Draft for Public Review

DRAFT ENVIRONMENTAL ASSESSMENT/ REGULATORY IMPACT REVIEW/ INITIAL REGULATORY FLEXIBILITY ANALYSIS

For Amending the Process by Which Annual Harvest Specifications Are Established for
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 draft Environmental Assessment/Regulatory Impact Review/Initial Regulatory Flexibility Analysis (EA/RIR/IRFA) provides an analysis of alternative administrative procedures necessary to support the harvest specifications process for setting Total Allowable Catch (TAC) and other management measures for the Alaska groundfish fisheries in the exclusive economic zones of the Bering Sea and Aleutian Islands management area and the Gulf of Alaska. This Federal action would amend the process by which harvest specifications would be set in future years. Objectives for the revised process include management of the Alaska groundfish fisheries based on the best available scientific information and providing meaningful opportunity for useful public comment. The action is not expected to have significant environmental, social, or economic impacts. Annual or biennial harvest specifications would continue to be assessed under separate EA/RIR/IRFAs prepared each period prior to agency approval of final harvest specifications.

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EXECUTIVE SUMMARY

Each year, normally in October, proposed groundfish harvest specifications for the Bering Sea and Aleutian Islands area (BSAI) and Gulf of Alaska (GOA) are published in the Federal Register. These proposed specifications are based upon total allowable catch (TAC), acceptable biological catch (ABC) and prohibited species catch (PSC) amounts, and apportionments thereof, which have been recommended by the North Pacific Fishery Management Council (Council) for the current year. Based on public comment on the proposed specifications and information made available at the December Council meeting, final specifications are published in the Federal Register during February or early March. So that fishing may begin January 1, regulations authorize the release of one-fourth of each proposed TAC and apportionment thereof, one-fourth of each PSC and apportionment thereof and the first seasonal allowance of pollock and Atka mackerel. These interim specifications are based upon the proposed specifications and published in the Federal Register in December and are superceded by the final specifications.

The existing harvest specification process is problematic for several reasons. The public is notified and given opportunity to comment on proposed specifications that often are outdated by the time they are published. The publication of proposed specifications each year can confuse the public, because incomplete and outdated information is provided due to the need to adhere to a strict time line in order to comply with all relevant regulations. Because the interim specifications are based on the proposed specifications, they do not take into account the recommendations contained in the Groundfish Plan Teams' final SAFE documents, or the recommendations coming from public testimony, the Science and Statistical Committee, Advisory Panel, and Council at its December meeting. One fourth of the initial TAC and PSC amounts have been found to be an inadequate amount for those fisheries that attract the greatest amount of effort at the beginning of the fishing year. As fisheries are seasonally apportioned to meet other management needs, (i.e., Steller sea lion protection measures) interim TACs based on one fourth of the annual TAC increasingly compromise other management objectives. Under the current process, administrative inefficiency exists in taking the regulatory actions necessary to set interim, proposed and final specifications. For these reasons, NMFS seeks to revise the harvest specification process.

The objectives of modifying the harvest specifications process are to manage fisheries based on best scientific information available, provide for adequate prior public review and comment to the Secretary on Council recommendations, provide for additional opportunity for Secretarial review, minimize unnecessary disruption to fisheries and public confusion, and promote administrative efficiency.

The management alternatives for amending this process are:

Alternative 1. Status quo. (Publish proposed specifications, followed by interim and final specifications)

Alternative 2: Eliminate publication of interim specifications. Issue proposed and final specifications prior to the start of the fishing year. Option of biennial harvest specification for BSAI and GOA target species on biennial survey schedule.

Alternative 3: Issue Proposed and Final Harvest Specifications based on an alternate fishing year schedule (July 1 to June 30).

- Option 1: Set sablefish TAC on a January through December schedule.
- Option 2: Reschedule the December Council meeting to January.

Alternative 4: Use Stock Assessment Projections for biennial harvest specifications. For the BSAI and GOA set the annual harvest specifications based on the most recent stock assessment and set harvest specifications for the following year based on projected OFL and ABC values. For setting PSC there are two options:

- Option 1: Set PSC limits annually
- Option 2: Set PSC limits every two years based on regulations and projected values

Option A: Abolish TAC Reserves

Option B: Update FMPs to reflect current fishing participants and harvest specifications process.

Section 4.12 gives the environmental summary and conclusions. The environmental components that may be affected by the proposed action are the target groundfish species (including the State groundfish fisheries), prohibited species, and Steller sea lions. Results from simulation model and retrospective analysis indicated that under Alternatives 2, 3 and 4 groundfish harvests would be less and several target species biomasses would be more than under the Status Quo. This was primarily due to uncertainty resulting from projecting harvest amounts further into the future than under Alternative 1. Alternative 3 is likely to provides less biomass variability and more likelihood of setting TAC below the OFL compared to alternatives 2 and 4. Alternatives 1 and 3 have potential effects on the temporal dispersion of harvest of Steller sea lion prey species because of the lag between the biomass information used to set harvest specifications and the commencement of the fisheries.

The harvesting effects on groundfish from Alternatives 2, 3 and 4 are unknown due to a number of factors that are not part of the retrospective analysis and simulation model, including the full Council process which can have a substantial effect on the final TAC and has historically been more conservative than the analysis predicted. Potential overfishing identified in the analysis is likely to be mitigated through the Council process and may also be mitigated by additional regulatory action if new information becomes available during the current fishing year that indicates that the level of fishing is inappropriate. Because the effects on groundfish species are unknown, the effects on availability of prey for Steller sea lions are also unknown.

Alternative 3 may also have temporal effects on the groundfish fisheries and potentially conflict with Steller sea lion protection measures. These measures require the temporal dispersion of harvest and current seasons may need to be adjusted for BSAI pollock and Pacific cod trawl fisheries to meet Steller sea lion protection measures and to coincide with the July 1 through June 30 fishing year. During years of high pollock TAC, the BSAI pollock fishery may be conducted into October as the industry attempts to fully harvest the B season allocations, encountering potentially more salmon bycatch and worse weather. Alternative 3 also has the potential for higher levels of harvest in the A season during times of falling biomass than what would occur under the status quo. Because it is not possible to predict if the fishing behavior may change or to predict actions that may be taken by the Council or the State Board of Fish, and because of Steller sea lion protection measures, it is unknown if Alternative 3 could have an effect on target groundfish or Steller sea lions. Option 1 to Alternative 3 to set the sablefish TAC on a January through December schedule would allow the sablefish IFQ program to be managed concurrently with the halibut IFQ program, eliminating any potential effects on these programs from shifting the fishing year.

The Regulatory Impact Review (RIR) meets the requirements of Presidential Executive Order (E.O.) 12866 for a benefit-cost analysis of the proposed action and its alternatives. A complete benefit-cost analysis was not possible. The information is not available to estimate dollar values for many of the benefits and costs. Moreover, the proposed action affects the conditions under which the Council and Secretary will make decisions about future TAC specifications. The actual benefits and costs will depend on the decisions made by the Council and Secretary, and those decisions cannot be predicted at this time. The RIR does examine a set of outcomes from this action that may affect the benefits and costs. Three general categories of outcomes are identified: (1) impacts on the TAC setting process itself, (2) changes in the fishing year under Alternative 3, and (3) changes in harvests and biomass size under Alternatives 2, 3, and 4.

Alternatives 2, 3 and 4, by extending the time within which the TAC setting should take place, will provide additional opportunities for scientific analysis, for peer review of scientific work, for public notice and comment on the proposed specifications regulations, and for consideration by the Council and the Secretary of Commerce. Since these alternatives will provide for public notice and comment on the specifications actually anticipated for the coming fishing year, comments received from the public will be more useful. Alternatives 2 and 4 provide the most time for this process; Alternative 3 increases the amount of time available, but not to the same extent. It may be difficult, moreover, to complete the entire rulemaking process in the time allotted under Alternative 3, especially with Option 2. Option 2 to Alternative 3 would provide additional time for stock assessment scientists to complete analysis but it may be administratively difficult to reschedule the December Council meeting to January.

Alternative 3 changes the fishing year to begin on July 1. A comparison of fishing seasons for different species with the proposed July 1 start date suggests that a shift from a January 1 to a July 1 start date would cause little disruption to many fisheries. The sablefish IFQ fishery in the GOA and BSAI is an important exception to this. A change in fishing year, and associated change in TAC, would be extremely disruptive in the middle of this fishing season, which currently runs from March 15 to November 15. It might be possible to delay the season, so that it started on July 1 with the start of the new fishing year. However, the administration of the individual quotas in this fishery requires a long closed period between the end of one fishing season and the start of the next. Currently the fishery is closed from November 15 to March 15. This closed period is best in the winter time since fishing conditions aren't as good, and there is less potential for bycatch conflicts with the related halibut fishery. However, a July 1 start for the year would mandate a closed period from March through June. Option 1 to Alternative 3, setting sablefish TAC on a January through December schedule, would eliminate this potential problem.

Alternatives 2, 3, and 4 lengthen the time between biomass surveys and the year in which specifications based on the surveys (specifications year) become effective. Under Alternative 1, the time between the survey information and implementation of the annual fishery based on that information is approximately 7 months, because the first three month of the year are managed under interim specification (which are based on the previous years TACs). Alternative 3 increases the period by three months, Alternative 2 increases the period by nine months, and Alternative 4 increases it by an average of 15 months per year (nine months for the first year of the biennial specifications, and 21 months for the second year). As the length of time between the biomass surveys and the specifications year increases, there is some evidence that biomass levels may vary more, ABCs and harvests may become smaller since lower harvest rates are triggered more often by the harvest control rule, mean spawning biomass levels become larger, and harvest variability increases. These results are extremely tentative.

If the harvest levels do decline as suggested by some modeling results, revenues to industry may also decline. Moreover, an increase in the year-to-year variability of harvest, also suggested by some model results, may impose increased interest and inventory carrying costs on industry.

The Initial Regulatory Flexibility Analysis (IRFA) identifies the numbers of small entities that may be regulated by the action, describes the adverse impacts that may be imposed on these small entities, and describes alternatives to the preferred alternative that may minimize the adverse impacts on the small entities and the reasons they weren't chosen. In this case a preferred action has not yet been identified. This IRFA addresses the statutory requirements imposed under the Regulatory Flexibility Act (RFA) of 1980, as amended by the Small Business Regulatory Fairness Enforcement Act (SBREFA) of1996.

The IRFA used the Small Business Administration (SBA) definitions of small entities. Small fishing entities were those that grossed less than $3.5 million, small shoreside processing entities were those employing fewer than 500 persons. Non-profit entities were also considered small. The SBA also requires that an entity's affiliations be considered in determining its size. Large numbers of small entities may be regulated by this action. These include an estimated 1,353 small groundfish catcher vessel entities, 33 small groundfish catcher/processors, 36 shoreside groundfish processors, and six CDQ groups. The total numbers of entities regulated by this action include 1, 366 groundfish catcher vessels, 79 groundfish catcher/processors, three groundfish motherships, 49 shoreside groundfish processors, and six CDQ groups.

There is some evidence that all alternatives compared to Alternative 1 would lead to somewhat reduced revenues, cash flow, and profits for the small entities, although this result is very uncertain. It was not possible to estimate the size of the impact on the small entities, although it was believed to be greatest for Alternative 4, less for Alternative 2, and least for Alternative 3. Increased year-to-year fluctuations in gross revenues may occur, and these also were expected to be greatest for Alternative 4, less for Alternative 2, and least for Alternative 3. The analysis was unable to determine whether or not there would be a disproportionate impact on small entities (compared to large entities). The analysis did identify additional impacts that were not adverse. Alternatives 2 and 4, and to a lesser extent Alternative 3, provide better opportunities for small business input into decision making about specifications since they provide for more informed public notice and comment.

An important component of an IRFA is a review of the alternatives that have not been chosen, but that minimize the burden of the rule on regulated small entities, and an explanation of why each of these has not been chosen. In this case, a preferred alternative has not yet been chosen. Therefore it has not yet been possible to complete this portion of the IRFA.

Environmental impacts and socioeconomic impacts resulting from changing fishing patterns as a result of the preferred alternative would be assessed annually in the EA/RIR/IRFA that accompanies the final harvest specifications.

At this time, a preferred alternative has not been identified. The Council seeks public comments on these alternatives and on the potential impacts on fishery participants and the environment. Alternative 1 appears to have the least potential for environmental effects but does not meet the objectives of this action. Considering administrative procedural aspects, Alternatives 2 is more desirable than Alternatives 1, 3, or 4. More time is provided under Alternative 2 to perform stock assessments, to develop Council recommendations and to allow NMFS to implement proposed and final rule making before the beginning of the fishing year. Alternative 4 for demersal shelf rockfish and option 1 for PSC limits, requires annual rulemaking, reducing the administrative efficiencies that could have been realized with a biennial harvest specifications process. Alternative 3 has the disadvantage of requiring changes to the Sablefish IFQ program to accommodate a new fishing year, potentially affecting the State fisheries, and providing less time for the stock assessment and rulemaking processes compared to Alternatives 2 and 4. Option 1 to Alternative 3 would eliminate the potential problems with the sablefish fisheries.

1.0 PURPOSE AND NEED FOR ACTION

The proposed federal action is (a) change the administrative process used to implement harvest specifications which are used to manage the groundfish fisheries off Alaska and (b) update the fishery management plans for the BSAI and GOA groundfish fisheries. This Environmental Assessment/Regulatory Impact Review/Initial Regulatory Flexibility Analysis (EA/RIR/IRFA) analyzes revisions to the harvest specification administrative process for determining and implementing ABCs, TACs, and PSC limits/apportionments for the groundfish fisheries of the Bering Sea and Aleutian Islands management area (BSAI) and the Gulf of Alaska (GOA). The intent of revisions is to reflect current stock assessment and analytical requirements, to provide for the regulatory development and review process, and to provide adequate prior public review and comment to the Secretary on Council recommendations and additional Secretarial review of proposed harvest specifications.

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

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

An environmental assessment (EA) is prepared pursuant to the National Environmental Policy Act (NEPA) to determine whether a proposed action will result in significant effects to the human environment. If the environmental effects of the action are determined not to be significant based on an analysis of relevant considerations, the EA and resulting finding of no significant impact are the final environmental documents required by NEPA. If it is concluded that the proposal is a major

Federal action significantly affecting the human environment, an environmental impact statement must be prepared.

