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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

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Abstract: This document contains an Environmental Assessment (EA) and Initial Regulatory Flexibility Analysis (IRFA) that analyze the potential impacts of the 2004 harvest specifications for the groundfish fisheries of the Bering Sea and Aleutian Islands management area and Gulf of Alaska. The analyses in this document address the requirements of the National Environmental Policy Act (NEPA) and the Regulatory Flexibility Act (RFA).

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Table of Contents

List of Tables

List of Figures

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Executive Summary

The actions evaluated in this document

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

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

Purpose and Need

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

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

Environmental Assessment

An Environmental Assessment (EA) was prepared for the 2004 Specifications to address the statutory requirements of the National Environmental Policy Act (NEPA). The purpose of the environmental assessment (EA) is to predict whether the impacts to the human environment resulting from setting the 2004 harvest specifications will be "significant", as that term is defined under NEPA. If the predicted impacts from the preferred alternatives are found not to be significant, and those alternatives are chosen, no further analysis is necessary to comply with the requirements of NEPA.

2004 Harvest Specifications Alternatives

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

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

Each of the five 2004 specifications alternatives represents alternative amounts of total allowable catch that could be set for managed species and species groups for the fishing year 2004. The alternatives have been selected to display a wide range of ABCs and TACs and their impacts to the environment. Fishing mortality (retained and discarded) is indicated as F. TAC specifications are harvest quotas that include both retained catch and discarded catch. The five alternatives are:

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

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

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

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

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

Special skate considerations

At its October 2003 meetings, the Council received an EA/RIR /IRFA for a proposed Amendment 63 to the GOA groundfish FMP that would move skates from the "other species" category to the "target species" category. This would make it possible to set GOA skate OFLs, ABCs, and TACs in the annual specifications process. This action was proposed as a response to the emergence of a targeted skate fishery in the Central GOA for the first time in 2003. In 2003 skates were included under the "other species" category in the FMP, and this provided little control over potential skate harvests. The Council took final action to adopt FMP Amendment 63 for Secretarial review, but deferred action on the specific method of including skates in specifications until the results of the 2003 GOA groundfish survey were available to the Council in December 2003.

This EA/IRFA evaluates five options and two suboptions for incorporating skates into 2004 specifications as a target species. Key issues differentiating the options are (1) whether or not to treat all skates as a group, or to break out separate species, and (2) whether to set OFL and ABC levels GOA-wide, or at the management area level within the GOA.

Options

Option 1: GOA-wide OFL and GOA-wide ABC for all skates (grouped together).

Option 2: GOA-wide OFL and GOA-wide ABC for big skates, longnose skates, and "other" skates.

Option 3: Management area OFLs and ABCs for big skates, longnose skates, and for "other" skates.

Option 4: Management area (Eastern, Central, and Western GOA) OFLs and ABCs for big skates and longnose skates, and GOA-wide OFL and ABC for "other" skates. This is the assessment author's recommendation.

Option 5: A GOA-wide OFL would be established for all species combined. ABCs would be established in each management area in the GOA a big/longnose skate grouping. A GOA-wide ABC would be established for “other” skates. In the Central GOA a TAC would be established for combined big and longnose skate catch. This TAC will equal 10% of the estimated biomass of big skates in the Central Area (this would have been the OFL for big skates in this area if such an OFL had been promulated) The Plan Team explicitly stated that this was meant to be a single year arrangement and that it should be reviewed during the 2005 specifications process. This was the recommendation of the GOA Plan Team at its November 2003 meetings.

Suboptions

Suboption 1: Set TAC at the ABC or a lower level sufficient to meet anticipated incidental catch needs in other directed fisheries throughout the fishing year. The result would be that skates would be on bycatch status throughout the fishing year, skates could be retained up to the maximum retainable amount (20%) but there would be no directed fishing for skates.

Suboption 2: Set TAC at the ABC level. The result would be the Regional Administrator would establish a directed fishing allowance for each applicable species group and management area adopted under under the selected option. For the species and areas adopted under the selected option where the TAC amount exceeds the amount anticipated incidental catch needs in other directed fisheries throughout the fishing year a directed fishery for skates would be authorized.

Environmental Analysis

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

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

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

The intent of TAC setting deliberations is to balance the harvest of fish during the fishing year consistent with established total optimum yield amounts and ecosystem needs. The effect of the alternatives must be evaluated for all resources, species, and issues that may directly or indirectly interact with the groundfish fisheries within the action area, as a result of specified TAC levels. The impacts of alternative TAC levels are assessed in section 4 of this EA. The Table below provides a summary of the impacts of the final harvest specifications alternatives on the human environment.

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

Coding: I = Insignificant, S = Significant, + = beneficial, - = adverse, U = Unknown					
Issue	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5
Target Fish Species					
Fishing mortality	I	I	I	I	S+
Spatial temporal concentration of catch	I	I	I	I	S+
Change in prey availability	I	I	I	I	S+
Habitat suitability: change in suitability of spawning, nursery, or settlement habitat, etc.	I	I	I	I	S+
Incidental Catch of non-specified species					
Incidental catch of non-specified species	U	I	U	U	S+
Forage Fish					
Incidental catch of forage fish	U	I	U	U	S+
Prohibited Species Management					
Incidental Catch of prohibited species stocks	I	I	I	I	I
Harvest levels in directed fisheries targeting prohibited species	I	I	I	I	I
Bycatch levels of prohibited species in directed groundfish fisheries	I	I	I	I	S+
Marine Mammals					
Incidental take/entanglement in marine debris	I	I	I	I	I
Spatial/temporal concentration of fishery	I	I/U*	I	I	S+
Global Harvest of prey species	I	I	I	I	U
Disturbance	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

Coding: I = Insignificant, S = Significant, + = beneficial, - = adverse, U = Unknown					
Issue	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5
Proc. Waste & Offal	I	I	I	I	U
Other Albatrosses & Shearwaters					
Incidental Take	U	U	U	U	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
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					

Coding: I = Insignificant, S = Significant, + = beneficial, - = adverse, U = Unknown					
Issue	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5
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	I	I	S-
Operating cost impacts	S-	I	I	I	S+
Net returns to industry	S+	I	I	I	S-
Safety and health impacts	U	I	U	U	U
Impacts on related fisheries	U	I	U	U	S-
Consumer effects	S+	I	I	I	S-
Management and enforcement	S-	I	I	I	S+
Excess capacity	S+	I	I	I	S-
Bycatch and discards	I	I	I	I	S+
Passive use values	U	I	U	U	U
Non-market use values	U	I	U	U	U
Non-consumptive use values	U	I	U	U	U

* Interim specifications for pollock, P. cod and Atka mackerel have unknown temporal effects on Steller sea lions. Information available in December 2003 to determine seasonal apportionment for 2004.

The skate options and suboptions were evaluated with respect to their impacts on groundfish, on prohibited species, and on the socioeconomic environment. The impact of prohibited species was determined to be insignificant and socioeconomic impacts were determined to be unknown. The groundfish impacts are summarized in the following table.

Table 4.12-2 Significance of Direct Effects of Skate Specifications Options and Suboptions on Groundfish

	Options and Suboptions									
	1		2		3		4		5	
Direct Effects	1	2	1	2	1	2	1	2	1	2
Fishing Mortality	S-[1]	S-[1]	I	I	I	I	I	I	I	I
Spatial and Temporal distributio n of catch	U[2]	U[2]	U[2]	U[2]	I	I	I	I	I	I
Change in Prey availability	I	I	I	I	I	I	I	I	I	I
Habitat Changes	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE

[1]Option 1 does not manage harvest at the species level so there is potential to jeopardize the ability of the Big and Longnose skates stocks to produce MSY
[2]Management is on a GOA-wide basis, making control of spatial harvest of skates unknown due to the ability to close areas of skate bycatch under 50 CFR 679.20(d)(3).

Initial Regulatory Flexibility Analysis

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

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 about 1,200 small catcher vessels, about 40 small catcher processors, and six small CDQ groups would be directly regulated by this action.

The IRFA examined the impacts on small entities within fisheries sectors defined by the harvest of species groups whose TACs might be affected by the specifications. The IRFA identified adverse impacts on small fishing operations harvesting rockfish in the GOA. The analysis examined one alternative (Alternative 1) that would have a smaller adverse impact on small entities. However this action would have increased rockfish harvests and would not have been as protective of the rockfish resource.

The IRFA reviewed the impacts of the five options and two suboptions for implementing skate specifications in the GOA. Two classes of affected small entities were identified: vessels targeting on skates and vessels catching skates incidentally while fishing for other targets. Both classes of entities could be adversely impacted in different ways depending on the combination of options and suboptions. Suboptions which preclude or restrict the harvest of the directed skate fishery would adversely affect operations targeting skates. The options aggregate skate species and species groups in different ways to create skate fishery overfishing levels (OFLs). If skate overfishing levels are approached, in-season fishery managers may have to take steps to restrict fisheries harvesting skates incidentally. These restrictions could take the form of prohibition of fishing in areas with high incidental skate harvests or, more seriously, closure of a directed fishery in a management area. Several of the fisheries that take skates incidentally are among the most important in the GOA, including fisheries for Pacific cod, sablefish, and halibut. While in-season managers manage to the TAC level and rarely allow a fishery to approach the OFL, this is a concern. The concern is increased when OFLs are disaggregated to provide separate OFLs for species, species-groups, or management areas.

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.

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.

Skates options

No preferred alternative has been identified at this time.

1.0 Purpose and Need

1.1 Introduction

This document contains an Environmental Assessment and Initial Regulatory Flexibility Review (EA/IRFA) analyzing final harvest specifications for the Bering Sea and Aleutian Islands (BSAI) and the Gulf of Alaska (GOA) groundfish fisheries for 2004. Harvest specifications include the setting of overfishing levels (OFLs), acceptable biological catches (ABCs), total allowable catches (TACs), 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 purpose of the environmental assessment (EA) is to predict whether the impacts to the human environment resulting from setting the 2004 final harvest specifications will be significant. See section 7.0 for the purpose and need of the IRFA. 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 is necessary for the management of the groundfish fisheries and the conservation of marine resources, as required by the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act).

1.2 The Annual Specifications Process

Fishing areas and the fishing year

TAC specifications define upper retained harvest limits, or fishery removals, for 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 at 50 CFR 679.20, 679.23, and 679.30. TAC can be further allocated to the various gear groups, management areas, and seasons according to pre-determined regulatory actions and for regulatory announcements by NMFS management authorities, opening and closing fisheries accordingly. No foreign fisheries are conducted in the exclusive economic zone (EEZ) off Alaska and therefore, the entire TAC amount is available to the domestic fishery. The gear authorized in the Federally managed groundfish fisheries off Alaska includes trawl, hook-and-line, longline pot, pot, and jig (50 CFR 679.2).

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

The fishing year coincides with the calendar year, January 1 through December 31 (§ 679.2 and 679.23). Depending on the target species' spatial allocation, additional specifications are made to particular seasons (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 makes a determination whether to approve the specifications..

Plan teams and SAFE documents

Establishing harvest specifications involves the gathering and analysis of fisheries data. The groups responsible for analyzing and packaging the data for Council consideration are the Council's Groundfish Plan Teams (Plan Teams). These teams include NMFS scientists and managers, Alaska, Oregon, and Washington fisheries management agencies scientists, and university faculty. Using stock assessments prepared annually by NMFS and by the Alaska Department of Fish and Game (ADF&G), Plan Teams calculate biomass, ABC, and OFL for each species or species group, as appropriate, for specified management areas of the EEZ off Alaska that are open to harvest of groundfish. Plan Team meetings are held in September to review potential model changes and are used for developing proposed ABC recommendations. In November, the Plan Teams' rationale, models, and resulting ABC and OFL calculations are documented in annual SAFE reports. The SAFE reports incorporate biological survey work recently completed, any new methodologies applied to obtain these data, and ABC and OFL determinations based on the most recent stock assessments. Periodically, an independent expert panel reviews the assumptions used in the stock assessments for a selected species or species group and provides recommendations on improving the assessment.

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

Proposed, interim, and final specifications

Specification of the upcoming year's harvest levels is currently a three-step process. First, proposed harvest specifications including ABCs, TACs, and PSC limits[1] are recommended by the Council at its October meeting and published in November or December in the Federal Register for public review and comment. In October, most current year stock assessments are not yet available. Since 2002, the proposed harvest specifications for a number of target species have been 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 for which there is enough information available to allow for projections.

For most BSAI target species, the initial TAC (ITAC) is calculated as 85 percent of the proposed TACs (50 CFR § 679.20(b)). The remaining 15 percent is split evenly between the Western Alaska Community Development Quota (CDQ) program reserve and a non-specified groundfish reserve. In the GOA, ITACs equal the full TAC, except for pollock, Pacific cod, flatfish, and "other" species. The ITACs for these four species or species groups equal 80 percent of the TACs. The remaining 20 percent of the TACs are established as a species specific reserve.

In the second step, 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 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.

The interim PSC limits are one quarter of the annual limit and PSC reserves. 7.5 percent of the PSC limits are set aside to establish the prohibited species quota (PSQ) for the CDQ program (50 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 thereof, are recommended to the Secretary for implementation in the upcoming fishing year. With the final specifications, most of the non-CDQ reserves are released and the final TAC is increased by

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

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.

Rulemaking process and publication of the specifications rule

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

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

Table 1.2-1   Current Groundfish Harvest Specifications Setting Process

Time	Activity	Opportunity for Public Involvement	Decision Points
January to August (of year prior to fishing year)	Plan and conduct stock assessment surveys.	Casual (staff and public may interact directly with stock assessment authors)	Cruise Plans finalized. Scientific Research Permits issued. Finalize lists of groundfish biomass and prediction models to be run. Staff assignments and deadlines set.
August - September	Preparation of proposed specifications recommendations. Groundfish Plan Teams meeting.	Open Public Meetings. *Federal Register* Notice of Plan Teams' Meetings.	Stock assessment teams fully scope out work necessary to complete SAFE reports, models to run, emerging ecosystem issues

Time	Activity	Opportunity for Public Involvement	Decision Points
September	Staff start drafting proposed and interim harvest specifications notices and EA/IRFA based on current year's specifications or current SAFE report projections.	None	Proposed specifications initially based on current year's specs. or projections. Interim specifications are formula driven based on proposed harvest specifications.
October 1-7 or so	October Council Meeting Presentation of proposed specifications, highlights of differences seen in recent surveys and ecosystem from past years. Council recommends proposed and interim specifications.	Open Public Meeting. *Federal Register* Notice of initial action on next year's harvest specifications as an agenda item	Council recommends proposed harvest specifications.
November	NMFS reviews interim and proposed specifications	None	NMFS publishes proposed and interim specs.
November	November Plan Team Meetings. Staff start drafting EA/IRFA for final specs. Finalize SAFE Reports. Initiation of informal Section 7 Consultation on final specs if needed.	Open Public Meetings. *Federal Register* Notice of Plan Teams' Meetings	Plan Teams make their ABC recommendations. Determination of whether Section 7 Consultation is needed and if it has to be formal or informal.
November - December	File proposed and interim specification rules with *Federal Register.* Interim specs. EA completed.	Written comments accepted on for 30 days comment period for proposed rule. Comments welcome on EA/IRFA for proposed specs. Some specifications announced in the proposed rule **are not** the same as the final specifications that will be in the final rule.	Interim specifications effective on Jan. 1 or date of publication if after Jan. 1. Not realistic documents for which to invite public comments; however, by regulation, comments are accepted and are responded to in preamble of the final rule.
December 10-17	December Council Meeting. Release and present Draft EA/IRFA containing Final SAFE Reports, Ecosystem information, Economic SAFE report.	Open Public Meeting *Federal Register* notice. Agenda includes next year's harvest specifications. Last meaningful opportunity for comments on the next year's quotas.	Determine amount to nearest mt of next year's TAC and PSC quotas.

Time	Activity	Opportunity for Public Involvement	Decision Points
Late December-January	NMFS staff draft final harvest specifications rule. Harvest specifications EA/FRFA finalized.	Comments related to information released prior to and during December Council meeting may still be trickling in. Those comments are given consideration in final edits of the EA/FRFA. No public comment period for EA/FRFA.	ESA Section 7 and EFH consultation concluded on final specifications. FONSI determination..
February of **subject fishing year**	Submit final rule to Secretary for filing with Office of Federal Register.	None	Secretarial determination whether to approve Council recommendation.
February or March of **subject fishing year**	*Federal Register* publication of Final Rule.	None. Administrative Procedure Act sets up 30 day cooling off period that may be waived for good cause.	Final harvest specifications replace interim specifications on date of effectiveness.

Required analyses

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

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

Four versions of the 2004 harvest specification EA (along with associated Initial Regulatory Flexibility Analysis (IRFA) and Final Regulatory Flexibility Analysis (FRFA) required by the 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 EA/IRFA	No new data on alternatives. Alternative 1, 3, 4, and 5 TACs equal final 2003 Alternative ABCs. Alternative 2 ABCs reflect plan team recommendations from September plan team meetings and TACs from 2003.	October AP, SSC, and Council deliberations on recommendations for proposed harvest specifications. (Proposed specifications are used for interim specifications.)
October EA/IRFA	Recommendations from the Council on ABCs and TACs for Alternative 2.	Secretarial decision-making on interim specifications.
November EA/IRFA	SAFE reports finalized; November Plan Team recommendations.	December AP, SSC, and Council deliberations on recommended specifications.
December/January EA/FRFA	Council December recommendations. Public comment on proposed specifications and IRFA.	Secretarial decision-making on final specifications.

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

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

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

1.3 GOA Skate Specifications

This section describes the history of the skate fisheries and explains the need to manage skates separately in the annual harvest specifications process.

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.[2]

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 commercial skate harvests (authorized at 5 ACC 28.083).

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

The Board allowed ADF&G to impose a number of requirements on permit recipients, 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.[3]

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 state-waters 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.[4]

Background to the federal fishery

In 1998, the ADF&G, on behalf of the Board, requested complementary federal action to the Board's 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 target fishery for skates in the Western and Central GOA, around Kodiak Island developed in 2003, while the protective measures were still under development.

There are active commercial skate fisheries elsewhere in the world, for example off of British Columbia (B.C.) 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 skate products. Efforts were also put into adapting trawl nets to incorporate features used in B.C. to target skates.[5]

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 for skates 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 ex-vessel 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 flatfish 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

[3] Ruccio, ibid.

[4] Ruccio, ibid.

[5] 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.

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" complex as a target fishery.[6]

Expansion of the federal fishery in 2003

The longline and trawl fisheries for skates expanded considerably in 2003. Tables 1.3-1, 1.3-2, 1.3-3, and 1.3-4 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 mt 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. 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 mt to 490 mt), but part was also due to increased retained incidental catch.

Total hook-and-line and trawl catches in 2003 totaled 3,651 mt. Total retained catches (from the tables below) were 3,024 mt. Therefore, the fishery catch was 627 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, both presently unknown.

Table 1.3-1 Catcher-processor retained skate harvests (incidental), 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. NMFS assigns CP targets by week. No CPs appear to have targeted skates on a weekly basis during this period. This does not preclude the possibility of occasional targeted hauls.				

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

Table 1.3-2 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 1.3-3 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.[7]

The increase in catches took place largely in management areas 620 and 630. Table 1.3-4 shows catch increases by management area from 2002 to 2003.

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

Table 1.3-4 Retained skate harvests and at-sea skate discards, 2002-2003 (mt)

	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 1.3-1 to 1.3-3 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.

Table 1.3-5. 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 4 of the skate assessment in Appendix B. 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 GOA-wide 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 at the November 2003 Plan Team meeting and by the SSC at its December 2003 meeting.

Potential future fishery

The targeted skate fishery is expected to 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.[8]

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 (assuming they hold QS). Longline fishermen do not target flatfish. A skate fishery may provide an additional income opportunity during this period for some.

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 is likely to harvest a smaller proportion of the halibut PSC.

[8]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.

These factors could create earlier longline interest in skates, and reduce the potential for halibut PSC to be a limiting factor in harvests. Note that some fishermen who hold halibut QS might continue to fish for skates, even after the PSC is harvested, by taking advantage of the MRAs associated with halibut IFQ fishing.

As suggested above, 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 MRA of 20% of their skate harvest, assuming skates are set out as a “target” species in regulation, as proposed. This may be an added inducement to target skates.

Council action

At its October 2003 meeting, the Council approved an action under Gulf of Alaska (GOA) Plan Amendment 63 to separate GOA skates from the “other species” category and add them to the target category because of concern over the rapidly developing skate directed fishery in 2003. The Council determined that the current FMP does not offer sufficient protection for the skate resource. Currently, skates are managed under the “other species” category TAC in combination with sharks, sculpin, octopus and squid. The GOA FMP does not authorize a separate ABC or TAC for the skate complex, nor for any of the individual skate species which make up that complex. Instead a TAC is calculated for the five taxonomic groups in the “other” species category as 5 percent of the total TACs for all of the combined GOA species TACs. Because Amendment 63 would allow for the separate management of skates through the annual specifications process, this analysis provides detailed information on the potential impacts of options for specifications for skates in the GOA.

Until the Secretary approves FMP Amendment 63, the Council cannot adopt one of the five skate options into specifications. In December, the Council will make ABC and TAC recommendations on a GOA “other species” category that includes skates. However, the Council may also choose one of the five skate specifications alternatives described in this EA/IRFA contingent on approval of GOA FMP Amendment 63 by the Secretary of Commerce. If the Secretary approves the FMP amendment, NMFS will proceed with development and review of proposed and final specifications for skates that would implement the Council’s recommended option. The year 2004 will open with skates included in the “other species” category under the interim specifications. Contingent on Secretarial approval of Amendment 63 and of recommended skate specifications, the separate skates management is likely to become effective in February or March 2004.

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

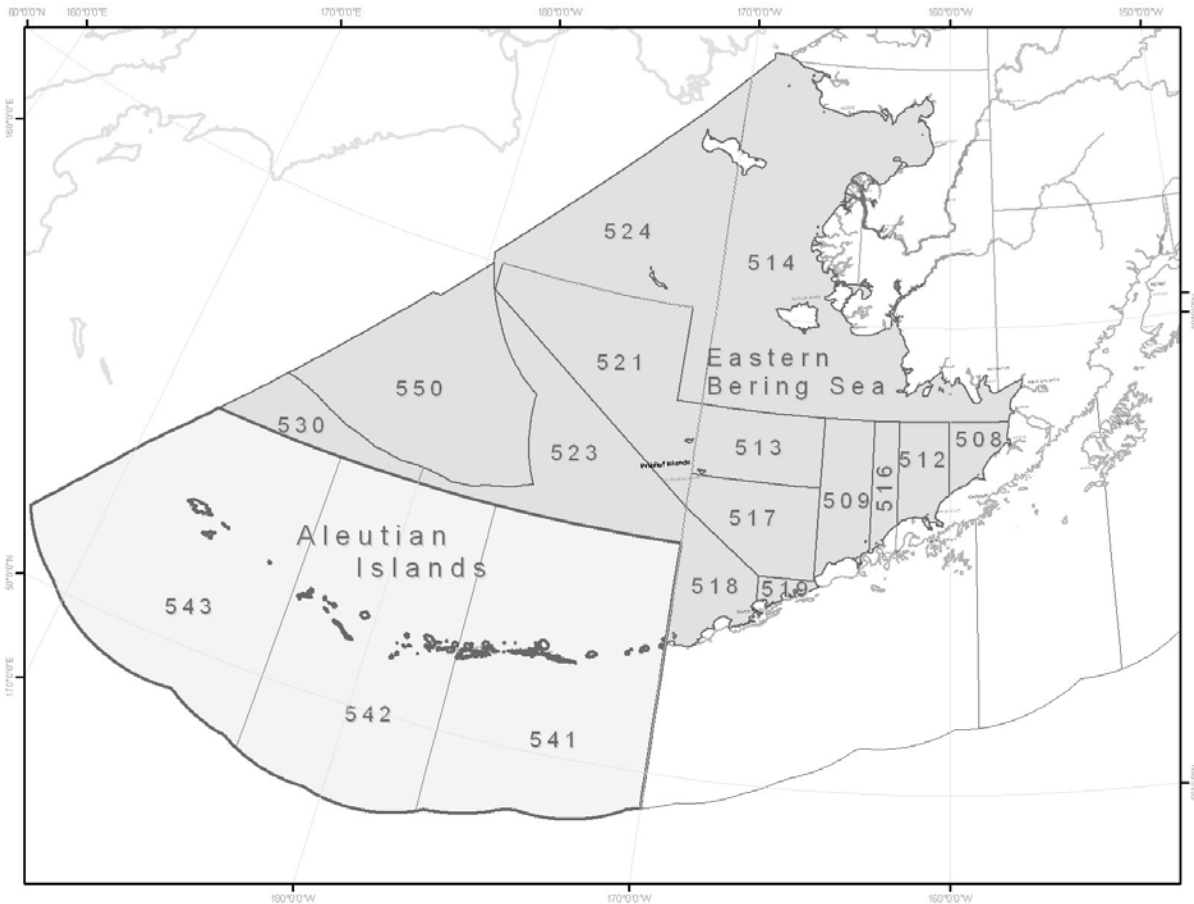
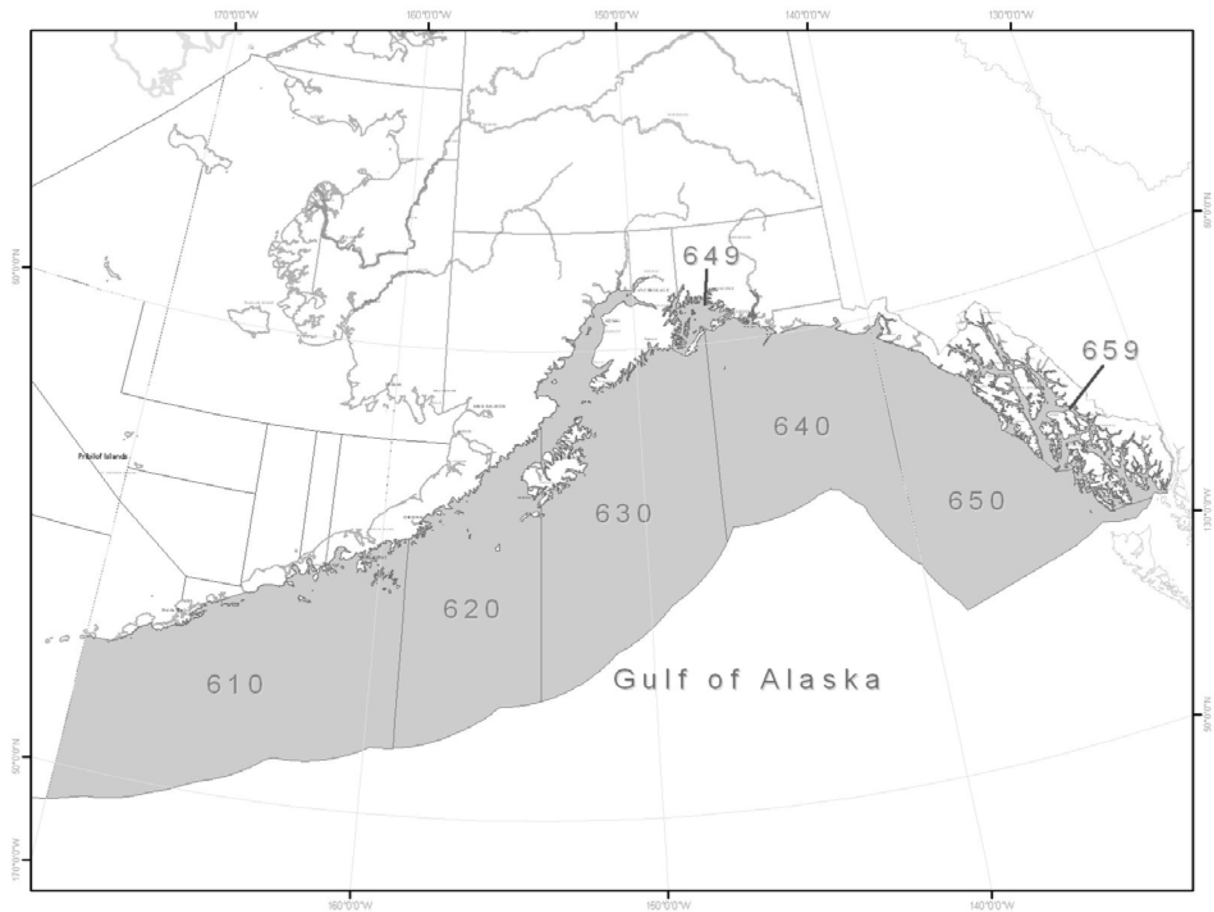


Figure 1-2 Gulf of Alaska (GOA) management area



2.0 Descriptions of Alternatives

2.1 Introduction

This chapter describes the five 2004 harvest specifications alternatives. This chapter also describes five options and two suboptions for the treatment of skates in the annual specifications (contingent on Secretarial approval of Amendment 63 to the GOA FMP).

