated as a separate small entity. This may overstate the number of separate entities since there is probably not a strict one-to-one correspondence between vessels and entities; some persons or firms may [25]own more than one vessel.

It is possible to draw on analysis done recently for the American Fisheries Act amendments (61/61/13/8) to add somewhat more precision to the estimates of small catcher vessel entities in the BSAI (NMFS 2002a. The FRFA prepared for those amendments provides the most detailed current picture of the affiliations and sizes of the catcher vessel entities active in the BSAI pollock fisheries. This FRFA reports that 112 catcher vessels were active in the pollock fisheries covered by the American Fisheries Act. One hundred of these delivered to inshore processing plants, 7 delivered to catcher/processors offshore, and 5 delivered only to motherships (a total of 20 delivered to motherships, but 15 of these also delivered to onshore processors and these 15 are included here with the onshore processing group). While Tables 7.8-2 and 7.8-3 suggest

[24]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 7.8-2 and 7.8-3. Catcher/processor affiliations are addressed in the text.

[25]This total of 69 catcher vessels affiliated with large entities is made up of 63 vessels delivering inshore, 2 of those delivering to catcher/processors, and 4 of those delivering to motherships. (NMFS 2002a, pages 4-176 to 4-181)

that all but six of these had gross revenues under $3.5 million, the FRFA indicates that 69 of them had affiliations with large entities and should be considered large under the SBA criteria. (NMFS 2002a, pages 4-176 to 4-181 Adjusting the numbers of small entities in light of these considerations, the number for the BSAI drops from 303 to 234 and the total for the BSAI and GOA drops from 1,324 to 1,255 The change in the GOA alone can't be determined.

The number of large catcher vessel entities from Table 7.8-1 is 1. In addition, the 69 pollock catcher vessels determined to be large based on their affiliations in the AFA FRFA were associated with an estimated 12 entities.[26] (NMFS 2002a, pages 4-176 to 4-181. Thus the total number of large catcher vessel entities is estimated to be 13.

Table 7.8-2 indicates that, in 2001, there were 21 small catcher/processors in the GOA and 43 in the BSAI. There were 44 small catcher/processors in total. These numbers suggest that 20 catcher/processors must have operated in both the BSAI and the GOA. Table 7.8-2 implies that each of the small catcher/processors is treated as a separate small entity. This may overstate the number of separate entities since there is probably not a strict one-to-one correspondence between vessels and entities; some persons or firms may [27]own more than one vessel. The AFA FRFA used above for the catcher vessel analysis indicates that in 2000, 20 large catcher/processors owned by 9 companies were authorized to fish for pollock in the BSAI under the AFA. (NMFS 2002a, pages 4-176 to 4-181 For the purposes of this IRFA, there were an estimated 44 small catcher/processor entities, and 36[28] large entities, for a total of 80 total catcher/processor entities in 2001. These may be underestimates of the numbers of large entities, and overestimates of the numbers of small entities, for the reasons discussed above in the catcher vessel paragraph.

The estimates of large and small shoreside processors in Table 7.8-1 were made by comparing a list of processors with gross revenues generated from groundfish products in 2000 with data from the Alaska Department of Labor on numbers of employees per month for each processing facility. The employee data counted each employee, treating part-time and full-time employees alike. If a plant employed more than 500 persons in any month it was considered to be a large plant. Multiple plants that could be connected to a single processing firm were treated as a single entity in the counts. This procedure may overstate the number of small entities somewhat, since there thought to be many interconnections between processing facilities in Alaska, but they are not well understood nor documented.

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[26]This estimate is not provided in the AFA FRFA, but is inferred from information contained in it. The 63 large catcher vessels delivering to inshore cooperatives were affiliated with seven large entities. The two delivering to catcher/processors and the four delivering only to motherships were each assumed to be affiliated with a separate entity (except that there were only three motherships so that there could be no more than three large entities in that case). (NMFS 2002a, pages 4-176 to 4-181)

[27]This total of 69 catcher vessels affiliated with large entities is made up of 63 vessels delivering inshore, 2 of those delivering to catcher/processors, and 4 of those delivering to motherships. (NMFS 2002a, pages 4-176 to 4-181)

[28]36 large entities = (47 vessels with gross revenues over $3.5 million) minus (20 vessel affiliated with companies) plus (the nine companies with which they were affiliated).

The three motherships are believed to be large entities. The six Community Development Quota (CDQ) groups are non-profit entities supporting the community development objectives of 65 Western Alaska communities and, as such, are small entities, consistent with SBA definitions.

Table 7.8-2€ Number of vessels that caught or caught and processed less than $3.5 million ex-vessel value or product value of groundfish by area, catcher type and gear, 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
1997									
All gear	1,178	39	1,217	266	57	323	1,256	60	1,316
Hook & line	946	25	971	93	36	129	958	38	996
Pot	142	4	146	70	13	83	187	13	200
Trawl	172	10	182	107	11	118	200	12	212
1998									
All gear	1,104	20	1,124	238	40	278	1,184	40	1,224
Hook & line	866	15	881	72	29	101	884	29	913
Pot	180	1	181	71	7	78	225	7	232
Trawl	167	4	171	115	6	121	205	6	211
1999									
All gear	1,149	29	1,178	284	31	315	1,265	34	1,299
Hook & line	902	17	919	75	19	94	926	22	948
Pot	201	10	211	90	11	101	256	11	267
Trawl	154	3	157	125	4	129	201	4	205
2000									
All gear	1,246	16	1,262	301	31	332	1,406	33	1,439
Hook & line	1,008	8	1,016	105	17	122	1,048	18	1,066
Pot	250	5	255	91	11	102	300	12	312
Trawl	123	3	126	113	6	119	203	7	210
2001									
All gear	1,115	21	1,136	303	43	346	1,280	44	1,324
Hook & line	933	15	948	118	31	149	967	31	998
Pot	155	4	159	74	7	81	213	9	222
Trawl	117	4	121	118	6	124	196	7	203

Note: Includes only vessels that fished part of Federal TACs.

Source: CFEC fish tickets, weekly processor reports, NMFS permits, annual processor survey, ADFG intent-to-operate listings. National Marine Fisheries Service, P.O. Box 15700, Seattle, WA 98115-0070.

Table 7.8-3€ **Number of vessels that caught or caught and processed more than $3.5 million ex-vessel value or product value of groundfish by area, catcher type and gear, 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
1997									
All gear	1	26	27	1	56	57	1	56	57
Hook & line	0	4	4	0	8	8	0	8	8
Trawl	1	22	23	1	48	49	1	48	49
1998									
All gear	0	27	27	0	59	59	0	59	59
Hook & line	0	7	7	0	14	14	0	14	14
Pot	0	0	0	0	1	1	0	1	1
Trawl	0	20	20	0	45	45	0	45	45
1999									
All gear	0	29	29	1	57	58	1	57	58
Hook & line	0	13	13	0	22	22	0	22	22
Pot	0	1	1	0	3	3	0	3	3
Trawl	0	15	15	1	36	37	1	36	37
2000									
All gear	0	28	28	4	57	61	4	57	61
Hook & line	0	13	13	0	26	26	0	26	26
Pot	0	0	0	0	2	2	0	2	2
Trawl	0	15	15	4	33	37	4	33	37
2001									
All gear	0	19	19	5	47	52	5	47	52
Hook & line	0	5	5	0	14	14	0	14	14
Trawl	0	14	14	5	33	38	5	33	38

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.

Section 4.10-1 of this EA/IRFA provides a description of the fishery participants. The section also lists other reports with detailed descriptions of the fishery. This section focuses on comparing the average revenues of small entities, absolutely, and in comparison with the revenues of large entities.

Tables 7.8-4 and 7.8-5 provide estimates of average gross revenues from groundfish production in the BSAI and GOA for small and for large vessels.[29] Considering activity in both the BSAI and the GOA, small catcher vessels grossed an average of about $150,000 in 2001. 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 $70,000, while small trawlers in the BSAI had the largest at $850,000. The overall average gross revenues for all small vessels active in the GOA were $130,000, while the overall average gross revenues for all small vessels active in the BSAI was $420,000. Corresponding average gross revenues for large entities for these gear types and areas may be found in Table 7.8-5. It is not possible to use this information to compare the average gross revenues for the small and the large catcher vessel entities.

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, 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 processors. 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.

[29]Since these estimates only include information on gross revenues from groundfish fishing, these are low estimates of the total gross revenues for these entities.