NEPA requires either an environmental assessment with a finding of no significant impact or an environmental impact statement for all federal actions that may have a significant impact on the human environment. EAs are generally done when an action is not anticipated to have a significant impact on the human environment or to provide additional information to support an environmental impact statement (EIS). The harvest specifications process alternatives examined in this EA/RIR/IRFA will still result in an annual or biennial Federal action that will require further analysis for potential significant impacts from the actual harvest quotas and management measures.

The scope of this analysis does not extend to the setting of any particular TAC or PSC for any of the managed species. The focus of this analysis is the administrative process used to promulgate harvest specifications.[1] The reason is the actual setting of TAC includes discretionary considerations and current information, therefore, it can not be analyzed in advance of each time period they are in effect. The harvest specifications process is an FMP component analyzed in the EIS (NMFS 1998) and recent draft programmatic SEIS (PSEIS) (NMFS 2001c).

1.1 Project Area

This proposed action applied to the BSAI and GOA FMPs. Figure 1.1 shows the waters included in Federal groundfish fisheries off Alaska. The groundfish fisheries occur in the North Pacific Ocean and Bering Sea in the EEZ from 50°N to 65°N. The subject waters are divided into two management areas: the BSAI and the GOA. The BSAI groundfish fisheries effectively cover all the Bering Sea under U.S. jurisdiction, extending southward to include the waters south of the Aleutian Islands west of 170° W. longitude to the border of the U.S. EEZ. The GOA FMP applies to the U.S. EEZ of the North Pacific Ocean, exclusive of the Bering Sea,

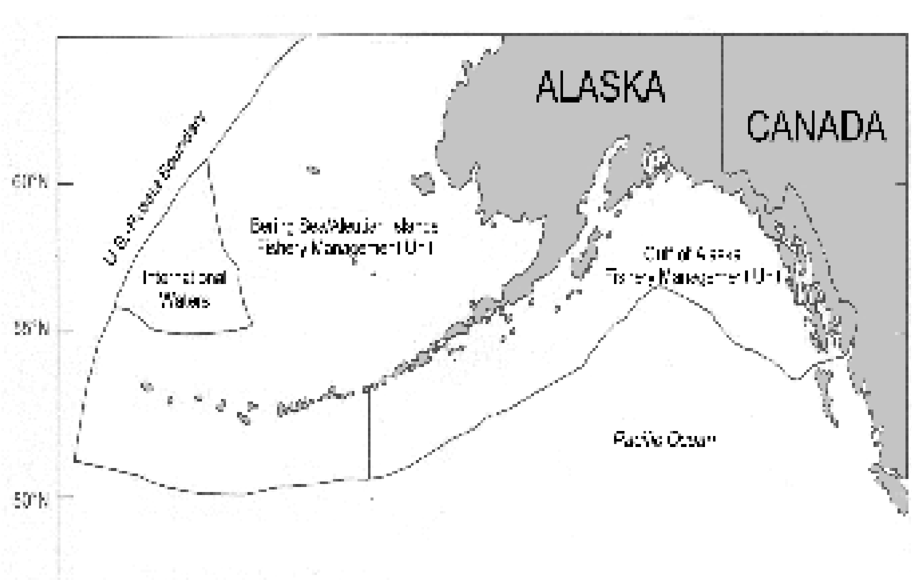

Figure 1.1 Federal Fisheries Off Alaska.

[1]Although, it also addresses some minor issues of updating FMP terminology.

between the eastern Aleutian Islands at 170° W. longitude and Dixon Entrance at 132°40' W. longitude. These regions encompass those areas directly affected by fishing, and those that are likely affected indirectly by the removal of fish at nearby sites. The area affected by the fisheries necessarily includes adjacent State of Alaska and international waters. Harvest specifications and fishery management measures affect groundfish fishing throughout the BSAI and GOA management areas.

1.2 Current Administrative Procedures for Harvest Specifications

Establishing harvest specifications involves the gathering and analysis of fisheries data. The groups responsible for analyzing and packaging the data for Council consideration are the Council's Groundfish Plan Teams (Plan Teams). These teams include NMFS scientists and managers, Alaska, Oregon, and Washington fisheries management agencies scientists, and university faculty. Using stock assessments prepared annually by NMFS and by the Alaska Department of Fish and Game (ADF&G), Plan Teams calculate biomass, ABC, and OFL for each species or species group, as appropriate, for specified management areas of the EEZ off Alaska that are open to harvest of groundfish. A Plan Team meeting is held in September to review potential model changes and is not usually used for ABC recommendations. In November, the Plan Teams' rationale, models, and resulting ABC and OFL calculations are documented in annual Stock Assessment and Fishery Evaluation (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 groups and provides recommendations on improving the assessment.

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

Specification of the upcoming year's harvest levels currently is a three-step process. First, proposed ABCs, TACs, and PSC limits[2] are recommended by the Council at its October meeting and published in November in the Federal Register for public review and comment. In October, most stock assessments are not yet available, so the proposed specifications are set equal to the current year's specifications.

Second, NMFS annually publishes interim specifications to manage the fisheries from January 1 until they are superceded by the final specifications. The interim specifications are based on the current year's specifications in the same manner as the proposed specifications. As specified in 50 CFR § 679.20(c)(2), interim specifications are one-fourth of each proposed initial TAC (ITAC) and apportionment thereof, one-fourth of each proposed PSC allowance, and the first seasonal allowance of GOA and BSAI pollock and BSAI Atka mackerel. These interim specifications are in effect on

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

January 1 and remain in effect until superceded by final specifications. For most BSAI target species, the ITAC is calculated as 85 percent of the previous year's TACs (50 CFR § 679.20(b)). The remaining 15 percent is split evenly between the Western Alaska Community Development Quota (CDQ) program reserve and a non-specified groundfish reserve. It is the nonspecified portion of the BSAI TAC reserves that is proposed to be eliminated in Option A. See section 1.4 for more information. 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 that also is proposed to be eliminated under Option A.

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

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

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

Table 1.1 Current FMP timeline for annual harvest specification procedure.

September	Plan Teams review models for ABC recommendations for a number of groundfish species.
October	Council approves proposed harvest specifications based on current year's harvest specifications
November	Proposed specifications are published[1] Interim specifications are published[1] Plan Teams provide final groundfish ABC recommendations
December	Council approves final groundfish specifications
January	Non-trawl groundfish fisheries open January 1 and trawl fisheries open January 20 with interim specifications equal to 25% of proposed specifications (with several exceptions)
February	Non-specific reserves released and final specifications are published[2]

[1]Publication of proposed and interim specifications can occur as late as December.
[2]Publication of final specifications can occur as late as March.

Compliance with the Magnuson-Stevens Act, NEPA, the Endangered Species Act (ESA), Executive Order 12866 (EO 12866), 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 decisionmakers 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 regulatory impact review (RIR) required under EO 12866 is incorporated into the EA. The RFA documents provide analysis of the potential impacts of the action on small entities. Development of these analyses requires a number of analysts in the NMFS Alaska Region office and the AFSC. Four to six months are needed to do an adequate job of drafting these analytical documents, and an additional month may be needed to finalize the documents after the Council makes its final recommendation on harvest specifications. However, currently, only about one week is available to draft the EA for Council review in December, based on the final SAFE reports.

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 Division and the Regional General Counsel. After Regional review is completed, the rule is forwarded to Headquarters, the NMFS Office of Sustainable Fisheries in Silver Spring, Maryland, where it undergoes a number of reviews within NMFS before forwarding to NOAA General Counsel. After clearing NOAA, the rule is reviewed by Department of Commerce (DOC) and usually the Office of Management and Budget. OMB review has been waived for harvest specifications in the past on the basis that the harvest specifications process was part of a framework process. Because of the amount of discretionary items in the harvest specifications now, OMB review may be required for all future harvest specifications rulemaking, increasing review time. 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 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 annual specification. Comments received by NMFS on the proposed rule are not likely to have much relation to the annual specifications because the proposed rule contains the previous year's harvest specifications and not the Council's recommended specifications. Once the Council makes a recommendation, the Secretary is required by the 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. Public review and comment during Council decision making can not substitute for the opportunity for public review and comment required by the statutes during proposed rulemaking.

Table 1.2 Current Groundfish Harvest Specifications Setting Process

Time	**Activity**	**Opportunity for Public Involvement**	**Decision Points**
January to August (of year prior to fishing year)	Plan and conduct stock assessment surveys	Casual (staff and public may interact directly with stock assessment authors)	Cruise Plans finalized Scientific Research Permits issued Finalize lists of groundfish biomass and prediction models to be run Staff assignments and deadlines set
August - September	Preparation of preliminary SAFE Reports Council Plan Teams meeting Initiation of informal Section 7 Consultation	Open Public Meetings *Federal Register* Notice of Plan Teams' Meetings	Stock assessment teams fully scope out work necessary to complete stock chapter, models to run, emerging ecosystem issues
September	Staff draft proposed and interim harvest specifications notices and EA/IRFA based on current year's specifications.	None	Proposed and interim specifications are formula driven based on current year Harvest specifications
October 1-7 or so	October Council Meeting Presentation of preliminary SAFE, highlights of differences seen in recent surveys and ecosystem from past years.	Open Public Meeting *Federal Register* Notice of initial action on next year's Harvest specifications as an agenda item	Council recommends interim and proposed Harvest specifications.

Time	**Activity**	**Opportunity for Public Involvement**	**Decision Points**
Late October	NMFS submits interim and proposed specifications package to HDQs.	None	Secretarial review of Council recommendation
November	November Plan Teams' Meetings EA/IRFA for final specs. drafted prior to and during Plan Team meetings. Finalize SAFE Reports.	Open Public Meetings *Federal Register* Notice of Plan Teams' Meetings	Plan Team makes its TAC recommendations Determination of whether Section 7 Consultation has to be formal or informal
November - December	File interim and proposed specification rule with *Federal Register*	Written comments accepted on 15-60 day (usually 30) comment period for proposed and interim rule. Specifications announced in the proposed rule **are not** the same as the final specifications that will be in the final rule.	Interim specifications effective on publication. Not realistic documents for which to invite public comments; however, by regulation, comments are accepted and are responded to in preamble of the final rule
December 2-10	December Council Meeting. Release and present Draft EA containing Final SAFE Reports, Ecosystem information, Economic SAFE	Open Public Meeting *Federal Register* notice of next year's TAC and PSC specifications as an agenda item. Last **meaningful** opportunity for comments on the next year's quotas.	Determine amount to nearest mt of next year's TAC and PSC quotas. Determination of no effect to Essential Fish Habitat. ESA Section 7 consultation concluded.

Time	Activity	Opportunity for Public Involvement	Decision Points
December 11-25	NMFS staff draft final harvest specifications rule	Comments related to information released prior to and during Council meeting may still be trickling in. Those comments are given consideration in final edits of the EA.	No original thinking occurs
December 25-31	Harvest specifications EA finalized.	No public comment period. Notices of intent to sue should be filed within 60 days of FONSI	FONSI determination
February of **subject fishing year**	Submit final rule to Secretary for filing with Office of Federal Register	None	Secretarial approval of Council recommendatio n
February of **subject fishing year**	*Federal Register* publication of Final Rule	None. Administrative Procedures Act sets up 30 day cooling off period that may be waived.	Final harvest specifications replace interim specifications on date of publication.

1.3 Problem Statement

The existing harvest specifications process is problematic as NMFS and the Council strive to be consistent with the national standards in the Magnuson-Stevens Act, (§ 301(a)) and meet all the statutory rule making requirements. NMFS must comply with the following statutes during the rule making process.

The Administrative Procedures Act:
§ 553 (b) requires NMFS to publish proposed regulations in the Federal Register.
§ 553(c) requires NMFS to provide "interested persons an opportunity to participate in the rule making through submission of written data, views, or arguments with or without opportunity for oral presentation" and NMFS must consider the relevant comments received.
§ 553(d) The rule is effective 30 days after the date of publication of the final rule in the Federal Register, unless the 30 days delay is waived for good cause.

Magnuson-Stevens Act:
§ 304(b)(1) The Secretary must immediately evaluate Council transmitted proposed regulations and determine within 15 days if the proposed regulations are consistent with FMPs, and applicable laws.
§ 304(b)(1)(A) Within the 15 days of evaluation and an affirmative determination, the Secretary shall publish proposed regulations in the Federal Register with a 15-60 day public comment period.
§ 304(b)(3) Within 30 days of the end of the comment period, the Secretary must publish final regulations and explain any changes that were made between the proposed and final regulations.

The current NMFS rulemaking process requires approximately six months from the date the Council recommendation is made to when the final rule is effective. In the current process, final stock assessment information used to develop harvest specifications is available 6 weeks (mid November) before the beginning of the fishing year. At least one month is needed by the Council to review the information and analysis and develop recommendations, The Council then makes its recommendations in mid December. Therefore, it is difficult for NMFS to do proposed and final rule making based on the final Council recommendation before the beginning of the fishing year.

In order to meet the 15 day Secretarial evaluation, determination and proposed rule publication deadline in the Magnuson-Stevens Act, the Council's proposed harvest specifications would need to be known and analyzed and draft regulations would need to be ready before the official transmittal by the Council for NMFS' action. Under the current NMFS regulatory review process, publishing proposed rules within 15 days of Council transmittal of a proposed action is very unlikely to occur. Likewise it is also unlikely that a final rule can be published within 30 days of the end of the comment period because of the time necessary to review comments and complete the drafting and review of the final rule package and submittal to the Federal Register. The proposed action analyzed in this EA/RIR/IRFA does not address this difficulty in meeting these deadlines. These deadlines should be examined during the reauthorization of the Magnuson-Stevens Act.

The APA requires that the public has the opportunity for review and comment on the proposed rule and supporting analysis that is used for the proposed and final rules. Under the current process, the analyses supporting the final rule are the November SAFE reports, EA/RIR/IRFA and ESA and EFH consultations that are completed after the December Council meeting. A final rule can not be significantly changed from a proposed rule without an additional rule proposal and opportunity for public review and comment on the changes. Concerns have been raised about the current process of publishing proposed specifications prior to the December Council meeting which contain harvest levels that are not the same levels that will actually be implemented, establishing interim specifications based on these proposed specifications, and preempting public opportunity to formally review analyses and comment on the Council's December recommendations for the upcoming year's harvest specifications. The public is notified and given opportunity to comment on proposed specifications that are not a true representation of the specifications that will be in the final rule.