Harvest specifications are a complex set of management measures used to control groundfish fishing. These measures include TAC and PSC limits and the seasonal and area apportionments and allocations of these limits. OFLs and ABCs are published with the harvest specifications and provide guidance to the Council and NMFS on the development of TACs. These values are scientifically developed based on the management schemes specified in the FMPs. The activities of the regulated community are controlled by the enforcement of TAC and PSC limits, apportionments, and allocations. TAC seasonal apportionments and allocations are specified in the regulations at 50 CFR 679. PSC limits are mostly set in regulation or are a result of the action of an international governing body, in the case of halibut and the International Pacific Halibut Commission. The Council does have discretion in how the PSC is apportioned and allocated, but these decisions are primarily driven by the available TAC to a sector. For instance, the Council will recommend an allocation of halibut PSC to the Pacific cod hook-and-line sector, based on the amount of Pacific cod TAC allocated to the sector, allowing for the potential full harvest of the available Pacific cod, while avoiding a fishery closure based on having reached the sector's halibut PSC limit. Because the harvest specifications are driven by the available TAC amounts and these amount are under the discretion of the Council for recommendations to NMFS, the alternatives in this analysis are based on a range of TACs.

Each of the five 2004 final harvest specifications alternatives represents alternative amounts of total allowable catch that could be set for managed species and species groups for fishing year 2004. The alternatives have been selected to display a wide range of ABCs and TACs, and their impacts to the environment. Fishing mortality (retained and discarded) is indicated as F. TAC specifications are harvest quotas that include both retained catch and discarded catch. The five alternatives are:

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

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

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

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

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

These alternatives have been changed somewhat from the alternatives used in earlier years. Changes to Alternatives 1, 2, and 5 involve wording changes meant to make the alternatives clearer. These alternatives have not been substantively changed. 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.

Skate specifications

At its October 2003 meetings, the Council received an EA/RIR/IRFA for a proposed Amendment 63 to the GOA groundfish FMP that would move skates from the "other species" category to the "target species" category. This would make it possible to set GOA skate OFLs, ABCs, and TACs in the annual specifications process. This action was proposed as a response to the emergence of a targeted skate fishery in the Central GOA for the first time in 2003. In 2003, skates were included under the "other species" category in the FMP, and this provided little control over potential skate harvests.

The Council took final action to adopt FMP Amendment 63 for Secretarial review, but deferred action on the specific method of including skates in specifications until the results of the 2003 GOA groundfish survey were available to the Council in December 2003. This EA/IRFA evaluates five options and two suboptions for incorporating skates into 2004 specifications as a target species should the Secretary of Commerce approve Amendment 63. The options and suboptions are described in section 2.4.

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

- ABCs for each of the five alternatives as recommended by the plan teams during their November 2003 meetings
- Estimated TACs for each of the five alternatives
- Options for skate target species specifications

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

Alternative	2003 Alternatives	2004 Alternatives	Comments
1	**Set *F* equal to $maxF_{ABC}$**. "$maxF_{ABC}$" refers to the maximum permissible value of F_{ABC} under Amendment 56. Historically, TAC has been constrained by ABC, so this alternative provides a likely upper limit for setting TAC within the limits established by the fishery management plan.	**Set TACs to produce fishing mortality rates, *F*, that are equal to $maxF_{ABC}$**. "$maxF_{ABC}$" refers to the maximum permissible value of F_{ABC} under Amendment 56. Historically, TAC has been set at or below ABC, so this alternative provides a likely upper limit for setting TAC within the limits of ABC.	The Council may recommend TAC above ABC but historically has not done this. This alternative is rephrased for increased clarity, but its substance is not changed. This alternative will generate BSAI TACs that, taken together, would violate OY - significantly.
2	**Preferred Alternative. Set *F* within the range of ABCs recommended by the Plan Team's and TACs recommended by the Council**. Under this scenario, *F* is set equal to a constant fraction of $maxF_{ABC}$, where this fraction is equal to the ratio of the F_{ABC} value recommended in the assessment to the $maxF_{ABC}$. The recommended fractions of $maxF_{ABC}$ may vary among species or stocks, based on other considerations unique to individual species or stocks.	**Set TACs that fall within the range of ABCs recommended by the Plan Team's and TACs recommended by the Council. (Preferred alternative)**. Under this scenario, *F* is set equal to a constant fraction of $maxF_{ABC.}$ The recommended fractions of $maxF_{ABC}$ may vary among species or stocks, based on other considerations unique to individual species or stocks.	This alternative is rephrased for increased clarity, but its substance is unchanged. Proposed specifications under this alternative would be developed based on SAFE report biomass and ABC projections for those species which have enough information to allow projections of allowable harvest. (In contrast to the practice, before 2002, of simply rolling over the current year's TACs for the following year's proposed TACs.) Final specifications would be based on December Council recommendations.
3	**Set *F* equal to 50% of $maxF_{ABC}$**. This alternative provides a likely lower bound on F_{ABC} that still allows future harvest rates to be adjusted downward should stocks fall below reference levels.	**For Tiers 1, 2, and 3, set TAC to produce *F* equal to 50% of $maxF_{ABC}$.** **For Tiers 4, 5, and 6, set TAC equal to 50% of TAC associated with $maxF_{ABC}$.** This alternative provides a likely lower bound on F_{ABC} that still allows future harvest rates to be adjusted downward should stocks fall below reference levels.	These are substantive changes. In 2003, estimates of ABC according to Alternative 3 and 4 definitions were not available for species classified as Tier 4, 5 or 6. In the absence of long-term biomass projections for those categories, no estimates could be made. These changes are meant to address this problem.
4	**Set *F* equal to the most recent five year average actual *F***. This alternative recognizes that for some stocks, TAC may be set well below ABC, and recent average *F* may provide a better indicator of F_{TAC} than F_{ABC}.	**For Tiers 1, 2, and 3, set TAC to produce *F* equal to the most recent five year average actual *F***. **For Tiers 4, 5, and 6, set TAC equal to the most recent five year average actual catch.** This alternative recognizes that for some stocks, TAC may be set well below ABC, and recent average *F* may provide a better indicator of F_{TAC} than F_{ABC}.	
5	**Set *F* equal to zero**. This alternative recognizes that, in extreme cases, TAC may be set at a level close to zero. This is the no action alternative. Alternative 5, effectively, "set all TACs equal to zero," has been chosen as the baseline alternative, against which the impacts of the other alternatives have been measured. This has been done to simplify the comparison of the alternatives and does not imply any preference among them.	**Set TAC equal to zero**. This alternative recognizes that, in extreme cases, TAC may be set at a level close to zero. This is the no action alternative.	This alternative is rephrased for increased clarity, but its substance is unchanged. This alternative is no longer identified as the baseline for analysis.

Note: The **status quo**, and the **baseline** against which the alternatives are to be evaluated, is the specifications for the preceding year. Alternative 5 is the **no action** alternative. Alternative 2 is the **preferred** alternative.

2.2 2004 Proposed ABCs

The annual specifications process begins with ABC determinations for each alternative by assessment authors and plan teams. The Council rarely sets TACs greater than ABCs. The Plan Team ABCs will therefore, as a practical matter, represent the maximum potential TAC associated with an alternative. The Plan Teams use the formulas described in section 2.0 for alternatives 1, 3, 4, and 5 to develop ABCs, providing guidance to the Council on the range of harvest levels within which TACs may be set. TACs associated with alternatives 1, 3, 4, and 5 will equal ABC levels because it is not possible to predict the adjustments of TAC that may be made by the Council, as captured in Alternative 2. TACs for Alternative 2 are often set below the ABC level based on Council recommendations.

Tables 2.2-1 and 2.2-2, below, summarize the ABCs associated with each of the alternatives. These ABCs are those developed by the BSAI and GOA Plan Teams during their November 2003 meetings. Alternative 2 ABCs are the Plan Team recommended ABCs and are highlighted in the tables.

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	2,560,000	2,560,000	1,400,000	1,240,000	0
	Aleutian Islands	67,400	39,400	36,000	900	0
	Bogoslof District	29,700	29,700	14,850	30	0
Pacific cod	BSAI	297,000	223,000	157,000	160,000	0
Sablefish	BS	3,300	3,010	1,700	2,000	0
	AI	3,810	3,450	1,970	2,310	0
Atka mackerel	Total	66,700	66,700	36,400	53,000	0
	WAI	24,400	24,400	13,316	19,388	0
	EAI/BS	11,200	11,200	6,112	8,900	0
	CAI	31,100	31,100	16,972	24,712	0
Yellowfin sole	BSAI	114,000	114,000	58,200	73,300	0
Rock sole	BSAI	139,000	139,000	72,400	31,000	0
Greenland turbot	Total	15,700	4,700	8,200	4,740	0
	BS	10,466	3,133	5,466	3,162	0
	AI	5,234	1,567	2,734	1,787	0
Arrowtooth flounder	BSAI	115,000	115,000	66,837	6,777	0
Flathead sole	BSAI	61,900	61,900	32,500	13,500	0
Alaska Plaice	BSAI	203,000	203,000	113,000	13,200	0
Other flatfish	BSAI	13,500	13,500	6,800	11,902	0
Pacific ocean perch	BSAI	13,300	13,300	6,700	10,300	0
	BS	2,128	2,128	1,072	1,648	0
	AI total	11,172	11,172	5,628	8,652	0
	WAI	5,150	5,150	2,595	3,989	0
	CAI	2,938	2,938	1,480	2,275	0
	EAI	3,083	3,083	1,553	2,388	0
Northern rockfish	BSAI	6,880	6,880	3,490	4,440	0
	BS	19	19	9	12	0
	AI	6,860	6,860	3,481	4,428	0
Shortraker	BSAI	526	526	263	479	0
	BS	84	84	42	69	0
	AI	442	442	221	410	0
Rougheye	BSAI	195	195	98	178	0
	BS	21	21	11	17	0
	AI	174	174	87	161	0
Other rockfish	BS	960	960	480	250	0
	AI	634	634	317	534	0
Squid	BSAI	1,970	1,970	985	699	0

Sharks	BSAI	1,980	1,980	990	802	0
Skates	BSAI	36,300	36,300	18,150	14,712	0
Sculpins	BSAI	23,800	23,800	11,900	9,646	0
Octopi	BSAI	1,120	1,120	560	454	0
Total		3,777,675	3,664,025	2,049,790	1,655,153	0

Notes

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

The November 2003 BSAI Plan Team suggested breaking out the BSAI "Other species" category with separate OFLs, ABCs and TACs for each of its constituent species (sharks, skates, sculpins, and octopi). Table 2.2-1 shows the ABCs for these species broken out in this way. It is not clear that it will be possible to do this breakout through specifications, without an amendment to the BSAI FMP.

Table 2.2-2, below, summarizes the GOA Plan Team's ABCs developed for Alternatives 1 to 5. In this table, skates have been included in the "other species" category. At its October, 2003, meetings, the Council voted to adopt GOA FMP Amendment 63, which would move skates from the "other species" category in the FMP, and add it to the "target species" category. However, until the FMP Amendment is approved by the Secretary of Commerce, skates must be treated as a part of the "other species" category. Other sections of this EA/IRFA evaluate options for implementing skates management separately in specifications, contingent on approval of Amendment 63 by the Secretary.

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	41,608	22,932	21,547	40,148	0
	620	48,061	26,488	24,889	46,374	0
	630	25,471	14,038	13,190	24,577	0
	640	2,326	1,282	1,205	2,244	0
Subtotal WYK/C/W		117,466	64,740	60,831	113,343	0
	650	6,520	6,520	3,260	4	0
Total GOA		123,986	71,260	64,091	113,347	0
Pacific cod (2)	GOA	71,200	62,800	37,500	48,000	0
	W	25,632	22,608	13,500	17,280	0
	C	40,584	35,796	21,375	27,360	0
	E	4,984	4,396	2,625	3,360	0
Flatfish	GOA	52,070	52,070	26,035	5,290	0
Shallow water	W	21,580	21,580	10,790	2,192	0
	C	27,250	27,250	13,625	2,768	0
	WYK	2,030	2,030	1,015	207	0
	SEO	1,210	1,210	605	123	0
Rex sole	GOA	12,650	12,650	6,325	3,055	0
	W	1,680	1,680	840	406	0
	C	7,340	7,340	3,670	1,772	0
	WYK	1,340	1,340	670	324	0
	SEO	2,290	2,290	1,145	553	0
Flathead sole	GOA	51,720	51,720	28,130	2,085	0
	W	13,410	13,410	7,340	541	0
	C	34,430	34,430	18,846	1,388	0
	WYK	3,430	3,430	1,877	138	0
	SEO	450	450	246	18	0
Flatfish	GOA	6,070	6,070	3,035	1,384	0
Deep water	W	310	310	155	71	0
	C	2,970	2,970	1,485	677	0

Species	Area	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5
	WYK	1,880	1,880	940	429	0
	SEO	910	910	455	207	0
Arrowtooth flounder	GOA	194,930	194,930	100,136	14,962	0
	W	23,590	23,590	12,118	1,811	0
	C	151,840	151,840	77,999	11,654	0
	WYK	10,590	10,590	5,440	813	0
	SEO	8,910	8,910	4,577	684	0
Sablefish (3)	GOA	18,272	16,550	13,100	15,400	0
	W	3,235	2,930	2,319	2,726	0
	C	8,060	7,300	5,778	6,795	0
	WYK	2,815	2,550	2,018	2,373	0
	SEO	4,162	3,770	2,984	3,510	0
Pacific ocean perch	GOA	13,340	13,340	6,761	10,756	0
	W	2,520	2,520	1,285	2,044	0
	C	8,390	8,390	4,279	6,776	0
	WYK	830	830	416	661	0
	SEO	1,600	1,600	801	1,275	0
Shortraker/rougheye	GOA	2,040	1,760	1,014	1,825	0
	W	388	335	193	347	0
	C	1,014	875	504	908	0
	E	638	550	317	570	0
Other rockfish	GOA	3,900	3900	2,007	875	0
	W	40	40	21	9	0
	C	300	300	156	68	0
	WYK	128	130	66	29	0
	SEO	3,430	200	1,764	769	0
Northern rockfish	GOA	4,870	4,870	2,468	2,542	0
	W	770	770	2,076	2,138	0
	C	4,100	4,100	392	404	0
	E	0	0	0	0	0
Pelagic shelf rockfish	GOA	4,470	4,470	2,264	3,562	0
	W	370	370	188	296	0
	C	3,010	3,010	1,524	2,397	0
	WYK	210	210	309	487	0
	SEO	880	880	243	382	0
Thornyhead rockfish	GOA	2,818	1,940	1,431	1,359	0
	W	592	407	301	285	0
	C	1,465	1,009	744	707	0
	E	761	524	386	367	0
Demersal shelf rockfish	SEO	560	450	280	450	0
Atka mackerel	GW	4,700	600	2,350	232	0
Subtotal		567,596	499,380	296,927	225,124	0
Other species (4)	GW	28,380	24,969	14,846	11,256	0
Total		595,976	524,349	311,773	236,380	0

Notes

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

2.3 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 ABCs recommended by the Plan Teams at their November 2003 meetings and the 2003 TACs. 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. This is the intent of the alternative language. While the sum of the Alternative 1 ABCs exceeds the BSAI annual optimal yield (OY), NEPA alternatives do not have to be currently authorized by law to be included in the analysis. Setting the TACs equal to ABCs is consistent with the language of the alternatives, and provides for a high-TAC alternative.

Regulations at 50 CFR §679.20(a) specify that the annual OY for groundfish in the BSAI is 1.4 million to 2.0 million metric tons. The OY 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 OY 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. For the final harvest specifications recommendations, 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	2,560,000	1,491,760	1,400,000	1,240,000	0
	Aleutian Islands	67,400	1,000	36,000	900	0
	Bogoslof District	29,700	50	14,850	30	0
Pacific cod	BSAI	297,000	207,500	157,000	160,000	0
Sablefish	BS	3,300	2,900	1,700	2,000	0
	AI	3,810	3,100	1,970	2,310	0
Atka mackerel	Total	66,700	60,000	36,400	53,000	0
	WAI	24,400	19,990	13,316	19,388	0
	EAI/BS	11,200	10,650	6,112	8,900	0
	CAI	31,100	29,360	16,972	24,712	0
Yellowfin sole	BSAI	114,000	83,750	58,200	73,300	0
Rock sole	BSAI	139,000	44,000	72,400	31,000	0
Greenland turbot	Total	15,700	4,000	8,200	4,740	0
	BS	10,466	2,680	5,466	3,162	0
	AI	5,234	1,320	2,734	1,787	0
Arrowtooth flounder	BSAI	115,000	12,000	66,837	6,777	0
Flathead sole	BSAI	61,900	20,000	32,500	13,500	0
Alaska Plaice	BSAI	203,000	10,000	113,000	13,200	0
Other flatfish	BSAI	13,500	3,000	6,800	11,902	0
Pacific ocean perch	BSAI	13,300	13,300	6,700	10,300	0
	BS	2,128	1,410	1,072	1,648	0
	AI total	11,172	11,172	5,628	8,652	0
	WAI	5,150	5,150	2,595	3,989	0
	CAI	2,938	2,938	1,480	2,275	0
	EAI	3,083	3,083	1,553	2,388	0
Northern rockfish	BSAI	6,880	6,000	3,490	4,440	0
	BS	19	19	9	12	0
	AI	6,860	5,879	3,481	4,428	0
Shortraker	BSAI	526	526	263	479	0
	BS	84	84	42	69	0
	AI	442	442	221	410	0
Rougheye	BSAI	195	195	98	178	0

	BS	21	21	11	17	0
	AI	174	174	87	161	0
Other rockfish	BS	960	960	480	250	0
	AI	634	634	317	534	0
Squid	BSAI	1,970	1970	985	699	0
Sharks	BSAI	1,980	1,980	990	802	0
Skates	BSAI	36,300	36,300	18,150	14,712	0
Sculpins	BSAI	23,800	23,800	11,900	9,646	0
Octopi	BSAI	1,120	1,120	560	454	0
Total		3,777,675	2,029,845	2,049,790	1,655,153	0

Notes

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

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

Species	Area	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5
Pollock (1)	610	41,608	22,932	21,547	40,148	0
	620	48,061	26,488	24,889	46,374	0
	630	25,471	14,038	13,190	24,577	0
	640	2,326	1,282	1,205	2,244	0
Subtotal WYK/C/W		117,466	64,740	60,831	113,343	0
	650	6,520	6,520	3,260	4	0
Total GOA		123,986	71,260	64,091	113,347	0
Pacific cod (2)	GOA	71,200	48,475	37,500	48,000	0
	W	25,632	16,956	13,500	17,280	0
	C	40,584	27,563	21,375	27,360	0
	E	4,984	3,956	2,625	3,360	0
Flatfish	GOA	52,070	20,740	26,035	5,290	0
Shallow water	W	21,580	4,500	10,790	2,192	0
	C	27,250	13,000	13,625	2,768	0
	WYK	2,030	2,030	1,015	207	0
	SEO	1,210	1,210	605	123	0
Rex sole	GOA	12,650	12,650	6,325	3,055	0
	W	1,680	1,680	840	406	0
	C	7,340	7,340	3,670	1,772	0
	WYK	1,340	1,340	670	324	0
	SEO	2,290	2,290	1,145	553	0
Flathead sole	GOA	51,720	10,880	28,130	2,085	0
	W	13,410	2,000	7,340	541	0
	C	34,430	5,000	18,846	1,388	0
	WYK	3,430	3,430	1,877	138	0
	SEO	450	450	246	18	0
Flatfish	GOA	6,070	6,070	3,035	1,384	0
Deep water	W	310	310	155	71	0
	C	2,970	2,970	1,485	677	0
	WYK	1,880	1,880	940	429	0
	SEO	910	910	455	207	0
Arrowtooth flounder	GOA	194,930	38,000	100,136	14,962	0
	W	23,590	8,000	12,118	1,811	0
	C	151,840	25,000	77,999	11,654	0
	WYK	10,590	2,500	5,440	813	0
	SEO	8,910	2,500	4,577	684	0
Sablefish (3)	GOA	18,272	16,550	13,100	15,400	0
	W	3,235	2,930	2,319	2,726	0

Species	Area	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5
	C	8,060	7,300	5,778	6,795	0
	WYK	2,815	2,550	2,018	2,373	0
	SEO	4,162	3,770	2,984	3,510	0
Pacific ocean perch	GOA	13,340	13,340	6,761	10,756	0
	W	2,520	2,520	1,285	2,044	0
	C	8,390	8,390	4,279	6,776	0
	WYK	830	830	416	661	0
	SEO	1,600	1,600	801	1,275	0
Shortraker/rougheye	GOA	2,040	1,760	1,014	1,825	0
	W	388	335	193	347	0
	C	1,014	875	504	908	0
	E	638	550	317	570	0
Other rockfish	GOA	3,900	670	2,007	875	0
	W	40	40	21	9	0
	C	300	300	156	68	0
	WYK	128	130	66	29	0
	SEO	3,430	200	1,764	769	0
Northern rockfish	GOA	4,870	4,870	2,468	2,542	0
	W	770	770	2,076	2,138	0
	C	4,100	4,100	392	404	0
	E	0	0	0	0	0
Pelagic shelf rockfish	GOA	4,470	4,470	2,264	3,562	0
	W	370	370	188	296	0
	C	3,010	3,010	1,524	2,397	0
	WYK	210	210	309	487	0
	SEO	880	880	243	382	0
Thornyhead rockfish	GOA	2,818	1,940	1,431	1,359	0
	W	592	407	301	285	0
	C	1,465	1,009	744	707	0
	E	761	524	386	367	0
Demersal shelf rockfish	SEO	560	450	280	450	0
Atka mackerel	GW	4,700	600	2,350	232	0
Subtotal		567,596	252,725	296,927	225,124	0
Other species (4)	GW	28,380	12,636	14,846	11,256	0
Total		595,976	265,361	311,773	236,380	0

Notes

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

2.4 GOA skate specifications options

At its October 2003 meetings, the Council received an EA/RIR/IRFA for a proposed Amendment 63 to the GOA groundfish FMP that would move skates from the “other species” category to the “target species” category. This would make it possible to set GOA skate OFLs, ABCs, and TACs in the annual specifications process. This action was proposed as a response to the emergence of a targeted skate fishery in the Central GOA for the first time in 2003. Skates are included under the “other species” category in the FMP, and this provided little control over potential skate harvests. The Council took final action to approve GOA FMP Amendment 63, but deferred action on the specific method of managing skates by specifications until the results of the 2003 GOA groundfish survey were available to the Council in December 2003.

This EA/IRFA evaluates five options and two suboptions for incorporating skates into 2004 specifications as a target species. Key issues differentiating the options are (1) whether or not to treat all skates as a group, or to break out separate species, and (2) whether to set OFL and ABC levels GOA-wide, or at the management area level within the GOA. The suboptions would provide further guidance to NMFS on how the skate directed fishery is to be managed under each option. A suboption may be adopted with any option. The analysis of the suboptions will provide information regarding the potential impacts of having or not having a skate directed fishery.

Options

Option 1: GOA-wide OFL and GOA-wide ABC for all skates (grouped together).

Option 2: GOA-wide OFL and GOA-wide ABC for Big skates, Longnose skates, and "other" skates.

Option 3: Management area OFLs and ABCs for Big skates, Longnose skates, and for "other" skates.

Option 4: Management area (Eastern, Central and Western GOA) OFLs and ABCs for Big skates and Longnose skates, and GOA-wide OFL and ABC for "other" skates. This is the assessment author's recommendation.