Table 7.8-4 Average revenue of vessels that caught or caught and processed less than $3.5 million ex-vessel value or€ product value of groundfish by area, catcher type and gear, 1997-2001. ($ millions)

	Gulf of Alaska			Bering Sea & Aleutians			All Alaska		
	Catcher Vessels	Catcher process	Total	Catcher Vessels	Catcher process	Total	Catcher Vessels	Catcher process	Total
1997									
All gear	.16	1.30	.20	.51	1.36	.66	.17	1.30	.22
Hook & line	.08	1.42	.12	.25	1.64	.64	.08	1.58	.14
Pot	.13	.23	.13	.11	.59	.19	.11	.59	.14
Trawl	.69	1.41	.73	.99	1.43	1.03	.67	1.31	.71
1998									
All gear	.12	1.68	.14	.37	1.58	.54	.12	1.58	.17
Hook & line	.06	1.58	.08	.13	1.57	.54	.06	1.57	.11
Pot	.11	-	.12	.22	.84	.28	.14	.84	.16
Trawl	.47	2.13	.51	.65	2.43	.74	.46	2.43	.52
1999									
All gear	.14	1.45	.18	.46	1.52	.57	.16	1.39	.19
Hook & line	.06	1.48	.09	.14	1.79	.47	.06	1.55	.10
Pot	.16	1.23	.21	.15	1.16	.26	.16	1.16	.20
Trawl	.66	-	.69	.89	1.59	.91	.66	1.59	.68
2000									
All gear	.12	1.34	.14	.57	1.39	.65	.19	1.38	.21
Hook & line	.09	1.25	.09	.23	1.62	.42	.08	1.54	.11
Pot	.15	1.04	.17	.12	.63	.18	.15	.75	.17
Trawl	.54	-	.58	1.23	1.84	1.26	.84	1.91	.87
2001									
All gear	.10	1.76	.13	.42	1.77	.59	.15	1.78	.20
Hook & line	.07	1.83	.10	.16	1.92	.53	.07	1.92	.13
Pot	.11	1.73	.15	.11	.86	.18	.11	1.17	.15
Trawl	.35	1.80	.40	.85	1.95	.90	.61	1.97	.65

Notes: Includes only vessels that fished part of Federal TACs.
Categories with fewer than four vessels are not reported.
Averages are obtained by adding the total revenues, across all areas and gear types, of all the vessels in the category, and dividing that sum by the number of vessels in the category.

Source: CFEC fish tickets, weekly processor reports, NMFS permits, annual processor survey, ADFG intent-to-operate listings. National Marine Fisheries Service, P.O. Box 15700, Seattle, WA 98115-0070.

Table 7.8-5 **Average revenue of vessels that caught or caught and processed more€ than $3.5 million ex-vessel value or product value of groundfish by€ area, catcher type and gear, 1997-2001. ($ millions)**

	Gulf of Alaska		Bering Sea & Aleutians			All Alaska		
	Catcher process	Total	Catcher Vessels	Catcher process	Total	Catcher Vessels	Catcher process	Total
1997								
All gear	8.54	8.40	-	10.37	10.27	-	10.37	10.27
Hook & line	4.48	4.48	-	4.28	4.28	-	4.28	4.28
Trawl	9.28	9.08	-	11.39	11.25	-	11.39	11.25
1998								
All gear	6.30	6.30	-	8.59	8.59	-	8.59	8.59
Hook & line	4.45	4.45	-	4.51	4.51	-	4.51	4.51
Trawl	6.95	6.95	-	9.86	9.86	-	9.86	9.86
1999								
All gear	5.58	5.58	-	10.14	10.04	-	10.14	10.04
Hook & line	4.71	4.71	-	4.72	4.72	-	4.72	4.72
Trawl	6.43	6.43	-	13.29	13.05	-	13.29	13.05
2000								
All gear	6.59	6.59	4.66	10.64	10.24	4.66	10.64	10.24
Hook & line	4.87	4.87	-	5.13	5.13	-	5.13	5.13
Trawl	8.08	8.08	4.66	14.81	13.71	4.66	14.81	13.71
2001								
All gear	7.55	7.55	4.29	13.03	12.19	4.29	13.03	12.19
Hook & line	4.98	4.98	-	4.68	4.68	-	4.68	4.68
Trawl	8.46	8.46	4.29	16.57	14.95	4.29	16.57	14.95

Notes: Includes only vessels that fished part of Federal TACs.
Categories with fewer than four vessels are not reported.
Averages are obtained by adding the total revenues, across all areas and gear types, of all the vessels in the category, and dividing that sum by the number of vessels in the category.

Source: CFEC fish tickets, weekly processor reports, NMFS permits, annual processor survey, ADFG intent-to-operate listings. National Marine Fisheries Service, P.O. Box 15700, Seattle, WA 98115-0070.

Impacts on regulated small entities

The impacts of the preferred alternatives on first wholesale revenues in the BSAI and the GOA are summarized in Figures 4.10.2-1 through 4.10.2-3 in Section 4.10.2 of this EA/IRFA.

Overall first wholesale revenues in the BSAI are very similar to what they were estimated to have been in 2002 and 2003. There do not seem to have been large shifts in the revenues from the different species that might be masked by the overall BSAI totals. On this basis, the proposed specifications are not expected to adversely effect the cash flow or profitability of small entities operating in the BSAI.

Overall first wholesale gross revenues in the GOA can be seen to have dropped from 2002 to 2003, and this drop may continue under the specifications proposed for 2004. An examination of the changes in gross revenues projected by species group indicates that a decline in gross revenues earned from GOA pollock has been a key factor behind the decline in overall gross revenues.

Interim first wholesale gross revenue estimates for the BSAI and GOA under the preferred alternative are summarized in Table 4.10-3. As noted in the table, the estimation methodology understates the true level of revenues under this alternative. In the absence of the interim specifications no fishing would take place. Thus, the proposed alternative has the smallest impact on small entities of the alternatives examined.

Recordkeeping and reporting requirements

The IRFA should include "a description of the projected reporting, record keeping and other compliance requirements of the proposed rule, including an estimate of the classes of small entities that will be subject to the requirement and the type of professional skills necessary for preparation of the report or record..."

This regulation does not impose new recordkeeping or reporting requirements on the regulated small entities.

Federal rules that may duplicate, overlap, or conflict with proposed action

An IRFA should include "An identification, to the extent practicable, of all relevant Federal rules that may duplicate, overlap or conflict with the proposed rule..."

This analysis did not reveal any Federal rules that duplicate, overlap or conflict with the proposed action.

Description of significant alternatives

An IRFA should include "A description of any significant alternatives to the proposed rule that accomplish the stated objectives of the proposed action, consistent with applicable statutes, and that would minimize any significant economic impact of the proposed rule on small entities."

There are no significant alternatives to the proposed rule that accomplish the stated objectives, are consistent with applicable statutes, and that would minimize the economic impact of the proposed rule on small entities.

For this preliminary analysis (October 2003) the Alternative 2 TAC for GOA pollock is the same as the 2003 TAC. Thus, no significant adverse effect is shown for the GOA in this preliminary analysis. If the

GOA pollock TAC is revised downwards at the November GOA Plan Team meeting there may be adverse impacts in the GOA.

7.6 Amendment 63 (GOA skates)

What is this action

In the winter and spring of 2003 GOA longline and trawl fishermen began to target skates. Skates are currently managed as a part of the GOA other species category. However, this approach provides limited harvest protection to skates given their new status as a target species. This Regulatory Impact Review (RIR) evaluates the costs and benefits of an action to split skates out from the "other species" category and add them to the target species category. Skates would receive separate OFL, ABC, and TACs in annual specifications.

This action has FMP-level and specifications-level alternatives. These have been described in detail in Section 2.5 of the EA, and in Section 8.5 of the RIR. At the FMP level, the Council is faced with Alternative A, the alternative of keeping skates in the FMP "other species" category, or of Alternative B, the alternative of moving skates to the FMP "target species" category. If the Council chooses FMP-level Alternative B, it must choose how to do that in specifications.

Three alternatives are considered for skate specifications, contingent on an FMP-level decision to treat skates as a target species: Alternative 1 - a single GOA wide OFL for the skate group, and management area ABCs for the skate group; Alternative 2 - a single GOA wide OFL for skates, and ABCs for key skate species in each management area; and Alternative 3 - management area OFLs and ABCs for each key skate species.

Reason for considering the proposed action

In 2003 a new targeted skate fishery emerged that raised concerns over the ability of NMFS to continue to manage the stock so as to avoid overfishing. Skate harvests are counted against the "other species" complex TAC, and this is large enough so that it does not protect the stock against overfishing.