Using 1996 as an example, the absolute difference between proposed and final TACs for the BSAI averaged 22 percent over all species and species groups, and individual species TACs ranged 0-200 percent. For the GOA the difference averaged 7 percent over all years with a range of 0-87 percent for individual species. If the public had perceived that the proposed specifications were an indication of what the final TACs and apportionments would be, they would have been misled. Any public comments received on the proposed rule would have had very little meaning because, although the proposed ABCs, TACs, and PSC limits/apportionments, were based on the best available stock assessment and harvest trends, these proposed amounts and trends would change before the start of the upcoming fishing year. Further, it is difficult under the current timeline to develop and make available to the public final analyses to accompany proposed and interim specifications prior to January 1.

The publication of proposed specifications each year can confuse the public, because incomplete and possibly erroneous information is provided due to the need to adhere to a strict timeline in order to comply with all relevant rule making statutes. Public comment on these specifications rarely occurs due to the fact that most informed, interested parties realize that those numbers will change, sometimes considerably, after release of the final SAFE reports and the December Council meeting.

The Federal Register publication of proposed specifications in November or December, therefore, does not meet the intended purpose of public notification and comment under the APA.

At the same time that NMFS is meeting requirements for proposed and final rule making, the actions must also be consistent with the national standards in the Magnuson-Stevens Act, (§ 301(a)). National Standard 2 requires that conservation and management measure be based on the best scientific information available. For harvest specifications the most critical decision making reports (SAFE reports) are completed in November of each year. These reports are based on new data from resource assessment surveys which become available under different schedules for different areas and species. Currently, the anticipated schedule is as follows:

Schedule	**Survey**
Annual	Bering Sea summer bottom trawl survey
Biennial	Bering Sea summer bottom trawl slope survey (first year is 2000)
Annual	Winter pollock spawning survey in Shelikof and Bogoslof
Biennial	Aleutian Islands and Gulf of Alaska summer trawl surveys: 2001 GOA; 2002 AI
Biennial	Acoustic surveys in Bering Sea and GOA: 2001 - GOA; 2002 - BS pending vessel availability and West Coast hake survey conflicts
Annual	GOA longline sablefish survey
Biennial	BSAI longline sablefish survey, BS odd years, AI even years

Publication of meaningful proposed specifications is currently not practicable, because much of the data necessary for calculating updated ABCs for the GOA and the Aleutian Islands are not available until late October or later. Bering Sea survey data are available in late August or early September. For the BSAI, the annual September Plan Team meeting produces final assessments for some species, but for most, stock assessment results still are preliminary. Many assessments are updated after all summer trawl survey data become available in October. As the year progresses, the Plan Team and the Council also acquire updated information on harvest trends. Although the proposed and final GOA ABCs do not change as much as those for the BSAI, proposed OFLs and ABCs are not produced for some species until the November Plan Team meeting. Regardless of the survey schedule for individual stocks, the SAFE reports are not completed and ready for Council consideration until mid November.

Because the interim specifications are based on the proposed specifications, they do not take into account the recommendations contained in the Plan Team's final SAFE documents or the recommendations coming from public testimony, the SSC, AP, and the Council at its December meeting. In addition, the interim TAC allocates one fourth of the initial TAC and PSC amounts to the first quarter and this has been found to be an inadequate amount for those fisheries that attract the greatest amount of effort at the beginning of the fishing year[3]. The Bering Sea fixed gear cod fishery, and the rock sole fishery are often constrained by the halibut PSC limit early in the fishing year. Those fisheries that are allocated their first seasonal allowance based on the previous year's TAC suffer if the new seasonal allowances recommended by the Council increase. That is, they may forego the benefits of that increase until the following year. This is true for the pollock fishery and the Aleutian Islands Atka mackerel fishery because they are high value fisheries that focus fishing effort early in the fishing year. Concern exists that the current interim specifications process does

[3]Harvest amounts of GOA and BSAI pollock and BSAI Atka mackerel under the interim TAC are limited to the proposed first seasonal allowance for each species.

not provide for meaningful public comment and that artificial constraints are placed on the fishery in the interim period which may impact the fishery as described above. The interim period may also undermine the intent of Steller sea lion protection measures that establish seasonal dispersion of the fisheries.

1.4 Reserve TAC: The Current Process and the Need for Change

Under existing regulations, the TACs are reduced by specified percentages to establish various reserves as follows:

BSAI Groundfish Reserves:

(1) 15 percent of the BSAI TACs for each target species and the "other species" category (except pollock and the hook and line and pot gear allocation for sablefish); This reserve amount is split 7.5 percent to CDQ and 7.5 percent to nonspecified reserves.

(2) BSAI CDQ: 20 percent of the fixed gear allocation of BSAI sablefish; 7.5 percent of each TAC category for which a reserve is established, i.e., half the reserve established under (1) above; 10 percent of pollock; and 7.5 percent of each prohibited species catch limit.

GOA Groundfish Reserves:

20 percent of the GOA TACs for pollock, Pacific cod, flatfish, and "other species";

Detailed information regarding apportionments can be found in 50 CFR § 679.20 (b) and 50 CFR § 679.21 (e).

1.4.1 BSAI Groundfish Reserves

Under the American Fisheries Act (AFA), BSAI pollock is fully allocated to different sectors of the fishing industry, including CDQ. Ten percent of the pollock TAC is allocated to the CDQ program under the AFA, and 7.5 percent of the TAC for the other groundfish species are placed in a reserve assigned to the CDQ program. Part of the pollock TAC is also set aside for an annual incidental catch allowance. Pollock reserves are not required. The reserve for the remaining groundfish species is 7.5 percent of the total allowable catch for target species and other species category (except pollock and hook and line and pot gear allocation for sablefish) which is set aside at the beginning of the fishing (calendar) year for later allocations. This reserve is not designated by species, and any amount of the reserve may be apportioned to a target species (except for the fixed gear allocation for sablefish, or the "other species" category) so long as apportionments do not result in overfishing. Any reserve apportioned to Pacific cod is allocated by gear type as established in the FMP. Reserves are scheduled to be released by the Regional Administrator on or about April 1, June 1, and August 1. In recent years, reserves have not resulted in TAC being reapportioned from one species to another, although nothing precludes this. For 2002, the nonspecified reserves for a number of target species were released with the setting of final TAC for BSAI and GOA (67 FR 956, January 8, 2002).

The nonspecified reserves were developed to provide flexibility to the management system when the fishery and processing were performed entirely by foreign fleets or under the joint venture system where American catcher vessels supplied groundfish to the foreign processors. The groundfish catch is now entirely domestic and the reserve is structured to provide some latitude in the management of individual TACs. Conceptually, the reserves can allow managers to increase a TAC of groundfish up to that species' or species group's ABC, so long as the optimum yield for the entire fishery of 2 million mt is not exceeded. This option has been exercised once in the years since the effort in the groundfish fishery became entirely domestic (1991).

The reserve system is expected to provide a 'buffer' for the in-season management of the fisheries. However, the buffer really doesn't slow the catch as the managers and fishermen know of the reserve and expect to catch the entire TAC. The same effect can be accomplished by establishing a limited directed fishing allowance (50 CFR § 679.20 (d)). Since the reserve system does not provide significant increases in efficiency of the fishery, its effect is to increase confusion regarding which numbers are currently available for harvest and increase the administrative burden on the fishery managers to provide regulatory actions to add the reserve back into the TAC amounts. In addition, the American Fisheries Act (AFA) requires that catch limits be set for AFA qualified vessels, based on a proportion of the TAC. Each time a reserve amount is apportioned to the TAC, the AFA catch limits must be adjusted as well.

1.4.2 GOA Groundfish Reserves

In the Gulf of Alaska 20 percent of the total allowable catches of pollock, Pacific cod, flatfish, and other species are set aside as reserves at the beginning of the fishing (calendar) year for later allocations. Reserves of pollock and Pacific cod are apportioned between inshore and offshore sectors. Reserves are scheduled to be released by the Regional Administrator on or about April 1, June 1, and August 1, or when NMFS determines it is appropriate. For 2002, all reserves were released with the setting of the final TAC (67 FR 956, January 8, 2002).

From 1997 to 2000, reserves were only used for the Pacific cod fishery. This fishery occurs early in the year and incurs high catch rates. The reserves were used to establish a buffer to prevent the fishery from exceeding the directed fishing allowance established by 50 CFR § 679.20 (d). This process has been cumbersome and the problem can be solved more easily under existing regulations, by establishing a conservative directed fishing allowance. As in the BSAI, establishing reserves not only requires additional work as the final specifications of groundfish are established, but the catch limits (sideboards) for vessels qualified under the American Fisheries Act must be revised as the reserve apportionments are made. This creates confusion not only as to what the "full" TAC is, but requires the AFA vessels to revise their fishing plans for groundfish sideboard amounts mid-season.

1.5 Updating FMP language.

The GOA FMP and the BSAI FMP have not been changed to reflect the nature or extent of current fishing practices (NPFMC 1999a, 1999b). Groundfish fisheries off Alaska initially were exclusively conducted by foreign vessels. Gradually, the ratio of foreign to American fishery participants changed until 1991, when the groundfish fishery participants were limited to American owned vessels and processors. A detailed description of the history of foreign and domestic groundfish fisheries is contained in Section 3.3 of the SEIS for Amendments 61/61/13/8 for American Fisheries Act provisions (NMFS 2002).

The FMPs have been amended over sixty times since approved in the late 1970s. Each amendment has dealt with a specific aspect of the groundfish fisheries and has not necessarily been used to clean up obsolete language. The result is FMPs that continue to describe conservation and management measures for the nonexistent foreign fishery participants. References to foreign fishing under objectives and conservation measures should be removed to make the FMPs more concise and to accurately describe the nature of the current groundfish fisheries, as required by the Magnuson-Stevens Act.

If the proposed action to change the harvest specifications process is adopted, several sections of each FMP will be updated to accurately describe the responsibilities of the Plan Team in providing information to the Council for harvest specifications. During the early development of the FMPs, the Plan Teams provided management assistance to the Council for harvest specification and FMP development. The FMPs are now more fully developed, and the focus of the Plan Teams has shifted to stock assessment activities, including implementation of the processes described in the FMPs to develop ABC and OFL recommendations. Currently, the FMPs require the Plan Teams to provide economic analyses of PSC limits and apportionments. In recent years, this function has been performed by Alaska Fisheries Science Center economists. An annual economic analysis of the groundfish fisheries (Economic SAFE report) including PSC information is included as an appendix to NEPA analysis for the Council's consideration in recommending harvest specifications.

Section 13.4.2.3 in the BSAI FMP and Section 4.2.3.1 in the GOA FMP require the Plan Teams to provide recommended seasonal apportionments and fishery allocations of PSC limits (NPFMC 1999a, 1999b). Currently, the Plan Teams provide a review of the previous year's apportionments and allocations of PSC limits and catches of PSC. Apportionments and allocations of PSC limits are primarily developed and recommended by the Council process and involve fishing industry considerations that are not available to the Plan Team for making apportionments and allocations recommendations. If the proposed action is adopted, the FMP language regarding the Plan Teams' role in PSC limits allocations and apportionments would be limited to providing this type of information if requested by the Council, rather than requiring this information as part of the SAFE reports.

1.6 Objectives of this Action and Considerations

The proposed action changes the process for establishing harvest specifications, eliminates nonspecified BSAI and GOA groundfish reserves, deletes obsolete foreign fishing references in the FMPs, and alters language dealing with Plan Team responsibilities. Its objectives are: (1) to manage fisheries based on best scientific information available, (2) to provide for adequate prior public review and comment to the Secretary on Council recommendations, (3) to provide for additional opportunity for Secretarial review, (4) to minimize unnecessary disruption to fisheries and public confusion, and (5) to promote administrative efficiency.

The use of best available scientific information is critical to a successful harvest specifications process. The annual or biennial resource survey results are part of the information used to define the current stock condition of each target species or species group. Catch information is also important in understanding the removals of a species over time and may affect the projected amount of fish available for the following year. Fine tuning the assessment models and updating the projections of fish available for harvest are necessary and time consuming activities that transform raw data into the "best available scientific" information for developing harvest specification, as required by the Magnuson-Stevens Act. At the conclusion of summer surveys, survey data may be available, but it is not considered "best available science" until analyzed and put into a format that can be used for establishing fishery management measures. The SAFE reports, ESA and essential fish habitat (EFH) consultations, and NEPA documents are considered the "best available science" for the harvest specification process. Because of the large number of species managed in the Alaska groundfish fisheries and the complexity of the marine environment, development of the analyses requires the involvement of numerous scientists from the Alaska Fisheries Science Center (AFSC) and Alaska Region and is estimated to require four to six months. Approximately four months are needed for the development of the SAFE reports and up to five months are needed for the completion of other analytical documents, such as ESA, NEPA and RFA analyses. Overtime, the management of the Alaska groundfish fisheries has become more complex with additional species and methods for providing stock assessment information. The AFSC scientist are finding it increasingly challenging to complete detailed analysis of data and provide reports in time for the December Council meeting. Additional time for analysis would likely improve the quality of the information that is used for management decisions.

The Magnuson-Stevens Act requires NMFS to provide at least 15 days and no more than 60 days for public review and comment on any proposed rule. For more complex rules, such as harvest specifications, it may be more appropriate to provide more than 15 days for public review and comment. Once the comment period is over, NMFS must develop the final rule, including responses to comments and repeat the agency rule review process for a proposed rule, as described in section 1.2. Once the final rule is published, APA requires a 30 day cooling off period before the rule goes into effect. This time period may be waived for good cause. Approximately, five to six months are required to take the Council's recommended harvest specifications through the proposed and final rulemaking process, depending on other review priorities in NMFS, NOAA General Counsel, OMB, and the Department of Commerce.

1.7 Related NEPA Documents

The original environmental impact statements (EISs) for the BSAI and GOA FMPs were completed in 1979 and 1978, respectively (NPFMC 1979 and NPFMC 1978). NMFS issued a Supplemental Environmental Impact Statement (SEIS) on the action of TAC setting in December 1998 (NMFS 1998a) which analyzed the impacts of groundfish fishing over a range of TAC levels (alternatives).