Option 5: A GOA-wide OFL would be established for all species combined. ABCs would be established in each management area in the GOA as Big/Longnose skate groupings. A GOA-wide ABC would be established for "other" skates. In the Central GOA a TAC would be established for combined Big and Longnose skate catch. This TAC will equal 10% of the estimated biomass of big skates in the Central Area (this would have been the OFL for Big skates in this area if such an OFL had been promulgated) The Plan Team explicitly stated that this was meant to be a single year arrangement and that it should be reviewed during the 2005 specifications process. This was the recommendation of the GOA Plan Team at its November 2003 meetings.

Suboptions

Suboption 1: Set TAC at the ABC or a lower level sufficient to meet anticipated incidental catch needs in other directed fisheries throughout the fishing year. The result in skates being on bycatch status throughout the fishing year. Skates could be retained up to the maximum retainable amount (20%), but there would be no directed fishing for skates.

Suboption 2: Set TAC at the ABC level. The result would be the Regional Administrator would establish a directed fishing allowance for each applicable species group and management area adopted under the selected option. For the species and areas adopted under the selected option where the TAC amount exceeds the amount of anticipated incidental catch needs in other directed fisheries throughout the fishing year, a directed fishery for skates would be authorized.

Detailed description of skate options

<u>1 A single GOA wide OFL for the skate group, and a single GOA wide ABC for the skate group</u> An OFL and ABC would be adopted for the entire GOA. Based on the average biomass in the last three GOA trawl surveys, and an estimated natural mortality rate (M) of 0.10 for skate species, the 2004 OFL would

be set at 10,859 mt. The ABC would be set at 8,144 mt, as shown in Table 2.4-1. The TAC would be set equal to or less than the ABC.

Table 2.4-1 Option 1: skate OFL and ABC for 2004 (values in mt)

	OFL[1]	ABC[2]
GOA wide Skates Total	10,859	8,144

[1]Average survey biomass*M
[2]OFL*0.75

<u>2 Separate GOA-wide OFLs and GOA-wide ABCs for Big skates, Longnose skates, and "other" skates</u>
OFLs and ABCs would be adopted for the entire GOA for Big skates, Longnose skates and "other skates". The Big skate OFL would be 5,332 and the ABC would be 3,999. The Longnose skate OFL would be 3,758 and the ABC would be 2,818. The "other" skates OFL would be 1,769, and the ABC would be 1,327. The OFLs and ABCs are summarized in Table 2.4-2.

Table 2.4-2 Option 2 skate species specific GOA-wide OFL and ABC for 2004 (values in mt)

Skates	OFL[1]	ABC[2]
Big skates	5,332	3,999
Longnose skate	3,758	2,818
"Other" skates	1,769	1,327
Total	10,859	8,144

[1]Average survey biomass*M
[2]OFL*0.75

<u>3 Management area OFLs and ABCs for Big, Longnose, and "other" skate species:</u> This option wold establish separate OFLs, ABCs, and TACs for the Longnose skates, Big skates, and the "other" skate species group for each of the management areas (Western , Central, and Eastern) within the GOA. Table 2.4-3 shows the proposed area OFLs and ABCs under this option.

Table 2.4-3 Option 3: Management area OFLs and ABCs for Big, Longnose, and "other" skate species for 2004 (values in mt)

	Western		Central		Eastern	
Skates	**OFL[1]**	**ABC[2]**	**OFL[1]**	**ABC[2]**	**OFL[1]**	**ABC[2]**
Big skate	969	727	3,284	2,463	1,079	809
Longnose skate	88	66	2,630	1,972	1,040	780
Other skates	345	97	1,294	971	130	259
Total	1,402	890	7,208	5,406	2,249	1,848

[1]Average survey biomass*M
[2]OFL*0.75

4 Management area OFLs and ABCs for Big skates and Longnose skates, and a GOA-wide OFL and ABC for "other" skates   This is the assessment author's recommendation. This is similar to Option 3, in that it creates separate OFLs and ABCs for the Longnose and Big skate species. This differs from Option 3 in that it sets the "other" skates OFL and ABC at the GOA-wide level rather than at the management area level. Table 2.4-4 shows the proposed area OFLs and ABCs under this option.

Table 2.4.4 Option 4: Management area OFLs and ABCs for Big and Longnose skate species for 2004 (values in mt)

	GOA-wide		Western		Central		Eastern	
	OFL[1]	ABC[2]	OFL[1]	ABC[2]	OFL[1]	ABC[2]	OFL[1]	ABC[2]
big skate	n.a.	n.a.	969	727	3,284	2,463	1,079	809
longnose skate	n.a.	n.a.	88	66	2,630	1,972	1,040	780
Other skates	1,769	1,327	na	na	na	na	na	na

[1]Average survey biomass*M
[2]OFL*0.75

5 A single GOA wide OFL for skates, an ABC for a Big and Longnose skate grouping in each management area, a TAC for the combined harvest of Big and Longnose skates in the Central GOA, a single GOA-wide ABC for "other skates": A GOA-wide OFL would be established for all species combined. ABCs would be set for a Big/Longnose skate grouping in each management area. A GOA-wide ABC would be set for "other" skates. In the Central GOA, a TAC would be established for the combined Big/ Longnose skate catch. This TAC will equal 10% of the estimated biomass of Big skates in the Central Area (this would have been the OFL for Big skates in this area if such an OFL had been promulgated) The Plan Team explicitly stated that this was meant to be a single year arrangement and that it should be reviewed during the 2005 specifications process. This was the recommendation of the GOA Plan Team at its November 2003 meetings.

Table2.4-5 Option 5: A single GOA wide OFL for skates, ABCs for Big and Longnose skate species groupings in each management area, and a TAC for combined Big/Longnose skate harvests in the Central Gulf (values in mt)

	Western	Central	Central	Eastern
Skates	ABC[2]	ABC[2]	TAC[1]	ABC[2]
big and longnose skates	792	4,436	3,284	1,589
Other skates	1,327			
GOA wide OFL	10,859			

[1]10 % of estimated Big skate biomass in Central GOA.
[2]OFL*0.75

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 non-traditional 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 specific species identification of skates (and many other non-target groups) 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-November 6, 2003 (NMFS 2003b). For more information see the http://www.fakr.noaa.gov/sustainablefisheries/seis/default.htm website.

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

The other NEPA documents listed above contain extensive information on the fishery management areas, marine resources, ecosystem, social and economic parameters of these fisheries and the TAC setting process. Rather than duplicate an affected environment description here, readers are referred to those documents. Additionally, the Ecosystem Considerations section of the 2003 SAFE reports is included as Appendix C to this EA. It contains summaries and pointers to recent studies and information applicable to understanding and interpreting the criteria used to evaluate significance of impacts that will result from setting harvest quotas at levels contemplated under the alternatives.

3.2 GOA skate specifications related analyses

For purposes of analyzing the effects of skate specifications, 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)

The reader is referred to the first annual SAFE document prepared for skates, which is included with the other GOA SAFE documents as part of Appendix B to this EA, for information on the biology of GOA skates and for details on the management of the skate fishery. The targeted skate fishery emerged in the GOA in 2003. The emergence of this fishery is described in section 1.3 of this EA.

4.0 Environmental Effects

4.1 Significance Criteria

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

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

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

Each section below contains an explanation of the significance criteria. The following ratings for significance are used; beneficial significance, adverse significance,, insignificant, and unknown. Where sufficient information on direct and indirect effects is available, rating criteria are quantitative in nature. In other instances, where less information is available, the discussions and rating criteria used are qualitative in nature. In instances where criteria to determine an aspect of significance (significant adverse, insignificant, or significant beneficial) do not logically exist, no criteria are noted. These situations are termed “not applicable” in the criteria tables. An example of an instance where criteria do not logically exist, is the evaluation of the impact vector of incidental take on a declining stock of marine mammals. In that situation, an increase in incidental take that caused a downward change in the population trajectory by greater than 10% is significant adverse. Any level below that which would have an effect on population trajectories is insignificant because the stock is continuing to decline regardless of fishery effects. There is no logical significant beneficial alternative (a reduction in take resulting in a beneficial effect on the population trajectory). Therefore, a criterion for significant beneficial is not applicable (NMFS 2003b).

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

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

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

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

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

NE No effect is anticipated from implementation of the action.

Table 4.1-1 Reference points for significance determinations

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

4.2 Effects on Target Species

The general impacts of fishing mortality within FMP Amendment 56/56 ABC/OFL definitions are discussed in Section 4.1.3 of the Draft PSEIS (NMFS 2003b), and apply to all fish species for which a TAC is specified. Since 2002, a modified harvest control rule applies to the directed fisheries for pollock, Pacific cod, and Atka mackerel and results in no directed fisheries when the spawning biomass is estimated to be less than 20% of the projected unfished spawning biomass. This new harvest control rule was evaluated in the Steller Sea Lion Protection Measures SEIS (NMFS 2001b).

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

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

The reference point against which each question is assessed is the current population trajectory or harvest rate of the subject target fish species (Table 4.2-1).

Analyses are prepared for each stock, species or species group in the Bering Sea and Aleutian Islands and the Gulf of Alaska and are contained in the stock assessment and fishery evaluation (SAFE) reports (Appendices A and B). The criteria used to estimate the significance of direct and indirect impacts of TAC setting Alternatives 1 through 5 on the BSAI and GOA stocks of target species are summarized in Table 4.2-1.

The 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). It is currently impossible to evaluate the status of stocks in Tiers 4 through 6 with respect to their MSSTs because stocks qualify for management under these tiers only if reference stock levels (such as MSST) cannot be estimated reliably. The SAFE reports also include Alternatives 6 and 7 which are intended to permit determination of the status of a stock with respect to its MSST. Any stock that is below its MSST is defined to be overfished. Any stock that is expected to fall below its MSST in the nest two years is defined to be approaching an overfished condition.

Under all alternatives, the spawning stock biomass of all target species that have calculated spawning stock biomasses are expected to be above their MSST. With Alternatives 6 and 7 analysis the probability that overfishing would occur is low for all of the stocks. The target species stocks that have calculated MSSTs (Tiers 1 through 3) are currently above their MSSTs and the expected changes that would result from harvest at the levels proposed are not substantial enough to expect that the genetic diversity or 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 4.2-1 Criteria used to estimate the significance of effects on targeted groundfish stocks in the Bering Sea, Aleutian Islands, and Gulf of Alaska

Intensity of the Effects				
Direct Effects	Significant Adverse	Unknown	Insignificant Impact	Significant Beneficial
Fishing mortality	Reasonably expected to jeopardize the capacity of the stock to produce MSY on a continuing basis: 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 and temporal distribution of catch; Leads to change in genetic structure of population	Evidence of genetic sub-population structure and evidence that the distribution of harvest leads to a detectable reduction in genetic diversity such that it jeopardizes the ability of the stock to sustain itself at or above the MSST	MSST and genetic structure is unknown, therefore no information to evaluate whether distribution of the catch changes the genetic structure of the population such that it jeopardizes *or* enhances the ability of the stock to sustain itself at or above the MSST	Evidence that the distribution of harvest is *not* sufficient to alter the genetic sub-population structure such that it jeopardizes the ability of the stock to sustain itself at or above the MSST	Evidence of genetic sub-population structure and evidence that the distribution of harvest leads to a detectable increase in genetic diversity such that it enhances the ability of the stock to sustain itself at or above the MSST

Intensity of the Effects				
Direct Effects	Significant Adverse	Unknown	Insignificant Impact	Significant Beneficial
Change in reproductive success	Evidence that the distribution of harvest leads to a detectable decrease in reproductive success such that it jeopardizes the ability of the stock to sustain itself at or above MSST	MSST is unknown therefore no information regarding the potential impact of the distribution of the catch on reproductive success such that it jeopardizes *or* enhances the ability of the stock to sustain itself at or above the MSST	Evidence that the distribution of harvest will *not* change reproductive success such that it jeopardizes the ability of the stock to sustain itself at or above the MSST	Evidence that the distribution of harvest leads to a detectable increase in reproductive success such that it enhances the ability of the stock to sustain itself at or above MSST
Change in prey availability	Evidence that current harvest levels and distribution of harvest lead to a change prey availability such that it jeopardizes the ability of the stock to sustain itself at or above the MSST	MSST is unknown therefore no information that current harvest levels and distribution of harvest lead to a change in prey availability such that it enhances *or* jeopardizes the ability of the stock to sustain itself at or above the MSST	Evidence that current harvest levels and distribution of harvest do *not* lead to a change in prey availability such that it jeopardizes the ability of the stock to sustain itself at or above the MSST	Evidence that current harvest levels and distribution of harvest lead to a change in prey availability such that it enhances the ability of the stock to sustain itself at or above the MSST
Habitat: Change in suitability of spawning, nursery, or settlement habitat, etc. due to fishing	Evidence that current levels of habitat disturbance are sufficient to lead to a decrease in spawning or rearing success such that it jeopardizes the ability of the stock to sustain itself at or above the MSST	MSST is unknown therefore no information that current levels of habitat disturbance are sufficient to lead to a detectable change in spawning or rearing success such that it enhances *or* jeopardizes the ability of the stock to sustain itself at or above the MSST	Evidence that current levels of habitat disturbance are not sufficient to lead to a detectable change in spawning or rearing success such that it jeopardizes the ability of the stock to sustain itself at or above the MSST	Evidence that current levels of habitat disturbance are sufficient to lead to an increase in spawning or rearing success such that it enhances the ability of the stock to sustain itself at or above the MSST

4.3 Effects on Incidental Catch of Non-specified Species

The non-specified species category contains a huge diversity of species, including invertebrates, that are not defined in the FMP as target, other, forage, or prohibited species, except for animals protected under the MMPA or the ESA. Jellyfish and grenadiers, a group of deep-sea species related to hakes and cods, appear to have dominated non-specified catches in recent years. (Grenadier biology and management are discusses in Section 3.5.5.1 of the Draft PSEIS (NMFS 2003b)). Other non-specified species caught in recent years include prowfish, smooth lumpsucker, eels, sea cucumbers, Pacific lamprey, greenling, and Pacific hagfish.

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

The information available for non-specified species is much more limited than that available for target fish species. Estimates of biomass, seasonal distribution of biomass, and natural mortality are unavailable for most non-specified species. Management concerns, data limitations, research in progress, and planned research to address these concerns are discussed in Section 5.1.2.6 of the Draft PSEIS (NMFS 2003b).

Predictions of impacts from different levels of harvest are therefore qualitatively described. Direct effects include the removal of non-specified species from the environment as incidental catch in the groundfish fisheries. The reference point against which significance was assessed was the current population trajectory or harvest rate of the non-specified species. For analytical purposes, this is assumed to be a 2003 trajectory or rate. The current trajectory or rate significance criterion had been used in the Steller Sea Lion Protection Measures SEIS (Table 4.0-1 of NMFS 2001b). The criterion for evaluating significance was whether a substantial difference in bycatch amount would occur (+>50% = adverse or - > 50%=beneficial). Indirect effects include habitat disturbance by fishing gear and disruption of food web interactions by disproportionate removal of one or more trophic levels. No attempt was made to evaluate the significance of indirect effects.

Insufficient information exists to estimate the indirect effects of changes in the incidental catch of non-specified species. Indicators of ecosystem function relating to non-specified species are summarized in a table at the start of Appendix C to this EA, on “Ecosystems Considerations for 2004.”

Qualitative estimates of the direction of change in non-specified species harvests are made assuming that non-specified harvests are roughly proportional to target species harvests. Alternatives which constrain target harvests relative to those in 2003 are assume to reduce non-specified species harvests relative to 2003, those that allow larger harvests are assumed to permit larger harvests of non-specified species. Alternative 1 allows larger harvests of target species in and could thus be associated with larger harvests of non-specified species. Alternative 2 is associated with target harvests that are, in general similar to those in 2003. Alternatives 3 and 4 are associated with lower harvests than in 2003, and Alternative 5 is associated with no harvests. Because of the lack of information on the relationship between changes in target harvests and changes in non-specified species harvests, Alternatives 1, 3 and 4 have been given an “unknown” rating. Alternative 2 has been rated “insignificant” due to the relatively minor harvest changes likely to be associated with it. Alternative 5, which does not permit target harvests is assumed to end non-specified harvests as well, and has been given a “positively significant” rating.

4.4 Effects on Forage Fish Species

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

Management concerns, data limitations, research in progress, and planned research to address these concerns are discussed in Section 5.1.2.5 of the Draft PSEIS (NMFS 2003b) and the Ecosystems Considerations for 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 4.1-1). For analysis purposes, this is assumed to be rates in 2003. 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 33 mt and in the GOA of 148[9] mt (2000 to 2002) 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."

Qualitative estimates of the direction of change in forage fish species harvests are made assuming that forage fish harvests are roughly proportional to target species harvests. Alternatives which constrain target harvests relative to those in 2003 are assume to reduce forage fish harvests relative to 2003, those that allow larger harvests are assumed to permit larger harvests of forage fish. Direct and indirect forage fish impacts are assumed to be correlated with forage fish catches, and thus with target species catches. Alternative 1 allows larger harvests of target species in and could thus be associated with larger harvests of forage fish. Alternative 2 is associated with target harvests that are, in general similar to those in 2003. Alternatives 3 and 4 are associated with lower harvests than in 2003, and Alternative 5 is associated with

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

no harvests. Because of the lack of information on the relationship between changes in target harvests and changes in forage fish harvests, Alternatives 1, 3 and 4 have been given an “unknown” rating. Alternative 2 has been rated “insignificant” due to the relatively minor harvest changes likely to be associated with it. Alternative 5, which does not permit target harvests is assumed to end forage fish harvests as well, and has been given a “positively significant” rating.

4.5 Effects on Prohibited Species

Prohibited species in the groundfish fisheries include: Pacific salmon (chinook, coho, sockeye, chum, and pink and ESA listed salmon in Table 6.0-2), steelhead trout, Pacific halibut, Pacific herring, and Alaska king, Tanner, and snow crab. The most recent review of the status of crab stocks may be found in the 2002 Crab SAFE report (NPFMC 2002).

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

The effects of the groundfish fisheries in the BSAI and GOA on prohibited species are primarily managed by conservation measures developed and recommended by the Council over the entire history of the FMPs for the BSAI and GOA and implemented by federal regulation. These measures can be found at 50 CFR part 679.21 and include prohibited species catch (PSC) limitations on a year round and seasonal basis, year round and seasonal area closures, gear restrictions, and an incentive plan to reduce the incidental catch of prohibited species by individual fishing vessels. These management measures are discussed in Section 3.5 of the Steller Sea Lion SEIS (NMFS 2001b) and in a review paper by Witherell and Pautzke (1997).

This analysis focuses on the effects of the 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; when escapement levels exceed goals, commercial fishing activities are enhanced by longer open seasons. In instances where minimum escapement goals are not met, sport and subsistence fishing activities may also be curtailed. The benchmark used to determine the significance of effects under each alternative on salmon stocks was whether or not salmon minimum escapement needs would reasonably be expected to be met. If the alternative was reasonably not expected to jeopardize the capacity of the salmon stocks to produce long term sustainable yields it was deemed insignificant; if the alternative was reasonably expected to jeopardize the capacity of the salmon stocks to produce long term sustainable yields it was deemed significantly adverse; and where insufficient information exists to make such conclusions, the alternative's effects were rated unknown.

The impact of the groundfish fisheries on ESA listed salmon is limited to incidental take during groundfish harvest. Designated critical habitat for ESA listed salmon does not occur in the EEZ. The potential impacts of implementation of Steller sea lion protection measures on ESA listed salmon was determined to be insignificant in the Steller sea lion protection measures SEIS (section 4.6.4, NMFS 2001b). No new information is available on the effects of the groundfish fisheries on listed salmon beyond that used for the FMP level Biop. (NMFS 2000a). The incidental take statement for listed salmon is 55,000 chinook salmon in the BSAI and 40,000 Chinook salmon in the GOA. Chinook salmon incidental catch through 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 are expected for the 2004 groundfish fisheries. Informal consultation for ESA listed salmon was completed on November 26, 2002 for the 2003 groundfish fisheries with a finding of not likely to adversely affect ESA listed salmon species. No consultation was initiated on salmon because these actions fall within the scope of previously analyzed actions and no additional adverse effects are expected and no new information is available or environmental changes have occurred.

The International Pacific Halibut Commission (IPHC) is responsible for the conservation of the Pacific halibut resource. The IPHC uses a policy of harvest management based on 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 be expected to lower the total CEY of the halibut stock below the long term estimated yield of 36,287 mt. If the alternative was reasonably not expected to decrease the total CEY of the halibut stock below the long term estimated yield of 36,287 mt it was rated insignificant, if the alternative was reasonably expected to lower the total CEY of the halibut stock below the long term estimated yield of 36,287 mt it was rated significantly adverse, and where insufficient information exists to make such conclusions the alternative's effects were rated unknown.

Pacific herring are managed by the State of Alaska on a sustained yield principal. Pacific herring are surveyed each year and the Guideline Harvest Levels (GHLs) are based on an exploitation rate of 20% of the projected spawning biomass, these GHLs may be adjusted inseason based on additional survey information to insure long term sustainable yields. The ADF&G have established minimum spawning biomass thresholds for herring stocks that must be met before a commercial fishery may occur. The benchmark used to determine the significance of effects under each alternative on herring stocks was whether minimum spawning biomass threshold levels could be reasonably expected to be met. If the alternative was reasonably not expected to jeopardize the capacity of the herring stocks to reach minimum spawning biomass threshold levels, it was deemed insignificant; if the alternative was reasonably expected to jeopardize the capacity of the herring stocks to reach minimum spawning biomass threshold levels it was rated significantly adverse; and where insufficient information exists to make such conclusions the alternative's effects were rated unknown.

Alaska king, Tanner, and snow crab stocks in the BSAI are protected by area trawl closures and PSC limitations. Minimum stock size thresholds (MSST) have been established for these crab species stocks to help prevent overfishing. The benchmark used to determine the significance of effects under each alternative on crab stocks was whether MSST levels would reasonably be expected to 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, and where insufficient information exists to make such conclusions the alternative's effects were rated unknown. These criteria are summarized in Table 4.5-1.

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 4.5-4), the effect was rated insignificant as harvest levels based on stock conditions often vary over this range from year to year. If under the alternative considered, insufficient information exists to estimate changes in harvest levels, the effect was rated as unknown. The authors acknowledge that individual fishing operations with substantial reliance upon participation in these state fisheries may experience adverse or beneficial effects at changes in harvest levels below the 20% level. These criteria are summarized in Table 4.5-2.

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 that 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 4.5-4.

Under the Magnuson-Stevens Act, National Standard 9 directs that when a regional council prepares an FMP or FMP amendments 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 4.5-4) were used to estimate the effects TAC levels set for each fishery on incidental catch levels of prohibited species under each alternative. It was assumed for each fishery that an increase or decrease in TAC would result in a proportional increase or decrease in incidental catch, increases were not assumed to exceed PSC limitations where applicable. 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 4.5-3.

Effects of Alternative 1 on Prohibited Species and Directed Fisheries

Under Alternative 1, catch quotas would be set at the $maxF_{abc}$ level. In the GOA this would amount to 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. With these PSC limits unchanged from 2003 levels, incidental catch of prohibited species with PSC limitations would be not be expected to increase in 2004 from expected 2002 levels (Table 4.5-4).

For Pacific salmon, these PSC numerical limits are very low compared to recent average returns and would not be expected to prevent salmon returns from reaching escapement goals. In recent years there have been concerns for several chinook and chum stocks in the Yukon and Kuskokwim Rivers, which empty into the Bering Sea. However, for 2003, ADF&G has estimated that at least minimum escapement goals for these stocks will be met. In an analysis on the effects on salmon returns, in the EA prepared for BSAI FMP Amendment 21b to reduce chinook salmon bycatch, it was estimated that with the elimination of all incidental catch in the groundfish fisheries, chinook salmon returns on average would increase by 4.4% in the Nushagak and by 1.7% in the Yukon Rivers (similar estimates of increases in chum salmon runs are not available). For these reasons, the effect of Alternative 1 on salmon stocks is rated insignificant. The most recent review of the effects of Alaska groundfish fisheries on Pacific salmon stocks in contained in the Draft PSEIS (2003b).

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

The PSC limitation for herring of 1% of current biomass estimates in the BSAI, and the low volume of herring bycatch in the GOA (1997 through 1999 average 13 mt (NMFS 2003b)), would not be expected to reduce herring stocks below minimum spawning biomass thresholds under Alternative 1 and the effects are rated insignificant.

In the BSAI, PSC limits for crab are set at a proportion of the estimated number of animals, with upper limits approximately 0.5% for red king crab, 1.2% for Tanner crab, and 0.1 % for snow crab. Given these low levels, even if crab PSC limits were reached it is unlikely that any effects on crab stocks could be detected. Incidental catch of crab in the GOA is very low. Incidental catch In 2002 was a total of 48 red king crab and 185,220 Tanner crab (Table 4.5-4)). Information on the abundance of red king crab in the GOA is limited by the lack of survey information. The 2001 survey of Tanner crab in the GOA yielded and estimate of 175.9 million crab (NMFS 2003b). The incidental catch of 185,220 Tanner crab in 2002 represents approximately 0.1% of this amount. Because incidental catch is small relative to other sources of mortality, time and area closures for trawl gear in the BSAI and GOA are thought to be more effective in reducing adverse effects on crab stocks (Witherell and Harrington 1996) and the effect of Alternative 1 on all crab stocks in the BSAI and GOA is rated insignificant.

Due to the low numbers of salmon incidentally taken in the GOA, and salmon PSC limitations for chum and chinook salmon in the BSAI, present levels of salmon incidental catch are not likely to affect escapement totals. For those western stocks of chinook salmon of concern, see the EA prepared for Amendment 21b to the BSAI FMP, a reduction in incidental catch of 40,000 chinook was estimated to increase commercial catches on average by 2,700 chinook in the Nushagak and 2,200 chinook in the Yukon Rivers. This amount represents 2.5% of the average commercial catch of 194,000 chinook in these drainages. Similar estimates 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 4.5-4) 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.

Due to the herring PSC limit of 1% of estimated biomass in the BSAI and the present low volume of incidental catch in the GOA, and increase or decrease in the commercial catches, herring would not be likely to increase or decrease by more than 20% under Alternative 1 and the effect on the commercial herring fisheries is rated insignificant. For these same reasons, floating PSC limits based on stock abundance in the BSAI and the present low numbers of animals taken in the GOA, the effect of incidental catch in the groundfish fisheries along with seasonal and area closures to trawl gear on all crab stocks the effect on commercial crab fisheries is rated insignificant.