Objectives of, and legal basis for the action

The objective of this action is to increase the control managers have over skate removals, in order to prevent overfishing, maintain healthy stocks of skate species, and make a sustainable target fishery more likely.

The National Marine Fisheries Service manages the U.S. groundfish fisheries of the Gulf of Alaska management area in the Exclusive Economic Zone under the Fishery Management Plan (FMP) for that area. The North Pacific Fishery Management Council prepared the FMP under the authority of the Magnuson-Stevens Fishery Conservation and Management Act. Regulations implement the FMPs at §50 CFR part 679. General regulations that also pertain to U.S. fisheries appear at subpart H of §50 CFR part 600.

Number and description of small entities directly regulated by the proposal

The entities directly regulated by this action will be the fishing operations harvesting species in the "other species" complex in the GOA with hook-and-line gear or with trawls. These vessels may be targeting skates (none of the other species are currently fishery targets), or they may be harvesting skates and other species in the "other species" category incidentally to other targeted fishing operations, such as fishing for Pacific cod or shallow water flatfish. Since any hook-and-line or trawl operation in the GOA may harvest the other species complex, the universe of potentially affected operations includes all GOA hook-and-line and trawl vessels.

In 2001, this included 953 hook-and-line vessels, and 135 trawlers. Of these, 933 were small hook-and-line catcher vessels, 15 were small hook-and-line catcher-processors, 117 were small trawl catcher vessels, and 4 were small trawl catcher-processors. This size determination is based on operation revenues from groundfish fishing in Alaska. Moreover, the data is not available to take account of affiliations between fishing operations and associated processors, or other associated fishing operations. For these reasons, these small entity counts may overstate the numbers of small entities. Average Alaska groundfish revenues for the small entities were $70,000 for hook-and-line catcher vessels, $1.83 million for hook-and-line catcher processors, $350,000 for trawl catcher vessels, and $1.80 million for trawl catcher-processors. (Tables 7.8-2, 7.8-3, and 7.8-4)

Impacts on directly regulated small entities

The action alternatives may limit skate harvests in order to protect skate stocks from depletion. If skate specific TACs lead to earlier closure of targeted skate harvests, they can reduce the annual revenue received by skate fishermen. This is a new fishery. Significant targeted skate harvests have only taken place in 2003. As noted in the Regulatory Impact Review in Chapter 8, 77 hook-and-line catcher vessels, 53 trawl catcher-vessels, 13 hook-and-line catcher-processors, and 10 trawl catcher-processors, took part in the fishery in 2003, producing an estimated ex-vessel gross revenue of about $1.7 million. This suggests average revenues for these vessels were about $11,000. Earlier closure may constrain skate revenues somewhat, but would not eliminate them. The GOA 7,741 metric ton ABC proposed for 2004 is greater than the 3,416 metric tons retained in 2003. Note that the ABC would apply against retained harvests, as well as fish that might be discarded at sea. The actual ABC in any year would depend on decisions made by the Council.

The three specifications-level alternatives impose different levels of restrictions on fishing operations. Alternative 1 creates a GOA-wide skate OFL and area specific skate ABCs. Alternative 2 creates a GOA-wide OFL and species specific and area specific skate ABCs. Alternative 3 creates species specific and area specific OFLs. These increasingly restrictive approaches would increase management control over skate harvests, however they may also be associated with increasing restrictions on short run small entity revenues.

Recordkeeping and reporting requirements

The FMP-level decision to make skates a target species in the FMP, coupled with either of the specifications-level alternatives that require separate skate OFLs, ABCs, and TACs by species, will require fishermen to report skate species on fish tickets. Currently fishermen only report to the skate "group." Thus, these alternatives would impose a new recordkeeping requirement.

Federal rules that may duplicate, overlap, or conflict with proposed action

The analysis did not reveal any Federal rules that duplicate, overlap, or conflict with the proposed action.

Description of significant alternatives

At this writing (September 23, 2003), the Council has not adopted a preferred alternative. It is thus not possible to identify significant alternatives to the proposed rule and discuss their impacts on regulated small entities. Table 7.6-1 below, provides summary information on the relative impacts of the FMP-level status quo alternative, and of the three specifications-level alternatives associated with the FMP-level action alternative.

Table 7.6-1 IRFA comparison of Amendment 63 (GOA skates) alternatives

Alternative	Description	Discussion
FMP-level status quo alternative	Skate species continue to be managed as part of the "other species" complex	No adverse short run impact on small entities. However, this option does not protect the skate stock from being fished down as well as the action alternatives do. In the long term this could lead to reduced skate harvests if the biomass is fished out.
A single GOA wide OFL for the skate group, and management area ABCs for the skate group	Skate species are managed as a target species. A single OFL is set for the GOA, and individual ABCs and TACs are set for each of the GOA management areas (Western, Central, and Eastern). Skates are managed as a group, not as individual species.	This alternative provides more protection for skates at the species group level. It provides some protection for individual skate species, but not as much as the "Species level skate alternative." Depending on Council action, small fishing entities may find themselves forced to stop fishing for skates sooner than they would like.
A single GOA wide OFL for skates, and ABCs for key skate species in each management area	Skate species are managed as target species. A single OFL is set for the GOA, and individual ABCs and TACs are set for big skates, longnose skates, and for other skates, in each of the GOA management areas (Western, Central, and Eastern). Two skate species are managed as individual species, the others are managed as a group.	This alternative provides more protection for skates at the species level. Depending on Council action, small fishing entities may find themselves force to stop fishing for skates sooner than they would like.

Alternative	Description	Discussion
Management area OFLs and ABCs for each key skate species	Skate species are managed as target species. Individual OFLs, ABCs and TACs are set for big skates, longnose skates, and for other skates, in each of the GOA management areas (Western, Central, and Eastern). Two skate species are managed as individual species, the others are managed as a group.	This alternative provides marginally greater protection for skates at the species level than Alternative 2. Depending on Council action, small fishing entities may find themselves force to stop fishing for skates, or for target harvests in fisheries that take skates, than they would like.

8.0 Regulatory Impact Review for Amendment 63 (GOA skates)

8.1 Introduction

In the winter and spring of 2003 GOA longline and trawl fishermen began to target skates. Skates are currently managed under the other species complex TAC. However, this approach provides limited harvest protection to skates given their new status as a target species. This Regulatory Impact Review (RIR) evaluates the costs and benefits of an action to split skates out from the "other species" complex in the GOA and establish separate skate OFL, ABC, and TACs.

8.2 What is a Regulatory Impact Review?

This RIR is required under Presidential Executive Order (E.O.) 12866 (58 *FR* 51735; October 4, 1993). The requirements for all regulatory actions specified in E.O. 12866 are summarized in the following statement from the order:

> In deciding whether and how to regulate, agencies should assess all costs and benefits of available regulatory alternatives, including the alternative of not regulating. Costs and benefits shall be understood to include both quantifiable measures (to the fullest extent that these can be usefully estimated) and qualitative measures of costs and benefits that are difficult to quantify, but nonetheless essential to consider. Further, in choosing among alternative regulatory approaches agencies should select those approaches that maximize net benefits (including potential economic, environmental, public health and safety, and other advantages; distributive impacts; and equity), unless a statute requires another regulatory approach.

E.O. 12866 requires that the Office of Management and Budget review proposed regulatory programs that are considered to be "significant". A "significant regulatory action" is one that is likely to:

- Have an annual effect on the economy of $100 million or more or adversely affect in a material way the economy, a sector of the economy, productivity, competition, jobs, local or tribal governments or communities;
- Create a serious inconsistency or otherwise interfere with an action taken or planned by another agency;
- Materially alter the budgetary impact of entitlements, grants, user fees, or loan programs or the rights and obligations of recipients thereof; or
- Raise novel legal or policy issues arising out of legal mandates, the President's priorities, or the principles set forth in this Executive Order.

8.3 Statutory authority

The National Marine Fisheries Service manages the U.S. groundfish fisheries of the Gulf of Alaska management area in the Exclusive Economic Zone under the Fishery Management Plan (FMP) for that area. The North Pacific Fishery Management Council prepared the FMP under the authority of the Magnuson-Stevens Fishery Conservation and Management Act. Regulations implement the FMPs at §50 CFR part 679. General regulations that also pertain to U.S. fisheries appear at subpart H of §50 CFR part 600.