NMFS notes that in a July 8, 1999 order, amended on July 13, 1999, the Court in Greenpeace, et al., v. NMFS. et al., Civ No. 98-0492 (W.D. Wash.) held that the SEIS did not adequately address aspects of the GOA and BSAI groundfish fishery management plans other than TAC setting, and therefore was insufficient in scope under National Environmental Policy Act (NEPA). In response to the Court's order, NMFS has developed a draft PSEIS for the GOA and BSAI groundfish fishery management plans which became available for public review on January 26, 2001 (NMFS 2001c). The draft PSEIS is available through the NMFS web site at http://www.fakr.noaa.gov/. The draft is currently being revised based on public comment and is scheduled for release in the fall of 2002.

Because the TAC setting process was determined to be adequately addressed by the 1998 SEIS, NMFS believes that the discussion of impacts and alternatives in the 1998 SEIS is directly applicable to the action analyzed in this EA/RIR/IRFA. Therefore, this EA/RIR/IRFA adopts the discussion and analysis in the SEIS (NMFS 1998a) and adopts by reference the applicable status and effects descriptions in the draft PSEIS (NMFS 2001c).

1.8 Public Participation and Issues Identified

This version of the draft EA/RIR/IRFA has not been subject to public review. Earlier versions of this draft EA/RIR/IRFA, including alternatives similar to 1 through 4, the alternatives not further analyzed, and the reserve option to the alternatives, were reviewed at the June 2000, January 2001 and February 2001 Council meetings (Agenda item D-1b), and the June 2000 version was reviewed during the joint Plan Team meeting in November 2000. The May 2002 version was reviewed during the June Council meeting at which time the Council recommended several revisions and release to the public for review. These meetings were open to the public.

Harvest specifications process issues identified during the development of the NEPA analysis and addressed in this EA include:

1) Use of survey data in development of stock assessments and ABC recommendation, (Section 4.1)
2) Ensuring the administrative process complies with all applicable laws and executive orders, (Sections 1.2 and 2.0)
3) Potential impacts on management of target species, (Section 4.1)
4) Interactions with State managed fisheries, (Section 4.8)
5) Provide one set of numbers for the industry to plan fishing activities, (Section 1.0) and
6) Interactions with individual fishing quota (IFQ) and Community Development Quota (CDQ) programs. (Sections 4.9 and 5.11)

1.9 Recent Court Decision

Recently, the federal court of the Northern District of California issued an order in favor of the Natural Resources Defense Council (NRDC) in litigation commenced by NRDC, *Natural Resources Defense Council V. Evans*, Case No. C 01-0421 JL (N.D. Cal. August 20, 2001). The NRDC challenged the Pacific Coast groundfish fishery annual harvest specifications process followed by the Pacific Fishery Management Council and authorized by the Secretary of Commerce, as well as the 2001 harvest specifications recommended by the Pacific Council and approved by the Secretary. The court decided in favor of the plaintiff, ruling among other things, that NMFS must publish the Pacific Coast groundfish fishery's proposed annual groundfish specifications in the Federal Register for public notice and comment prior to publication of final groundfish specifications.

This case is currently under appeal regarding the Magnuson-Stevens Act and Administrative Procedures Act (APA) findings. It is unknown if a challenge of the harvest specifications process currently used by NMFS for the North Pacific groundfish fisheries would have the same results under this court's review. Regardless, an alternative that met the objectives for this action would likely meet the findings specified in this case.

2.0 ALTERNATIVES CONSIDERED

CEQ regulations implementing NEPA require a range of alternatives to be analyzed for a federal action. The alternatives analyzed may be limited to a range of alternatives that could reasonably achieve the need that the proposed action is intended to address. Section 1.0 of this document described the purpose and need of the proposed action. Section 1.6 describes the objectives that must be met in order to meet the purpose and need of this action. These objectives are summarized below in Table 2.1.

Table 2.1 Objectives

Objectives
Develop and use best available scientific information
Provide adequate opportunity for prior public comment to the Secretary on Council recommendations
Provide additional opportunity for Secretarial review
Minimize disruption to fisheries and minimize public confusion
Promote administrative efficiency

2.1 Reasonable Alternatives

Alternatives 1 through 4 provide a range of actions that are considered to meet the objectives for the proposed action that were listed in Table 2.1. Three alternatives include options. The option under Alternative 2, setting two year harvest specifications for those GOA and BSAI species on a biennial survey schedule, does not need to be part of the alternative. Alternative 3 could be implemented without options or with one or both options. For Alternative 4, one of the PSC options must be chosen with the alternative action.

Two separate options, (a) eliminate some TAC reserves and (b) update the FMPs, could be adopted in conjunction with Alternatives 2 through 4. Additional alternatives that were considered and not further analyzed are presented in section 2.3.

Under each of these alternatives, there may be times during the rulemaking process or during the fishing year when new information may warrant changes in the specifications. The mechanism used to change the specifications will depend on the timing of the new information in relation to the rulemaking process for the fishing year. If the information is reviewed and action is recommended by the Council before the publication of the proposed rule, it is likely that the recommendation could be included in the proposed rule. If the specifications have already been proposed, the recommendation may be part of the final rule if the change can be considered a logical outgrowth from the proposed rule. If the change is significant or the rulemaking for the fishing year is in process or completed, an emergency rule may be used to implement Council recommendations for action on only unforseen, serious conservation or fishery management problems (62 FR 44421, August 21, 1997).

Alternative 1. Status Quo (NO ACTION ALTERNATIVE).

Descriptive information about the status quo process for setting harvest specifications can be found in Sections 1.2, 1.3, and 1.4. This alternative would continue the existing process for setting harvest specifications for the Alaska groundfish fisheries (proposed specifications, followed by interim and final specifications) and would not be amended to address the objectives outlined above nor the concerns raised regarding TAC ‘reserves.’

Alternative 2: Eliminate publication of interim specifications. Issue Proposed and Final Specifications Prior to Start of the Fishing Year.

Option: For those GOA and BSAI target species on biennial survey schedule, set TAC biennially.

NMFS would publish proposed harvest specifications based on Council recommendations followed by a comment period and publication of final specifications, prior to the beginning of the fishing year. In order to issue proposed and final harvest specifications prior to the start of the fishing year, scheduling of the "steps" in the current process must be modified.

Under this alternative, NMFS would set proposed and final specifications before the "preliminary" survey data collected during the current year becomes available. Instead, all harvest specifications for the following year would be recommended at the beginning of the current year based on the previous year's survey data and incorporated into stock model biomass and ABC projections reflecting the best available scientific information.

This shift in the specification schedule would leave the stock assessment scientists more time to: (1) assess and incorporate survey data and catch data into stock model projections; (2) adjust current models or explore new modeling techniques; and (3) allow peer review of preliminary results and conclusions. This additional time would allow thorough analysis of survey and research data, providing greater assurance that annual harvest specifications would be based on the best available scientific information. The preliminary SAFE reviewed in February would be a more complete document than the preliminary SAFE review in October under Alternative 1.

Under this scenario, the Council would recommend proposed harvest specifications in February with final action in April. In June or July, NMFS would publish proposed harvest specifications based on the Council's final recommendations. After the public comment period, NMFS would publish final harvest specifications by December 1, so that the 30 day delayed effective period could be met before the start of the groundfish fishery on January 1. This alternative provides: (1) traditional public input avenues during Council meetings; (2) a public comment period on proposed specifications; (3) adequate time to develop analyses for decision making; (4) adequate time to complete rulemaking before the beginning of the fishing year; and (5) opportunity for the fishery industry to plan operations based on final harvest specifications.

The option to this alternative would have harvest specifications for the GOA and the BSAI target species set on a biennial basis. The species on a biennial survey schedule include all of the target species in the Aleutian Islands, Bering Sea sablefish, and all GOA target species, except for sablefish. Currently, the resource surveys in these areas are done every two years. ABCs are recommended based on the most recent survey data which may have been collected one or two years in the past.

Table 2.2 shows the schedule for different actions and groups involved in the harvest specification process under Alternative 2. The process shown on the table would be the same if the option to this alternative was adopted, except that the stock assessment and rulemaking process for the biennially surveyed species would be completed every other year with ABC recommendations and harvest specifications established for two years.

In the first year of implementation of this alternative, the harvest specifications would be issued through emergency rule making completed by January 1, and extending for a full year of implementation. The initial harvest specifications would be based on projections from the latest completed SAFE report while the new process is put in place. During the first year, the process shown in Table 2.2 for Year 1 would be followed to establish harvest specifications for Year 2. See Section 2.3 for more details.

See Appendices A and B for draft FMP amendment language for this alternative and Options A and B.

Table 2.2 **Schedule for setting annual harvest specifications under Alternative 2**

	Year 1									Year 2	
	Jan	**Feb**	**April**	**May**	**June-July**	**Aug.**	**Sept.**	**Oct.-Nov.**	**Dec.**	**Jan.**	**Feb-Dec.**
Data	Catch Data for previous year available				biennial and annual survey age & length data collected					Catch Data for Year 1 available for Year 2 SAFE.	Repeat Year 1 process.
Plan Team	Preliminary SAFE completed for February Council meeting		Complete Final SAFE for April Council meeting				Data analyses and model review. November Plan Team Meeting			Prepare preliminary SAFE for February Council meeting	
Council		Review preliminary SAFE and preliminary NEPA/RIR/IRFA and announce proposed harvest spec. for YR2 for final action in April	Review revised SAFE, NEPA/RIR/IRFA and /ESA documents. Final action on harvest specifications for YR2								
NMFS	Complete initial Council review drafts of YR 2 NEPA/RFA/IRFA and ESA analyses	Revise NEPA/ESA/RFA/IRFA analyses based on Council recommendations and comments		Complete drafting and review of proposed harvest specs and analyses.	Publish proposed YR 2 annual specs. NEPA/RIR/IRFA and ESA drafts available	Review and respond to comments. Finalize NEPA/RIR/FRFA. Complete drafting and review of final rule.		Publish final harvest specifications for YR2.	30 day cooling off	Manage Fisheries with YR2 final harvest spec. Complete initial Council review drafts of NEPA/RIR/IRFA/ESA analyses for YR3.	
Public Comment	Welcome at Plan team meeting	Welcome at Council meeting.	Welcome at Council meeting.		30 day comment period on proposed specifications published in <u>Fed. Register</u>			Welcome at Plan team meeting		Welcome at Plan team meeting	

Alternative 3: **Issue Proposed and Final Harvest Specifications based on an alternate fishing year schedule (July 1-June 30)**

Option 1: Set sablefish TAC separately on a January 1 through December 31 schedule.

Option 2: Reschedule the December Council meeting for January

This alternative would use the same schedule for Council action as under the Status Quo but without interim specifications (Table 1.1). The Council would make final harvest specifications recommendations in December. NMFS would propose harvest specifications in February and do final rulemaking in May or June. The fishing year would be adjusted to begin July 1. This would allow for adequate public review and comment and would be consistent with APA and Magnuson-Stevens Act requirements. The time allowed for developing analytical documents would be constrained in this alternative as it is in the Status Quo Alternative. Approximately 6 months (January through June) would be available for the rulemaking process compared to 8 months (May through December) under Alternatives 2 and 4.

In December 2003, the SAFE documents prepared by the assessment authors and the Plan Teams would contain recommended ABCs for the period July 1, 2004 to June 30, 2005 (the "quota year"). These ABCs would be based on assessment projections covering this period and accounting for existing TACs. The recommended quota year ABCs in the SAFE documents would equal the sum of: (a) the ABC target for 2004, minus the known amount of TAC currently in regulations for January to June 2004, and (b) half of the 2005 ABC target. Seasonal apportionments of the July 2004 to June 2005 quota year TAC would be based on proportions and dates specified in the regulations.

In the first year of implementation of this alternative, the harvest specification would be implemented by proposed and final rulemaking for the first six months of the year (January through June 2004), until superceded by final harvest specifications, effective on July 1. See figure 2.2 for an implementation schedule.

Option 1 to this alternative would have TAC for sablefish set for January 1 through December 31. The purpose of this option is to maintain the management of the sablefish IFQ program on the same annual schedule as the halibut IFQ program. Stock assessment information would be used to project the TAC to the following calendar year. For instance, 2000 stock assessment information would be used to establish TAC for all species, except sablefish, for July 2001 through June 2002. Sablefish TAC would be established with 2000 stock assessment information for January 2002 through December 2002.

The first year of implementation of this option is similar to the process outlined above for the other groundfish species. The sablefish TAC would be established by proposed and final rulemaking for the first calendar year and for the following year. Harvest specification for the other groundfish species would be effective July 1 and the sablefish specifications would be effective for the following January.

Option 2 would reschedule the December Council meeting to January. This would allow additional time for stock assessment authors to complete their reports and to deal with unusual data. The extra month for analysis would likely result in better scientific data on which to base fishery management decisions.

See Appendices C and D for draft FMP amendment language for this alternative without Option 1 and with Options A and B.

Alternative 4: **Use Stock Assessment Projections for biennial harvest specifications. For the BSAI and GOA set the annual harvest specifications based on the most recent stock assessment and set harvest specifications for the following year based on projected OFL and ABC values.**

Option 1: Set PSC limits annually
Option 2: Set PSC limits every two years based on regulations and for crab and herring use either projected values or rollovers from previous year.

This alternative would use stock assessment information provided by the Plan Teams and approved by the Council to establish OFL, ABC and TAC levels for two years based on projections from the current stock assessment. The harvest specifications process would take place every other year.

In the first year of implementing this alternative, harvest specifications would need to be issued by emergency rule in December for the following year. While the harvest specifications for the first year are in effect by emergency rule, harvest specifications for the second and third year will be implemented by proposed rulemaking in June or July and final rulemaking in October or November. After the "start-up", harvest specifications for the following years would be implemented by proposed and final rulemaking. See Section 2.3 for more details.

Under Option 1, the PSC apportionments would need to be recommended annually by the Council and NMFS would implement the PSC limits with proposed and final rulemaking. Option 2 would put the PSC limit specifications on the same 2 year schedule as the other harvest specifications. Option 2 may be considered if the State of Alaska and NMFS have the resources, and if the biomass assessments are reliable enough to project crab and herring PSC limits. Option 2 may also be a PSC limits rollover from the previous year. The remainder of the PSC limits are specified in regulations (50 CFR §679.21).