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

Assuming incidental catch rates of prohibited species in 2004 are similar to 2002 levels in the BSAI and GOA (Table 4.5-4), for TAC levels under Alternative 1 in combination with seasonal and fishery specific PSC apportionments, the total incidental catch of each prohibited species group would not be expected to increase or decrease by more than 50%. The effect of Alternative 1 on levels of incidental catch of prohibited species in the groundfish fisheries is therefore rated insignificant in the BSAI and GOA.

Effects of Alternative 2 on Prohibited Species and Directed Fisheries

Under Alternative 2, catch quotas (TACs) for the proposed 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 3.5.2 of the Draft PSEIS (NMFS 2003b) anticipated changes in the incidental catch of prohibited species under each alternative considered is discussed. 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 decline by 9%. In the Pacific cod fisheries, reductions of incidental catch of halibut (11%), Tanner crab (30%), chinook (25%), and other salmon (8%) were expected. Assuming incidental catch rates of prohibited species in 2004 are similar to 2002 levels in the BSAI (Table 4.5-4), for TAC levels under Alternative 2, in combination with seasonal and fishery specific PSC apportionments, the total incidental catch of each prohibited species group would not be expected to increase or decrease by more than 50%. The effect of Alternative 2 on levels of incidental catch of prohibited species in the groundfish fisheries is therefore rated insignificant in the BSAI (Table 6.0-1). In Section 4.5.2.4 the Steller sea lion Protection Measures SEIS (NMFS 2001b) the effects of the preferred alternative on the incidental catch levels of prohibited species in the GOA were estimated to range from an increase of up 15% (Tanner crab in the pollock fishery) to a decease of 11% (other salmon in the pollock fishery) for TACs set at 2000 levels. Assuming incidental catch rates of prohibited species in 2004 are similar to 2002 levels in the GOA (Table 4.5-4), for TAC levels under Alternative 2, in combination with seasonal and fishery specific PSC apportionments, the total incidental catch of each prohibited species group would not be expected to increase or decrease by more than 50%. The effect of Alternative 2 on levels of incidental catch of prohibited species in the groundfish fisheries is therefore rated insignificant in the GOA (Table 6.0-1).

Effects of Alternative 3 on Prohibited Species and Directed Fisheries

Under Alternative 3, catch quotas would be set for TACs to produce *F* equal to 50% of the $maxF_{abc}$ level for 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, very close to the current 2003 total catch . For the reasons discussed under Alternative 1, the effect of Alternative 3 on stocks of prohibited species is rated insignificant (Table 6.0-1), because PSC limits, even if reached, would not have a significant impact on stocks of prohibited species. Additionally, for the reasons discussed under Alternative 1, the effects of Alternative 3 on the directed fisheries for prohibited species is rated insignificant (Table 6.0-1), because PSC limits, even if reached, would not significantly reduce the amount harvested by the directed fisheries which are permitted to target prohibited species.

Assuming incidental catch rates of prohibited species in 2004 are similar to 2002 levels in the BSAI (Table 4.5-4), for TAC levels under Alternative 3, in combination with seasonal and fishery specific PSC apportionments, the total incidental catch of each prohibited species group would not be expected to increase or decrease by more than 50%. In section 4.5.2.4 of the Steller sea lion Protection Measures SEIS (NMFS 2001b), the effects of the preferred alternative on the incidental catch levels of prohibited species in the GOA was estimated to range from an increase of up to 15% (Tanner crab in the pollock fishery), to a decease of 11% (other salmon in the pollock fishery) for TACs set at 2000 levels.

In combination with TAC recommendations, annual halibut PSC limits, seasonal and fishery specific PSC apportionments, and incidental catch rates unchanged from 2002 in the different fisheries (Table 4.5-4), the total incidental catch of each prohibited species group would not be expected to increase or decrease by more than 50%. The effect of Alternative 3 on incidental catch levels of prohibited species in the groundfish fisheries is, therefore, rated insignificant in the BSAI and GOA (Table 6.0-1).

Effects of Alternative 4 on Prohibited Species and Directed Fisheries

Under Alternative 4, catch quotas would be set at levels equal to the most recent 5 year average actual *F* for stocks at a Tier 3 level and above, and at the recent 5 year average actual catch for stocks at a Tier 4 level and below. This distinction between stocks at different tiers is necessary since fishing rates are not available for stocks in Tier 4 or below. In the BSAI this would amount to 1,526,980 mt and in the GOA 187,959 mt, these amounts are above current total catch in 2003. Alternative 4 sets TAC at levels that fall within the range of 1,400,000 to 2,000,000 mt in the BSAI and 116,000 mt to 800,000 mt in the GOA, established for optimum yield. For the reasons discussed under Alternative 1, the effect of Alternative 4 on stocks of prohibited species is rated insignificant (Table 6.0-1), because PSC limits, even if reached, would not have a significant impact on stocks of prohibited species. Additionally, for the reasons discussed under Alternative 1, the effects of Alternative 4 on the directed fisheries for prohibited species is rated insignificant (Table 6.0-1), because PSC limits, even if reached, would not significantly reduce the amount harvested by the directed fisheries which are permitted to target prohibited species.

In combination with TAC recommendations and seasonal and fishery specific PSC apportionments, and assuming incidental catch rates in the different fisheries unchanged from 2002 (Table 4.5-4), the total incidental catch of each prohibited species group would not be expected to increase or decrease by more than 50%. In section 4.5.2.4 of the Steller sea lion Protection Measures SEIS (NMFS 2001b) the effects of the preferred alternative on the incidental catch levels of prohibited species in the GOA was estimated to range from an increase of up 15% (Tanner crab in the pollock fishery) to a decease of 11% (other salmon in the pollock fishery) for TACs set at 2000 levels. The effect of the preferred alternative 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 would be insignificant (Table 6.0-1). A 100% reduction in harvest levels of groundfish (to zero) would reduce the incidental catch level of prohibited species in the groundfish fisheries also to zero (>50%) and is rated significantly positive (Table 6.0-1).

Table 4.5-1 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 4.5-2 Criteria used to estimate the significance of effects on of harvest levels in state managed directed fisheries targeting stocks of prohibited species in the BSAI and GOA

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

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

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

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

Groundfish and Prohibited Species Catch by Trawl Gear in the BSAI.

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

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

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

Groundfish and Prohibited Species Catch by Hook-and-Line Gear in the BSAI.

Target	Total Catch[1] (mt)	Halibut Mortality (mt)	Numbers[2] of Bairdi Crab	Numbers of Red King Crab	Numbers of Chinook Salmon	Numbers of Other Salmon[3]
Pacific cod	110,635	585	17,386	26,497	23	54
Greenland turbot	2,493	49	64	7	3	45
Sablefish	2,534	Not Available	6	0	0	0
Rockfish	18	1	0	0	0	0
Other species	29	6	0	0	0	0
Arrowtooth	43	0	0	0	0	0
Non-retained groundfish	1	0	0	0	0	0
Total	115,753	641	17,456	26,504	26	105

Groundfish and Prohibited Species Catch by Pot Gear in the BSAI.

Target	Total Catch[1] (mt)	Halibut Mortality (mt)	Numbers[2] of Bairdi Crab	Numbers of Red King Crab	Numbers of Chinook Salmon	Numbers of Other Salmon[3]
Pacific cod	15,879	5	81,297	973	0	0
Sablefish	252	3	95	0	0	6
Total	16,131	8	81,392	973	0	6

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

Total Groundfish and Prohibited Species Catch by All Gear Types in the BSAI.

Target	Total Catch[1] (mt)	Halibut Mortality (mt)	Numbers[2] of Bairdi Crab	Numbers of Red King Crab	Numbers of Chinook Salmon	Numbers of Other Salmon[3]
All	1,759,053	4,073	1,229,899	133,781	37,581	78,875

Groundfish and Prohibited Species Catch by Trawl Gear in the GOA.

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

Groundfish and Prohibited Species Catch by Hook-and-Line Gear in the GOA.

Target	Total Catch[1] (mt)	Halibut Mortality (mt)	Numbers[2] of Bairdi Crab	Numbers of Red King Crab	Numbers of Chinook Salmon	Numbers of Other Salmon[3]
Pacific cod	15,557	239	18	18	0	0
Rockfish	421	4	0	0	0	0
Other species	20	2	3	0	0	0
Deep water flatfish	3	0	0	0	0	0
Total[4]	16,001	245	21	18	0	0

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

Groundfish and Prohibited Species Catch by Pot Gear in the GOA.

Target	Total Catch[1] (mt)	Halibut Mortality (mt)	Numbers[2] of Bairdi Crab	Numbers of Red King Crab	Numbers of Chinook Salmon	Numbers of Other Salmon[3]
Pacific cod	7,929	2	95,766	0	0	0
Other species	59	0	0	0	0	0
Total	7,988	2	95,766	0	0	0

Total Groundfish and Prohibited Species Catch by All Gear Types in the GOA.

Target	Total Catch[1] (mt)	Halibut Mortality (mt)	Numbers[2] of Bairdi Crab	Numbers of Red King Crab	Numbers of Chinook Salmon	Numbers of Other Salmon[3]
All	150,670	2,264	185,220	48	12,920	3,225

Source: NMFS 2001 Blend Data

Notes:

1 Total catch includes all groundfish harvested, the targeted species as well as incidental catch of all other groundfish.

2 Numbers are estimates of individual animals and include estimates (in the case of crab) all animals, male and female, juvenile and adult, and should not be interpreted as an estimate of legal sized males that are targeted in directed crab fisheries.

3 Other salmon numbers include pink, chum, coho, and red salmon.

4 The total catch for hook-and-line gear in the GOA does not include catch in the sablefish fishery as estimates of prohibited species catch are not available.

4.6 Effects on Marine Mammals and ESA Listed Marine Mammals

Marine mammals were considered in groups that include: ESA listed Steller sea lions, ESA listed great whales, other cetaceans, northern fur seals, harbor seals, other pinnipeds, and sea otters. Direct and indirect interactions between marine mammals and groundfish harvest occur due to overlap in the size and species of groundfish harvested in the fisheries that are also important marine mammal prey, and due to temporal and spatial overlap in marine mammal foraging and commercial fishing activities.

Impacts of the various proposed 2004 harvest levels are analyzed by addressing four core questions modified from Lowry (1982):

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

The reference point for determining significant impact to marine mammals is predicting whether the proposed harvest levels will impact the current population trajectory of any marine mammal species. Criteria for determining significance are contained in Table 4.1-1. Significance ratings for each question are summarized in Table 4.5-1.

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, the western distinct population segment (DPS) of Steller sea lions were the only species that were determined to potentially be adversely affected by the groundfish fisheries. (FMP BiOp, NMFS 2000a). The information contained in this analysis, including the SAFE reports (Appendices A and B), comprises the biological assessment the action agency is required to present to the consulting agency under section 7 of the Endangered Species Act. NMFS is both the action and the consulting agency for consultations on Steller sea lions. Steller sea lion protection measures are implemented as part of the harvest specifications so 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, if necessary, will be completed once the Council final 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 the affected management areas. Alternatives 1-4 would be conducted according to these protection measures and the impacts are expected to be insignificant. Alternative 5 would cease fishing, removing temporal and spatial concentration of fishing and would therefore have a significantly beneficial effect.

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

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

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, which are considered key Steller sea lion prey species (50 CFR 679.20(d)(4)). If the spawning biomass of a prey species is predicted to fall below 20 percent of its unfished spawning biomass, directed fishing for that species would be prohibited. The analysis of the harvest control rule is in the Steller sea lion protection measures SEIS (NMFS 2001b). Alternatives 1-4 do not allow directed fishing if the spawning biomass of pollock, Pacific cod, or Atka mackerel fall below 20 % of the unfished spawning biomass, and therefore, would have insignificant impacts on the global availability of prey species. Concerns regarding GOA pollock biomass is further explained below. Even with no fishing under Alternative 5, it is unknown if the reduction in harvest would lead to increased availability of prey overall so the effect from Alternative 5 is unknown.

<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 Island and Middleton Island in February and March. Overall, the total GOA biomass is estimated to be similar to last year with mixed results found at the various survey locations.

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 pollock 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, that could affect marine mammal behavior. Foraging could potentially be affected not only by interactions between vessel and species, but also by changes in fish schooling behavior, distributions, or densities in response to harvesting activities. In other words, disturbance to the prey base may be as relevant a consideration as disturbance to the predator itself. For the purposes of this analysis, we recognize that some level of prey disturbance may occur as a fisheries effect. The impact on marine mammals using those schools for prey is a function of both the amount of fishing activity and its concentration in space and time, neither of which may be extreme enough under any alternative to represent population level concerns. To the extent that fishery management measures do impose limits on fishing activities inside critical habitat, we assume at least some protection is provided from these disturbance effects. The criterion set for insignificant impacts is a similar level of disturbance as that which was occurring in 2001. Thus, the effect under alternatives 1-4 is insignificant according to the criteria set for significance (Table 4.6-1). Effects on all marine mammals under Alternative 5 is likely to be significantly beneficial because there would be no interaction between marine mammals and the groundfish fisheries.

Because of the recent change in Northern sea otter status it is being mentioned individually. Northern sea otters in the Aleutian Islands (from Unimak Pass to Attu Island) were designated by the US Fish and Wildlife Service (USFWS) as candidate species under the ESA on August 22, 2000,(65 FR 67343). Funding has not been available to develop proposed rule making for listing the sea otter under the ESA. On August 21, 2001, the USFWS was petitioned under the Marine Mammal Protection Act (MMPA) for the Alaska stock of sea otters to be listed as depleted. On November 2, 2001 (66 FR 55693), the USFWS determined that the current population of sea otters throughout Alaska exceeds the optimum sustainable population of 60,000 animals and, therefore, does not meet the criteria to be listed as depleted under the MMPA. The USFWS is continuing to evaluate the sea otter under both the ESA and MMPA. As far as interaction with the groundfish fisheries, NMFS observers monitored incidental take in the 1990–1995 groundfish trawl, longline, and pot fisheries. No mortality or serious injuries to sea otters were observed. All alternatives for setting 2004 TAC specifications will have insignificant impacts on northern sea otter.

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

Table 4.6-1 Criteria for determining significance of effects to marine mammals.

Effects	Significance Criteria			
	Significant Adverse	Insignificant	Significant Beneficial	Unknown
Incidental take/ entanglement in marine debris	Take rate increases downward change in population trajectory by >10%	Level of take below that which would have an effect on population trajectories by > 10%	Not Applicable	Insufficient information available on take rates
Spatial/ temporal concentration of fishery	More temporal and spatial concentration in key areas	Spatial concentration of fishery as modified by SSL Protection Measures	Much less temporal and spatial concentration of fishery in all key areas	Insufficient information as to what constitutes a key area
Global harvest of prey species**	Harvest level exceeds harvest control rule likely to cause JAM* determination.	Harvest level at or below harvest control rule	Not applicable	Insufficient information to determine level of harvest in relation to available prey biomass
Disturbance	More disturbance (closed areas reopened)	Similar level of disturbance as that which was occurring in 2001	Much less disturbance by groundfish fishery.	Insufficient information as to what constitutes disturbance

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

4.7 Effects on Seabirds

The five alternatives in this EA set the catch quota, by target species and region, equal to variably defined levels of fishing mortality rates used to set the ABC. Alternative 5 sets harvest equal to zero, 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 Draft PSEIS, (Section 3.7) and was followed by a description of the comparative baseline to be used for analysis (Sections 3.7.1 and 4.4). An analysis of the effects of each Draft PSEIS alternative on seabirds is provided in sections 4.5 through 4.8, followed by an analysis of the preliminary preferred alternative effects on seabirds (Section 4.9.7, NMFS 2003b). The significance determinations of analysis performed in this EA 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 Draft PSEIS (NMFS 2003b). Birds are taken incidentally in longline (hook and line), trawl, and pot gear. Estimation of seabird incidental take from longline and pot vessels is very straightforward. On trawlers, however, the estimation procedure is confounded by sample size issues (Appendix C). This unfortunately creates the need to provide two estimates of total seabird takes for trawl fisheries, depending on the sample size for hauls where seabirds were not recorded. Further, while observers are able to see all gear-related mortalities from longline and pot vessels, on trawl vessels there is anecdotal evidence that seabird mortalities occur from collisions with the trawl sonar cable and main net cables. The degree of that mortality is currently unknown, as observers are fully tasked with sampling the catch. Note that the amount of mortality contributed by the pot fleet is very minimal, accounting for less than one half percent annually. The trawl fleet contributes from 10.6% to 44.9% of the overall mortality, depending on which estimation methodology is used, with the actual amount likely being somewhere between these two bounds. Longline operations contribute the remainder. Due to its minimal contribution to overall seabird mortality, the pot fleet will not be considered in this analysis.

As noted in Section 3.7.1 of the Draft PSEIS (NMFS 2003b), several factors are likely to affect the risk of seabird incidental catch. It is reasonable to assume that risk goes up or down, partly as a consequence of fishing effort (measured as total number of hooks in the longline fleet, and total haul time in the trawl fleet) each year (NMFS 2003b). In the longline fleet, if seabird avoidance measures used to prevent birds from accessing baited hooks are effective, then effort levels would probably be less of a critical factor in the probability of a bird getting hooked. Seabird bycatch avoidance measures are outlined on pages 3.7-7 through 3.7-10 of the Draft PSEIS (NMFS 2003b). 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 Draft PSEIS (NMFS 2003b). Detailed conclusions or predictions cannot be made regarding the effects of forage fish bycatch on seabird populations or colonies. However, the present understanding is that fisheries management measures affecting abundance and availability of forage fish or other prey species could affect seabird populations (NMFS 2003b; NMFS 2001b), although commercial fisheries do not compete directly with seabirds. There is no directed commercial fishery for those species which compose the forage fish management group and seabirds typically target juvenile stages rather than adults for those target species where there is an overlap between seabirds and commercial fisheries.

Indirect Effects - Benthic habitat The fishery effects on benthic habitat are described in Section 3.6.4 of the Draft PSEIS (NMFS 2003b). The indirect fishery effects on benthic habitat as utilized by seabirds are described in the seabird summaries provided in each alternative (Sections 4.5.7, 4.6.7, etc. to the PSEIS) (NMFS 2003b). The seabird species most likely to be impacted by any indirect gear effects on the benthos would be diving sea ducks such as eiders and scoters as well as cormorants and guillemots (NMFS 2001b). Bottom trawl gear has the greatest potential to indirectly affect seabirds via their habitat. Thus, the remainder of this analysis will be limited to the impacts of bottom trawl gear on benthic foraging habitat.

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

Criteria used to determine significance of effects on seabirds Significance of impacts is determined by considering the context in which the action will occur and the intensity of the action. When complete information is not available to reach a strong conclusion regarding impacts, the rating of 'unknown' is used. Table 4.7-1 outlines the qualitative significance criteria or thresholds that are used for determining if an effect has the potential to create a significant impact on seabirds.

Effects of Alternative 1 on Seabirds

Direct Effects - Incidental take In as much as Alternative 1 could increase fishing effort by setting the quota for harvest to $max F_{ABC}$, it has the potential to increase interactions with those seabird species prone to incidental bycatch. The Draft PSEIS (NMFS 2003b) noted that the data suggest that northern fulmars were the only species showing a positive linear relationship between fishing effort and numbers of birds hooked. This relationship did not exist for other bird groups. The short-tailed albatross, because of its small population and endangered species status, and the black-footed albatross, because of concerns of a population decline and high incidental take in the GOA, might also be affected by greater fishing effort (NMFS 2001b). These three species, the northern fulmar, short-tailed albatross, and black-footed albatross, may demonstrate conditionally significant negative effects from incidental take resulting from this alternative. However, because there is insufficient information to document a link between colonies or population trends and incidental take of these species, the effect was rated 'unknown'. The overall effectiveness of seabird avoidance measures has not yet been evaluated, but these measures do appear to substantially reduce seabird incidental take in the longline fishery. If implemented fleet-wide, either through voluntary action or regulation, these may substantially reduce incidental take.

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

Indirect Effects - Prey (forage fish) abundance and availability The Draft PSEIS concluded that fishery influences on the abundance and availability of forage fish was considered insignificant for populations of northern fulmars and most other seabird groups (NMFS 2003b). The prey base for some piscivorous seabirds, however, could be affected by localized increases in TAC level (NMFS 2001b). The effect at the population level of high TAC for these seabird species remains unknown.

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

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

Effects of Alternative 2 on Seabirds

Direct Effects - Incidental take TAC levels under Alternative 2 are less than those under Alternative 1 in the BSAI. In the GOA, TAC levels under Alternative 2 are 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 $F_{50\%}$ strategy., thus the effect of this alternative on incidental take for albatrosses is considered unknown. Other seabird species are not likely to be affected significantly by this amount of change in fishing effort.

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

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

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

Effects of Alternative 4 on Seabirds

Direct Effects - Incidental take Under Alternative 4, fishing effort varies among target species and regions, with respect to effort under Alternatives 1-3. It is thus difficult to make a determination about the potential effects of this alternative on seabirds. In general, using the 5-year average to set TAC levels produces a TAC that is lower than other alternatives (with the exception of Alternative 5, 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 Draft PSEIS and summarized in the Steller Sea Lion Protectio Measures SEIS (NMFS 2001b), the potential indirect fishery effects on prey abundance and availability resulting from Alternative 4 are considered insignificant or unknown at the population level for all seabirds.

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

Indirect Effects - Processing waste and offal This alternative has the potential of increasing offal in the GOA, and thus could affect fulmars in particular. However, the population or colony effects of TAC levels under 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 Draft PSEIS and summarized in NMFS 2001b, the potential indirect fishery effects on prey abundance and availability of Alternative 5 are considered insignificant at the population level for most seabirds, and unknown for eiders and other seaducks.

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

Indirect Effects - Processing waste and offal 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 4.7-1 Criteria used to determine significance of effects on seabirds.

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

4.8 Effects on Marine Benthic Habitat and Essential Fish Habitat Assessment

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

Thorough information on marine habitat concerns and on the effects of fishing on benthic habitat is available in two analyses which have been prepared recently by NMFS. One is the Revised Draft Programmatic SEIS (Draft PSEIS) (NMFS 2003b), which is available online through the NMFS Alaska region homepage at http://www.fakr.noaa.gov/ and is also available in a CD which can be requested from NMFS. Several sections of the Draft PSEIS deal with EFH. Section 3.6 identifies EFH, discusses the role of particularly sensitive or vulnerable areas and types of EFH, referred to as Habitat Areas of Particular Concern (HAPCs); and outlines the history of fisheries management in protecting EFH. It also includes a discussion of the effects of different gear types on EFH and on different types of substrate, and has information on the patterns of trawling in the North Pacific and on the past and present effects of fishing on EFH. Section 4.1.1.2 explains the criteria for evaluating impacts. Table 4.1-4 summarizes these criteria. A habitat impacts model is presented in Section 4.1.6, and discussions of the Draft PSEIS' alternatives' probable effects on EFH is contained within the individual sections of Chapter 4 that are devoted to each alternative. Appendix A contains tables summarizing the effects of each alternative on habitat.

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

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

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

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

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

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

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

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

For the purpose of the TAC-setting analysis, we have set the TAC Alternative 1, the most aggressive management alternative, equivalent to Alternative 2.1 in the Draft PSEIS. Alternatives 2, 3, and 4 in the TAC-setting EA are treated as variations of the baseline alternative, as they fall within NMFS' traditional management approach. Alternative 5, which sets the TAC equal to zero, is set equivalent to the DPEIS

Alternative 4, the most precautionary alternative. It must be stressed that this is a qualitative, relative comparison and that the alternatives compared are not identical. The results are shown in Table 4.8-2.

NMFS Views Regarding the Effects of the Action on EFH

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

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

Table 4.8-1 Significance Criteria for Habitat

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

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

Table 4.8-2 Direct/Indirect Effects Analysis

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

4.9 Effects on the Ecosystem

Ecosystems are populations (consisting of single species) and communities (consisting of two or more species) of interacting organisms and their physical environment that form a functional unit with a characteristic trophic structure (food web) and material cycles (the ways mass and energy move among the groups). To interpret and predict the effects of the BSAI and GOA groundfish fisheries on the ecosystem, different indicators of ecosystem function were used and are listed in Table 4.9-1. The indicators were separated into categories relating to key ecosystem attributes of predator/prey relationships, energy flow/removal, and diversity. Background information specific to the North Pacific ecosystem is contained in the ecosystem consideration section of this document (Appendix C).

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

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

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

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

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

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

Table 4.9-1 Significance thresholds for fishery induced effects on ecosystem attributes.

Issue	Effect	Significance Threshold	Indicators
Predator-prey relationships	Pelagic forage availability	Fishery induced changes outside the natural level of abundance or variability for a prey species relative to predator demands	Population trends in pelagic forage biomass (quantitative - pollock, Atka mackerel, catch/bycatch trends of forage species, squid and herring)
	Spatial and temporal concentration of fishery impact on forage	Fishery concentration levels high enough to impair the long term viability of ecologically important, nonresource species such as marine mammals and birds	Degree of spatial/temporal concentration of fishery on pollock, Atka mackerel, herring, squid and forage species (qualitative)
	Removal of top predators	Catch levels high enough to cause the biomass of one or more top level predator species to fall below minimum biologically acceptable limits	Trophic level of the catch Sensitive top predator bycatch levels (quantitative: sharks, birds; qualitative: pinnipeds) Population status of top predator species (whales, pinnipeds, seabirds) relative to minimum biologically acceptable limits
	Introduction of nonnative species	Fishery vessel ballast water and hull fouling organism exchange levels high enough to cause viable introduction of one or more nonnative species, invasive species	Total catch levels
Energy flow and balance	Energy re-direction	Long-term changes in system biomass, respiration, production or energy cycling that are outside the range of natural variability due to fishery discarding and offal production practices	Trends in discard and offal production levels (quantitative for discards) Scavenger population trends relative to discard and offal production levels (qualitative) Bottom gear effort (qualitative measure of unobserved gear mortality particularly on bottom organisms)
	Energy removal	Long-term changes in system-level biomass, respiration, production or energy cycling that are outside the range of natural variability due to fishery removals of energy	Trends in total retained catch levels (quantitative)

Diversity	Species diversity	Catch removals high enough to cause the biomass of one or more species (target, nontarget) to fall below or to be kept from recovering from levels below minimum biologically acceptable limits	Population levels of target, nontarget species relative to MSST or ESA listing thresholds, linked to fishing removals (qualitative) Bycatch amounts of sensitive (low potential population turnover rates) species that lack population estimates (quantitative: sharks, birds, HAPC biota) Number of ESA listed marine species Area closures
	Functional (trophic, structural habitat) diversity	Catch removals high enough to cause a change in functional diversity outside the range of natural variability observed for the system	Guild diversity or size diversity changes linked to fishing removals (qualitative) Bottom gear effort (measure of benthic guild disturbance) HAPC biota bycatch
	Genetic diversity	Catch removals high enough to cause a loss or change in one or more genetic components of a stock that would cause the stock biomass to fall below minimum biologically acceptable limits	Degree of fishing on spawning aggregations or larger fish (qualitative) Older age group abundances of target groundfish stocks

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

Determinations of significance of impacts on the ecosystem issues of predator-prey relationships, energy flow and balance, and diversity are made from these individual groundfish stock assessment chapters. The overall interpretations are insignificant impact determinations for the three questions 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).