8.4 Purpose and need for action

The policy objective for this action is to prevent overfishing and maintain healthy stocks of skate species. The observed problem in the fishery is the development of a targeted fishery on skate species that are managed under a total allowable catch (TAC) for five very different groups of groundfish species. Each year an "other species" TAC is calculated as 5 percent of the total TAC for all of the combined GOA species. This offers minimal protection to individual species or groups within the "other species" complex. Removing GOA skates from the "other species" complex would allow individual specifications (OFLs, ABCs, and TACs) to be adopted for these skate species.

Additional problems with current management stems from:

- Targeting in the new fishery on one or two of approximately 14 skate species
- Lack of observers (small vessels and low volume plants) in the new fishery
- Problems with identifying skate species by processors
- Lack of life history information on skates in Alaska
- Knowledge that skates are relatively long lived, late maturing, and have a low fecundity as a group

8.5 Alternatives considered

This RIR evaluates two FMP-level alternatives for breaking GOA skates out of the "other species" grouping, and setting OFL, ABC, and TAC levels separately for skates.[30] It also evaluates three specifications-level alternatives for incorporating skates into specifications, contingent on an FMP level decision to break them out of the GOA "other species" category. The FMP-level, and the specifications-level, decisions are discussed separately in this section.

Amendment 63

Two alternatives are considered for removing skates from the "other species" category in the GOA FMP. These are:

> (A) the status quo, no action alternative, under which skates would continue to be managed as a part of the "other species" category, and

[30] The action discussed in this section does not change the BSAI FMP. It does not change the management of skates in the BSAI.

(B) an action alternative under which Section 3.1 of the GOA FMP would be amended to remove skates from the "other species" category and add them to the "target species" category.

The GOA FMP does not provide detailed guidance on the details of target species specifications (how to group target species, whether to set OFL or ABC at the FMP region level or at sub-area levels, etc.) These details are incorporated into the annual specifications. The skate specifications alternatives are discussed below.

Skate specifications

Three alternatives are considered for skate specifications, contingent on an FMP-level decision to treat skates as a target species: (1) a single GOA wide OFL for the skate group, and management area ABCs for the skate group, (2) a single GOA wide OFL for skates, and ABCs for key skate species in each management area, (3) management area OFLs and ABCs for each key skate species.

1 A single GOA wide OFL for the skate group, and management area ABCs for the skate group An OFL and ABC would be adopted for the entire GOA, and ABCs and TACs would be adopted by GOA management area (Western, Central, and Eastern). Based on 2001 biomass for skate species, the 2004 OFL would be set at 10,322 mt. The ABC would be set at 7,741 mt, and is divided among the management areas within the GOA as shown in Table 8.5-1. The TAC would be set at equal to or less than the ABC. This specifications alternative provides less protection for individual species than either of the other two specifications alternatives. In September 2003, the BSAI and GOA Groundfish Plan Teams considered and rejected this alternative in favor of an alternative that created a separate OFL GOA-wide and ABCs for the longnose and big skate species, and left other skate species grouped together.

Table 8.5-1 Alternative 1 skate OFL and ABC for 2004

	OFL	**ABC**
Skates	**2001 biomass*M (0.10)**	**OFL*0.75**
Western		3,599
Central		2,717
Eastern		1,425
Total	10,322	7,741

2 A single GOA wide OFL for skates, and ABCs for skate species in each management area Sufficient data is available upon which to base species-level specifications for the longnose and big skate species in the directed fishery. An OFL would be adopted for the entire GOA, and ABCs and TACs would be adopted by GOA management area (Western, Central, and Eastern) for each species. Based on 2001 biomass for skate species, the 2004 OFL would be set at 10,322 mt. The ABC would be set at 7,741 mt. The TAC would be set at equal to or less than the ABC. This alternative provides more protection than specifications alternative 1 for individual species. In September 2003, the BSAI and GOA Groundfish Plan Teams recommended adoption of this alternative. Table 8.5-2 also provides the area specific ABCs (these are the same under specifications-level Alternatives 2 and 3).

Table 8.5-2 Alternative 2: A single GOA wide OFL for skates, and ABCs for key skate species in each management area 2004 (From S. Gaichas, AFSC 9/22/03)

	Western	**Central**	**Eastern**
	ABC	**ABC**	**ABC**
Skates	**OFL*0.75**	**OFL*0.75**	**OFL*0.75**
big skate	1,942	1,212	720
longnose skate	890	1,169	579
Other skates	767	336	126
Total	3,599	2,717	1,425
GOA wide OFL		10,322	

3 Management area OFLs and ABCs for each key skate species: Creates separate OFLs, ABCs, and TACs for the longnose and big skate species and an other species group, as does alternative 2. However, this alternative increases the protection from overfishing provided to species, by creating separate OFLs for each of these species in each of the three major management areas in the GOA (Western, Central and Eastern). Table 8.5-3 shows the proposed area OFLs and ABCs under this alternative.

Table 8.5-3 Alternative 3: Management area OFLs and ABCs for each key skate species for 2004 (From S. Gaichas, AFSC 9/22/03)

	Western		**Central**		**Eastern**	
	OFL	**ABC**	**OFL**	**ABC**	**OFL**	**ABC**
Skates	**2001 biomass*M (0.10)**	**OFL*0.75**	**2001 biomass*M (0.10)**	**OFL*0.75**	**2001 biomass*M (0.10)**	**OFL*0.75**
big skate	2,590	1,942	1,617	1,212	961	720
longnose skate	1,186	890	1,558	1,169	771	579
Other skates	1,023	767	448	336	168	126
Total	4,799	3,599	3,623	2,717	1,900	1,425

8.6 Description of fishery

Detailed background

Detailed descriptions of the social and economic backgrounds of the GOA groundfish fisheries may be found in reports described in Section 3.1 of the EA.

The state skate fishery

Initial Alaska regulation of the skate fishery came in 1998 when the Alaska Board of Fisheries (Board) took action in response to concerns over the possibility of an emerging shark fishery in Prince William Sound. Charter fishermen there had begun to target salmon sharks. The Board took preemptive action given concerns over the emergence of a fishery on this slow growing species with relatively low reproductive rates. The action took the form of heavy restrictions on shark harvests.[31]

In conjunction with this action, the Board also arranged for the Alaska Department of Fish and Game (ADF&G) to issue Commissioner's permits for skate harvests (authorized at 5 ACC 28.083). The Board allowed ADF&G to impose a number of requirements on permitees, including seasonal, area, and other operational restrictions and logbook requirements. The Commissioner's permits became effective in 1999. Permits were only available for longline gear since non-pelagic trawls were not allowed in state waters and pots are not effective gear for skates.[32]

Although the commissioner's permit program was in place for 1999, the state did not issue any commissioner's permits until 2002. The emergence of the fishery will be discussed below in conjunction with the development of the fishery in federal waters. Since, the state did not want a fishery to emerge in its waters independently of the federal fishery the commissioner's permits contained conditions requiring fishermen to use legal federal gear and only to take species at times when it was legal to do so in federal regulations. These conditions essentially created a parallel fishery in state waters. Initial permits were issued for 90 days at a time. However only a few were issued on that time frame; most have been issued for 60 days, making it easier for ADF&G to enforce logbook requirements.[33]

Background to the federal fishery

In 1998, the ADF&G, on behalf of the Board, requested complementary federal action to the Board actions regulating directed commercial fishing of sharks, skates, and rays in territorial waters of Alaska. In response, the Council initiated GOA Plan Amendment 63 (and BSAI Plan Amendment 63, which is not part of this proposed action). Since 1998, NMFS Alaska Fisheries Science Center and Alaska Department of Fish and Game stock assessment authors, the BSAI and GOA Groundfish Plan Teams, SSC, and Council have been moving towards revising management of non-target species. However, the targeted fishery for skates in the Western and Central GOA around Kodiak Islands developed in 2003, while the protective measures were still under development.

There are active skate fisheries elsewhere in the world, for example off of British Columbia and the east coast of the United State. There are Asian, European and domestic U.S. markets for skate products. The current interest in skates in the GOA appears to stem from market development work by Kodiak entrepreneurs in 2001. At that time, individuals developed relationships with Korean firms interested in

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[31]Personal communication from Michael Ruccio, Alaska Department of Fish and Game. Commercial Fisheries Division. Kodiak. 211 Mission Road Kodiak, AK 99615. September 10, 2003.

[32]Ruccio, ibid.