The schedule described under Alternative 2 for OFL, ABC and TAC recommendations by the Plan Teams and the Council would be used in this alternative. In February, the Plan Team would present the preliminary SAFE report with OFL and ABC levels to the SSC, for the following fishing year and for the second following year. For example, a February 2002 Plan Team recommendation would include OFL and ABC levels for the year 2003 and projected OFL and ABC levels for the year 2004. Public comment would be taken during the proposed harvest specifications comment period and at Plan Team meetings and Council meetings. NMFS would set groundfish harvest specifications for two years at a time for all target species whether on a biennial or annual survey schedule. Each step in the Alternative 4 process for setting harvest specifications is identified in Table 2.3. Option 2 under this alternative would follow the same schedule as shown in Table 2.3. Option 1 would have to be a separate process from the biennial harvest specifications process, with annual PSC limit rulemaking as shown in Table 2.2.

Table 2.3 **Schedule for setting annual harvest specifications under Alternative 4**

	Year 1									Year 2	Year 3
	Jan	**Feb**	**April**	**May**	**June-July**	**Aug.**	**Sept.**	**Oct.-Nov.**	**Dec.**	**Jan.-Dec**	**Jan-Dec.**
Data	Catch Data from the previous year available				biennial and annual survey age & length data					biennial and annual Survey Age & length data	Repeat Year 1 process
Plan Team	Preliminary SAFE completed for February Council meeting		Final SAFE completed for April Council meeting				Data analyses and model review November Plan Team Meeting			Data analyses and model review Sept.-Dec. Plan Team meetings	Repeat Year 1 process
Council		Review preliminary SAFE, NEPA/RIR/IRFA and announce proposed harvest spec. for YR2 and YR3 for final action in April	Review revised, SAFE, NEPA/RIR/IRFA/ESA documents. Final action on harvest specifications for YR2 and YR3								Repeat Year 1 process
NMFS	Complete initial Council review drafts of NEPA/RIR/IRFA analyses	Revise NEPA/RIR/IRFA analyses based on Council recommendations and comments		Complete drafting and review of proposed regulation and analyses.	Publish proposed YR 2 and YR3 annual specs. NEPA/RIR/IRFA/ESA drafts available	Review and respond to comments. Finalize NEPA/RIR/FRFA/ESA documents. Complete drafting and review of final rule.		Publish final harvest specifications for YR2 and YR3.	30 day cooling off	Manage Fisheries with YR2 final harvest spec.	Manage Fisheries with YR3 final harvest spec. Repeat Year 1 process

	Year 1									Year 2	Year 3
	Jan	**Feb**	**April**	**May**	**June-July**	**Aug.**	**Sept.**	**Oct.-Nov.**	**Dec.**	**Jan.-Dec**	**Jan-Dec.**
Public Comment	Welcome at Plan Team Meeting	Welcome at Council meeting.	Welcome at Council meeting.		30 day comment period on proposed specifications in Fed. Register			Welcome at Plan team meeting		Welcome at Plan Team and Council meetings	Repeat Year 1 process

Option A: Abolish TAC Reserves.

Under Option A, NMFS would no longer set aside nonspecified TAC reserves in the BSAI and would no longer set aside TAC for the GOA reserves. CDQ reserves would be established as a set allocation of the total TAC (7.5 percent of each BSAI PSC limit; and 7.5 percent of most BSAI groundfish TACs, except 10 percent of BSAI pollock and 20 percent of the fixed gear sablefish allocation). Option A could be implemented with Alternatives 2 through 4 to promote administrative efficiency while minimizing public confusion regarding TAC specifications.

Option B: Updating Portions of the FMPs

The FMPs do not accurately reflect the current condition of the fisheries and the harvest specification process (NPFMC 1999a and 1999b). This option would update language in certain sections of the FMPs to remove references to foreign fishing and allocation to foreign fishing and to update the description of the harvest specification process, including the Plan Teams' responsibilities regarding PSC limits apportionments and allocations and to update fishing participants information. Appendices A and B to this EA/RIR/IRFA contain draft amendment language for the BSAI and GOA FMPs for consideration in implementing this option.

The groundfish fisheries in Alaskan waters have shifted from exclusively foreign fisheries to exclusively American fisheries in 1991. At the time the FMPs were developed, much of the descriptive text contained references to foreign fishing, and management measures included provisions for foreign and domestic fisheries. This option will remove obsolete references to foreign fishing in the Introduction, Goals and Objectives, Stock and Area Description, and Management Measures sections of the FMPs and update the description of the current groundfish fisheries.

Section 303(a) of the Magnuson-Stevens Act requires that an FMP address foreign fishing by:
1. Describing the conservation and management measures that apply to foreign fishing,
2. Describing the nature and extent of foreign fishing, and
3. Assessing and specifying the portion of optimal yield made available to foreign fishing.

These requirements will be met by describing that foreign fishing is no longer allowed in Alaskan waters and therefore no conservation and management measures are needed and no portion of optimal yield is made available to foreign fishing. Implementing this option would meet the objectives of promoting administrative efficiency and minimizing public confusion regarding the FMP language.

The BSAI and GOA FMPs contain descriptions of the actions taken by the Plan Teams in providing information to the Council to make harvest specifications recommendations. Each FMP contains a description of the Plan Teams providing recommended PSC limits allocations and apportionments and an economic analysis of these allocations and apportionments. The Plan Teams have not provided this economic analysis for a number of years because there are no economists on the Plan Teams. The Plan Teams normally provide the Council a report on the previous year's PSC limits apportionments and allocations and catches of PSC species for Council consideration. The Council uses the Plan Team information and fishing industry concerns in developing recommended PSC limits apportionments and allocations for the coming year. The fishing industry concerns are a crucial part of the development of the PSC recommendations and are not available to the Plan Teams. Therefore, the Plan Teams do not have all the information needed able to make comprehensive recommendations to the Council regarding PSC limit apportionments and allocations for the harvest specifications. However, as noted in Section 1.5, for several years economic analysis has been provided by the economists at the AFSC in the annual "Economic SAFE document". If this option is adopted, references to the Plan Teams providing recommended PSC limits apportionments and allocations and economic analyses will be changed to an optional part of the SAFE reports to the Council.

Appendices A through D contain the draft FMP amendment language for implementation of alternatives 2 and 3, and the updates previously described in this section for the BSAI and GOA FMPs. Language describing the Council process for developing and recommending harvest specifications would be amended to reflect the schedule specified in alternatives 2 or 3. This option adds the additional amendments of removing references to foreign fishing where appropriate and changing the Plan Teams' responsibility for providing the Council recommended PSC limit apportionments and allocations for harvest specifications to an optional activity.

Excluding the draft FMP language for a harvest specifications process (Alternative 2), this option is a housekeeping procedure. Updating language in the FMP will not change the management or nature of the groundfish fisheries in Alaskan waters. By not changing the management or nature of the groundfish fisheries, this option will have no effect on the human environment. Because this option is a housekeeping procedure to update the Plan Teams' responsibilities for recommending PSC limit allocations and apportionments and to reflect the current nature of foreign and domestic fisheries in Alaskan waters, this option is considered a minor correction to the FMP. Minor corrections to an FMP are considered eligible for categorical exclusion from NEPA analysis under NOAA Administrative Order 216-6, section 6.03(a)(3)(b)(2). This option will not have an effect on the human environment and is considered a minor correction. Therefore, it will not be further analyzed in this EA and is categorically excluded from NEPA analysis. The alternative harvest specifications process included in this option is analyzed in this EA/RIR/IRFA.

2.2 Alternatives Considered and Eliminated from Detailed Study

Set harvest specifications through a single Federal Register notice

An alternative to set harvest specifications through a single Federal Register notice was also considered and rejected. Under this alternative, the Council would recommend harvest specifications in December based upon SSC and AP recommendations. NMFS would approve and publish the harvest specifications as a notice in the Federal Register by the end of December. Public review and comment on the SAFE reports and EA/RIR/IRFA would be possible at the Plan Team and Council meetings. Three issues make this a nonviable alternative. The first problem is the lack of time to complete the NEPA and RIR analyses between the December Council meeting and before publication of the notice. The second problem is that this alternative does not provide ample opportunity for public review and comment on the proposed federal action, one of the most important goals of revising the harvest specification process. The third possible problem is that the fishery may not open on January 1 if the notice is not issued by then. Because of these problems, this alternative will not be further analyzed in this document.

Issue proposed and final specifications based on current year survey results, but conduct surveys earlier in year

This alternative would maintain the existing fishing year schedule but resource assessment surveys would be conducted earlier in the year, and Council recommendations would be provided earlier in the year to provide completion of the proposed and final specifications process before January 1. Survey work would be required to be conducted in late winter months. This alternative would allow for adequate public review and comment on the proposed federal action, but would constrain time to develop analyses prior to Council recommendation and agency approval for the harvest specifications. Major scientific problems exist with this option because the distribution and abundance of the fish in the winter/spring surveys would be different than in historically timed stock surveys. Further, severe weather may reduce the number of surveys completed and reduce sampling precision. Because of these problems, this option will not be further analyzed in this EA/RIR/IRFA.

Calculate interim specifications from ABC, followed by proposed and final specifications.

Under this alternative, NMFS would issue interim specifications by Federal Register notice after the December Council meeting and prior to January 1, based on the following non-discretionary formula which uses the best available information on status of the stocks. This information comes from the November/December Plan Team, SSC, and Council deliberations.

$[ABC_{year\ x+1} / ABC_{year\ x} * TAC_{year\ x}] = \text{Interim } TAC_{year\ x+1}$

Under this simple formula, interim TACs would be proportionately adjusted up or down from the previous year's TACs based on changes to ABCs. The interim TACs would be the lower of the calculated TACs or the Council-recommended TACs. The interim TAC would be apportioned into gear, season, and area allocations as specified in regulations. In addition, this alternative would provide for sablefish CDQ and IFQ interim TACs according to the above formula. Interim specifications would be superceded by proposed and final rulemaking with final specifications replacing interim specifications by late spring.

Because this alternative would not allow for a proposed and final rule making process on the interim specifications, this would not comply with the main objective to allow prior notice and public comment on harvest specifications and is therefore not further analyzed in this EA/RIR/IRFA.

Rollover existing specifications until superceded by new specifications

This alternative would set harvest specifications for a 16-month period (Jan-Dec + following year Jan-April). The harvest specifications would effectively "rollover" into the first four months of the following year, until replaced by new final specifications. If final specifications were not in place on or before May 1, the fishery would not be authorized to operate. Public comment would be taken at Plan Team meetings and Council meetings. No changes would occur in the resource assessment survey schedule. This alternative would reduce administrative costs relative to the status quo because no need would exist for issuing interim specifications. Two options are detailed below.

Option 1: Rollover current year's specifications on interim basis; NMFS would publish proposed specifications with a 15-day comment period and would publish final specifications, following the December Council meeting.

This option would implement regulations that would stipulate the rollover of the current year's specifications, without any Federal action needed. That is, the TACs would be set for a 16-month period, or until superceded by final specifications. Proposed specifications would be based on Council recommendations and would be published after the December Council meeting. Public comment would be taken during the proposed specifications comment period and at Plan Team meetings and Council meetings.

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Option 2: Rollover current year's specifications on an interim basis; NMFS would publish interim final specifications with a 30-day comment period. If necessary after considering comments received, NMFS would publish revised final specifications.

Under this alternative, NMFS would publish interim final specifications based on the Council recommendations after the December Council meeting, accompanied by the required NEPA and economic analyses. Public comment would be taken during interim final specification comment period, and at Plan Team meetings and Council meetings.

Option 1 would cause confusion to the public and difficulty in management of the fisheries as the harvest specifications would likely change half way through the fishing year. Option 1 does not meet the objectives to minimize disruption to the fisheries and public confusion, and to promote administrative efficiency. Option 2 does not meet the statutory requirements for prior public notification and comment on a proposed federal action. Because these options do not meet the objectives, this alternative is not further analyzed in this document.

2.3 Implementation Process

Figure 2.1 shows the implementation process for revising the FMPs and implementing Alternatives 2 or 4. In Figure 2.1, the Council makes a final recommendation in October 2002, proposed and final rule making for the harvest specifications process would need to be completed before April 2003 to allow the Council to make a final harvest specifications recommendation for 2004 (and 2005 for Alternative 4) under the new administrative procedure. At the same time, the 2003 harvest specifications would need to be implemented by proposed, interim, and final rulemaking as the new process is being put in place. Proposed and final rulemaking for 2004 harvest specifications would happen in June and October 2003, respectively so those specifications will be in place by January 2004.

In Figure 2.2, Alternative 3 would has a similar FMP amendment approval and rulemaking process as Alternatives 2 or 4 for revising the harvest specifications process. Regulatory action for implementing the FMP amendments may occur later in 2003 compared to Alternative 2 because harvest specifications under Alternative 3 need to be effective 6 months later than under Alternative 2. Establishing the harvest specifications for 2003 would be done by proposed, interim and final rulemaking as currently specified in the regulations. FMP amendments and regulatory amendment for the harvest specifications process would be completed in 2003, including proposed and final rulemaking for harvest specifications for January through June 2004 and January through December 2004 for sablefish. In December 2003, the Council would recommend July 2004 through June 2005 harvest specifications, and January through December 2005 sablefish TAC if Option 1 is implemented. Proposed and final rulemaking for the July 2004 through June 2005 harvest specifications would be completed in the first half of 2004.