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

The State of Alaska manages state water seasons for several species of groundfish in internal waters: sablefish in Statistical Areas 649 (Prince William Sound) and 659 (Southeast Inside District), pollock in Area 649 (Prince William Sound), and Pacific cod in Areas 610 (South Peninsula District), 620, 630 (Chignik, Kodiak, and Cook Inlet Districts), and 649 (Prince William Sound). The state also manages groundfish fisheries for which federal TACs are established within state waters. Unless otherwise specified by the state, open and closed seasons for directed fishing within state waters are concurrent with federal seasons. These fisheries have been referred to as parallel fisheries or parallel seasons in state waters. Harvests of groundfish in these fisheries accrue towards their respective federal TACs.

This analysis focuses on the effects of Alternatives 1 through 5 on harvest levels in these state managed fisheries. The criteria used in estimating the effects is outlined below in Table 4.10-1. 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% or more in either direction was clearly a significant change and that a change of less than 50% in either direction was clearly insignificant as stocks of groundfish frequently change over the short term within this range. The authors acknowledge that individual fishing operations with greater reliance upon participation in these state fisheries may experience adverse or beneficial effects at changes in harvest levels below the 50% level. The year 2003 was used as a benchmark for comparison. These effects are discussed in Section 4.10 Social and Economic Consequences in this EA. The effects on other state managed fisheries (salmon, herring, and crab) are discussed in Section 4.4 Effects on Prohibited Species in this EA.

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

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

Alternatives which result in a decrease or increase in 2004 TAC levels in the BSAI and GOA from 2003 levels are assumed to have a proportionate effect on harvest levels in the state managed parallel seasons. Alternatives 1 through 4 do not increase or decrease TACs by more than 50% from 2003 levels in the BSAI and GOA, and therefore the effect of these alternatives on harvest levels in the parallel seasons is rated insignificant. Alternative 5 (which would set TACs at zero) would be expected to decrease harvest levels in the state managed parallel seasons by more than 50% and is rated significantly adverse. These effects are summarized in Table 6.0-1.

The state currently manages a skate fishery parallel to the Federal fishery, under the same management measures as the Federal fishery.

Table 4.10-1 Criteria used to estimate the significance of effects on harvest levels in state managed groundfish fisheries in the BSAI and GOA.

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

4.11 Social and Economic Effects

Section 4.11 describes the social and economic consequences of the alternatives. Sub-section 4.11.1 describes the fishery and Sub-section 4.11.2 analyses the significance of the alternatives for twelve economic criteria. Appendix H provides a detailed discussion of the approach to making the gross revenue estimates.

4.11.1 Description of the Fishery

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

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

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

4.11.2 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."[10] 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

[10] "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.

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
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.

The use of a benefit/cost framework is the appropriate way to examine the relative merits of the several competing alternatives under consideration in the proposed action. Such a framework has been adopted here. When performing a benefit/cost analysis, the objective is to derive conclusions about "net" effects of each alternative action under consideration (e.g., net revenue impacts). However, in the present case, necessary data on costs are simply not available to the analyst at this time, making a quantitative net impact analysis impossible. Nonetheless, the following section utilizes the best available information and quantitative data, in combination with accepted economic theory and practice, to provide the fullest possible assessment (both quantitative and qualitative) of the potential economic benefits and costs attributable to each alternative action. Based on this analysis, tentative conclusions are offered concerning the "likely" net effects that may derive from the competing alternatives. This is fully consistent with prevailing policy at NMFS and OMB levels, as well as that prescribed by Executive Order 12866.

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 revenue impacts of the alternatives and their significance are defined with respect to the change between the alternative and the year 2003 estimates. The 2003 estimates were generated through the same estimation process used to produce the estimates for the alternatives - in other words the 2003 gross revenues estimates were produced, treating the 2003 ABCs and TACs in the same manner as the ABCs and TACs for the alternatives. Average 2002 prices were used for all alternatives and for 2003. These issues, and others, are discussed in more detail in Appendix H.

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

Alternative 1 sets TAC's to produce fishing mortality rates, F, that are equal to $maxF_{ABC}$, where $maxF_{ABC}$ refers to the maximum permissible value of F_{ABC} under Amendment 56. Historically, TAC has been constrained by ABC, so this alternative provides a likely upper limit for setting TAC within the limits established by the fishery management plan. It is important to note that Alternative 1 results in total TAC that significantly exceeds the 2 million metric ton OY in the BSAI.

Figures 4.11-1, 4.11-2, and 4.11-3 show that in each case, the total first wholesale revenues under Alternative 1 are significantly larger than those in 2003. Therefore, the significance rating for "Gross Revenues", under alternatives 1, is "positively significant." This assessment should be qualified by the observation that price declines associated with higher catches are not taken into account. The revenue projection may thus overstate the likely increase. Alternative 2, which is usually the preferred alternative, shows "insignificant" change. In each case Alternative 5, which sets all ABCs to zero, eliminates all revenues from the fishery. This alternative has been given a rating of "negatively significant."

Alternatives 3 and 4 have a greater negative impact on gross revenues than Alternative 2, but a significantly smaller negative impact than Alternative 5. The gross revenue estimates in this analysis may have an upward bias (for the reasons discussed in Appendix 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 larger threshold). In other words, only a decline in gross revenues of 20% or more from 2003 levels will be described as significant. Estimated BSAI ITAC 2003 revenues were about $1.14 billion, BSAI CDQ revenues were about $116 million, and GOA revenues were about $170 million. The corresponding significance thresholds are changes of $228 million, $23 million, and $34 million, respectively. Neither Alternative 3 or 4 for BSAI ITAC, BSAI CDQ or GOA revenues exceeded these thresholds. Thus, these alternatives have been given a rating of "insignificant" for impacts on gross revenue.

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

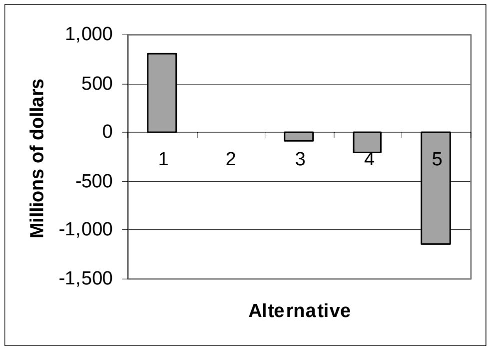


Figure 4.11-2 BSAI First Wholesale Value Estimates for CDQ reserve: Difference Between Estimated 2003 First Wholesale Value and First Wholesale Value of Each Alternative (in millions of dollars)[11]

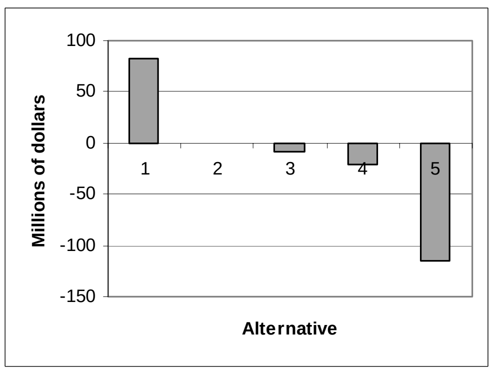
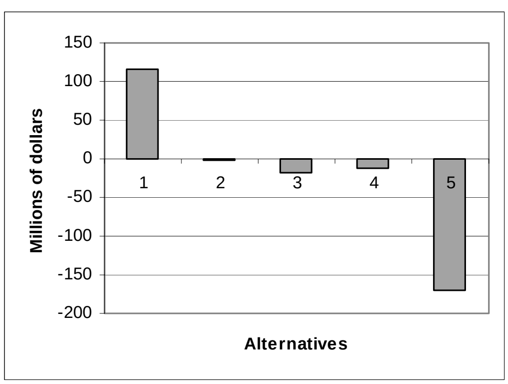


Figure 4.11-3 GOA Gross Revenue Estimates: Difference Between Estimated 2003First Wholesale Value and First Wholesale Value of Alternatives (millions of dollars)



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

Operating Cost Impacts

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

However, even absent empirical data, it is clear that harvesting, delivering, and processing of larger volumes of fish would increase the variable costs of fishing and fish processing. Conversely, reductions in production imposed by reduced specifications would decrease variable costs. Thus, Alternative 1, which increased TACs to theoretical upper bounds has been given a "negatively significant" rating due to the likelihood of increased costs with significant increases in harvest. Since the Alternative 2 specifications are similar to the 2003 specifications, suggesting that there may be little change in variable costs, this alternative has been given a cost impact significance rating of "insignificant." TACs are generally smaller under Alternatives 3 and 4. Thus, variable costs are expected to be smaller. However, as discussed previously, these alternatives did not reduce gross revenues enough to exceed the 20 percent of gross revenues threshold and were consequently rated as insignificant. Similarly, these alternatives are not expected to create significant changes in operating costs and have been given "insignificant" operating cost significance ratings.

Under Alternative 5, no groundfish fishing would be allowed during 2004. In these circumstances, no variable costs would be incurred for active fishing operations. Fixed costs would continue to be incurred. Fishermen would experience transitional expenses as they move into their next best alternative employment. However, on balance, fishing costs would be expected to decline. For this reason, Alternative 5, again when examined in isolation, has been given a rating of "positively significant" for this indicator.

Net Returns to Industry

Although it has been possible to make crude estimates of gross first wholesale revenues under the alternatives, without cost information, it is not possible to make corresponding numerical estimates of net returns to industry. 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 would be expected to be the case in the BSAI pollock fisheries, where the American Fisheries Act (AFA) allowed fishing operations to rationalize through the use of fishing cooperatives; it also may be the case in the portions of BSAI fisheries conducted under the auspices of the Community Development Quota program, and it is likely to be the case in the sablefish fisheries which operate under an IFQ program. Each of these programs allow fishermen to operate with greater efficiency. In general, however, the groundfish fisheries in the GOA and the BSAI are conducted in an essentially open-access environment. While a limited entry program has been adopted, the numbers of permits provide little constraint on fishing effort. Theory suggests that economic costs and benefits would be closely balanced in these fisheries, and that in equilibrium net revenues would be only large enough to cover the opportunity costs of labor and capital.

Specifications associated with gross revenues that are larger than current levels of production would relax constraints on fishermen and fish processors and would almost certainly be associated with higher levels of profits, all other things equal, while specifications associated with lower gross revenues would increase the constraints on fishermen and processors, and would likely result in lower profits to the sector.

Alternative 1, which had positively significant impacts on gross revenue is assumed to have positively significant impacts on net returns. Alternative 2, which had insignificant impacts on gross revenues and costs is assumed to have insignificant impacts on net returns. Alternatives 3 and 4 were rated as having insignificant impacts on revenues and costs, and have thus been given a similar "insignificant" rating for net returns. Alternative 5 eliminates all revenues and variable costs, but fishermen would be left with fixed costs. This alternative has been rated "negatively significant" in terms of this net effects criterion.

Safety and Health Impacts

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

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

Alternative 1 increases TACs, thereby likely increasing fishing/processing activity and time at sea. This would be expected to affect safety and health negatively. However, if increased TACs lead to greater net returns (as argued above), then safety and health may be positively affected. Thus, it is not possible to unequivocally state what net effect Alternative 1 would be expected to have on safety and health, and this has resulted in an "unknown" ranking. Alternative 2 has essentially the same projected TACs as 2003.[12] 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 to this sector would drop to zero. However, Alternative 5, by closing the fisheries for a year, and by eliminating this source of yearly income for thousands of persons and their families, would introduce new sources of stress, and stress-related health problems, for those connected with the affected fishing, processing, and support businesses. While the fishery closure would reduce at-sea accidents, increased stress associated with income loss would have an offsetting effect of unknown magnitude. This alternative has thus been given a significance rating of "unknown."

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[12]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[13]

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

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

CDQ groups use their revenues, either from royalty payments or from their CDQ operations, to invest in new fishery related activities. Many of these investments take place in fisheries other than groundfish fisheries. For example, the Coastal Villages Region Fund operates seasonal halibut buying stations and, in addition, has invested in a custom salmon processing plant in Quinhagak. (ADCED 2001, page 54). The impact of a reduction in groundfish revenue is difficult to predict quantitatively. CDQ groups may have smaller revenues to invest in other fishing related activities, however, they also may be compelled by these changes to accelerate their diversification (a potentially desirable action to distribute economic risk more widely) into other non-groundfish fishing activities, in order to offset the potential adverse impacts associated with lower groundfish harvests.

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

The projected TACs under Alternative 2 are very similar to those in place in 2003. The impact of these alternatives on related fisheries has been rated, "insignificant." Alternative 1 significantly increases the TAC for several species, while Alternatives 3 and 4 produce moderate reductions in fish harvests. Given the uncertainties associated with projecting impacts on other fisheries, these alternatives have been given a rating of "unknown".

Alternative 5 sets all TACs equal to zero. This alternative would clearly create strong incentives for fishermen to explore other fisheries (although most fisheries in the U. S. EEZ are fully subscribed and entry into many is strictly limited), would make it harder for CDQ programs to develop additional local

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

fishery resources (even if it would increase the incentive for them to do so), and would increase prices and incentives to use more effort in fisheries that can be used as substitutes in markets. For these reasons, this alternative has been given a “negatively significant” rating.

Consumer Effects

Consumer effects of changes in production will be measured by changes in the consumers’ surplus. The consumers’ surplus is a measure of what consumers would be willing to pay to be able to buy a given amount of a product or service at a given price, above that which they actually must pay. A decrease in quantity supplied and an associated increase in price will reduce consumer welfare as measured by consumers’ surplus. An increase in quantity supplied and a consequent decrease in price will increase consumer welfare as measured by consumers’ surplus.[14] A decrease in consumers’ surplus is not a total loss to society, since some of that decrease is transferred to producers/suppliers (e.g., fishermen) in the form of higher prices. However, this transfer is still a loss to consumers and if the producer gains accrue to non-U. S. fishermen and processors, there is a net welfare loss to the nation.

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

Alternative 1 would increase TAC’s significantly for some species. As a result, this alternative would tend to decrease market prices, leading to increased consumer surplus, and has been rated “significantly positive.” TACs projected under Alternative 2 are not expected to change much from those in 2003. This alternative has therefore been given a consumer impact significance rating of “insignificant.” Similarly, alternatives 3 and 4 lead to some reductions in a number of TACs. However, the overall effect of alternatives 3 and 4 on consumers is rates as “insignificant.”

Alternative 5 would close Alaska’s federal groundfish fisheries in 2004, creating large reductions in supplies to U.S. consumers (as well as, severe disruptions of world seafood markets). This alternative would eliminate the consumers’ surplus from consumption of Alaska groundfish and lead to price increases in markets for substitute species. As a result, this alternative has been given a “significantly negative” rating.

Management and Enforcement Costs

Enforcement expenses are related to TAC sizes in complicated ways. Larger TACs may mean that more offloads would have to be monitored and that each offload would take longer. Both these factors might increase the enforcement expenses to obtain any given level of compliance. Conversely, smaller TACs may lead to increased enforcement costs as it becomes necessary to monitor more openings and closures and to prevent poaching[15].

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

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

In-season management expenses are believed to be more closely related to the nature and complexity of the regulations governing the fishery (for example, on the number of separate quota categories that must be monitored and closed on time) than to TAC size. Over a wide range of possible specifications, in-season management expenses are largely fixed. For example, increases in TACs from 50% above 2003 levels to 50% below 2002 levels could probably be handled with existing in-season management resources[16] (Tromble, pers. comm[17].).

Alternative 1 increases TACs more than 50 % above 2003 levels for several species and is therefore rated as "negatively significant" for management and enforcement costs. Alternative 2 does not change TACs to a great extent. Therefore, the management and enforcement cost impacts of this alternative has been rated "insignificant." Alternatives 3 and 4 impose larger reductions in TACs, but, in light of the considerations described above, the impacts of these have also been rated "insignificant."

Under Alternative 5, in which there would be no groundfish fishing in 2004, management and enforcement costs would be reduced, but not eliminated. Prohibitions on fishing activity would still need to be enforced to prevent poaching; however, enforcement expenses would be reduced because it would be immediately clear, in any instance, that a vessel found using groundfish gear in the Federal waters would be in violation. In-season management expenses and activities would be eliminated if there were no fishing in 2004, however, management and research efforts devoted to the longer term would still continue. Because of the expected reduction in groundfish management and enforcement costs under Alternative 5, it has been given a significance rating of "positively significant."

Excess Capacity

The groundfish fisheries off of Alaska have considerable excess capacity. A recent study tried to estimate the difference between the maximum amount of fish that could and would be caught by fishermen (given existing technological and economic constraints, and assuming the limitations imposed by TACs were removed), and the actual amounts harvested in 2001. This study used two methodologies to address this question.[18] The results of the more conservative method are summarized here. The study estimated that, conservatively, there was about 17% excess capacity (as described above) in the Atka mackerel fleet, about 26% for flatfish, 35% for Pacific cod, 39% for pollock, 21% for rockfish, 24% for sablefish, and 30% for other groundfish. (Hiatt, *et al.* 2002, page 111). These estimates apply to the catcher vessel and catcher-processor components of the fleet. Corresponding data are not available for on-shore processors. Excess capacity in the pollock fleets may have been reduced since 2001 as fishing operations have taken advantage of cooperative fishing arrangements, provided for under the American Fisheries Act (AFA).

Alternative 1 increases TACs significantly for several species. Significantly greater TACs may be expected to improve capacity utilization in limited entry fisheries. Therefore, Alternative 1 is rated as "positively significant." TACs projected under Alternative 2 are not expected to change much from those in 2003 and the overall effect of alternatives 3 and 4 have been rates as insignificant on operational aspects of the fleet. These alternatives have therefore been given a significance rating of "insignificant."

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[16]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.).

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

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

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, the changes in the harvests in the directed groundfish fisheries associated with the different specifications alternatives should have little impact on catches of prohibited species. The exception is Alternative 5, which, by shutting down the groundfish fisheries, clearly would reduce associated prohibited species catches to zero.

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

The impacts of the alternatives on the bycatch and discard of prohibited species are discussed in EA Section 4.4. 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 (i.e., Alternatives 1 through 4 have been rated "insignificant," while Alternative 5 has been rated positively significant").

Passive Use Values

Passive use is also called "non-use" value, because a person need never actually use a resource in order to derive value from it.[19] That is, people enjoy a benefit (which can be measured in economic terms) from simply knowing that some given aspect of the environment exists. Survey research suggests that passive use values can be significant in at least some contexts. Because passive use values pertain to the continued existence of resources, the focus in this discussion is on classes of resources in the GOA and BSAI which have been listed as endangered under the U.S. Endangered Species Act. Under the Act, an endangered species is one that is "...in danger of extinction throughout all or a significant portion of its range..."and not one of certain insects designated as 'pests'."(16 U.S.C. §1532(6)).

Changes in groundfish harvests in the GOA and the BSAI may affect (largely indirectly) passive use values by affecting the probability of continued existence or recovery of a listed species. At present, four endangered species or classes of endangered or threatened species range into the GOA and BSAI management areas: (a) Steller sea lions; (b) seven species of Great Whales; (c) Pacific Northwest salmon; and (d) three species of sea birds (Table 6-2 lists the affected species).

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

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 under Alternatives 1 to 4 were either "insignificant" or "unknown." Alternative 5 had some positively significant, and one negatively significant impacts.

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

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

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

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

TACs projected under Alternative 2 are not expected to change much from those in 2003. This alternative has, therefore, been given a significance rating of "insignificant". Alternatives 3, 4, and 5 all reduce groundfish harvests to a greater or lesser extent, while Alternative 1 significantly increases groundfish TACs. However, since the impact of this on subsistence activity is hard to gauge, Alternatives 1, 3, 4, and 5 have been rated "unknown" on this criterion.

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

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

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

Summary of the significance analysis

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

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

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

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

4.12 GOA skate specifications analysis

Environmental Components Potentially Affected

The choice of an approach to skate specifications is limited in scope and will not likely affect all environmental components of the GOA. Table 4.12-1 shows the potentially affected components. Under groundfish, the effects are primarily limited to the "target" species category which may be taken in a skate directed fishery, such as Pacific cod. The TAC for the "Other species" complex is also potentially affected by the action, because the amount of "Other species" harvest will increase based on the formula used to set the “Other species” TAC (i.e., 5 percent of the combined TAC amounts for target species, as specified in the FMP). Halibut may be affected, for example, as a result of PSC bycatch, given that they are taken incidentally in the skate fishery. The way skates are managed may have socioeconomic effects on the participants in the skate fisheries and on participants in other directed fisheries that take skates incidentally.

Table 4.12-1 Resources potentially affected by Skate Options

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

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

Table 4.12-1 suggests that there are three potential environmental sectors that may be impacted. These would be:

- Groundfish target species impacts, including skates, “Other species”, and species harvested in fisheries taking skates as incidental catch
- Halibut PSC
- Social and Economic

The potential impacts are evaluated below. The significance criteria for each class is the same as that described in section 4.2, 4.5, and 4.11 for the harvest specifications action.

Options and suboptions effects

Five options and two suboptions were described in section 2.4 of the EA. Each option with the two suboptions is reviewed in detail below. This section ends with an analysis of the significance of the effects of the options on the environmental components identified above.

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 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 maximum retained amount (MRA) may be retained and the remainder must be discarded. This protects against incidental and directed harvests that together 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 to be approaching the OFL; the target species 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 closure of other directed fisheries which experience incidental catches of the species which is approaching an OFL. Approaching the OFL of any targeted fishery and closing other directed fisheries as a result is a rare event. It is rare because fishery managers strive to keep annual harvests at or below TAC levels. It is most likely to occur in a fishery very conservatively managed (with Tier 5 or 6 OFLs) and with relatively low estimates of stock biomass.

Option 1

Under Option 1 a GOA-wide OFL and a GOA-wide ABC would be established for all skates as a group (That is, there would be a single OFL and a single ABC for Big, Longnose, and "Other" skates.)

The actual management of skates would depend on the TAC suboption chosen by the Council. Under Suboption 1, a GOA-wide TAC would be set equal to, or less than, the ABC at a level sufficient to meet anticipated incidental catch needs in other directed fisheries through the fishing year. Fishing operations could retain skates up to the MRA, which would be 0 to 20 percent of retained species open for directed fishing. Once the TAC was harvested, the skates group would become a prohibited species; if subsequent harvests approached the OFL level, NMFS in-season managers might have to close fisheries taking skates as incidental catches.

Alternatively, under Suboption 2, the skate TAC would be set at the ABC level. Under this suboption, the regional administrator would estimate likely incidental skate catches in other directed fisheries throughout the fishing year. These would be subtracted from the TAC to calculate the directed fishing allowance (DFA). If the DFA were sufficiently large, fishery managers would permit a directed skate fishery. Under Option 1, the ABC would be 8,144 mt. The Skate SAFE report estimates a mean incidental catch of 4,933 mt over the period 1997 to 2002 (Skate SAFE Table 16). This suggests a DFA under this suboption of about 3,200 mt. The Skate SAFE estimates directed fishery harvest (retained and discarded) in 2003 at about 2,700 mt (Skates SAFE, Table 16, page 24). Therefore, it is likely that this suboption would permit a directed fishery for skates in 2004. Under suboption 2, the targeted fishery would be closed if the DFA was reached and retention of incidental skate harvests in other fisheries would be prohibited if the skate TAC were harvested.

Option 1 would provide protection to skates at the GOA-wide level. Conservative management would be very likely to prevent overall GOA skate harvests from approaching the GOA-wide OFL. It would provide an incrementally heightened level of protection, while better information on the biology of, and fishery for, GOA skates was gathered.

This option would provide less protection against localized depletion of skates than options that incorporate management area allocations. The 2003 target fishery was concentrated in the Central Gulf management area. Under this alternative, the entire GOA-wide ABC for skates could be taken within the Central Gulf. This would be a harvest of 8,144 mt. The estimated OFL for all species in the Central Gulf is 7,208 mt. The significance of this potential is difficult to determine. First, the entire harvest of skates would only take place in the Central GOA if no skates were harvested elsewhere in the GOA. Secondly, information about skate movement and migration within the GOA is limited. The extent to which, and the time frame within which, harvest depletion in the Central GOA would be offset by in-migration from the Eastern GOA or Western GOA is unknown.

This option would also provide less protection against the depletion of individual species than other options. Excessive harvest of Big skates is a particular concern. As the Skates SAFE document indicates, the fishery may have a tendency to harvest larger skates (Skate SAFE, page 9). Big skates tend to be larger than Longnose skates, and female Big skates tend to be larger than males. Female Big skates are believed to make up a disproportionate part of the catch. Moreover, as the Skates SAFE indicates, the overharvest of particular skate species within a species group has been a problem in other skate fisheries in New England (Appendix B skate assessment, page 3).

Because Option 1 does not establish separate OFLs or ABCs by species, it does not require historical information about the proportions of the different species of skates in the harvest for the determination of TACs and DFAs. Our knowledge of these proportions is currently limited. Most of the harvest is delivered by small unobserved vessels. These vessels have not been required to report the species of the skates they are delivering. Prior to 2003, the Observer Program did not report skates by species. A program to gather this information was partially implemented in 2003. Considerably more information on the numbers of the different species of skates in the harvest should become available during 2004. The State of Alaska and NMFS haves modified their species codes to gather more species information on skate deliveries. The Observer Program will begin to systematically gather information on skate species being delivered and discarded.