[33]Ruccio, ibid.

skate products. Efforts were also put into adapting trawl nets to incorporate features used in B.C. to target skates.[34]

Despite the work on market and gear development in 2001, significant targeted longline or trawl skate fisheries did not emerge in 2002. The rapid growth in the fishery came in 2003. In 2003 there was an early closure of the Pacific cod longline fishery. Prices were more attractive in 2003 than in 2002. Anecdotal evidence indicates that skate ex-vessel prices rose by $0.05 to $0.10 per pound, between 2002 and 2003 (Spring 2003 prices reached the area of $0.25/pound - they are apparently currently lower). In the trawl fisheries, these skate price increases combined with lower prices on an alternative target species, shallow water flats. Prices for these may have dropped from about $0.22 to about $0.18 per pound. In 2003 trawl fishermen may also have responded to large incidental Pacific cod catches in the 2002 shallow water flat fishery by directing their efforts towards skates to a greater extent. The lag in development of the skate fishery may also have been a result of a failure by longline fishermen to view the "other species" as a target fishery[35]

Expansion of the federal fishery in 2003

The longline and trawl fisheries for skates expanded considerably in 2003. Tables 8-3, 8-4, and 8-5 below, show this for catcher-processors (CP) and for catcher vessels (CV). In summary:

- The number of hook-and-line CPs delivering skates, and their retained incidental and targeted harvest rose modestly.
- The number of trawl CPs delivering skates stayed the same, but retained incidental and targeted harvest rose dramatically.
- The number of hook-and-line CVs delivering skates rose dramatically (from 23 to 77 vessels), as did their retained incidental and targeted harvest (from 33 to 1,309 mt). This was because of increases in retained incidental catch, but much more so because of increases in targeted harvest.
- The number of trawl CVs delivering skates rose from 39 to 53 vessels. Total retained incidental and targeted harvests rose as well, from 473 mt to 1,146 mt. Much of this was because of an increase in retained targeted harvest from 2 to 490 mt, but part was also due to increased retained incidental catch.

Total hook-and-line and trawl catches in 2003 totaled 3,416 mt. Total retained catches (from the tables below) were 3,024 mt. Therefore, the fishery catch was 392 mt larger than retained catch. Because observer records are incomplete, this estimate of discarded skate catch is a conservative estimate of total discards. Total mortality would depend on the total level of discards and the mortality rate for discards.

[34] Ruccio, ibid.; Personal communication with Robert Foy, Assistant Professor, University of Alaska Fairbanks School of Fisheries and Ocean Sciences. 118 Trident Way, Kodiak, AK 99615. September 10, 2003.

[35] Ruccio, ibid. Personal communication from Julie Bonnie. Alaska Groundfish Data Bank. P.O. Box 788, Kodiak, AK 99615. September 17, 2003.

Table 8.6-1 Catcher-processor retained skate harvests, 2002-2003

	Hook and line gear		Non Pelagic Trawl gear	
	Number vessels	Volume of skates (mt)	Number vessels	Volume of skates (mt)
2002	8	139	10	137
2003	13	164	10	405
Source: NMFS AKR "Catch Accounting System". Small amounts of jig and pelagic trawl skate harvest not included.				

Table 8.6-2 Catcher-vessel retained skate harvests (incidental and targeted), 2002-2003

	Hook and line gear		Non Pelagic Trawl gear	
	Number vessels	Volume of skates (mt)	Number vessels	Volume of skates (mt)
2002	23	33	39	473
2003	77	1,309	53	1,146
Source: NMFS AKR "Catch Accounting System". Small amounts of jig and pelagic trawl skate harvest not included.				

Small amounts of jig and pelagic trawl skate harvests are not included in these tables. Combined harvests by these two gear types were 3.7 mt in 2002 and 46.7 mt in 2003.

Table 8.6-3 Catcher-vessel retained skate harvests (targeted), 2002-2003

	Hook and line gear		Non Pelagic Trawl gear	
	Number vessels	Volume of skates (mt)	Number vessels	Volume of skates (mt)
2002	13	18	2	2
2003	45	1,183	12	490
Source: NMFS AKR "Catch Accounting System". Small amounts of jig and pelagic trawl skate harvest not included.				

Thirteen distinct processors accepted deliveries of skates from longline and trawl operations in 2002, and 23 accepted delivery in 2003. Anecdotal evidence suggests that a plausible ex-vessel price estimate for early 2003 is $0.25/pound (prices may be from $0.12 to $0.20 now). At the higher price, the total ex-vessel value of the harvest would have been on the order of $1.7 million. This is a very crude estimate and is only provided to give an indication of the approximate ex-vessel value of the fishery.[36]

The increase in catches took place largely in management areas 620 and 630. Table 8.6-4 shows catch increases by management area from 2002 to 2003.

Table 8.6-4 Catcher-vessel retained and at-sea discards skate catchs, 2002-2003

	GOA Management areas		
Year	610	620-630	640-659
2002	451	1,135	12
2003	459	3,131	61

Source: NMFS AKR
Notes: Includes retained catch and at-sea discards for vessels not delivering to shore. Tables 8.6-1 to 8.6-3 only included retained catch, since their focus was on the increase in delivered catch in response to the emergence of the fishery in 2003.

The following table highlights the target species fisheries that have taken the largest amounts of skate bycatch during 2002 and 2003.

[36]Bonnie, ibid. This estimate includes an “implicit” ex-vessel unprocessed valuation for fish harvested by catcher-processors.

Table 8.6-5. GOA Target Fisheries with the largest Skate incidental catches, 2002-2003 (fisheries selected if total skate harvests exceeded 50 mt in a GOA management area in either year; catches over 50 mt shown in metric tons.)

2002		
	610	**620-630**
Pacific cod	304	185
Shallow water flats		438
Rockfish		60
Flathead sole		59
Arrowtooth flounder	77	121
Rex Sole		224
2003		
	610	**620-630**
Pacific cod	268	299
Shallow water flats		492
Rockfish		
Flathead sole		100
Arrowtooth flounder	70	
Rex Sole		295

Source: NMFS AKR "Catch Accounting System"
Notes: Fisheries selected if they harvested 50 mt or more of skate bycatch. The Eastern GOA management area is not shown in the table since none of the fisheries there took more than 50 mt in this time period.

The sablefish and halibut IFQ fisheries do not appear in this table. Sablefish IFQ fishery skate catches in 2002 and 2003 were lower than those in 1997-99 as shown in Table 3.2-2. In the Catch Accounting System, skate harvests in halibut IFQ fisheries are recorded under a halibut designation, or under the heading of the species that made up the principal alternative catch to halibut it the deliveries.

Initial federal management response

At their September 2003 meeting, the Joint BSAI and GOA Groundfish Plan Teams identified that the GOA skate complex is of immediate concern regarding the rapid development of the skate fishery in the Gulf, and the need to have this fishery develop in a sustainable manner. The Joint Plan Teams recommended setting a gulfwide OFL and separate ABCs for areas 610, 620, and 630 for: (1) big skate; (2) longnose skate; and

(3) the other skates to afford the greatest level of protection possible based on the best available data on these species. However, setting specifications would afford a greater level of protection from overfishing compared with the status quo, although not as much as setting them at the individual species level.

The teams deferred final determination of the OFL and ABCs to the analysts to allow for incorporation of the most current 2003 landings data. However, the teams reviewed a draft OFL recommendation of 7,519 mt, based on Tier 5. The ABCs are equal to 75 percent of OFL. For development of area ABCs, the Joint Plan Team recommended that the analysts consider using weighted averages, including information on catchability as data allowed, and examining the halibut surveys to look at the skate bycatch information in the halibut fishery to determine distribution and target fishery information. A complete review of the methodology and the specifications for GOA skates will be provided in the public review draft of this analysis and will undergo rigorous review a the November 2003 Plan Team meeting and by the SSC at its December 2003 meeting.

Potential future fishery

The targeted skate fishery may persist in future years. As noted above, in the past, GOA fishermen may not have viewed the "other species" complex as a target. This point of view will have changed with the 2003 fishery.[37]

Skate fishing fills a seasonal gap for longline fishermen. Pacific cod fishing tends to close early in March, when halibut PSC caps are taken. At that time fishermen currently can switch gear to jigs or pots to fish in the state managed Pacific cod fishery or fish for IFQ halibut and sablefish with longlines. Longline fishermen do not target flatfish. A skate fishery would provide an additional income opportunity during this period.

Moreover, the Pacific cod ABC is projected to be lower in 2004 than in 2003. This means that the Pacific cod fishery is likely to close earlier and likely to harvest a smaller proportion of the halibut PSC. These factors would create earlier longline interest in skates, and reduce the potential for halibut PSC to be a limiting factor in harvests. Note that some fishermen might continue to fish for skates, even after the PSC is harvested, by taking advantage of the MRAs associated with halibut IFQ fishing.