Figure 2.1 Rulemaking Schedule for Implementing Alternatives 2 or 4 Harvest Specification Process

ID	Task Name	Start
1	Council takes final action on harvest specification process - October 6-15, 2002; Council recommends proposed and interim 2003 specifications	10/7
2	NMFS publish proposed & interim 2003 harvest specifications - November 11, 2002	11/11
3	Council recommends final 2003 harvest specifications - December 2-10, 2002	12/2
4	Council transmits FMP amendment package to NMFS - December 16, 2002	12/16
5	Notice of Availability of FMP published with 60 day comment period - December 23. 2002 to February 23, 2003	12/23
6	2003 interim harvest specifications - January 1, 2003	1/1
7	Proposed rule published with 45 day comment period - January 30 to March 15, 2003	1/30
8	Council follows new harvest specifications process - recommends proposed harvest specifications for 2004. February 3-10. 2003	2/3
9	2003 final harvest specifications published - March 3, 2003	3/3
10	Secretarial approval of FMP - March 21, 2003	3/21
11	Council recommends final 2004 harvest specifications - April 7, 2003	4/7
12	Final Rule published with 30 day delayed effectiveness period - June 1, 2003	6/1
13	Harvest specification process rule effective - July 1, 2003	7/1
14	Publish proposed rule for 2004 harvest specifications with 30 day comment period - July 1 to August 1, 2003	7/1
15	Publish final rule for 2004 harvest specifications with 30 day delayed effectiveness - October 15 - November 14, 2003	10/15
16	2004 harvest specifications effective - January 1, 2004	1/1

Figure 2.2: Alternative 3: Amendments 48/48 Implementation Schedule

ID	Task Name	2003–2004 (Aug–Jul)
1	**Council 1)Recommend proposed & interim 2003 specs**	**10/21**
2	**Council 2) Take final action on Amendment 48/48**	**10/24**
3	**NMFS publish proposed & interim 2003 harvest specifications**	**11/11-12/11**
4	**Council recommed final 2003 harvest specifications & final action on Jan-June 2004 harvest specs**	**12/16**
5	**Interim 2003 specifications effective**	**Effective 1/1/03**
6	**Council transmits FMP amendment 48/48 package to NMFS**	**01/16**
7	**NMFS publish NOA of FMP Amendment 48/48 with 60 day comment period**	**2/23-4/25**
8	**NMFS publish 2003 harvest specs final rule**	**2/03**
9	**Final 2003 specifications effective**	**Effective 3/03**
10	**NMFS Secretarial approval of FMP Amendment 48/48**	**5/25**
11	**NMFS publish PR for Amendment 48/48 & Jan-June 04 harvest specs**	**6/2-7/17**
12	**NMFS publish FR for Amendment 48/48 and Jan-June 2004 harvest specs**	**9/1-10/1**
13	**Council final recommendation for July 04 - June 05 harvest specs**	**12/3**
14	**Jan 2004 to June 2004 harvest specs effective**	**Effective 1/1/04**
15	**NMFS publish July 04-June 05 proposed harvest specs**	**2/16-3/15**
16	**NMFS publish July 04-June 05 Final harve**	**6/1 - 7/1**
17	**NMFS publish July 04-June 05 final harvest specs (effective 7/1)**	**Effective 7/1/04**

3.0 AFFECTED ENVIRONMENT

Because the proposed action would only change an administrative process, impacts to many of the physical and biological components of the human environment are not predicted. A change in the administrative procedures will not affect the location or methods of groundfish harvest. Because environmental impacts are not expected from the alternatives for most of the environmental components, a detailed description of the marine environment is not necessary. For those components where impacts may occur, detailed descriptions are found in other recent NEPA analyses and will be cross referenced for the purposes of this EA/RIR/IRFA. General information and sources of additional information regarding the environment of the groundfish fisheries off Alaska is provided in this section.

Table 3.1 shows the components of the human environment and whether the alternatives may have an impact on the component beyond status quo, or Alternative 1, and require further analysis. Potential impacts under marine mammals are related to Steller sea lions and groundfish harvest and are further explained in section 4.3. Potential impacts on groundfish are explained in section 4.1. Socioeconomic descriptions and impacts are described in the RIR and IRFA, Sections 5 and 6. Environmental impacts from a range of TACs using the administrative process under Alternative 1 are analyzed in the 1998 SEIS (NMFS 1998) and in the draft PSEIS (NMFS 2001c). Extensive environmental analysis on all environmental components is not needed in this document because none of the alternatives are anticipated to have environmental impacts on all components. Analysis is included for those environmental components on which an alternative may have an impact beyond impacts analyzed for Alternative 1 in previous NEPA analysis.

Table 3.1 Resources potentially affected by an alternative beyond Alternative 1

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

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

The groundfish fisheries occur in the North Pacific Ocean and Bering Sea in the U.S. EEZ from 50° N to 65°N latitude. The harvest specifications apply to groundfish fishing under approved FMPs for the BSAI and GOA. The draft PSEIS provides a complete detailed description of the affected environment. Features of the physical environment are described in section 3.1. Fishing gear effects on substrate and benthic communities are described in section 3.2. Groundfish resources are in section 3.3, marine mammals in Section 3.4, seabirds in Section 3.5, other species in Section 3.6, prohibited species in Section 3.7, contaminants in Section 3.8, interactions between climate, commercial fishing and the ecosystem in Section 3.9 and the socioeconomic environment in Section 3.10. The draft PSEIS (NMFS 2001c) is available through the NMFS Alaska Region home page at http://www.fakr.noaa.gov. This EA/RIR/IRFA adopts much of the environmental status description in the draft PSEIS because it is a recent, detailed description. Additionally, the current, detailed status of each target species category, biomass estimates, and acceptable biological catch specifications are presented annually both in summary and in detail in the annual GOA and BSAI SAFE reports (NPFMC 2001a and 2001b). The SAFE reports for the 2002 fisheries are available through the Council's home page at http://www.fakr.noaa.gov/npfmc.

3.1 Status of Managed Groundfish Species

Designated target groundfish species and species groups in the BSAI are walleye pollock, Pacific cod, yellowfin sole, Greenland turbot, arrowtooth flounder, rock sole, other flatfish, flathead sole, sablefish, Pacific ocean perch, other rockfish, Atka mackerel, squid, and other species. Designated target species and species groups in the GOA are walleye pollock, Pacific cod, deep water flatfish, rex sole, shallow water flatfish, flathead sole, arrowtooth flounder, sablefish, other slope rockfish, northern rockfish, Pacific Ocean perch, shortraker and rougheye rockfish, pelagic shelf rockfish, demersal shelf rockfish, Atka mackerel, thornyhead rockfish, and other species. This EA cross-references and summarizes the status of the stock information in the SAFE reports (NPFMC 2001a for BSAI and 2001b for GOA). For detailed life history, ecology, and fishery management information regarding groundfish stocks in the BSAI and GOA see Section 3.3. in the draft PSEIS (NMFS 2001c).

For those stocks where enough information is available, none are considered overfished or approaching an overfished condition. The BSAI and GOA Plan Teams met in November 2001 to finalize the SAFE reports and to forward ABC and OFL recommendations to the Council for action at its December 2001 meeting. The ABC, OFL, and TAC amounts for each target species or species group for 2002 were specified in an emergency interim rule (67 FR 956, January 8, 2002) due to the necessity to have them effective simultaneously with Steller sea lion protection measures at the start of the fishing year. Tables 3.2 and 3.3 show the 2002 ABC, OFL and TAC amounts for the BSAI and GOA groundfish fisheries, respectively.

Table 3.2 2002 Acceptable Biological Catch (ABC), Total Allowable Catch (TAC), Initial TAC (ITAC), CDQ Reserve Allocation, and Overfishing Levels of Groundfish in the Bering Sea and Aleutian Islands Area (BSAI)[1]

[All amounts are in metric tons]

Species	Area	Overfishing level	ABC	TAC	ITAC[2]	CDQ reserve[3]
Pollock[4]	Bering Sea (BS)	3,530,000	2,110,000	1,485,000	1,283,040	148,500
	Aleutian Islands (AI)	31,700	23,800	1,000	900	100
	Bogoslof District	46,400	4,310	100	90	10
Pacific cod	BSAI	294,000	223,000	200,000	170,000	15,000
Sablefish[5]	BS	2,900	1,930	1,930	821	265
	AI	3,850	2,550	2,550	541	431
Atka mackerel	BSAI	82,300	49,000	49,000	41,650	3,675
	Western AI	....	19,700	19,700	16,745	1,478
	Central AI	....	23,800	23,800	20,230	1,785
	Eastern AI/BS	....	5,500	5,500	4,675	413
Yellowfin sole	BSAI	136,000	115,000	86,000	73,100	6,450
Rock sole	BSAI	268,000	225,000	54,000	45,900	4,050
Greenland turbot	BSAI	36,500	8,100	8,000	6,800	600
	BS	....	5,427	5,360	4,556	402
	AI	....	2,673	2,640	2,244	198
Arrowtooth flounder	BSAI	137,000	113,000	16,000	13,600	1,200
Flathead sole	BSAI	101,000	82,600	25,000	21,250	1,875
Other flatfish[6]	BSAI	21,800	18,100	3,000	2,550	225
Alaska plaice	BSAI	172,000	143,000	12,000	10,200	900
Pacific ocean perch	BSAI	17,500	14,800	14,800	12,580	1,111
	BS		2,620	2,620	2,227	197
	AI Total	....	12,180	12,180	10,353	914
	Western AI	....	5,660	5,660	4,811	425
	Central AI	....	3,060	3,060	2,601	230
	Eastern AI	....	3,460	3,460	2,941	260
Northern rockfish [7]	BSAI	9,020	6,760	6,760	5,746	
	BS			19	16	See 7
	AI			6,741	5,730	506
Shortraker/Rougheye[7]	BSAI	1,369	1,028	1,028	874	
	BS			116	99	See 7
	AI			912	775	68
Other rockfish[8]	BS	482	361	361	307	27
	AI	901	676	676	575	51
Squid	BSAI	2,620	1,970	1,970	1,675	
Other species[9]	BSAI	78,900	39,100	30,825	26,201	2,312
TOTAL		4,974,242	3,184,085	2,000,000	1,717,399	187,504

[1] Amounts are in metric tons. These amounts apply to the entire Bering Sea (BS) and Aleutian Islands (AI) management area unless otherwise specified. With the exception of pollock, and for the purpose of these specifications, the Bering Sea subarea includes the Bogoslof District.

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

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

[4] The American Fisheries Act (AFA) requires that 10 percent of the annual pollock TAC be allocated as a directed fishing allowance for the CDQ sector. NMFS then subtracts 4 percent of the remainder as an incidental catch allowance of pollock, which is not apportioned by season or area. The remainder is further allocated by sector as follows: inshore, 50 percent; catcher/processor, 40 percent; and motherships, 10 percent. NMFS, under regulations at § 679.24(b)(4), prohibits nonpelagic trawl gear to engage in directed fishing for non-CDQ pollock in the BSAI.

[5] The ITAC for sablefish reflected in Table 3 is for trawl gear only. Regulations at § 679.20(b)(1) do not provide for the establishment of an ITAC for the hook-and-line or pot gear allocation for sablefish. Twenty percent of the sablefish TAC allocated to hook-and-line gear or pot gear and 7.5 percent of the sablefish TAC allocated to trawl gear is reserved for use by CDQ participants (see § 679.31(c)).

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

[7] The CDQ reserves for shortraker, rougheye, and northern rockfish will continue to be managed as the “other red rockfish” complex for the BS. For 2002 the CDQ reserve for the “other red rockfish” complex is 10 mt.

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

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

Table 3.3 2002 ABCs, TACs, and Overfishing Levels of Groundfish for the Western/Central/West Yakutat (W/C/WYK), Western (W), Central (C), Eastern (E) Regulatory Areas, and in the West Yakutat (WYK), Southeast Outside (SEO), and Gulf-Wide (GW) Districts of the Gulf of Alaska [Values are in metric tons]

Species	Area[1]	ABC	TAC	Overfishing
Pollock[2]				
Shumagin	(610)	17,730	17,730	
Chirikof	(620)	23,045	23,045	
Kodiak	(630)	9,850	9,850	
WYK	(640)	1,165	1,165	
Subtotal	W/C/WYK	51,790	51,790	75,480
SEO	(650)	6,460	6,460	8,610
Total		58,250	58,250	84,090
Pacific cod[3]				
	W	22,465	16,849	
	C	31,680	24,790	
	E	3,455	2,591	
Total		57,600	44,230	77,100
Flatfish[4] (deep-water)	W	180	180	
	C	2,220	2,220	
	WYK	1,330	1,330	
	SEO	1,150	1,150	
Total		4,880	4,880	6,430
Rex sole[4]	W	1,280	1,280	
	C	5,540	5,540	
	WYK	1,600	1,600	
	SEO	1,050	1,050	
Total		9,470	9,470	12,320
Flathead sole	W	9,000	2,000	
	C	11,410	5,000	
	WYK	1,590	1,590	
	SEO	690	690	
Total		22,690	9,280	29,530
Flatfish[5] (shallow-water)	W	23,550	4,500	
	C	23,080	13,000	
	WYK	1,180	1,180	
	SEO	1,740	1,740	
Total		49,550	20,420	61,810
Arrowtooth flounder	W	16,960	8,000	
	C	106,580	25,000	
	WYK	17,150	2,500	
	SEO	5,570	2,500	
Total		146,260	38,000	171,060
Sablefish[6]	W	2,240	2,240	
	C	5,430	5,430	

	WYK	1,940	1,940	
	SEO	3,210	3,210	
Subtotal	E	5,150	5,150	
Total		12,820	12,820	19,350

Table 3.3. (continued)

Species	Area[1]	ABC	TAC	Overfishing
Pacific[7] ocean perch	W	2,610	2,610	3,110
	C	8,220	8,220	9,760
	WYK	780	780	
	SEO	1,580	1,580	
Subtotal	E			2,800
Total		13,190	13,190	15,670
Short raker/ rougheye[8]	W	220	220	
	C	840	840	
	E	560	560	
Total		1,620	1,620	2,340
Other rockfish[9,10]	W	90	90	
	C	550	550	
	WYK	260	150	
	SEO	4,140	200	
Total		5,040	990	6,610
Northern Rockfish[10,12]	W	810	600	
	C	4,170	4,170	
	E	N/A	N/A	
Total		4,980	4,980	5,910
Pelagic shelf rockfish[13]	W	510	510	
	C	3,480	3,480	
	WYK	640	640	
	SEO	860	860	
Total		5,490	5,490	8,220
Thornyhead rockfish	W	360	360	
	C	840	840	
	E	790	790	
Total		1,990	1,990	2,330
Demersal shelf rockfish[11]	SEO	350	350	480
Atka mackerel	GW	600	600	6,200
Other[14] species	GW	N/A[15]	11,330	N/A
TOTAL[16]		394,780	237,890	509,450

[1] Regulatory areas and districts are defined at § 679.2.

[2] Pollock is apportioned in the Western/Central Regulatory areas among three statistical areas. During the A and B seasons the apportionment is based on the relative distribution of pollock biomass at 23 percent, 68 percent, and 9 percent in Statistical Areas 610, 620, and 630 respectively. During the C and D seasons pollock is apportioned based on the relative distribution of pollock biomass at 47 percent, 23 percent, and 30 percent in Statistical Areas 610, 620, and 630 respectively. These seasonal apportionments are shown in Table 21. In the West Yakutat and the Southeast Outside Districts of the Eastern Regulatory Area the annual pollock TAC is not divided into seasonal allowances.

[3] The annual Pacific cod TAC is apportioned 60 percent to an A season and 40 percent to a B season in the Western and Central Regulatory Areas of the GOA. Pacific cod is allocated 90 percent for processing by the inshore component and 10 percent for processing by the offshore component. Seasonal apportionments and component allocations of TAC are shown in Table 22.