Suboption 1 (bycatch only, with a 20 percent MRA) would meet the needs of fisheries targeting other species which take skates incidentally, but would preclude a directed fishery for skates in 2004. As noted in Section 3.2 of this EA, 45 hook-and-line vessels and 12 trawl vessels delivered about 1,700 mt of skates with an ex-vessel value of about $1.7 million in the 2003 directed skate fishery in the Central Gulf. Twenty-three distinct processors accepted deliveries of skates in 2003.

Directed skate fisheries would be possible under Suboption 2. Given incidental catch levels reported in the Skates SAFE, a targeted fishery would be possible. There is probably not a high likelihood of closure of fisheries harvesting skates incidentally given high level of aggregation and the conservative management to TAC that would be practiced.

Option 2

Option 1 manages skates at the “group” level, however the group would contain 12 to 14 different species. These species have different characteristics with differing implications for management. Option 2 attempts to address the distinctiveness of skate species.

As noted in the Skate SAFE, different skate species have different life cycle parameters, with different growth rates, average weights at age, ages at sexual maturity, life spans, and fecundities. In other parts of the world, “The mixture of life history traits between smaller and larger skate species has led to apparent population stability for the aggregated “skate” group...where fisheries occur, and this combined with the common practice of managing skate species within aggregate complexes has masked the decline of individual skate species in European fisheries...Similarly, in the Atlantic off new England, declines in barndoor skate abundance were concurrent with an increase in the biomass of skates as a group...” (Skate SAFE, page 3).

GOA Skates differ in average weight at age, and there is some evidence that fishing operations tend to harvest larger animals. This suggests that within the skate complex, fishermen will tend to put more pressure on the larger Big skate species than on other species. Moreover, female Big skates tend to be larger than males, and there is concern that fishing operations might harvest females disproportionately. Larger skates tend to be less resilient to fishing pressure, "This is most often attributed to the long juvenile stage during which relatively large yet immature skates are exposed fo fishing mortality..." This relative lack of resilience in larger skates, "explains the mechanism for the shift in species composition to smaller skate species in heavily fished areas."

Little is known about skate characteristics in general, compared to other species. This is especially true for the skate populations in the waters off of Alaska. Operation in this "information-poor" environment argues for a precautionary approach to management.

Option 2 partially addresses these concerns harvesting a group of skate species with varying life cycle parameters under a single quota, by providing separate GOA-wide ABCs for Big skates, Longnose skates and "other" skates (*Bathyraja sp.*). In addition, GOA-wide OFLs would be established for each species. This option provides a GOA-wide OFL of 5,332 mt and an ABC of 3,999 mt for Big skates, an OFL of 3,758 mt and an ABC of 2,818 mt for Longnose skates, and an OFL of 1,769 mt and an ABC of 1,327 mt for "Other" skates.

Trawl survey research indicates that Big and Longnose skates dominate the GOA skate biomass, and they are believed to dominate skate harvests as well. Both of these species tend to be larger than the species included in the "Other" species category. As noted above, it is believed that the fishery tends to disproportionately harvest larger skates. The species categories under this option have been designed to provide more protection to Big and Longnose skate species which are most vulnerable to fishing pressure and which appear to be harvested disproportionately by the fleet.

Management for each of these species would depend on the suboption chosen. Under Suboption 1, each of these species would be managed as an incidental catch fishery under a 20 percent MRA. The TAC would be set equal the sum of the estimated incidental harvests of each species in the different fisheries that take skates incidentally. A skate species would be made a prohibited species when the species TAC was harvested, and if the species OFL was approached, target fisheries for other species that take skates incidentally could be closed. This suboption would preclude a directed fishery for skates.

Under Suboption 2, TAC would be set equal to ABC for each species, and estimated incidental harvests by species would be deducted from TAC to determine species-specific DFAs. If DFAs were large enough, a targeted fishery could be allowed. Harvest of the TAC would lead to prohibited species status for skates; harvests approaching OFL could lead to closures of targeted fisheries harvesting skates. Under Suboption 2, the ABC for Big skates is 3,999 mt; the Skates SAFE document reports an estimated mean incidental catch of 1,210 mt over the period 1997 to 2002; this suggests a DFA under this option of 2,789 mt. The estimated directed Big skate harvest in 2003 was 2,400 mt, so this Suboption is likely to allow a directed Big skate fishery in 2004. The ABC for Longnose skates is 2,818 mt and the mean incidental harvest from 1997 to 2002 is estimated to be 2,164 mt, suggesting a DFA of about 654 mt. Estimated directed Longnose harvests in 2003 were 300 mt, so a directed Longnose fishery may be possible in 2004 under this Suboption. However, this is not as likely as a directed fishery for big skates. As noted below, the procedures used to make estimates of the species composition of skate catch are believed to produce estimates of species catches that have a large margin for error. In the face of the uncertainty this causes, in-season managers may have to be conservative. The "Other species" category is not believed to be the object of a directed fishery.

Option 2 requires more detailed data than Option 1. Historical data on incidental harvest by species are required to estimate the TAC under Suboption 1 and the DFA under Suboption 2. However, only limited harvest data is available at the species level. Federal and state harvest record systems have not been collecting skate data at the species level. Some information is available from observer data, particularly for 2003. However observers have only recently begun to collect species level data; a time series covering several years is unavailable.

The authors of the Skate SAFE document have made estimates of the skate composition of the catch using data from annual summer trawl surveys of the biomass to project species composition on observer and fish ticket records of aggregate skate harvests. The SAFE is explicit about some of the concerns raised by this approach. (Skate SAFE, page 7-8) The data from trawl surveys are being applied to fisheries using other gears (and hook-and-lines are a particularly important source of skate harvests) and to fish caught for other purposes (for commercial harvest as opposed to biological sampling). Trawl data from the summer and selected years is being extrapolated to harvests from other seasons and years. Despite the shortcomings of this method, it or a very similar approach would have to be used to estimate incidental skate catches in the fisheries harvesting skates, in order to implement Option 2 in 2004.

In addition to the historical data for determination of TAC or DFA levels (depending on the suboption), Option 2 requires species level data for in-season monitoring of harvests. It is likely that this requirement will be met during 2004. The State of Alaska has added species codes to its fish ticket landings information system, in order to gather species level data. NMFS is conducting rulemaking to elaborate the skate species codes used in its recordkeeping system. The observer program has trained its observers in skate identification, and will be collecting species information in 2004.

Species specific OFLs are a concern to some fishermen because they increase the potential for closure of valuable target fisheries that take skates incidentally. Pacific cod is one of these target species. If an OFL is set at the single species level, a fishery harvest of the 1,769 mt “Other” skates OFL could lead to the shut down of an extremely valuable fishery like Pacific cod in order to protect the “Other” skates stock. An “Other” skate shutdown is much less likely when other skates are included with Big and Longnose skates in a single OFL. The potential for problems with species specific specifications is exacerbated when the OFLs and ABCs are based on limited historical information and extrapolations from summer trawl surveys.

Suboption 2 may lead to targeted fisheries for more than one skate species. It is unlikely that these target fisheries would close together. If fishermen, tending to harvest larger animals, caught the Big skate TAC before the Longnose TAC, Big skates would be placed on prohibited status, while the Longnose fishery might remain open. Fishermen might be in the position of being required to discard Big skates taken incidentally to targeted fishing for Longnose skates, if they are over the MRA for skates or if Big skates are on PSC status.

Option 3

Under Option 3, area OFLs and ABCs would be established for each of the species groups in Option 2 (Big, Longnose and Other) in each of the major management areas in the GOA (Western, Central and Eastern). This option adds protection against localized depletion to Option 2. This option is the most restrictive of the five, and raises the most concerns for industry.

Not much is known about the habitat requirements or migration patterns of skates, either in the GOA or elsewhere in the world. The Skates SAFE notes that “The observed catch and landings of skates have shown consistent spatial patterns between 1997 and 2002, suggesting that skates are associated with certain areas and or habitats in the GOA and may be found there predictably...” (Skates SAFE, page 7) Skate SAFE figures suggest that from 1997-2002 incidental skate catches, and 2003 targeted catches within the Central GOA tended to come from the same locations. (Skates SAFE, Figures 3 to 9). Walker and Hislop found evidence of spatial segregation of species in the North Sea, suggestive of species specific habitat requirements. (Walker and Hislop, 1998, page 392).

Given the evidence suggestive of localized harvests and species specific habitat requirements, and in the absence of more detailed information on skate habitat requirements and migration patterns, a precautionary approach to management may be appropriate. Option 3 provides a precautionary approach, by setting separate OFLs and ABCs for each of the Option 2 species or species groups (Big, Longnose, and Other skates) in each of the main management areas in the GOA (Western, Central, and Eastern).

The areas chosen are large with respect to the areas from which skates are taken. They represent a compromise with an ideal of much more specific spatial management and the practical needs of fisheries management. The areas are consistent with the areas used for management of other GOA fisheries.

Management for each of these species would depend on the suboption chosen. Under Suboption 1, each of these species would be managed as an incidental catch fishery within one of the management areas under a 20 percent MRA. The TAC would be set equal the sum of the estimated incidental harvests of each species in the different fisheries that take skates incidentally within that management area. A skate species would be made a prohibited species when the species TAC in the area was harvested, and if the species OFL in the area were approached, target fisheries for other species that take skates incidentally could be closed. This suboption would preclude a directed fishery for skates in any area.

Under Suboption 2, TAC would be set equal to ABC for each species, and estimated incidental harvests by species would be deducted from TAC to determine species-specific DFAs. If DFAs were large enough, a targeted fishery could be allowed. Harvest of the TAC would lead to prohibited species status for skates; harvests approaching OFL could lead to closures of other targeted fisheries incidentally harvesting skates. The estimates of ABC and incidental catch in the Skates SAFE suggest that directed fisheries may be more likely for Big skates than for Longnose or for “Other” skate species. In the Central GOA, the Big skate ABC is 2,463 mt, while the estimated incidental catch is 811 mt. In the Eastern GOA, the Big skate ABC is 809 mt, while the estimated incidental catch is 131 mt. In the Western GOA the Big skate ABC is 727 mt while the estimated incidental catch is 268 mt. ABCs and estimated incidental catches are closer together for Longnose skates. In the Central GOA, the ABC is 1,972 mt and the estimated incidental catch is 1,403 mt. In the Eastern GOA, the ABC is 780 and the estimated incidental catch is 726 mt. In the Western GOA, the ABC is 66, while the estimated incidental catch is 35 mt. (Skate SAFE, Table 16 on page 24).

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

While Option 3 provides some additional protection to the targeted stocks from being overfished, it also increases the possibility that fisheries for other species, that harvest skates incidentally, will be closed if one of the skate species and area specific OFLs were reached. 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 option compared to one in Option 1 (resulting in lower OFLs, ABCs, and TACs for individual skate targets). Fisheries known to harvest skates incidentally include hook-and-line and trawl fisheries for Pacific cod and rockfish, hook-and-line fisheries for sablefish and halibut, and flatfish trawl fisheries. (Skates SAFE, Table 4, page 16) Some of these are among the most valuable fisheries in the GOA.

Because the management of skate species under Options 3 would be to the TAC level under either of the suboptions, the addition of area specific OFLs may not add much protection for the skates. It is rare to reach OFL levels in a fishery. If this is the case, it would also suggest that closure of a fishery taking skates incidentally would be unlikely.

Option 4

Management area (Eastern, Central and Western GOA) OFLs and ABCs for Big skates and Longnose skates, and Gulf-wide OFL and ABC for "Other" skates. This is the assessment author's recommendation.

Option 4 combines the elements of Option 3 for Big and Longnose skates with the Option 2 approach for "Other" skate species. As such, it has been fully analyzed in the analyses for those two options.

Option 4 provides the highest level of protection to Big and Longnose skates, while providing a lesser level of protection for "Other" skates. However, it is less restrictive than Option 3. Under Option 3, the creation of OFLs and ABCs for "Other" skates in each management area created small "Other" skate quotas that increased the potential for fishery closures, without providing proportionate protection to "Other" skates. "Other" skates do not tend to be targeted by the directed skate fisheries and thus pose fewer concerns.

Option 5

Option 5 was designed during the November GOA Plan Team meeting in an explicit effort to provide incremental protection for skate species, and protecting industry from closures caused by limited information on the skate resource and past skate harvests.

This option would establish a GOA-wide OFL for the skate species group. ABCs would be established in each management area in the GOA for a joint Big/Longnose skate grouping. That is, Big and Longnose skates would be treated together under a single ABC in each management area. A GOA-wide ABC would be established for "Other" skates. In the Central GOA a TAC would be established for combined Big and Longnose skate catch. This TAC will equal 10 percent of the estimated biomass of Big skates in the Central GOA (this would have been the OFL for Big skates in this area if such an OFL had been promulgated). The Plan Team explicitly stated that this was meant to be a single year arrangement and that it should be reviewed during the 2005 harvest specifications process. This was the recommendation of the GOA Plan Team at its November 2003 meetings.

The grouping of species for the ABCs at the management area level takes account of three main factors: (1) the Big and Longnose skate species are targeted while the "Other" skates category is still believed to only be harvested incidentally - this justifies separate treatment for these categories; (2) the grouping of Big and Longnose skate species together reflects a concern that limited information on the species composition of catch makes it hard to determine in advance the appropriate ABCs for these species if they were treated separately; (3) separate Big and Longnose ABCs raise the possibility that fishermen, targeting Longnose after the closure of a Big skate directed fishery (which may happen given the tendency of the fishery to harvest larger skates) might be taking and discarding large bycatch amounts of Big skates - with consequent mortality.

The OFL set for all species together at the GOA-wide level reflects concerns that smaller OFLs, at the species or at the management area level, increase the risks of triggering the closures of fisheries taking skates incidentally to other fisheries. As noted in the discussion of Option 2, this is especially a concern at the species level given the relative lack of skate by species landings information. This also reflects a sense that careful management to TACs and ABCs will provide most protection to species. Since OFLs are rarely approached given TAC management, more disaggregate OFLs provide a modest increment in species protection. Managers rarely approached species OFLs because of their care to not exceed TACs and ABCs. This approach also reflects the customary approach in the GOA: most species are managed with a GOA-wide OFL and area ABCs.

The skate fishery appears to harvest larger than average skates. The TAC set for the Big/Longnose grouping in the Central GOA (and only in the Central Area) reflects concerns that directed skate fishermen, harvesting a joint Big/Longnose skate TAC, might concentrate their harvest on the larger Big skates, and especially on the female Big skates, which are larger than the male Big skates. This TAC is being established only in the Central GOA since that is where the targeted fishery is occurring. The TAC is being set equal to what the Big skate OFL would have been, if there were one for the Central GOA. In the absence of this TAC, theoretically a targeted fishery could harvest the full Big/Longnose TAC with female Big skates.

The desire to revisit the harvest specifications after a year reflects the compromise between objectives built into these harvest specifications. To protect skate species, it would be desirable to manage at the individual species level, especially for Big and Longnose skates which provide a large portion of the total skate species biomass estimates. However, concerns with accuracy of the data, and the potential to disrupt fishing activity based on inaccurate data led us to group the species. Better species specific data will become available during 2004. Of particular importance will be species specific landing data. This may allow us to take a second incremental step towards protection of these species in 2005.

Either suboption could be implemented with Option 5. Under Suboption 1, TACs would be set equal to estimated incidental catch needs for the Big/Longnose grouping in the Eastern and Western areas, and for Other skates GOA-wide. The Big/Longnose TAC in the Central area is explicitly set using different criteria under this alternative. This suboption would preclude directed skate fisheries for Big/Longnose skates in the Eastern and Western areas, and for “Other” skates GOA-wide. Unlike Options 1 to 4, however, this Option does not preclude a directed fishery for Big/Longnose skates in the Central GOA.

Under Suboption 2, Western GOA and Eastern GOA Big/Longnose TACs and the GOA-wide “Other” species TAC would be equal to the ABCs for those species in those areas. The DFAs would be calculated by subtracting estimated incidental catches. The Big/Longnose TAC in the Central GOA is explicitly set using different criteria, and a DFA would be calculated for these species by deducting incidental catches of the species in the Central GOA.

This option pulls together elements from other options already analyzed. The GOA-wide OFL for all species is found in Option 1. The GOA-wide ABC for “Other” skates is found in Option 2. Separate GOA-wide ABCs for Big and Longnose skates are also reviewed in Option 2. Option 5 combines these, reducing both the protections for individual skates, and the potential for problems caused under Suboption 2 by the closure of a directed fishery for one of these skate species while the other remains open. The one new component is the TAC for Big/Longnose skates in the Central area. This TAC provides protection for Big skates, in the face of a tendency of fishermen to harvest larger skates in preference to smaller skates. Fishermen would not be able to exceed a harvest rate equal to 10 percent of the Big skate biomass (estimated natural mortality) under this alternative.

Groundfish Target Species Impacts

The impacts of skate harvest specifications on groundfish target species will likely be limited to skates, “other species” complex, 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 species groups: sharks, skates, squids, octopus, and sculpins. “Other species” are considered ecologically important and may have future economic potential; therefore an aggregate annual quota is used to limit 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.

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 percent of the weight of their retained groundfish harvest that is open to a directed fishery, while targeting skates, as provided for in 50 CFR 679.20(e) and Table 10 to 50 CFR part 679. 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. They could retain even more, if their groundfish catch was not composed purely of skates (e.g., if it also contained arrowtooth if open to directed fishing, etc.). 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.

The separate management of skates 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 even 50 percent of that amount in any of those years. The highest harvest took place in 2003, when fishermen harvested almost 50 percent of the TAC. Approximately 63 percent of the “other species” harvest in 2003 was skates (NMFS inseason data). In light of this, all options have been given a “not significant” rating for “other species” impacts. This modest increase in the “other species” TAC will (marginally) increase the potential for overfishing of the species in the remaining groups in the complex (I. e., sharks, squids, sculpins, and octopus). 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 skate specification options include a range of levels of management depending on species and area application of ABCs and OFLs. Option 1 would manage skates with a single GOA wide OFL and ABC. This option would still allow for a disproportionately high level of harvest of a single species within a narrow geographic range and is considered the least protective. Option 2 manages skates with species specific ABCs and OFLs, providing some management over the amount of a single skate species taken on a GOA wide basis. Option 3 is the most protective alternative for the skate stocks because it establishes species and area specific ABCs and OFLs, but there is a paucity of data available to support the management of the skate fishery to this level of detail. 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 or closure of areas of high skate bycatch under 50 CFR 679.20(d)(3), if OFL levels were approached. Option 4 uses species and area specific ABCs and OFLs for Big and Longnose skates and GOA-wide OFL and ABC for “Other” skates. This is slightly less protective than Option 3. Option 5 provides less protection than Options 3 and 4, but more management protection than Options 1 and 2, by using grouped Big and Longnose skate, area specific ABCs and GOA-wide OFLs and “Other “ skates ABC. For purposes of managing skate species in 2004, Option 5 may provide the best level of protection with the currently available information.

Because Option 1 would not protect against the possibility of overfishing an individual species of skate, the impact of Option 1 may be significantly adverse for Big or Longnose skate species. Options 2 provide the ability to control skate harvest to avoid the likelihood of overfishing an individual species on a GOA-wide level and Options 3 through 5 give further protection to skate species by establishing the area specific OFLs. Because the management of skates under Option 5 would be to the area TAC level, the addition of area specific OFLs under Options 3 and 4 is not likely to add much more protection. Options 2 through 5 are not expected to jeopardize the capacity of the stock to produce MSY on a continuing basis and therefore the impacts of Options 2 through 5 on skate stocks is insignificant. None of the options affect the prey availability for groundfish species beyond those already identified in the PSEIS and are therefore insignificant effects. No changes in fishing practices are expected under each option, and therefore, no additional impacts on groundfish habitat is expected with each option.

The significance criteria for effects on groundfish species is found in Table 4.2-1. Table 4.12-2 provides a summary of the significance of groundfish target effects expected from the options and suboptions.

Table 4.12-2 Significance of Direct Effects of Skate Specifications Options and Suboptions on Groundfish

	Options and Suboptions									
	1		2		3		4		5	
Direct Effects	1	2	1	2	1	2	1	2	1	2
Fishing Mortality	S-[1]	S-[1]	I	I	I	I	I	I	I	I
Spatial and Temporal distribution of catch	U[2]	U[2]	U[2]	U[2]	I	I	I	I	I	I
Change in Prey availability	I	I	I	I	I	I	I	I	I	I
Habitat Changes	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE

[1]Option 1 does not manage harvest at the species level so there is potential to jeopardize the ability of the Big and Longnose skates stocks to produce MSY

[2]Management is on a GOA-wide basis, making control of spatial harvest of skates unknown due to the ability to close areas of skate bycatch under 50 CFR 679.20(d)(3).

Prohibited Species Impacts

The only PSC species that may be affected is halibut which likely will be taken in the skate fishery. The significance criteria for effects on PSC species are in Tables 4.5-1 though 4.5-3. 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 all skate specifications options. Halibut bycatch will occur on trawl and hook-and-line vessels targeting skates. Many of these vessels are less than 60 ft LOA and are unobserved. Data from the 2003 skate fishery has not been evaluated 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, given both target fisheries would operate under the same aggregate PSC limit[20].

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 take of halibut is not expect to jeopardize the capacity of the stock to maintain benchmark population levels and is not likely to substantially increase or decrease the amount of harvest of PSC species in the directed skate fishery. Therefore, the effects of the skate specifications options on halibut PSC are insignificant.

Socioeconomic Impacts

Two classes of fishing operations may be affected: vessels targeting on skates and vessels catching skates incidentally while fishing for other targets. Impacts would vary by combination of options and suboptions. Suboptions which preclude or restrict the harvest of the directed skate fishery would reduce revenues for operations targeting skates. The options aggregate skate species and species groups in different ways to create skate fishery overfishing levels (OFLs). If skate overfishing levels are approached, in-season fishery managers may have to take steps to restrict fisheries harvesting skates incidentally. These restrictions could take the form of prohibition of fishing in areas with high incidental skate harvests or, more seriously, closure of a directed fishery in a management area. Several of the fisheries that take skates incidentally are among the most important in the GOA, including fisheries for Pacific cod, sablefish, and halibut. While in-season managers manage to the TAC level and rarely allow a fishery to approach the OFL, this is a concern. The concern is increased when OFLs are disaggregated to provide separate OFLs for species, species-groups, or management areas.

However, the options may also create long-run benefits for the fishing industry if they prevent skate stocks from being driven down by overfishing and preserve fishing opportunities. Overfishing has taken place in skate fisheries elsewhere. Skates are believed to have relatively slow growth rates, a high age of sexual maturity, and low fecundity. These characteristics imply slow recovery for stocks that are fished down.

Given the uncertainties about future Council TAC recommendations, 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 skate specifications options has been designated, "unknown."

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

5.0 Cumulative Effects

Analysis of the potential cumulative effects of a proposed action and its alternatives is a requirement of the NEPA. An environmental assessment or environmental impact statement must consider cumulative effects when determining whether an action significantly affects environmental quality. The CEQ regulations for implementing NEPA define cumulative effects as:

> "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or nonfederal) or person undertakes such other actions. Cumulative effects can result from individually minor but collectively significant actions taking place over a period of time" (40 CFR 1508.7).

Cumulative effects are thoroughly analyzed for the groundfish fisheries in the revised Draft PSEIS in Chapter 4.0 (NMFS 2003b). Section 4.1.4 describes the methodology used to do the cumulative effects analysis. In section 4.5 and the accompanying tables in Appendix A, the current groundfish management regime is analyzed for effects on the environment, including cumulative effects for each component of the environment. A summary of the cumulative effects of Alternative 1 of the Draft PSEIS are in Table 5.0-1. See section 4.5 of the Draft PSEIS for further details on the cumulative effects.

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

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

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

Alternative 2 in the Draft PSEIS is a more aggressive harvest strategy that may be compared to Alternative 1 in this EA. An increase in the occurrence of significantly adverse cumulative effects on the environment is seen for Alternative 2 in the Draft PSEIS compared to Alternative 1 in the Draft PSEIS. Alternative 3 in the Draft PSEIS is a more precautionary harvest strategy which is considered to be "similar" to Alternative 3 in this EA. Alternative 4 in this EA is considered to likely have similar cumulative effects as those seen for Alternative 1 in the Draft PSEIS, because it is an average of the levels of fishing under a similar fishing regime. The action to set harvest specifications analyzed in this

EA is within the scope of alternatives analyzed in the Draft PSEIS, and therefore, the cumulative effects analysis in the Draft PSEIS is adopted in this EA by reference.

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

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

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

The cumulative effects of the skate options 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. Foreseeable future actions include further development of a skate fishery. The skate fishery is likely to have socioeconomic cumulative impacts on the participants in the directed skate fishery, and in other fisheries where the targeted species will be taken as incidental catch in a directed skate fishery. Also affected are fisheries that will rely on the same halibut PSC limits as the directed skate fishery. 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. The 2004 harvest specifications are therefore determined to have no cumulative impacts other than those impacts evaluated in the most recent environmental impact statements prepared for 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 skate specification options are assessed in Chapters 4 and 5 of this EA.

In addition to the Draft PSEIS and Steller Sea Lion Protection Measures SEIS, the significance of impacts of the actions analyzed in this EA were determined through consideration of the following information as required by NEPA and 50 CFR Section 1508.27:

Context: For the 2004 harvest specifications action, the setting of the proposed action is the groundfish fisheries of the BSAI and GOA. Any effects of these actions are limited to these areas. The effects of the 2004 harvest specifications on society, within these areas, is on individuals directly and indirectly participating in the groundfish fisheries and on those who use the ocean resources. 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 federal groundfish fisheries harvest specifications for 2004 are summarized in Table 6.0-1 and in section 4.12. No significant adverse impacts were identified for the preferred alternative (Alternative 2) or for the skate specifications options. The EFH consultation for the interim and annual harvest specifications was completed on November 10, 2003 with a finding that the preferred alternative continues to minimize adverse effects, and no additional conservation recommendations were provided.