Anecdotal information suggests the price reached $0.25/pound round weight in early 2003, although prices are lower now. This was an attractive price. It was comparable to some prices paid for Pacific cod. An expectation of a price that could reach that level in 2004 may attract targeted skate fishing effort. Skate fishermen, fishing after the closure of the Pacific cod fishery, may retain a Pacific cod MB of 20% of their skate harvest. This may be an added inducement to target skates.

8.7 Summary of the benefits and costs

The Council faces two separate decisions, the FMP-level decision about whether skates should be included in the "other species" or in the "target species" category, and the specifications-level decision about the

[37]This discussion is based on Ruccio, ibid and a personal communication from Tom Pearson, National Marine Fisheries Service, Kodiak 301 Research Court, RM. 212Kodiak, AK 99615, Septebmer 10, 2003.

details of setting OFLs and ABCs. These decisions are not independent of each other, and are treated jointly here.

The benefits and costs of the alternatives are summarized below in Table 8.7-1. The final section of the RIR, Section 8.8, summarizes the implications for the E.O. 12866 significance analysis. These proposals are not believed to be significant within the meaning of E.O. 12866.

The FMP-level and specifications-level alternatives raise three key questions: (1) Should skates be in the "other species category, or in the "target species" category? (2) Should skate ABCs be set separately for each species/area combination? (3) Should skate OFLs be set separately for each species/area combination? Each of these is addressed below.

Should skates be in the "other species" category, or in the "target species" category?

As the description of the fishery suggests, over the period 2001-2003, fishermen began to target skates. Fishermen developed skate markets in Korea in 2001. Data analysis and anecdotal information clearly indicates that they were targeting skates in 2003. Anecdotal information also suggests a changed perspective toward skate fishing in 2003. Observers suggest that prior to 2003, fishermen did not perceive skates as a target, while in 2003 they began to do so.

The fishery developed to a considerable extent in 2003. Tables 8.6-1 and 8.6-2 indicate that GOA retained harvests rose from 782 mt in 2002 to 3,024 mt in 2003. This is a 287% increase in retained harvests between 2002 and 2003.

While the future is uncertain, there is reason to believe that a targeted fishery will continue. As noted above, fishermens' perceptions of skates as a potential target have shifted. As noted earlier, skates may fill a gap in the annual fishing pattern for many fishermen. They offer some fishermen an opportunity to increase Pacific cod harvests through the use of MRAs.

The skate background in Section 3.2 of the EA indicated that there is a great deal of uncertainty about skate biology and population dynamics. These species are believed to be relatively long-lived, taking a number of years to reach sexual maturity, and have low fecundity. In these circumstances, it may take many years for a stock to recover if it is fished down.

Under the FMP-level Alternative A (status quo) the Council has a limited ability to protect the skate stock in the face of this uncertainty and the rapidly developing target fishery. The "other species" complex TAC in 2003 (11,260 mt) is larger than the projected OFL for skates in this EA (10,322 mt). Harvest by the new targeted skate fishery could drive down the skate biomass and reduce its reproductive potential. While revenues from the fishery would be higher in the short run, while the biomass was being driven down, they would be lower in the longer run as a reduced biomass supports a smaller skate fishery. Long-run fishing costs might be higher if the biomass were fished down due to lower catch per unit of effort.

The benefits of an FMP-level action to move skates out of the "other species" category and into the "target species" category will depend in part on future annual OFL, ABC, and TAC recommendations made by the Council. They will also depend on the specifications-level decision about how to implement skate OFLs, ABCs, and TACs in specifications. These issues are discussed below. The benefits would also depend on future fishing activity in the absence of the action, the impact of the activity on skate biomass, and the choice of a discount rate used to facilitate a comparison of current and future revenues.

Should skate ABCs be set separately for each species/area combination?

The greatest protection to a targeted fishery comes from management at the TAC level. TACs are often set at or near ABC levels for the most valuable fisheries such as pollock, Pacific cod, and sablefish after a consideration of limits placed on the permissible range of Optimum Yields (OYs) by regulation. Once a TAC has been established, fisheries managers estimate (mostly on historical data) the anticipated incidental catch (both retained and discarded) in other directed fisheries throughout the year. This amount is deducted from the TAC and the resulting amount is a directed fishing allowance (DFA).

Once this DFA amount has been harvested, fishery managers close the directed fishery and place the target on bycatch status where only the MRA may be retained and the remainder must be discarded. This provides the greatest protection that both incidental and directed harvest considered together do not exceed the established TAC.

Once the TAC has been harvested, fishery managers place the target on prohibited status where none of the fish may be retained. Once the harvest exceeds the ABC the target is considered being over exploited, the target remains on prohibited status. When an OFL is reached the harvest is considered to be at an unsustainable level, and fishery managers look for additional ways to reduce catch through the fishing year. In extreme cases this may result in the premature closure of other directed fisheries which experience high incidental catch of the fishery which has reached an OFL. Reaching the OFL of any targeted fishery and closing other directed fisheries as a result is a rare event. It is a rare event because fishery managers strive to keep annual harvests at or below TAC levels. It is most like to occur in a fishery very conservatively managed (with Tier 5 or 6 OFLs) and with relatively low estimates of stock biomass.

Specifications-level Alternative 1, is a single, GOA-wide, OFL for the skate group, and management area ABCs for the skate group. Alternative 2 retains the single, GOA-wide OFL for the skate group, but provides ABCs for key skate species in each management area. Thus, under Alternative 1 there would be one OFL and three ABCs, under Alternative 2 there would be one OFL and nine (three species and three areas) ABCs. OFLs and ABCs would be based on estimates of the species composition and distribution. Species categories would include the big skate, the longnose skate, and an "other skates" group.

Alternative 2 would provide more protection to species than Alternative 1, since it would provide area-specific ABCs, TACs, and DFAs for individual species as opposed to skates as a whole. Alternative 1 still allows for a disproportionately high level of harvest of a single species within a narrow geographic range. As noted in Section 3.2 of the EA, management of the skate species within aggregate complexes and the apparent population stability for skate species in aggregate has masked the decline of individual skate species in European fisheries (Dulvy et al. 2000). Alternative 2 partially addresses this issue by providing separate ABCs in each of the three management areas for big skates and longnose skates. The remaining skate species are left in an "other skates" category.

Managers haven't collected species specific data on skate catches in the GOA fisheries. While the overall catch of skates is known, the catches of big skates and longnose skates are not. The absence of information on past skate catches at the species level will make it difficult to estimate the DFA for skate species under this proposal. Harvests of big and longnose skates in target fisheries for other species such as Pacific cod are unknown and will have to be estimated for DFA calculations.

The BSAI and GOA Plan Team's joint recommendation at its September 2003 meeting was for specifications-level Alternative 2. The Plan Teams thought that Alternative 1 did not provide enough protection for individual species and would still allow for a disproportionately high level of harvest of a single species within a narrow geographic rage and that Alternative 3 with its area and individual species OFLs could increase the likelihood of other directed fishery closures in the event that an OFL was reached. The stock assessment author's recommendation was for Alternative 3 with its area and individual species OFLs that would provide for more protection for skates in the event an OFL was reached.

Alternative 2 may constrain skate fishing operations more than Alternative 1. The shift from Alternative 1 to Alternative 2 is a shift from a GOA wide ABC and TAC for a skate "group" to area and species specific ABCs and TACs. In 2003 this fishery was concentrated in the Central GOA and is believed to have focused on big skates and longnose skates (although species specific information is not available from landings records). To illustrate the problem, under the Alternative 1 proposal, the entire GOA ABC could be used for Central GOA big skates; under Alternative 2, the Central GOA ABC and TAC for big skates is more circumscribed. The likelihood of meeting it, and of placing big skates on prohibited status, is larger. Thus, Alternative 2 may circumscribe fishery gross revenues more than Alternative 1 in the short run. However, since Alternative 2 provides more protection to the stocks, it increases the likelihood that the skate fishery, and skate fishery revenues, will be sustainable in the long run.

Should skate OFLs be set separately for each species/area combination?

If OFLs were established for each species (big skates, longnose skates, and other skates) in each management area (Western, Central, Eastern), skates would be provided with the highest level of protection in the event OFLs were reached. However, this level of protection increases the likelihood of closures of fishing for other target species above that for the other specifications-level alternatives.

It is unusual, but not unprecedented, for a GOA species to be protected in specifications with area specific OFLs. As shown in Table 2.1-2, Pacific ocean perch has three area OFLs in the GOA, and pollock has two. The other GOA species each have a GOA-wide OFL.