[4] "Deep water flatfish" means Dover sole, Greenland turbot, and deepsea sole.

[5] "Shallow water flatfish" means flatfish not including "deep water flatfish," flathead sole, rex sole, or arrowtooth flounder.

[6] Sablefish is allocated to trawl and hook-and-line gears (Table 20).

[7] "Pacific ocean perch" means Sebastes alutus.

[8] "Shortraker/rougheye rockfish" means Sebastes borealis (shortraker) and S. aleutianus (rougheye).

[9] "Other rockfish" in the Western and Central Regulatory Areas and in the West Yakutat District means slope rockfish and demersal shelf rockfish. The category "other rockfish" in the Southeast Outside District means Slope rockfish.

[10] "Slope rockfish" means Sebastes aurora (aurora), S. melanostomus (blackgill), S. paucispinis (bocaccio), S. goodei (chilipepper), S. crameri (darkblotch), S. elongatus (greenstriped), S. variegatus (harlequin), S. wilsoni (pygmy), S. babcocki (redbanded), S. proriger (redstripe), S. zacentrus (sharpchin), S. jordani (shortbelly), S. brevispinis (silvergrey), S. diploproa (splitnose), S. saxicola (stripetail), S. miniatus (vermilion), and S. reedi (yellowmouth). In the Eastern GOA only, "slope rockfish" also includes northern rockfish, S. polyspinous.

[11] "Demersal shelf rockfish" means Sebastes pinniger (canary), S. nebulosus (china), S. caurinus (copper), S. maliger (quillback), S. helvomaculatus (rosethorn), S. nigrocinctus (tiger), and S. ruberrimus (yelloweye).

[12] "Northern rockfish" means Sebastes polyspinis.

[13] "Pelagic shelf rockfish" means Sebastes ciliatus (dusky), S. entomelas (widow), and S. flavidus (yellowtail).

[14] "Other species" means sculpins, sharks, skates, squid, and octopus. The TAC for "other species" equals 5 percent of the TACs of assessed target species.

[15] N/A means not applicable.

[16.] The total ABC is the sum of the ABCs for assessed target species.

3.2 Status of Prohibited Species Stocks

Prohibited species taken incidentally in groundfish fisheries include: Pacific salmon (chinook, coho, sockeye, chum, and pink salmon), steelhead trout, Pacific halibut, Pacific herring, and Alaska king, Tanner, and snow crabs. In order to control bycatch of prohibited species in the groundfish fisheries, the Council annually specifies halibut limits for the GOA fishery and halibut and other PSC limits in BSAI. The status of the prohibited species is detailed in section 3.7 of the draft PSEIS (NMFS 2001c) and in the SAFE reports (NPFMC 2001a, 2001b). During haul sorting, these species or species groups are to be returned to the sea with a minimum of injury except when their retention is required by other applicable law.

3.3 Forage Species and Nonspecified Species

Forage fish species are abundant fishes that are preyed upon by marine mammals, seabirds and other commercially important groundfish species. The following forage species are included in the forage fish category established in 1998: Osmeridae (which includes capelin and eulachon), Myctophidae (lanternfishes), Bathylagidae (deep sea smelts), Ammodytidae (sand lances), Trichodontidae (sandfishes), Pholididae (gunnels), Stichaeidae (pricklebacks), Gonostomatidae (bristlemouths), and the Order Euphausiacea (krill). For further detailed discussion of forage fish species, see section 3.3.1.13 of the draft PSEIS (NMFS 2001c) and the EA for Amendments 36 and 39 to the FMPs (NMFS 1998b). Nonspecified species are fish and invertebrate species that are not managed under the FMPs, such as jellyfish and sea stars. Detailed information on nonspecified species may be found in section 3.6 of the draft PSEIS (NMFS 2001c)

The information available for forage and nonspecified 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 forage and non-specified species. Predictions of impacts from different levels of harvest can only be qualitatively described. Management concerns, data limitations, research in progress, and planned research to address these concerns are discussed in Section 4.5 of the draft PSEIS (NMFS 2001c). Direct effects of groundfish fishing include the removal of forage and nonspecified species from the environment as incidental catch in the groundfish fisheries. Information on the current research on several forage species and nonspecified species may be found in Ecosystem Considerations for 2002 (NMFS 2001a, appendix C).

3.4 Status of Marine Habitat

The adjacent marine waters outside the EEZ, adjacent State of Alaska waters, shoreline, freshwater inflows, and atmosphere above the waters, constitutes habitat for prey species, other life stages, and species that move in and out of, or interact with, the target species in the management areas (NMFS 2001c). Distinctive aspects of the habitat include water depth, substrate composition, substrate infauna, light penetration, water chemistry (salinity, temperature, nutrients, sediment load, color, etc.), currents, tidal action, phytoplankton and zooplankton production, associated species, natural disturbance regimes, and the seasonal variability of each aspect. Substrate types include bedrock, cobbles, sand, shale, mud, silt, and various combinations of organic material and invertebrates which may be termed biological substrate. Biological substrates present in these management areas include corals, tunicates, mussel beds, tube worms. Biological substrate has the aspect of ecological state (from pioneer to climax) in addition to the organic and inorganic components. Ecological state is heavily dependant on natural and anthropogenic disturbance regimes.

The fishery management plans (NPFMC 1999a, 1999b) contain descriptions of habitat requirements and life histories of the managed species. All the marine waters and benthic substrates in the management areas comprise the habitat of the target species. Much remains to be learned about habitat requirements for most of the target species. A detailed discussion of habitat and potential effects of fishing on habitat is in section 3.2 of the draft PSEIS (NMFS 2001c).

3.5 Status of Marine Mammal Populations

Marine mammals not listed under the ESA that may be present in the GOA and BSAI include cetaceans, [minke whale (*Balaenoptera acutorostrata*), killer whale (*Orcinus orca*), Dall's porpoise *(Phocoenoides dalli*), harbor porpoise (*Phocoena phocoena*), Pacific white-sided dolphin (*Lagenorhynchus obliquidens*), and the beaked whales (e.g., *Berardius bairdii* and *Mesoplodon spp.*)] as well as pinnipeds [northern fur seals (*Callorhinus ursinus*), and Pacific harbor seals (*Phoca vitulina*)] and the sea otter (*Enhydra lutris*). The sea otter has been identified as a candidate for listing under the Endangered Species Act and the US Fish and Wildlife Service(USFWS) is conducting a formal review. For further information on marine mammal population status, see Section 3.4 of the draft PSEIS (NMFS 2001c).

3.6 Seabird Species Population Status

Seabirds by definition spend the majority of their life at sea rather than on land. Alaska's extensive estuaries and offshore waters provide breeding, feeding, and migrating habitat for approximately 100 million seabirds. Thirty-four species breed in the Bering Sea/Aleutian Islands (BSAI) and Gulf of Alaska (GOA) regions numbering 36 million and 12 million individuals in each respective area. Another 6 species breed at other locations in Alaska. In addition, up to 50 million shearwaters and 3 albatross species feed in Alaskan waters during the summer months but breed farther south. The current world population of short-tailed albatross is approximately 1200 individuals. Detailed seabird information on species population status, life history, ecology, and bycatch is contained in section 3.5 of the draft PSEIS (NMFS 2001c) and section 3.7 of the Steller sea lion SEIS (NMFS 2001b).

3.7 Status of Endangered or Threatened Species

The Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq*; ESA), provides for the conservation of endangered and threatened species of fish, wildlife, and plants. The program is administered jointly by the NMFS for most marine mammal species, marine and anadromous fish species, and marine plants species, and by the USFWS for bird species, and terrestrial and freshwater wildlife and plant species.

The designation of an ESA listed species is based on the biological health of that species. The status determination is either threatened or endangered. Threatened species are those likely to become endangered in the foreseeable future [16 U.S.C. § 1532(20)]. Endangered species are those in danger of becoming extinct throughout all or a significant portion of their range [16 U.S.C. § 1532(20)]. Species can be listed as endangered without first being listed as threatened. The Secretary of Commerce, acting through NMFS, is authorized to list marine fish, plants, and mammals (except for walrus and sea otter) and anadromous fish species. The Secretary of the Interior, acting through the USFWS, is authorized to list walrus and sea otter, seabirds, terrestrial plants and wildlife, and freshwater fish and plant species.

In addition to listing species under the ESA, the critical habitat of a newly listed species is designated concurrent with its listing to the "maximum extent prudent and determinable" [16 U.S.C.

§ 1533(b)(1)(A)]. The ESA defines critical habitat as those specific areas that are essential to the conservation of a listed species and that may be in need of special consideration. Federal agencies are prohibited from undertaking actions that destroy or adversely modify designated critical habitat. Some species, primarily the cetaceans, which were listed in 1969 under the Endangered Species Conservation Act and carried forward as endangered under the ESA, have not received critical habitat designations.

Federal agencies have an affirmative mandate to conserve listed species. One assurance of this is Federal actions, activities or authorizations (hereafter referred to as Federal action) must be in compliance with the provisions of the ESA. Section 7 of the ESA provides a mechanism for consultation by the Federal action agency with the appropriate expert agency (NMFS or USFWS). Informal consultations, resulting in letters of concurrence, are conducted for Federal actions that may affect but are not expected to adversely affect listed species or critical habitat. Formal consultations, resulting in biological opinions, are conducted for Federal actions that may have an adverse affect on the listed species. Through the biological opinion, a determination is made as to whether the proposed action is likely to jeopardize the continued existence of a listed species (jeopardy) or destroy or adversely modify critical habitat (adverse modification). If the determination is that the action proposed (or ongoing) will cause jeopardy, reasonable and prudent alternatives may be suggested which, if implemented, would modify the action to avoid the likelihood of jeopardy to the species or destruction or adverse modification of designated critical habitat. A biological opinion with the conclusion of no jeopardy may contain conservation recommendations intended to further reduce the negative impacts to the listed species. These conservation recommendations are advisory to the action agency [50 CFR. 402.25(j)]. If a likelihood exists of any taking[4] occurring during promulgation of the action, an incidental take statement may be appended to a biological opinion to provide for the amount of take that is expected to occur from normal promulgation of the action.

Twenty-three species occurring in the GOA and/or BSAI groundfish management areas are currently listed as endangered or threatened under the ESA (Table 3.4). The group includes great whales, pinnipeds, Pacific salmon and steelhead, and seabirds.

[4] The term "take" under the ESA means "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or attempt to engage in any such conduct" [16 U.S.C. § 1538(a)(1)(B)].

Table 3.4 **ESA listed and candidate species that range into the BSAI or GOA groundfish management areas and whether Reinitiation of Section 7 Consultation is occurring for the proposed action**

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Common Name	Scientific Name	ESA Status	Whether Reinitiation of ESA Consultation is occurring
Blue Whale	*Balaenoptera musculus*	Endangered	No
Bowhead Whale	*Balaena mysticetus*	Endangered	No
Fin Whale	*Balaenoptera physalus*	Endangered	No
Humpback Whale	*Megaptera novaeangliae*	Endangered	No
Right Whale	*Balaena glacialis*	Endangered	No
Sei Whale	*Balaenoptera borealis*	Endangered	No
Sperm Whale	*Physeter macrocephalus*	Endangered	No
Steller Sea Lion (Western population)	*Eumetopias jubatus*	Endangered	No
Steller Sea Lion (Eastern Population)	*Eumetopias jubatus*	Threatened	No
Chinook Salmon (Puget Sound)	*Oncorhynchus tshawytscha*	Threatened	No
Chinook Salmon (Lower Columbia R.)	*Oncorhynchus tshawytscha*	Threatened	No
Chinook Salmon (Upper Columbia R. Spring)	*Oncorhynchus tshawytscha*	Endangered	No
Chinook Salmon (Upper Willamette .)	*Oncorhynchus tshawytscha*	Threatened	No
Chinook Salmon (Snake River Spring/Summer)	*Oncorhynchus tshawytscha*	Threatened	No
Chinook Salmon (Snake River Fall)	*Oncorhynchus tshawytscha*	Threatened	No
Sockeye Salmon (Snake River)	*Oncorhynchus nerka*	Endangered	No
Steelhead (Upper Columbia River)	*Onchorynchus mykiss*	Endangered	No
Steelhead (Middle Columbia River)	*Onchorynchus mykiss*	Threatened	No
Steelhead (Lower Columbia River)	*Onchorynchus mykiss*	Threatened	No
Steelhead (Upper Willamette River)	*Onchorynchus mykiss*	Threatened	No
Steelhead (Snake River Basin)	*Onchorynchus mykiss*	Threatened	No
Steller's Eider [1]	*Polysticta stelleri*	Threatened	Ongoing
Short-tailed Albatross [1]	*Phoebaotria albatrus*	Endangered	Ongoing
Spectacled Eider[1]	*Somateria fishcheri*	Threatened	Ongoing
Northern Sea Otter[1]	*Enhydra lutris*	Candidate	No

[1]The Steller's eider, short-tailed albatross, spectacled eider, and Northern sea otter are species under the jurisdiction of the U.S. Fish and Wildlife Service. For the bird species, critical habitat has been proposed only for the Steller's eider (65 FR 13262). The northern sea otter has been proposed by USFWS as a candidate species (November 9, 2000; 65 FR 67343).

Of the species listed under the ESA and present in the action area (Table 3.4), some may be negatively affected by groundfish fishing. Steller sea lions are negatively affected by groundfish fisheries, but NMFS has implemented protection measures for the groundfish fisheries that avoid the likelihood of posing jeopardy or adverse modification of critical habitat for the western distinct population segment of Steller sea lions (NMFS 2001b, appendix A).

Section 7 consultations with respect to actions of the federal groundfish fisheries have been done for all the species listed in Table 3.1, either individually or in groups. See section 3.8 of the SEIS (NMFS 1998a), for summaries of section 7 consultations done prior to December 1998. An FMP-level biological opinion was prepared pursuant to Section 7 of the ESA on all NMFS listed species present in the fishery management areas for the entire groundfish fisheries program. This comprehensive biological opinion (BiOp) was issued November 30, 2000 (NMFS 2000). The Steller sea lion was the only species to be determined to be in jeopardy or risk of adverse modification of its habitat based upon the FMPs. Consultations prepared subsequent to the SEIS (NMFS 1998a) are summarized below.

Steller sea lions and other ESA listed marine mammals.