6.2 **Public health and safety** will not be affected in any way not evaluated under previous actions or disproportionally. The harvest specifications will not change fishing methods, timing of fishing or quota assignments to gear groups which are based on previously established seasons and allocation formulas in regulations.

6.3 **Cultural resources and ecologically critical areas**: These actions take place in the geographic areas of the Bering Sea, Aleutian Islands, and Gulf of Alaska, generally from 3 nm to 200 nm offshore. The land adjacent to these areas contains cultural resources and ecologically critical areas. The marine waters where the fisheries occur contain ecologically critical areas. Effects on the unique characteristics of these areas are not anticipated to occur with these actions and mitigation measures such as a bottom trawling ban in specified portions of the Bering Sea are part of fisheries management measures.

6.4 **Controversiality**: These actions deal with management of the groundfish fisheries. Differences of opinion exist among various industry, environmental, management, and scientific groups on the appropriate levels of TAC to set for various target species and in particular fishery management areas. 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 no significant adverse impacts to the human environment beyond that disclosed in the Draft PSEIS (NMFS 2003b) or the Steller Sea Lion Protection Measures SEIS (NMFS 2001b). No significant adverse impacts were identified for the preferred alternatives (Alternative 2) for the harvest specification or for the skates specifications options.

6.6 **Future actions** related to this action may result in impacts. NMFS is required to establish fishing harvest levels on an annual basis for the BSAI and GOA groundfish fisheries. Changes may occur in the environment or in fishing practices that may result in significant impacts. Additional information regarding marine species may make it necessary to change management measures. Pursuant to NEPA, appropriate environmental analysis documents (EA or EIS) will be prepared to inform the decision makers of potential impacts to the human environment and to implement mitigation measures to avoid significant adverse impacts. Impacts of a future developing skate fishery on other fisheries is unknown.

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

6.8 **Districts, sites, highways, structures, or objects listed or eligible for listing in the National Register of Historic Places**: This action will have no effect on districts, sites, highways, structures, or objects listed or eligible for listing in the National Register of Historic Places, nor cause loss or destruction of significant scientific, cultural, or historical resources. Because this action is 3 to 200 nm at sea, this consideration is not applicable to this action.

6.9 **Impact on ESA listed species and their critical habitat**: ESA listed species that range into the fishery management areas are listed in Table 6.0-2. An FMP level Section 7 consultation was completed for the groundfish fisheries in November 2000 (NMFS 2000) for those species under the jurisdiction of NMFS. This document is limited to those species under NMFS jurisdiction and covers most of the endangered and threatened species which may occur in the action area, including marine mammals, turtles, and Pacific salmon.

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

Under the FMP level BiOp (NMFS 2000), the western distinct population segment of Steller sea lions was the only ESA listed species identified as likely to be adversely affected by the groundfish fisheries. A subsequent biological opinion on the Steller sea lion protection measures was issued in 2001 (NMFS 2001b, Appendix A, Supplement June 19, 2003). The 2001 BiOp found that the groundfish fisheries conducted in accordance with the Steller sea lion protection measures were unlikely to cause jeopardy of extinction or adverse modification or destruction of critical habitat for Steller sea lions.

No consultations are required for the 2004 harvest specifications at this time because based on the best available information, the proposed actions will not modify the actions already analyzed in previous BiOps, are not likely to adversely affect ESA listed species beyond the effects already analyzed, and the incidental take statements of ESA species are not expected to be exceeded. Summaries of the ESA consultations on individual listed species are located in the section 3.0 and accompanying tables of the Draft PSEIS under each ESA listed species' management overview (NMFS 2003b).

6.10 These actions pose **no known violation of Federal, State, or local laws or requirements for the protection of the environment**. Implementation of the harvest specifications would be conducted in a manner consistent, to the maximum extent practicable, with the enforceable provisions of the Alaska Coastal Management Program within the meaning of section 30(c)(1) of the Coastal Zone Management Act of 1972, and its implementing regulations.

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

6.12 Comparison of Alternatives and Selection of a Preferred Alternative

2004 Harvest Specifications

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

Alternative 2 was chosen as the preferred alternative because: 1) it takes into account the best and most recent information available regarding the status of the groundfish stocks, public testimony, and socio-economic concerns; 2) it sets all TACs at levels equal to or below ABC levels; 3) it sets TACs which, in the aggregate, fall within the specified range of OY for both the BSAI and GOA, and 4) it is consistent with the Endangered Species Act, the Magnuson-Stevens Act (including the national standards), and other applicable law.

Specifications options

The skate options and suboptions were evaluated with respect to their impacts on groundfish, on prohibited species, and on the socioeconomic environment. The impact of prohibited species was determined to be insignificant and socioeconomic impacts were determined to be unknown. The groundfish impacts are summarized in the following table.

Table 4.12-2 Significance of Direct Effects of Skate Specifications Options and Suboptions on Groundfish

	Options and Suboptions									
	1		2		3		4		5	
Direct Effects	1	2	1	2	1	2	1	2	1	2
Fishing Mortality	S-[1]	S-[1]	I	I	I	I	I	I	I	I
Spatial and Temporal distribution of catch	U[2]	U[2]	U[2]	U[2]	I	I	I	I	I	I
Change in Prey availability	I	I	I	I	I	I	I	I	I	I
Habitat Changes	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE

[1]Option 1 does not manage harvest at the species level so there is potential to jeopardize the ability of the Big and Longnose skates stocks to produce MSY

[2]Management is on a GOA-wide basis, making control of spatial harvest of skates unknown due to the ability to close areas of skate bycatch under 50 CFR 679.20(d)(3).

Table 6.0-1 Summary of significant determinations with respect to direct and indirect impacts.

Coding: I = Insignificant, S = Significant, + = beneficial, - = adverse, U = Unknown					
Issue	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5
Target Fish Species					
Fishing mortality	I	I	I	I	S+
Spatial temporal concentration of catch	I	I	I	I	S+
Change in prey availability	I	I	I	I	S+
Habitat suitability: change in suitability of spawning, nursery, or settlement habitat, etc.	I	I	I	I	S+
Incidental Catch of non-specified species					
Incidental catch of non-specified species	U	I	U	U	S+
Forage Fish					
Incidental catch of forage fish	U	I	U	U	S+
Prohibited Species Management					
Incidental Catch of prohibited species stocks	I	I	I	I	I
Harvest levels in directed fisheries targeting prohibited species	I	I	I	I	I

Coding: I = Insignificant, S = Significant, + = beneficial, - = adverse, U = Unknown					
Issue	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5
Bycatch levels of prohibited species in directed groundfish fisheries	I	I	I	I	S+
Marine Mammals					
Incidental take/entanglement in marine debris	I	I	I	I	I
Spatial/temporal concentration of fishery	I	I/U*	I	I	S+
Global Harvest of prey species	I	I	I	I	U
Disturbance	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
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					

Coding: I = Insignificant, S = Significant, + = beneficial, - = adverse, U = Unknown					
Issue	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5
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	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	I	I	S-
Operating cost impacts	S-	I	I	I	S+
Net returns to industry	S+	I	I	I	S-
Safety and health impacts	U	I	U	U	U
Impacts on related fisheries	U	I	U	U	S-
Consumer effects	S+	I	I	I	S-
Management and enforcement	S-	I	I	I	S+
Excess capacity	S+	I	I	I	S-
Bycatch and discards	I	I	I	I	S+
Passive use values	U	I	U	U	U
Non-market use values	U	I	U	U	U
Non-consumptive use values	U	I	U	U	U

* Interim specifications for pollock, P. cod and Atka mackerel have unknown temporal effects on Steller sea lions. Information available in December 2003 to determine seasonal apportionment for 2004.

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

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

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

7.0 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 options to incorporate skates in specifications as a target fishery (pursuant to GOA FMP Amendment 63 approved by the Council in October 2003). Sections 7.1 to 7.4 provide background on IRFA requirements. Section 7.5 evaluates the Regulatory Flexibiltiy Act (RFA) implications of the proposed annual specifications, while Section 7.6 evaluates the RFA implications of the skate options. This IRFA meets the statutory requirements of the Regulatory Flexibility Act of 1980, as amended by the Small Business Regulatory Enforcement Fairness Act (SBREFA) of 1996 (5 U.S.C. 601-612).

7.2 The purpose of an IRFA

The Regulatory Flexibility Act, 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 (adverse) economic impacts 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 alleged 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 fewer than 50,000.

7.5 IRFA for 2004 Specifications

What is this action?

The proposed action is adoption of OFL, ABC, and TAC specifications recommended by the North Pacific Fishery Management Council's GOA and BSAI Plan Teams at their November 2003 meetings. The details of these specifications may be found in Tables 2.2-1 to 2.3-2 of this EA/IRFA Also, detailed descriptions of each alternative analyzed in this EA/IRFA can be found in Section 2.0.

Reason for considering the proposed action

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

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 (i.e., Eastern, Central, Western Aleutian Islands; Bering Sea; Western, Central, and Eastern Gulf of Alaska) among management programs (e.g., open access or community development quota program), processing components (i.e., inshore or offshore), specific gear types (e.g., trawl, non-trawl, hook-and-line, pot, jig), and seasons according to regulations § 679.20, § 679.23, and § 679.31. TAC can be sub-allocated to the various gear groups, management areas, and seasons according to pre-determined regulatory actions and by regulatory announcements by NMFS management authorities opening and closing the fisheries accordingly. The entire TAC amount is available to the domestic fishery. Authorized gear in the Federally managed groundfish fisheries off Alaska includes trawl, hook-and-line, longline pot, pot, and jig (50 CFR 679.2).

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

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

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

Objectives of, and legal basis for, the proposed action

The objectives of the proposed action (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), passed in 1976 and amended in 1996, the United States has exclusive fishery management authority over all living marine resources, except for marine mammals and birds, found within the exclusive economic zone (EEZ) between 3 and 200 nautical miles from the baseline used to measure the territorial sea. The management of these marine resources is vested in the Secretary of Commerce (Secretary) and in Regional Fishery Management Councils. In the Alaska region, the North Pacific Fishery Management Council (Council) has the responsibility to prepare fishery management plans (FMPs) for the marine resources it finds require conservation and management. The National Marine Fisheries Service (NMFS) is charged with carrying out the federal mandates of the Department of Commerce with regard to marine fish. The Alaska Regional Office of NMFS and Alaska Fisheries Science Center (AFSC), research, draft, and provide technical support for the management actions recommended by the Council.

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

Number and description of small entities regulated by the proposed action[21]

The entities regulated by this action are those that commercially harvest federally managed groundfish in the BSAI and GOA. These entities include the groundfish catcher vessels and catcher/processor

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[21]This overview of the number and description of small commercial fishing entities in the BSAI and GOA groundfish fisheries uses the most complete and comprehensive available published summary data on small and large commercial fishing entities in the BSAI and GOA. These are the data in Table 26 of the 2002 Economic SAFE document (Appendix D to the EA/IRFA for the 2003 specifications (NMFS, 2003a)). This table is built from a data set using groundfish revenues in federal fisheries off of Alaska to distinguish between large and small entities. However, these revenues are also known to be an incomplete measure of gross revenues for distinguishing between large and small entities. The distinction should be made using a comprehensive measure of revenues, including revenues from fisheries for other species, revenues from non-fishing activities, revenues from fishing activities outside of Alaska, and revenues from affiliated firms. A fully comprehensive data set is not currently available, and given the difficulties in measuring revenues for affiliated operations, may never be. However, a later section of this analysis utilizes a data set prepared by the Alaska Fisheries Information Network to look at directly regulated small entities that are adversely affected by this action. That data set does include other gross revenues from Alaskan fisheries other than the groundfish fisheries (i.e., fisheries for salmon, crab, herring and scallops).

vessels active in these areas. It also includes organizations to whom direct allocations of groundfish are made. In the BSAI, this includes the CDQ groups and the AFA fishing cooperatives.

Table 7.5-1 shows the estimated numbers of small and large entities in the BSAI and GOA groundfish fisheries. The reasoning behind these estimates is summarized in the paragraphs which follow the table.

Table 7.5-1 Estimated numbers of regulated entities in the BSAI and GOA groundfish fisheries

Fleet segment	Number small entities	Number large entities	Total number of entities
Catcher vessels	832-838	7-12 (81-87 vessels)	839-925
Catcher processors	30-33	54-57	87
Motherships	0	3	3
CDQ groups	6	0	6

Notes: In some cases, the number of entities is smaller than the number of vessels - indicating that at least some entities have multiple vessels. The estimated numbers of vessels have been placed in parentheses. Catcher vessel and catcher/processor estimates prepared from fish tickets, weekly processor reports, product price files, and intent-to-operate listing. The methodology used probably overstates the numbers of small entities. All CDQ groups are non-profits and are therefore treated as small.

Fishing vessels, both catcher vessels and catcher/processors, are "small entities" if they gross less than $3.5 million in a year. Table 7.5-2 provides estimates of the numbers of catcher vessels and catcher/processors with less than $3.5 million in gross revenues from groundfish fishing in the BSAI and GOA.[22] 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 7.5-3, provides similar information for catcher vessels and catcher/processors grossing more than $3.5 million.

Catcher-vessels

Table 7.5-2 indicates that, in 2002, there were 781 small catcher vessels active in groundfish harvesting in the GOA and 251 in the BSAI. There were 913 small groundfish catcher vessels in total. These numbers suggest that 119 vessels must have operated in both the BSAI and the GOA.[23] Table 7.5-2

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

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

implies that each of the small catcher vessels is treated as a separate small entity. This likely overstates the number of separate entities, since there is probably not a strict one-to-one correspondence between vessels and entities; (i.e., some persons or firms are known to own more than one vessel).

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

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

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

Catcher-processors

Table 7.5-2 indicates that, in 2002, there were 20 small catcher/processors in the GOA and 32 in the BSAI. There were 33 small catcher/processors in total. These numbers suggest that 19 catcher/processors must have operated in both the BSAI and the GOA. Table 7.5-2 implies that each of the small catcher/processors is treated as a separate small entity. This may overstate the number of separate entities since there is probably not a strict one-to-one correspondence between vessels and entities (i.e., some persons or firms are known to own more than one vessel).

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

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

Economic SAFE in this version has led changes in estimates of large and small vessels, and especially to significant reductions in the estimates of catcher-vessels.

Therefore, the number of large catcher-processors might range from 54 (from Table 7.5-3) up to 57 (if all of the six with revenues under $3.5 million are large by affiliation).

Motherships and CDQ groups

The three active groundfish 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 7.5-2 Number of vessels that caught or caught and processed less than $3.5 million ex-vessel value or product value of groundfish by area, catcher type and gear, 1997-2001.

	Gulf of Alaska			Bering Sea and Aleutian			All Alaska		
	Catcher Vessels	Catcher process	Total	Catcher Vessels	Catcher process	Total	Catcher Vessels	Catcher process	Total
1998									
All gear	915	21	936	232	41	273	998	41	1,039
Hook & line	658	15	673	62	29	91	676	29	705
Pot	180	1	181	71	7	78	225	7	232
Trawl	167	5	172	115	7	122	205	7	212
1999									
All gear	889	29	918	277	31	308	1,010	34	1,044
Hook & line	625	17	642	67	19	86	651	22	673
Pot	201	10	211	90	11	101	256	11	267
Trawl	154	3	157	126	4	130	202	4	206
2000									
All gear	991	16	1,007	278	30	308	1,143	32	1,175
Hook & line	719	8	727	79	17	96	749	18	767
Pot	252	5	257	91	11	102	302	12	314
Trawl	127	3	130	114	5	119	206	6	212
2001									
All gear	853	21	874	280	43	323	1,013	44	1,057
Hook & line	650	15	665	92	31	123	681	31	712
Pot	154	4	158	74	7	81	212	9	221
Trawl	120	4	124	118	6	124	196	7	203
2002									
All gear	781	20	801	251	32	283	913	33	946
Hook & line	619	13	632	78	24	102	633	24	657
Pot	127	4	131	59	5	64	169	6	175
Trawl	107	3	110	118	3	121	186	3	189

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

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

Table 7.5-3 **Number of vessels that caught or caught and processed more than $3.5 million ex-vessel value or product value of groundfish by area, catcher type and gear, 1997-2001.**

	Gulf of Alaska		Bering Sea and Aleutian			All Alaska		
	Catcher process	Total	Catcher Vessels	Catcher process	Total	Catcher Vessels	Catcher process	Total
1998								
All gear	26	26	0	58	58	0	58	58
Hook & line	7	7	0	14	14	0	14	14
Pot	0	0	0	1	1	0	1	1
Trawl	19	19	0	44	44	0	44	44
1999								
All gear	29	29	1	57	58	1	57	58
Hook & line	13	13	0	22	22	0	22	22
Pot	1	1	0	3	3	0	3	3
Trawl	15	15	1	36	37	1	36	37
2000								
All gear	28	28	4	58	62	4	58	62
Hook & line	13	13	0	26	26	0	26	26
Pot	0	0	0	2	2	0	2	2
Trawl	15	15	4	34	38	4	34	38
2001								
All gear	19	19	5	47	52	5	47	52
Hook & line	5	5	0	14	14	0	14	14
Trawl	14	14	5	33	38	5	33	38
2002								
All gear	23	23	6	54	60	6	54	60
Hook & line	10	10	0	18	18	0	18	18
Trawl	13	13	6	36	42	6	36	42

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

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

Tables 7.5-4 and 7.5-5 provide estimates of average gross revenues from groundfish production in the BSAI and GOA for small and for large vessels.[24] Considering activity in both the BSAI and the GOA, small catcher vessels grossed an average of about $230,000 in 2002. This average conceals variation by fishery management area and gear type. Small hook and line gear vessels (longline and jig) in the GOA had the smallest average gross revenues at about $100,000, while small trawlers in the BSAI had the largest at $1,070,000. The overall average gross revenues for all small vessels active in the GOA groundfish fisheries were $140,000, while the overall average gross revenues for all small vessels active in the BSAI groundfish fisheries was $600,000. Corresponding average gross revenues for large entities for these gear types and areas may be found in Table 7.5-5.

Catcher/processors carry the equipment and personnel they need to process the fish that they themselves catch. In some cases catcher/processors will also process fish harvested for them by catcher vessels and transferred to them at sea. There are many types of catcher/processors operating in the BSAI and GOA groundfish fisheries. They are distinguished by target species, gear, types of products, and vessel size. The 44 small catcher/processor vessels had first wholesale gross revenues of about $78 million in 2001; average revenues were about $1.8 million. The 47 large catcher/processor vessels had first wholesale gross revenues of about $612 million in 2001; average revenues were about $13 million.

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

Through the Community Development Quota (CDQ) program, the North Pacific Fishery Management Council and NMFS allocate a portion of the BSAI groundfish, prohibited species, halibut and crab TAC limits to 65 eligible Western Alaska communities. These communities work through six non-profit CDQ Groups to use the proceeds from the CDQ allocations to start or support commercial fishery activities that will result in ongoing, regionally based, commercial fishery or related businesses. The CDQ program began in 1992, with the allocation of 7.5 percent of the BSAI pollock TAC. The fixed gear halibut and sablefish CDQ allocations began in 1995, as part of the halibut and sablefish Individual Fishing Quota Program. In 1998, allocations of 7.5 percent of the remaining groundfish TACs, 7.5 percent of the prohibited species catch limits, and 7.5 percent of the crab guidelines harvest levels were added to the CDQ program. At this time, the CDQ share of the pollock TAC was increased to 10 percent. The CDQ groups are reported to have had gross revenues of about $63.2 million, in 2000 (Alaska Department of Community and Economic Development 2001, page 25); average gross revenues were thus about $10.5 million.

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

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

	Gulf of Alaska			Bering Sea & Aleutians			All Alaska		
	Catcher Vessels	Catcher process	Total	Catcher Vessels	Catcher process	Total	Catcher Vessels	Catcher process	Total
1998									
All gear	.14	1.77	.18	.43	1.63	.61	.16	1.63	.22
Hook & line	.07	1.59	.10	.12	1.57	.58	.07	1.57	.13
Pot	.11	-	.12	.24	.84	.29	.15	.84	.17
Trawl	.50	2.40	.56	.76	2.58	.86	.53	2.58	.59
1999									
All gear	.20	1.44	.24	.53	1.51	.63	.21	1.38	.25
Hook & line	.09	1.48	.12	.14	1.79	.50	.08	1.55	.13
Pot	.17	1.23	.22	.15	1.16	.26	.16	1.16	.20
Trawl	.75	-	.77	1.00	1.59	1.02	.73	1.59	.75
2000									
All gear	.16	1.33	.18	.65	1.34	.72	.24	1.34	.27
Hook & line	.11	1.24	.12	.23	1.60	.47	.10	1.53	.14
Pot	.16	1.03	.18	.16	.63	.21	.17	.75	.19
Trawl	.56	-	.60	1.33	1.72	1.34	.89	1.83	.92
2001									
All gear	.13	1.76	.17	.48	1.76	.65	.20	1.77	.26
Hook & line	.10	1.82	.14	.16	1.91	.60	.09	1.91	.17
Pot	.12	1.73	.16	.13	.86	.19	.12	1.17	.16
Trawl	.37	1.80	.42	.93	1.93	.98	.66	1.95	.70
2002									
All gear	.14	1.70	.18	.60	1.81	.74	.23	1.76	.29
Hook & line	.10	1.89	.14	.19	1.96	.61	.10	1.96	.17
Pot	.15	.38	.16	.19	.62	.23	.15	.52	.16
Trawl	.40	-	.46	1.07	-	1.11	.76	-	.79

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

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

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

	Gulf of Alaska		Bering Sea & Aleutians			All Alaska		
	Catcher process	Total	Catcher Vessels	Catcher process	Total	Catcher Vessels	Catcher process	Total
1998								
All gear	6.41	6.41	-	8.64	8.64	-	8.64	8.64
Hook & line	4.46	4.46	-	4.51	4.51	-	4.51	4.51
Trawl	7.12	7.12	-	9.95	9.95	-	9.95	9.95
1999								
All gear	5.53	5.53	-	10.09	10.00	-	10.09	10.00
Hook & line	4.69	4.69	-	4.70	4.70	-	4.70	4.70
Trawl	6.36	6.36	-	13.23	13.00	-	13.23	13.00
2000								
All gear	6.57	6.57	4.66	10.72	10.33	4.66	10.72	10.33
Hook & line	4.82	4.82	-	5.09	5.09	-	5.09	5.09
Trawl	8.09	8.09	4.66	14.87	13.80	4.66	14.87	13.80
2001								
All gear	7.54	7.54	4.29	13.02	12.18	4.29	13.02	12.18
Hook & line	4.97	4.97	-	4.66	4.66	-	4.66	4.66
Trawl	8.45	8.45	4.29	16.57	14.95	4.29	16.57	14.95
2002								
All gear	6.96	6.96	4.22	12.76	11.91	4.22	12.76	11.91
Hook & line	4.28	4.28	-	4.25	4.25	-	4.25	4.25
Trawl	9.03	9.03	4.22	17.02	15.19	4.22	17.02	15.19

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

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

Impacts on directly regulated small entities

Section 4.11.2 of the EA summarized the results of a simple model used to project the impacts each of the five alternatives considered in this action have on first wholesale gross revenues. The results are summarized in Figures 4.11-1 to 4.11-3. The first wholesale gross revenue estimates included the processed value of groundfish delivered shoreside by the catcher vessel fleet, and the value of processed groundfish received by catcher-processors. It did not reflect the ex-vessel value of the fish received by the catcher vessel fleet. The same model can be used to project the changes in first wholesale value for fleet sectors defined by species, or species-group harvest (for example, changes in the value of pollock harvests).

This model is of limited use, however, in examining the impacts of specification changes on the small entities directly regulated by the action. The reason for this is that many of these are catcher vessels, and, in its current state, the model does not provide estimates of ex-vessel revenue changes to catcher vessels.

A two-part approach is used to address this shortcoming of the model, and examine the impacts of the preferred alternative on directly regulated small entities. In the first step, first wholesale gross revenue changes associated with the model used in the EA are reported for each of the major fleet sectors (defined by species or species-group) in the BSAI and GOA. In this first step, the first wholesale gross revenues are used as an "index" or indicator to, in effect "flag", the fleet sectors that may be adversely affected by the action for more focused examination. In the second step, then, these directly regulated and potentially adversely affected small entities are described using data sets that have been specially prepared by the Alaska Fisheries Information Network (AKFIN) for this analysis. These data sets contain information on groundfish gross revenues at the ex-vessel level for catcher vessels and at the first wholesale level for catcher-processors.[25]

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

While several sectors experience small adverse impacts, under 5%. The most important adverse impact appears to be experienced by vessels fishing for rockfish in the GOA. Here, first wholesale revenues decline by about 7.35%. First wholesale revenues exceed ex-vessel revenues for catcher-vessels. This does imply that this segment of the fleet will be adversely impacted by the preferred alternative

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

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

	BSAI		BSAI CDQ	
	Revenue change ($)	**Percent change (%)**	**Revenue change ($)**	**Percent change (%)**
Pollock	0	0	0	0
Sablefish	-338	0	207	0
Pacific cod	0	0	0	0
Arrowtooth	0	0	0	0
Flathead sole	0	0	0	0
Rock sole	0	0	0	0
Turbot	0	0	0	0
Yellowfin	0	0	0	0
Other flatfish	0	0	0	0
Rockfish	-363,034	-4.62	-22,785	-4.62
Atka mackerel	0	0	0	0
Other	0	0	-1,188	0

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

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

	GOA	
	Revenue change ($)	**Percent change (%)**
Pollock	0	0
Sablefish	0	0
Pacific cod	0	0
Arrowtooth	0	0
Flathead sole	-26,306	-2.42
Rex sole	0	0
Flats deep	0	0
Flats shallow	-138,528	-4.07
Rockfish	-987,969	-7.35
Atka mackerel	0	0
Other species	0	0

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

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."

Four alternatives to the rule were analyzed. Three of these, Alternatives 3, 4, and 5, involve lower overall gross revenues for fishing operations, and thus a likely greater adverse impact on small entities. One of these, Alternative 1, involves higher level of gross revenues and thus may have a smaller adverse impact on small entities than the preferred alternative. However, the higher harvest levels associated with Alternative 1 exceed the optimal yield in BSAI, and exceed Plan Team recommended harvests for many species in both the GOA and the BSAI. 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 IRFA for GOA skate specification options

What is this action

The proposed action is to choose the method of specifying OFL, ABC, and TAC levels for GOA skates.