The arguments for this increased level of protection involve known vulnerabilities in skate populations, and a precautionary-motive based on uncertainty. Big skates and longnose skates have several characteristics that appear to make them vulnerable to fishing activity. They do not range widely as individuals, they potentially aggregate in certain areas, fishing is concentrated in one region of the GOA, and their life history traits make them unlikely to quickly spring back from unintended intense fishing pressure.

Little is know about the biology or population dynamics of the skate species of the GOA, including the big and longnose skates. As noted in Section 3.2 of the EA, there is evidence that similar skate species like it have been heavily harvested by fisheries in other areas. This is an argument for taking a precautionary approach to management until information becomes available to be more liberal.

Alternative 3 provides some additional protection to the targeted stocks from being overfished. If by some chance an OFL were unexpectedly reached for a given skate target in a given area other directed fisheries with high bycatch rates in that area could be closed. The likelihood that an OFL could be reached for a particular skate target in a given area is increased by the greater number of skate targets, nine in this alternative compared to one in Alternative 1 (resulting in lower OFLs, ABCs, and TACs for individual skate targets). However, because the management of skate species under Alternatives 2 and 3 would be to the area TAC level, the addition of area specific OFLs under Alternative 3 may not add much more protection. As noted earlier, it is rare to reach OFL levels in a fishery.

In the event that an OFL was reached, one way to further reduce harvest of that target would be to close those other directed fisheries that have a high incidental catch of that target. In Table 3.2-2 the highest average incidental catch of skates (about 1,000 mt) are in the Pacific cod and sablefish directed fisheries. Over the period considered, the yearly incidental catch of skates was fairly consistent (ranging from 873 mt to 1,174 mt annually) in the Pacific cod fishery but not in the sablefish fishery (ranging from 166 mt to 2,834 mt annually). A recurrence of the high level of incidental catch of skates in the sablefish fishery that was observed in 1998 of 2,834 mt could be an example of a rare and unanticipated event that could result in an OFL being reached. However, fishery managers would be monitoring the harvest of skates on an inseason basis and a more likely result would be that the directed skate fishery affected would close earlier than anticipated or placed on prohibited status.

Table 8.7-1 Summary of the cost and benefit analysis

	FMP Alternative A	FMP Alternative B		
		Specifications alternative 1	Specifications alternative 2	Specifications alternative 3
Impacts on resource management	Status quo. Skate species continue to be managed as part of the "other species" complex	A single GOA wide OFL for the skate group, and management area ABCs for the skate group	A single GOA wide OFL for skates, and ABCs for key skate species in each management area	Management area OFLs and ABCs for each key skate species
Benefits	Baseline	Depending on the change in the pattern of harvests, this action offers the possibility of larger long term fishery revenues than Alts. 2 and 3. This approach does not protect the individual skate species as much as Alternative 2 and 3.	Depending on the change in the pattern of harvests, this action offers the possibility of larger long term fishery revenues than Alt 1. This approach protects the individual skate species to a greater extent that Alternative 1.	highest protection for skates upon reaching OFL. long term sustainable fishery
Costs	Baseline	Constraints on fishermen in the short run could reduce their short term revenues.	Constraints on fishermen in the short run could reduce their short term revenues, possibly to a greater extent than Alternative 1 since this alternative increases likelihood that an unexpected overfishing event could close other target fisheries which have large bycatch of the skate target. This alternative will place greater demands on fishery managers than Alternative 1	Constraints on fishermen in the short run could reduce their short term revenues, possibly to a greater extent than Alternative 2 since this alternative increases likelihood that an unexpected overfishing event could close other target fisheries which have large bycatch of the skate target. This alternative will place greater demands on fishery managers than Alternative 2
Net benefits	Baseline	The alternative gives managers greater control over skates in the face of economic and biological uncertainty. The benefits depend on future Council decisions and on the impact fishermen would have on the stock in their absence.	The alternative gives managers greater control over skates in the face of economic and biological uncertainty. Control is greater than under Alternative 1, but so are management costs. The benefits depend on future Council decisions and on the impact fishermen would have on the stock in their absence of the action.	The alternative gives managers marginally greater control over skates in the face of economic and biological uncertainty than Alternative 2. Control is greater than under Alternative 2, but so are management costs. The benefits depend on future Council decisions and on the impact fishermen would have on the stock in their absence of the action.
Action objectives	Does not meet the objectives of this action.	This alternative meets the objectives of this action.	This alternative meets the biological management objectives of this action more fully than Alternative 1.	This alternative meets the biological management objectives of this action more fully than Alternative 2.
E.O. 12866 significance	This action is not significant.	This action is not significant.	This action is not significant.	This action is not significant.
Notes: Alternative 1 (**status quo**) is the **no action** alternative and provides the **baseline** against which the costs and benefits for Alternative 2 have been estimated.				

8.8 Summary of the significance criteria

A “significant regulatory action” under E.O. 12866 means any action that is likely to result in a rule that may:

1. Have an annual effect on the economy of $100 million or more or adversely affect in a material way the economy, a sector of the economy, productivity, competition, jobs, the environment, public health or safety, or State, local, or tribal governments or communities;
2. Create a serious inconsistency or otherwise interfere with an action taken or planned by another agency;
3. Materially alter the budgetary impact of entitlements, grants, user fees, or loan programs or the rights and obligations of recipients thereof; or
4. Raise novel legal or policy issues arising out of legal mandates, the President’s priorities, or the principles set forth in the executive order.

As noted earlier, a crude estimate of 2003 ex-vessel revenues in this fishery is close to two million dollars. This estimate does not include revenues at the first wholesale level. Even with that caveat, economic activity associated with this fishery does not approach $100 million. This action will therefore not have an annual effect on the economy of $100 million or more or adversely affect in a material way the economy, a sector of the economy, productivity, competition, jobs, the environment, public health or safety, or State, local, or tribal governments or communities

NMFS has not identified any factors that would (a) “Create a serious inconsistency or otherwise interfere with an action taken or planned by another agency”; (b) “Materially alter the budgetary impact of entitlements, grants, user fees, or loan programs or the rights and obligations of recipients thereof”; or (c) “Raise novel legal or policy issues arising out of legal mandates, the President’s priorities, or the principles set forth in the executive order.”

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Appendix H: Detailed Analysis of 2004 Gross Value Impacts

Prices used to calculate gross values

The gross value analysis provides estimates of gross revenues for products received 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 price level 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 The most recent year for which relatively complete price data are available is 2001. 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.[38] Prices for the first six groupings are "Alaska-wide" while separate prices for "other" species were available for the BSAI and GOA. Price estimates for the first six species were based on data in the 2002 Economic SAFE.[39] Price estimates for "other" species were made at the Alaska Fisheries Science Center[40].

How first wholesale revenues were estimated

The volumes of fish harvested under the different alternatives were estimated as follows: (a) species ABCs for each alternative were obtained from the Council plan teams following their September 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;[41](c) TACs were projected for each species group

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[38]2001 price estimates were: $648/mt for pollock, $6,069 for sablefish, $1,109 for Pacific cod, $527 for flatfish, $602 for rockfish, $789 for Atka mackerel, $370 for BSAI other species, $789 for GOA other species.

[39]Retained catch was calculated using Tables 4 and 5 which contains information on catch and discards. Total first wholesale revenues were estimated from Table 36. The species groupings used were determined by the groupings used in the 2002 Economic SAFE.

[40]Hiatt, Terry. (2002). National Marine Fisheries Service. Alaska Fisheries Science Center. 7600 Sand Point Way N.E., Seattle, WA. 98115-6349. Personal communication. September 10, 2002.

[41]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,

(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 average proportion of the projected TAC for the species group taken on average in the years 1998-2002 as used to estimate total catch (separate proportions were used in the BSAI and GOA and for CDQ and other fishing in the BSAI); (f) an estimate of the average proportion of the total catch that was discarded in 1998 to 2001 was used to estimate the proportions of catch that were discarded and retained.[42]

For this preliminary analysis, 2004 TACs and interim TACs were estimated by the groundfish plan team in September and are used for all alternatives. Note, however, that projections of revenues for Alternatives that monetize ABCs could be seriously misleading. Alternative 1 essentially uses ABC values as an upper bound harvest limit, where the sum of ABCs is 168% 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 the how the Council might reallocate these "spare" metric tonnages to other species. This may create a downward bias in the final gross revenue estimates.

In the BSAI the TACs were divided into two categories. The fish available in the CDQ reserves, and the fish available for use by fishermen harvesting the ITAC and the unspecified reserves. The CDQ reserve was assigned 10% percent of the pollock TAC, 20% of the sablefish allocated to hook-and-line and pot fishermen, 7.5% of the sablefish allocated to trawl fishermen, and 7.5% of all other groundfish species. The CDQ reserve calculations were done for both the overall TACs and the interim TACs provided by the plan team in September.

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 2001 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 the 2001 prices 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, the same price 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

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flathead sole, rex sole, deep water flatfish, shallow water flatfish rockfish, Atka mackerel, and other species.

[42]The proportions of available harvest actually taken were obtained for the NOAA Fisheries Alaska Region web site. BSAI and GOA percents caught were averaged over 1998-2002; CDQ percents 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 1998-2001.

Alternative 2, because TAC changes are relatively small. However, Alternative 1 increases TACs significantly, which 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, 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 limits, 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 4.10-3 and 4.10-4. Estimates of the first wholesale value of the BSAI ITAC and unspecified reserves are summarized in Table 4.10-5, estimates of the value for the CDQ reserve are summarized in Table 4.10-6, and estimates for the GOA are summarized in Table 4.10-7.

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

Species group	A1	A2	A3	A4	A5	2003
BSAI						
Pollock	2,373,400	1,492,810	1,279,700	1,128,253	0	1,492,810
Sablefish	7,300	5500	3,650	4,500	0	5,500
Pacific cod	278,000	207,500	147,000	168,200	0	207,500
Arrowtooth	112,000	12,000	59,800	7,300	0	12,000
Flathead sole	66,000	20,000	34,800	14,700	0	20,000
Rock sole	110,000	44,000	57,300	34,800	0	44,000
Greenland turbot	14,700	4,000	7,700	5,880	0	4,000
Yellowfin sole	114,000	83,750	58,200	92,600	0	83,750
Flats (other)	160,700	13,000	85,200	26,102	0	13,000
Rockfish	24,659	22,493	12,380	15,952	0	22,493
Atka mackerel	82,800	59,111	45,400	51,000	0	59,111
Other	21,290	34,279	10,645	24,671	0	34,279
Total	3,364,849	1,998,443	1,801,775	1,515,050	0	2,000,000
Potenial max.	2,000,000	2,000,000	1,764,650	1,573,958	0	n.a.
Shortfall	-1,364,849	1,557	-37,125	-46,979		n.a.
GOA						
Pollock	65,668	54,350	33,625	77,605	0	54,350
Sablefish	18,034	11,400	9,301	11,148	0	11,400
Pacific cod	59,900	36,809	31,600	45,000	0	46,809
Arrowtooth	155,140	38,000	79,719	12,820	0	38,000
Flathead sole	41,402	10,770	22,464	2,103	0	10,770
Rex sole	9,470	9,470	4,774	3,053	0	9,470
Flats (deep)	4,880	4,880	2,149	1,400	0	4,880
Flats (shallow)	53,263	21,620	27,668	5,264	0	21,620
Rockfish	35,831	29,190	17,945	17,956	0	29,190
Atka mackerel	4,700	600	2350	182	0	600
Other	22,414	10,854	11,580	8,826	0	11,400
Total	470,702	227,943	243,175	185,357	0	228,489
Potenial max.	470,702	409,690	243,175	187,959	0	n.a.
Shortfall	0	181,747	0	2,602	0	n.a.

Notes: TACs were projected on the basis of 2003 Plan Team ABC recommendations. Actual TACs will be prepared by the NPFMC at its December 2003 meeting. BSAI TAC estimates have been constrained to meet the two million metric ton optimum yield constraint for Alternatives 2-4 but not for Alternative 1. BSAI 2004 projected TACs are equal 2003 TACs for Alternative 2 (unless the 2003 TAC was greater than the proposed 2003 ABC) and equal to proposed 2004 ABCs for Alternatives 3 and 4. (GOA Potential max is sum of ABCs)

Table H-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	0%	-9%	-47%	-53%
Sablefish	6,000	22%	-8%	-39%	-25%
Pacific cod	223,000	25%	10%	-34%	-25%
Arrowtooth	112,000	0%	27%	-47%	-93%
Flathead sole	66,000	0%	-7%	-47%	-78%
Rock sole	110,000	0%	-9%	-48%	-68%
Turbot	5,880	150%	17%	31%	0%
Yellowfin	114,000	0%	-4%	-49%	-19%
Flats (other)	153,000	5%	1%	-44%	-91%
Rockfish	24,762	0%	-1%	-69%	-56%
Atka mackerel	63,000	31%	-2%	-28%	-19%
Other	45,270	-53%	0%	-100%	-100%
TACs (2003)					
Pollock	1,492,810	59%	0%	-14%	-24%
Sablefish	5,500	33%	0%	-34%	-18%
Pacific cod	207,500	34%	0%	-29%	-19%
Arrowtooth	12,000	833%	0%	398%	-39%
Flathead sole	20,000	230%	0%	74%	-27%
Rock sole	44,000	150%	0%	30%	-21%
Turbot	4,000	268%	0%	93%	47%
Yellowfin	83,750	36%	0%	-31%	-11%
Flats (other)	13,000	1136%	0%	555%	101%
Rockfish	22,493	10%	0%	-45%	-29%
Atka mackerel	59,111	40%	0%	-23%	-14%
Other	34,279	-38%	0%	-69%	-28%

Notes: Alt 4 estimates are based on Alt 4 projections that may contain errors. As noted in the footnote to Table 2.0-4, the assessment authors may have used a recent 5 year total catch by target over periods ranging from 1995-1999 to 1998-2002. In the final EA for this action these values will be corrected to the average for the period 1997-2001.

Table H-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%	0%	-38%	43%
Sablefish	14,890	21%	-23%	-38%	-25%
Pacific cod	52,800	13%	-9%	-40%	-15%
Arrowtooth	155,140	0%	4%	-49%	-92%
Flathead sole	41,390	0%	-9%	-46%	-95%
Rex sole	9,470	0%	0%	-50%	-61%
Flats (deep)	4,880	0%	0%	-56%	-60%
Flats (shallow)	49,340	8%	0%	-44%	-87%
Rockfish	33,740	6%	-1%	-47%	-46%
Atka mackerel	600	683%	0%	292%	-62%
Other	0	n/a	n/a	n/a	n/a
TACs (2003)					
Pollock	54,350	21%	0%	-38%	43%
Sablefish	11,400	58%	0%	-18%	-2%
Pacific cod	36,809	63%	0%	-14%	22%
Arrowtooth	38,000	308%	0%	110%	-66%
Flathead sole	10,770	284%	0%	109%	-80%
Rex sole	9,470	0%	0%	-50%	-68%
Flats (deep)	4,880	0%	0%	-56%	-71%
Flats (shallow)	21,620	146%	0%	28%	-76%
Rockfish	29,190	23%	0%	-39%	-38%
Atka mackerel	600	683%	0%	292%	-70%
Other	11,400	97%	-5%	2%	-23%

Notes: Alt 4 estimates are based on Alt 4 projections that may contain errors. As noted in the footnote to Table 2.0-4, the assessment authors may have used a recent 5 year total catch by target over periods ranging from 1995-1999 to 1998-2002. In the final EA for this action these values will be corrected to the average for the period 1997-2001.

Table H-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	**1,347**	**847**	**726**	**640**	**0**
Sablefish	**18**	**14**	**9**	**11**	**0**
Pacific cod	**276**	**206**	**146**	**167**	**0**
Flatfish	**60**	**30**	**31**	**31**	**0**
Rockfish	**7**	**6**	**4**	**5**	**0**
Atka mackerel	**47**	**34**	**26**	**29**	**0**
Other	**1**	**1**	**0**	**1**	**0**
Total	**1,755**	**1,138**	**942**	**884**	**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 H-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	**150**	**95**	**81**	**71**	**0**
Sablefish	**2**	**2**	**1**	**1**	**0**
Pacific cod	**21**	**16**	**11**	**13**	**0**
Flatfish	**1**	**1**	**1**	**1**	**0**
Rockfish	**0**	**0**	**0**	**0**	**0**
Atka mackerel	**4**	**3**	**2**	**2**	**0**
Other	**0**	**0**	**0**	**0**	**0**
Total	**179**	**115**	**96**	**89**	**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 H-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	37	31	19	31	0
Sablefish	98	62	50	60	0
Pacific cod	60	37	32	37	0
Flatfish	24	9	8	3	0
Rockfish	13	11	7	7	0
Atka	1	0	0	0	0
Other	1	0	0	0	0
Total	235	150	116	138	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.					

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