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 provides limited harvest protection to skates, given their new status as a target species. At its October 2003 meeting, the Council adopted GOA FMP Amendment 63, which moves skates from the "other species" category, and adds them to the FMP's target species category. The Council deferred a decision on a method to implement skates in specifications until the December 2003 meeting, when it would have the results of the summer 2003 trawl survey, the assessment author's evaluation, and GOA plan team recommendations.

Five options and two suboptions are considered in this analysis.

Option 1: GOA-wide OFL and GOA-wide ABC for all skates (grouped together).

Option 2: GOA-wide OFL and GOA-wide ABC for big skates, longnose skates, and "other" skates.

Option 3: Management area OFLs and ABCs for big skates, longnose skates, and for "other" skates.

Option 4: Management area (Eastern, Central, and Western GOA) OFLs and ABCs for big skates and longnose skates, and GOA-wide OFL and ABC for "other" skates. This is the assessment author's recommendation.

Option 5: A GOA-wide OFL would be established for all species combined. ABCs would be established in each management area in the GOA a big/longnose skate grouping. A GOA-wide ABC would be established for "other" skates. In the Central GOA a TAC would be established for combined big and longnose skate catch. This TAC will equal 10% of the estimated biomass of big skates in the Central Area (this would have been the OFL for big skates in this area if such an OFL had been promulated) The Plan Team explicitly stated that this was meant to be a single year arrangement and that it should be reviewed during the 2005 specifications process. This was the recommendation of the GOA Plan Team at its November 2003 meetings.

Suboption 1: Set TAC at the ABC or a lower level sufficient to meet anticipated incidental catch needs in other directed fisheries throughout the fishing year. The result would be that skates would be on bycatch status throughout the fishing year, skates could be retained up to the maximum retainable amount (20%) but there would be no directed fishing for skates.

Suboption 2: Set TAC at the ABC level. The result would be the Regional Administrator would establish a directed fishing allowance for each applicable species group and management area adopted under under the selected option. For the species and areas adopted under the selected option where the TAC amount exceeds the amount anticipated incidental catch needs in other directed fisheries throughout the fishing year a directed fishery for skates would be authorized.

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 skate stock against overfishing. The Council has adopted an FMP amendment that moves skates from the GOA FMP's "other species" category to its "target species" category. The Council must now decide how to implement skate OFL, ABC, and TAC levels.

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 FMP 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, if adopted, would be the fishing operations harvesting species in the "other species" complex in the GOA, using hook-and-line gear or trawls. These vessels may be targeting skates (the only species in the "other species" category currently fished as a target), or they may be harvesting skates and other species in the "other species" category incidentally to other targeted fishing operations; (e.g., 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, the universe of potentially affected vessels 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.[26] 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 counts may overstate the numbers of small entities potentially directly regulated by the proposed action. Average Alaska groundfish revenues, in 2001, for these 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 7.5-2, 7.5-3, and 7.5-4)

The directed skate fishery that emerged in 2003 is described in Section 1.3 of the EA. As noted there, 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.

Impacts on directly regulated small entities

The options could have adverse impacts on small fishing entities if they restricted the target fishery for skates, or if they restricted fisheries taking skates incidentally while targeting other species. Options 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 may reduce the annual revenue received by skate fishermen.

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[26]The counts of small and large entities in this paragraph are based on estimates from Appendix D (the Economic SAFE report) of the 2003 Specifications EA/IRFA. As noted earlier in this analysis, these counts are based on revenues from groundfish fishing in the BSAI and GOA.

Skates are also taken incidentally in fisheries for other species. Incidental skate catches appear to be relatively important (over 300 mt in total during the years 1997-2002) in the trawl fisheries arrowtooth flounder, flathead sole, Pacific cod, rex sole, rockfish and shallow water flats, and in the longline fisheries for rockfish, sablefish, Pacific cod, and halibut. If estimated targeted and incidental catches of skates reached TAC levels, skates would become a prohibited species, and retention of incidental skate catches would be prohibited. If estimated catches approached OFL levels, fisheries taking skates incidentally may be closed, or restricted in regions with high incidental skate catches, to protect the skate stocks.

The five options impose different levels of restrictions on fishing operations. Section 4.12 in the EA included with this document provides a more detailed review of the implications of these options. The start of that section reviews the use of OFL, ABC, TAC, and DFA restrictions in GOA in-season management.

Table 7.6-1. Summary of Option 1 small entity considerations

Overview	Option 1 creates a single GOA-wide OFL for all skate species, and a single GOA-wide ABC for all skate species. This option imposes the fewest restrictions on small fishing entities.
Suboption 1	Option 1, Suboption 1 would make skates a bycatch-only species. This would eliminate the directed fishery for skates that emerged in 2003 and would have an adverse impact on the vessels that participated in that fishery, or that planned to enter that fishery.
Suboption 2	Option 1, Suboption 2 would permit a directed fishery if estimated incidental catch needs could be met. The ABCs projected for this alternative, and the estimated incidental catch needs reported in the Skates SAFE document suggest that this would be the case.
Other fisheries	Fishing in fisheries targeting other species, but harvesting skates incidentally, could be stopped if estimated skate catches approached the OFL level. This is an unlikely outcome. In addition to actually closing a fishery, managers may also have the option of restricting its operations in regions where incidental skate catches are relatively high. Fishery managers manage stocks to stay within TAC levels, and rarely approach OFLs. Moreover, the high level of species aggregation in this option reduces the likelihood of this. Although this outcome appears unlikely, it remains a concern. This concern is greater for options 2, 3, and 4.
Data source: Information on OFLs, ABCS, 2003 harvest, and estimated incidental catches is from Table 16 on page 24 of the Skates SAFE (Appendix B).	

Table 7.6-2. Summary of Option 2 small entity considerations

Overview	Option 2 creates three GOA-wide OFLs for skate species or species groups (Big skates, Longnose skates, and Other skates) and three GOA-wide ABCs for the same species or species groups.
Suboption 1	Suboption 1 makes skates a bycatch-only species. This would eliminate the directed fishery for skates and would have an adverse impact on the vessels in that fishery.
Suboption 2	Option 2, Suboption 2 would only allow a directed fishery if TAC (set equal to ABC) was sufficiently greater than estimated incidental catch needs to permit a directed fishery. This is likely to be the case for Big skates. The 2004 ABC for Big skates is 3,999 mt. The preliminary estimate of incidental catch needs in the Skates SAFE is 1,210 mt. The excess of 2,789 mt is slightly larger than the estimated directed fishery catch in 2003. This may not be the case for Longnose skates, or for Other skates. The difference between TAC and estimated incidental catch needs for Longnose skates is 654 mt and the difference for Other skates is -233 mt. Other skates, however, are not the target of the directed skate fishery. Note also, that these incidental catch estimates are based in part on extrapolations to commerical longline and trawl fishing based on catch composition in the summer trawl survey, and in part on an analysis of halibut data incorporating many assumptions. These estimates have a large margin for error. This may encourage more conservative management by in-season managers. This consideration applies to this option and to Options 3 to 5, each of which incorporates species specific restrictions.
Other fisheries	Option 2 creates species specific OFLs in the GOA. These OFLs are smaller than the OFL that would be created under Option 1. The possibility that one or more of these may be approached, and a fishery for another species, taking skates incidentally, shut down, is somewhat larger. It is still unlikely however, given in-season management to stay within TACs, and that managers may also have the option of restricting fishing operations in relatively small areas where incidental skate catches may be high.
Data source: Information on OFLs, ABCS, 2003 harvest, and estimated incidental catches is from Table 16 on page 24 of the Skates SAFE (Appendix B).	

Table 7.6-3. Summary of Option 3 small entity considerations

Overview	Option 3 creates a separate OFL and a separate ABC for each of the species and species groups defined under Option 2, in each of the three management areas in the GOA (the Western, Central and Eastern management areas). This is the most restrictive of the options, and is the most likely to create adverse impacts for small entities.
Suboption 1	Option 3, Suboption 1 makes skates a bycatch-only species. This would eliminate the directed fishery for skates and would have an adverse impact on the vessels in that fishery.
Suboption 2	Option 3, Suboption 2 would allow directed skate fishing similar to that in 2003, if the TACs for Big skates and Longnose skates in the Central area were sufficiently larger than the estimated incidental catch requirements. This appears to be the case for Big skates, which would have a 2004 Central area TAC of 2,463 mt and estimated incidental catch requirements of 811 mt. It might also be the case for Longnose skates, which have a Central area TAC of 1,972 mt, and an estimated incidental catch requirement of 1,403 mt. However, the margin is much smaller in the case of Longnose skates.

Other fisheries	The creation of OFLs for each skate species or species group in each management area will create OFLs that are often small. As noted above, incidental catch estimates are extrapolations to commerical longline and trawl fishing based on catch composition in the summer trawl survey, and have a large margin for error. This may encourage more conservative management by in-season managers. The possibility that one or more of these may be approached, and that a fishery for another species, taking skates incidentally, might be shut down, is largest for this alternative.
Data source: Information on OFLs, ABCS, 2003 harvest, and estimated incidental catches is from Table 16 on page 24 of the Skates SAFE (Appendix B).	

Table 7.6-4. Summary of Option 4 small entity considerations

Overview	Option 4 combines the Big skate and Longnose skate management area specific OFLs and ABCs of Option 3, with the GOA-wide OFL and ABC for Other skates in Option 2. It therefore falls between these in terms of its adverse impacts on small entities. The relevant analyses for those options applies to this.

Table 7.6-5. Summary of Option 5 small entity considerations

Overview	Option 5 provides a GOA-wide OFL would be established for all species combined. ABCs would be established in each management area in the GOA for a big/longnose skate grouping. A GOA-wide ABC would be established for “other” skates. In the Central GOA a TAC would be established for combined big and longnose skate catch. This TAC will equal 10% of the estimated biomass of big skates in the Central Area (this would have been the OFL for big skates in this area if such an OFL had been promulated) This option is meant to be in place for one year, and to be reviewed at the end of 2004, in light of species-specific harvest data to be collected in 2004.
Suboption 1	Option 5, Suboption 1 makes skates a bycatch-only species, except for the Big/Longnose skate group in the Central area. The directed fishery in 2003 was a fishery for these species in this area. This alternative, therefore, would not necessarily eliminate the directed fishery. A directed fishery could occur if estimated incidental catch needs were sufficiently smaller than the TAC. The Skates SAFE document estimates suggest that this would be the case. The Big/Longnose TAC would be 3,284 mt, and estimated bycatch needs are 2,214 mt. This leaves a residual of 1,070 mt for a directed fishery. This, however, is significantly below the 2,700 mt estimated to have been caught in the directed fishery in 2003. Thus, this Suboption is likely to adversely affect small entities. The adverse impact is likely to be less than under this Suboption in Options 1 to 4, where a directed skate fishery is precluded.

Suboption 2	The directed fishery in 2003 took place in the Central area for Big skates and for Longnose skates. The combined ABCs for these species in this area are 4,435 mt, while the estimated combined incidental catches for these are 2,214 mt. The balance, 2,221 mt is somewhat smaller than the estimated 2003 harvest of 2,700 mt. It therefore appears likely that this suboption would permit a directed fishery for skates in 2004. The DFA, however, might restrict the size of this fishery compared to the 2003 level, imposing some adverse impact on fishermen in the directed skate fishery. A GOA-wide ABC for Other skates is unlikely to permit a directed fishery for this species; estimated incidental Other skate catches exceed the proposed ABC for Other skates. However, this is unlikely to create an adverse impact for small entities, since the directed skate fishery is targeted on Big and Longnose skates.
Other fisheries	This option creates a highly aggregated GOA-wide OFL, as was done in Option 1. The Option 1 considerations therefore apply to this option. Fishing in fisheries targeting other species, but harvesting skates incidentally, could be stopped if estimated skate catches approached the OFL level, but this is unlikely. Fishery managers manage stocks to stay within TAC levels, and rarely approach OFLs. Moreover, the high level of species aggregation in this option reduces the likelihood of this. Nevertheless, this is a concern. This concern is greater for options 2, 3, and 4.
Data source: Information on OFLs, ABCS, 2003 harvest, and estimated incidental catches is from Table 16 on page 24 of the Skates SAFE (Appendix B).	

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..."[27]

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

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 its October 2003 meeting, the Council adopted FMP-level Amendment 63 to move skates from the GOA FMP's "other species" to its "target species" category. The Council did not, however, choose

[27]Certain options that might be implemented under this action might require greater information on the species composition of skate catch (although options that do not require individual skate species OFLs and ABCs would not). The Alaska Department of Fish and Game is implementing a change in species codes to gather more detailed information. Observers are collecting more skate species information. NMFS is preparing a regulatory amendment to make several changes to its species codes, including the addition of a skate species code. These actions are being implemented independently of the current FMP amendment. Therefore, the FMP amendment will not change paperwork requirements. The IRFA for the skate species codes addresses the paperwork requirements.

among the specifications options at that time. It deferred action on these until better information on skates was available from the 2003 groundfish survey in December 2003. Therefore, it is not possible to identify the preferred option at this time (November 2003) and to discuss the reasons why other options were not chosen.

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

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

Appendix C: Ecosystem Considerations for 2003

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

Appendix E: Detailed Analysis of 2004 Gross Value Impacts

Prices used to calculate gross values

The gross value analysis provides estimates of gross revenues received for products at the first wholesale level, or "first wholesale gross revenues." First wholesale gross revenues are used as a measure of gross value for two reasons. First, they provide the first market transaction common to two major sectors of the industry: (1) the "inshore sector," comprised of catcher vessels that harvest fish and deliver them for processing to shoreside or at-sea processors, and these same processors; and (2) catcher/processor vessels that process their own harvest. Ex-vessel revenues for catcher vessels would not be comparable to the revenues received in the first commercial transaction of a catcher/processor, because the latter transaction involves a value added product, while the former involves raw catch. The second reason first wholesale gross revenues were used, was to capture impacts on the combined fishing and fish processing sectors.

The prices are defined as "first wholesale price per metric ton of retained catch." First wholesale prices are necessary for calculating gross revenues at the first wholesale level. Prices are measured in metric tons of retained catch by the fishermen. Retained catch differs from total catch because fishermen often discard parts of their total catch.

Price projections are not available for 2004, nor are observed prices available for 2003 at present. The most recent year for which relatively complete price data are available is 2002. The first wholesale price per metric ton of retained catch was calculated by dividing an estimate of gross first wholesale revenues by an estimate of retained catch for seven species groupings. These groupings were pollock, sablefish, Pacific cod, flatfish, rockfish, Atka mackerel, and "other" species.[28] The prices estimates are "Alaska-wide" and are based on data in the 2003 Economic SAFE.[29]

How first wholesale revenues were estimated

The volumes of fish harvested under the different alternatives were estimated as follows: (a) species ABCs for each alternative were obtained from the Council plan teams following their November 2003

[28] 2001 price estimates per metric ton were: $653 for pollock, $5,619 for sablefish, $1,061 for Pacific cod, $667 for flatfish, $729 for rockfish, $659 for Atka mackerel, and $1,127 for other species.

[29] Retained catch was calculated using Tables 4 and 5 which contains information on catch and discards. Total first wholesale revenues were estimated from Table 36. The species groupings used were determined by the groupings used in the 2003 Economic SAFE.

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;[30](c) TACs were projected for each species group (using a procedure discussed below) in the BSAI and GOA; (d) BSAI TACs were divided into the CDQ reserve and the ITAC plus unspecified reserves using formulas from the regulations; (e) an estimate of the proportion of the projected TAC for the species group taken on average in the years 1998-2002, was used to estimate total catch (separate proportions were used in the BSAI and GOA, and for CDQ and other fishing in the BSAI); (f) an estimate of the average proportion of the total catch that was discarded in 1998 to 2002, was used to estimate the proportions of catch that were discarded and retained.[31]

For this analysis, 2004 TACs and interim TACs were estimated by the groundfish plan team in November and are used for all alternatives. Note, however, that projections of revenues for Alternatives that monetize ABCs could be seriously misleading. Alternative 1 essentially uses ABC values as an upper bound harvest limit, where the sum of ABCs is 189% of the optimum yield (OY). There were also some 2003 ABCs that were smaller than the 2003 TACs, which leads to overall total fishery yields that were less than they might be in the Council process. No effort was made to anticipate how the Council might reallocate these "spare" metric tonnages to other species. This may create a downward bias in the final gross revenue estimates.

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

The first wholesale value of the harvests under each alternative were estimated using the first wholesale price per metric ton of retained weight and the estimated retained harvests. Prior to this calculation, the species groupings were aggregated into larger groupings corresponding to the seven groups for which first wholesale prices were available. Values were estimated for each species grouping and then summed across groupings.

Estimates of gross revenues for actual TACs in 2002 and 2003 were also prepared using similar procedures. In each year, the actual TACs were adjusted by the average percentage of the TAC caught, and by the discard rate, and monetized with 2002 prices (just as the alternatives were). Thus, these revenue estimates are based on estimated, rather than actual, harvests in those years and incorporate 2001 prices. This was done for two reasons. The 2002 estimates were prepared to see if the procedure generated revenue estimates similar to those provided in the Economic SAFE. The 2003 estimates were prepared using assumed constant prices (using the 2002 prices as the base year) to provide a benchmark against which to compare the revenue estimates produced for the five alternatives.

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[30]These tables report on fishery discards. In the BSAI the species groupings were pollock, sablefish, Pacific cod, Arrowtooth flounder, Flathead sole, rock sole, Greenland turbot, yellowfin sole, other flatfish, rockfish, Atka mackerel, and other species. In the GOA the species groupings were pollock, sablefish, Pacific cod, arrowtooth, flathead sole, rex sole, deep water flatfish, shallow water flatfish rockfish, Atka mackerel, and other species.

[31]The proportions of available harvest actually taken were obtained from the NOAA Fisheries Alaska Region web site. BSAI and GOA percentages caught were averaged over 1998-2002; CDQ percentages were averaged over 1999-2002. Separate discard rates for the GOA and BSAI were obtained from Economic SAFEs for various years; rates were averaged over the period 1998-2002.

There are several important conceptual problems with this approach. First, changes in the quantity of fish produced, might be expected to lead to changes in the price paid. However, in this analysis, a constant price, by species and product form, was used to value the different quantities that would be produced under the different alternatives. Since, all else equal, an increase in quantity should reduce price, while a decrease in quantity should increase price, leaving price changes out of the calculation may lead to an exaggeration of actual gross revenue changes across alternatives. The magnitude of this exaggeration is unknown. This is probably not a serious issue for Alternative 2, because TAC changes are relatively small. However, Alternative 1 increases TACs significantly, so the absence of a price effect may overstate revenue increases because prices would be expected to decline. In contrast, the method may cause the revenue reductions for Alternatives 3 and 4, which have moderate reductions in TACs of highly valued species, to be overstated, since the declines in TACs might be offset to some extent by increases in prices. It is not an issue for Alternative 5, since with no harvests, prices are undefined.

Second, many of the groundfish fisheries become limited by PSC catch constraints, rather than attainment of TAC. PSC constraints are not proportional to groundfish specifications and are likely to bind sooner, or impose greater costs on groundfish fishermen, given higher levels of TAC specifications. This suggests that gross revenues for alternatives with generally higher levels of TAC specifications will be biased upward. This may not be an issue for most alternatives in this instance, since TACs generally are the same as or lower than TACs in 2003. The exception could be Alternative 1, which increases TACs significantly.

Other assumptions incorporated into the model may affect the results in ways that are difficult to determine. These include (1) the use of first wholesale prices per metric ton of retained weight, implies that outputs at the wholesale level change in proportion to the production of the different species; (2) the use of broad species categories were used in the analysis implies that changes in specifications would result in proportional changes in the harvest by all the gear groups harvesting a species; (3) similarly, the lumping of species together in categories implies that changes in specifications would result in proportional changes in the harvest of all the species included in the category.

This discussion has pointed to several factors that tend to upwardly bias the revenue estimates associated with Alternative 1 and downwardly bias those associated with Alternatives 3 and 4. In the BSAI, the method for projecting TACs leaves some ABC that might be assigned to TACs, given the ABCs and OY, unassigned. The procedures appear to underestimate revenues in the GOA (based on the estimate for 2002). Price impacts are not considered, and these might offset harvest reductions to some extent under Alternatives 3 and 4, while potentially offsetting harvest increases under Alternative 1.

Estimates of first wholesale gross revenues

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

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

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

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

Species group	A1	A2	A3	A4	A5	2003
BSAI						
Pollock	2,657,100	1,492,810	1,450,850	1,240,930	0	1,492,810
Sablefish	7,110	6000	3,670	4,310	0	6,000
Pacific cod	297,000	207,500	157,000	160,000	0	207,500
Arrowtooth	115,000	12,000	66,837	6,777	0	12,000
Flathead sole	61,900	20,000	32,500	13,500	0	20,000
Rock sole	139,000	44,000	72,400	31,000	0	44,000
Greenland turbot	15,700	4,000	8,200	4,740	0	4,000
Yellowfin sole	114,000	83,750	58,200	73,300	0	83,750
Flats (other)	216,500	13,000	119,800	25,102	0	13,000
Rockfish	22,495	21,615	11,348	16,179	0	22,661
Atka mackerel	66,700	60,000	36,400	53,000	0	60,000
Other	65,170	34,279	32,585	24,671	0	34,279
Total	3,777,675	1,998,954	2,049,790	1,653,509	0	2,000,000
Potenial max.	2,000,000	2,000,000	1,764,650	1,526,980	0	n.a.
Shortfall	-1,777,675	1,046	-317	-534	0	n.a.
GOA						
Pollock	123,996	71,260	64,091	113,347	0	54,350
Sablefish	18,272	16,550	13,100	15,400	0	14,890
Pacific cod	71,200	48,475	37,500	48,000	0	40,540
Arrowtooth	194,930	38,000	100,136	14,962	0	38,000
Flathead sole	51,720	10,880	28,130	2,085	0	11,150
Rex sole	12,650	12,650	6,325	3,055	0	9,470
Flats (deep)	6,070	6,070	3,035	1,384	0	4,880
Flats (shallow)	52,070	20,740	26,035	5,290	0	21,620
Rockfish	31,998	27,500	16,225	21,369	0	29,680
Atka mackerel	4,700	600	2,350	232	0	600
Other	28,380	12,636	14,846	11,256	0	11,260
Total	595,976	265,361	311,773	236,380	0	236,440

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

Species	2003 (mt)	Alt. 1 %	Alt 2%	Alt 3%	Alt 4%
ABCs					
Pollock	2,373,470	12%	11%	-39%	-48%
Sablefish	6,000	19%	8%	-39%	-28%
Pacific cod	223,000	33%	0%	-30%	-28%
Arrowtooth	112,000	3%	3%	-40%	-94%
Flathead sole	66,000	-6%	-6%	-51%	-80%
Rock sole	110,000	26%	26%	-34%	-72%
Turbot	5,880	167%	-20%	39%	-19%
Yellowfin	114,000	0%	0%	-49%	-36%
Flats (other)	153,000	42%	42%	-22%	-84%
Rockfish	24,762	-9%	-9%	-55%	-37%
Atka mackerel	63,000	6%	6%	-42%	-16%
Other	45,270	55%	44%	-28%	-46%
TACs (2003)					
Pollock	1,492,810	78%	0%	-3%	-17%
Sablefish	6,000	19%	0%	-39%	-28%
Pacific cod	207,500	43%	0%	-24%	-23%
Arrowtooth	12,000	858%	0%	457%	-44%
Flathead sole	20,000	210%	0%	63%	-33%
Rock sole	44,000	216%	0%	65%	-30%
Turbot	4,000	293%	0%	105%	19%
Yellowfin	83,750	36%	0%	-31%	-12%
Flats (other)	13,000	1565%	0%	822%	93%
Rockfish	22,661	-1%	-5%	-50%	-29%
Atka mackerel	60,000	11%	0%	-39%	-12%
Other	34,279	90%	0%	-5%	-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 E-3 Percent differences between GAO ABCs and TACs for Alternatives, and 2003 GOA ABCs and TACs

Species	2003 (mt)	Alt. 1 %	Alt 2%	Alt 3%	Alt 4%
ABCs (2003)					
Pollock	54,350	21%	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	128%	31%	18%	109%
Sablefish	14,890	23%	11%	-12%	3%
Pacific cod	40,540	76%	20%	-7%	18%
Arrowtooth	38,000	413%	0%	164%	-61%
Flathead sole	11,150	364%	-2%	152%	-81%
Rex sole	9,470	34%	34%	-33%	-68%
Flats (deep)	4,880	24%	24%	-38%	-72%
Flats (shallow)	21,620	141%	-4%	20%	-76%
Rockfish	29,680	8%	-7%	-45%	-28%
Atka mackerel	600	683%	0%	292%	-61%
Other	11,260	152%	12%	32%	0%

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

	First Wholesale Value by Alternative (millions of dollars)				
Species group	**1**	**2**	**3**	**4**	**5**
Pollock	1,522	855	831	711	0
Sablefish	16	14	8	10	0
Pacific cod	282	197	149	152	0
Flatfish	81	38	42	32	0
Rockfish	8	8	4	6	0
Atka mackerel	31	28	17	25	0
Other	8	4	4	3	0
Total	1,947	1,143	1,055	938	0
Notes: All estimates have been rounded to the nearest million dollars. This causes some cells to read "0" when actual value is non-zero. Cells may not sum to totals due to rounding.					

Table E-5 Estimates of First Wholesale Value of CDQ Reserve in the BSAI (millions of dollars)

	First Wholesale Value by Alternative (millions of dollars)				
Species group	**1**	**2**	**3**	**4**	**5**
Pollock	170	95	93	79	0
Sablefish	2	2	1	1	0
Pacific cod	21	15	11	12	0
Flatfish	2	1	1	1	0
Rockfish	0	0	0	0	0
Atka mackerel	2	2	1	2	0
Other	1	0	0	0	0
Total	198	116	108	95	0
Notes: All estimates have been rounded to the nearest million dollars. This causes some cells to read "0" when actual value is non-zero. Cells may not sum to totals due to rounding.					

Table E-6   Estimates of First Wholesale Value in the GOA (millions of dollars)

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

Notes: All estimates have been rounded to the nearest million dollars. This causes some cells to read “0" when actual value is non-zero. Cells may not sum to totals due to rounding.