The only marine mammal identified as a concern with the implementation of the FMPs for the BSAI and GOA groundfish fisheries was the Steller sea lion. In compliance with the ESA, NMFS developed a reasonable and prudent alternative (RPA) for the BSAI and GOA groundfish fisheries to avoid jeopardy to endangered Steller sea lions and adverse modification of their critical habitat. The RPA is based on the following three main principles: (1) temporal dispersion of fishing effort, (2) spatial dispersion of fishing effort, and (3) sufficient protection from fisheries competition for prey in waters adjacent to rookeries and important haulouts. The RPA focused on three fisheries that posed the most concern for competition with Steller sea lions for prey; the BSAI and GOA pollock and Pacific cod fisheries, and the BSAI Atka mackerel fishery. Neither the conclusions of the comprehensive BiOp (NMFS 2000) nor the RPA was adopted by the Council at its December 2000 meeting for numerous reasons, including lack of confidence in the scientific premises supporting the biological opinion, lack of public and Council input during its development, and general disagreement about the efficacy of the RPA measures. Subsequently, the Alaska congressional delegation sponsored a rider to the 2001 appropriations bill (Section 209 of Pub. L. 106-554) that provided direction for a one-year phase-in of the RPA and opportunity for the Council to assess and potentially modify the RPA prior to full implementation in 2002 based on independent scientific reviews or other new information.

The protection measures in the emergency rule (66 FR 7276, January 22, 2001) reflect the first year implementation phase of the RPA. In January 2001, the Council established an RPA Committee to make recommendations on Steller sea lion protection measures for the second half of 2001 and to develop Steller sea lion protection measures for 2002 and beyond. The RPA Committee was composed of 21 members from the fishing community, the environmental community, NMFS, the Council's Science and Statistical Committee, the Council's Advisory Panel, and ADF&G. In April 2001, the RPA Committee presented its recommendations to the Council for fishery management measures for the second half of 2001. These recommendations were then forwarded by the Council to NMFS and were implemented by amendment to an emergency interim rule (66 FR 37167, July 17, 2001). In June 2001, the RPA Committee recommended Steller sea lion protection measures for 2002 and beyond, and the Council modified and forwarded these recommendations to NMFS in October 2001. ESA consultation was requested on these protection measures and a biological opinion (2001 BiOp) was prepared by the Protected Resources Division (NMFS 2001b, Appendix A). The final 2001 BiOp concluded that the proposed Steller sea lion protection measures were not likely to jeopardize the continued existence of either the eastern or western distinct population segment of Steller sea lions or adversely modify their critical habitat. These protection measures are implemented by emergency interim rule in 2002 (67 FR 956, January 8, 2002) and are scheduled for permanent rulemaking for 2003 and beyond. Detailed analysis of the Steller sea lion protection measures is contained in the SEIS for Steller sea lion protection measures (NMFS 2001b).

ESA Listed Pacific Salmon

When the first Section 7 consultations for ESA listed Pacific salmon taken by the groundfish fisheries were done in 1994 and 1995 only three evolutionary significant units (ESUs) of Pacific salmon were listed that ranged into the fishery management areas (NMFS 1994, 1995). Additional ESUs of Pacific salmon and steelhead were listed under the ESA in 1998 and 1999 (NMFS 1999). Only the Snake River fall chinook salmon has designated critical habitat and none of that designated habitat is marine habitat. Under Section 7 regulations, consultation should be reinitiated in the event of additional listings. Using the year 2000 proposed TAC specifications, NMFS reinitiated consultations for ESA listed Pacific salmon for all twelve ESUs of Pacific salmon that are thought to range into Alaskan waters. The consultation for the Pacific salmon species was issued December 22, 1999, and contained a determination of not likely to jeopardize their continued existence. No critical habitat has been designated for these species within the action area, therefore, none will be affected by the proposed fisheries. The biological opinion reviewed the status of Snake river fall chinook, Snake River spring/summer chinook, Puget Sound chinook, Upper Columbia river spring chinook, Upper Willamette River chinook, Lower Columbia river chinook, Upper Columbia river steelhead, Upper Willamette River steelhead, Middle Columbia river steelhead, Lower Columbia river steelhead, and Snake river Basin steelhead, the environmental baseline for the action area, the effects of the proposed fishery and the cumulative effects. The opinion was accompanied by an Incidental Take Statement that states the catch of listed fish will be limited specifically by the measures proposed to limit the total bycatch of chinook salmon. Bycatch should be minimized to the extent possible and in any case should not exceed 55,00 chinook per year in the BSAI fisheries or 40,000 chinook salmon per year in the GOA fisheries.

For the year 2002 harvest specifications, the December 23, 1999 biological opinion on the effects of the 2000 BSAI and GOA groundfish fisheries harvest specifications on listed salmon was extended till January 1, 2003. The comprehensive BiOp (NMFS 2000) stated that ESA listed Pacific salmon are not in jeopardy or risk of adverse modification of their habitat by the groundfish fisheries in the BSAI or GOA.

ESA Listed Seabirds

The only new information on seabirds since publication of the SEIS (NMFS 1998a) concerns the taking of short-tailed albatross and subsequent Section 7 consultations on listed seabird species. It is summarized below:

On 22 October 1998, NMFS reported the incidental take of 2 endangered short-tailed albatrosses in the hook-and-line groundfish fishery of the BSAI. The first bird was taken on 21 September 1998, at 57 30'N, 173 57'W. The bird had identifying leg bands from its natal breeding colony in Japan. It was 8 years old. In a separate incident, one short-tailed albatross was observed taken on 28 September 1998, at 58 27'N, 175 16'W, but the specimen was not retained for further analysis. Identification of the bird was confirmed by USFWS seabird experts. The confirmation was based upon the observer's description of key characteristics that matched that of a subadult short-tailed albatross to the exclusion of all other species. A second albatross was also taken on 28 September 1998, but the species could not be confirmed (3 species of albatross occur in the North Pacific). Both vessels were using seabird avoidance measures when the birds were hooked.

The USFWS listed the short-tailed albatross as an endangered species under the ESA throughout its United States range (65 FR 46644, July 31, 2000). Under terms of the 1999 biological opinion, incidental take statement, a take of up to 4 birds is allowed during the 2-year period of 1999 and 2000 for the BSAI and GOA hook-and-line groundfish fisheries (USFWS 1999). If the anticipated level of incidental take is exceeded, NMFS must reinitiate formal consultation with the USFWS to review the need for possible modification of the reasonable and prudent measures established to minimize the impacts of the incidental take.

NMFS Regional Office, NMFS Groundfish Observer Program, and the USFWS Offices of Ecological Services and Migratory Bird Management are actively coordinating efforts and communicating with each other in response to the 1998 take incidents and are complying to the fullest extent with ESA requirements to protect this species. Regulations at 50 CFR § § 679.24(e) and 679.42(b)(2) contain specifics regarding seabird avoidance measures. In February 1999, NMFS presented an analysis on seabird mitigation measures to the Council that investigated possible revisions to the currently required seabird avoidance methods that could be employed by the long-line fleet to further reduce the take of seabirds.

The Council took final action at its April 1999 meeting to revise the existing requirements for seabird avoidance measures. The Council's preferred alternative would: 1) explicitly specify that weights must be added to the groundline (Currently, the requirement is that baited hooks must sink as soon as they enter the water. It is assumed that fishermen are weighting the groundlines to achieve this performance standard.); 2) the offal discharge regulation would be amended by requiring that prior to any offal discharge, embedded hooks must be removed; 3) streamer lines, towed buoy bags and float devices could both qualify as bird scaring lines (Specific instructions are provided for proper placement and deployment of bird scaring lines.); 4) towed boards and sticks would no longer qualify as seabird avoidance measures; 5) the use of bird scaring lines would be required in conjunction to using a lining tube; and 6) night-setting would continue to be an option and would not require the concurrent use of a bird scaring line. These revised seabird avoidance measures are expected to be in effect in 2002. The avoidance measures affect the method of harvest in the hook-and-line fisheries, but are not intended to affect the amount of harvest.

A Biological Opinion on the BSAI hook-and-line groundfish fishery and the BSAI trawl groundfish fishery for the ESA listed short-tailed albatross was issued March 19, 1999, by the USFWS for the years 1999 through 2000 (USFWS 1999). The conclusion continued a no jeopardy determination and the incidental take statement expressing the requirement to immediately reinitiate consultations if incidental takes exceed four short-tailed albatross over two years' time. Consultations on short-tailed albatross was not re-initiated for the year 2000 TAC specifications because the March 19, 1999, biological opinion covered through the end of calendar year 2000. In September 2000, NMFS requested re-initiation of consultation for all listed species under the jurisdiction of the USFWS, including the short-tailed albatross, spectacled eider and Steller's eider for the BSAI and GOA FMPs and 2001-2004 TAC specifications. Based upon NMFS' review of the fishery action and the consultation material provided to USFWS, NMFS concluded that the BSAI and

GOA groundfish fisheries are not likely to adversely affect either the spectacled eider or the Steller's eider or destroy or adversely modify the critical habitat that has been proposed for each of these species.

3.8 Ecosystem Considerations

Ecosystem considerations for the BSAI and GOA groundfish fisheries are explained in detail in *Ecosystem Considerations for 2002* (NMFS 2001a). That document provides updated information on biodiversity, essential fish habitats, consumptive and non-consumptive sustainable yields, and human considerations. This information is intended to be used in making ecosystem-based management decisions such as establishing ABC and TAC levels.

3.9 The Human Environment

The operation of the groundfish fishery in the Bering Sea/Aleutian Islands and the Gulf of Alaska is described by gear type in the SEIS (NMFS, 1998a) and in the draft PSEIS (NMFS 2001c). General background on the fisheries with regard to each species is given in the BSAI and GOA groundfish FMPs (NPFMC 1999a and 1999b). The following fishery sectors are most likely to be affected by a change in the annual harvest specification process: pollock (GOA and BSAI), Pacific cod fishery, Atka mackerel fishery, and the rock sole roe fishery. These fisheries are predominantly high volume fisheries (or high value fisheries) that are prosecuted early in the calendar year and could be affected by beginning the fishery midyear, as proposed in Alternative 3. Environmental impacts resulting from the specified TACs would be assessed in annual EAs that accompany the final harvest specifications.

3.9.1 Fishery Participants

For detailed information on the fishery participants including vessels and processors see sections 5.3 and 5.4 of this EA/RIR/IRFA. Revising the process by which annual harvest specifications are set may result in impacts on all fishery participants but would particularly affect those who concentrate effort early in the calendar year, depending on which alternative is selected. Section 5.0 outlines the economic impacts of each alternative on fishery participants. Additional information regarding fishery participants can be found in the 2000 Economic SAFE report (Hiatt and Terry, 2001).

3.9.2 Economic Aspects of the Fishery

The most recent description of the economic aspects of the groundfish fishery is contained in the 2000 Economic SAFE report (Hiatt and Terry, 2001). This report, incorporated herein by reference, presents the economic status of groundfish fisheries off Alaska in terms of economic activity and outputs using estimates of catch, bycatch, ex-vessel prices and value, the size and level of activity of the groundfish fleet, the weight and value of processed products, wholesale prices, exports, and cold storage holdings. The catch, fleet size and activity data are for the fishing industry activities that are reflected in Weekly Production Reports, Observer Reports, fish tickets from processors who file Weekly Production Reports, and the annual survey of groundfish processors. External factors that, in part, determine the economic status of the fisheries are foreign exchange rates, the prices and price indices of products that compete with products from these fisheries, and fishery imports. Sections 5.0 and 6.0 of this document contain additional information regarding the economics of the groundfish fisheries.

4.0 ENVIRONMENTAL IMPACTS OF THE ALTERNATIVES

The environmental impacts generally associated with fishery management actions are effects resulting from (1) harvest of fish stocks which may result in changes in food availability to predators and scavengers, changes in the population structure of target fish stocks, and changes in the marine ecosystem community structure; (2) changes in the physical and biological structure of the marine environment as a result of fishing practices, e.g., effects of gear use and fish processing discards; and (3) entanglement/entrapment of non-target organisms in active or inactive fishing gear. A recent summary of the effects of the impacts associated with groundfish harvest on the biological environment are discussed in the final EA for the 2002 annual groundfish harvest specifications (NMFS 2001a). The SEIS (NMFS 1998a) and draft PSEIS (NMFS 2001c) analyzes the impacts of fishing over a range of TAC specifications.

This section analyzes alternative administrative procedures associated with implementing the harvest specifications.[5] An analysis of possible impacts from each alternative follow. Any environmental impacts of the actual TAC levels set using these administrative procedures would be determined each year when the EA is prepared for the annual harvest specifications for the groundfish fishery. Revising the annual harvest specification process will not affect NEPA compliance procedures. A draft EA on proposed harvest specifications would still be developed and made available for public review and comment. A final EA would be prepared annually prior to the approval of the final harvest specifications. The analyses would consider any change in fishing patterns or levels and the resulting impacts.

4.1 Impacts on Groundfish Species

Two types of analyses were done to compare the alternatives, retrospective evaluation and simulation modeling. Alternative 1 was used as status quo for purposes of comparing the effects of Alternatives 2 and 4. Alternative 3 was not separately analyzed because it was expected to have an effect between effects from Alternatives 1 and 2 because the time delay for using survey data is between the time delays in Alternatives 1 and 2. Alternatives 2 and 4 involve projecting ABC amounts one or two years into the future compared to Alternatives 1 and 3.

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[5] An additional discussion of these analyses may be found in Section 5.10.

4.1.1 Retrospective evaluation

One simple approach to evaluating Alternative 2 was developed whereby assessment authors extracted ABC which was used as a proxy for TAC recommendations, as projected one year further than usual (e.g., an assessment presented at the December 2000 Council meeting would give 2001 recommendations as usual, and also 2002 projected recommendations). These values were compiled for four key stocks: Eastern Bering Sea (EBS) pollock, EBS/AI Pacific cod, Aleutian Island Atka mackerel, and GOA pollock, and compared with the status quo Alternative 1. The species selected reflect the true variability in assessment/ABC/TAC setting processes due to changes in stock assessment approaches and changes in management considerations. Except for EBS pollock, these species were also chosen because their ABCs were close to the TAC values. When EBS pollock has a high ABC, its TAC is usually restricted by the 2 million OY cap. Mean catch and catch variability (expressed as coefficients of variability) were computed for Alternatives 1 and 2. Additionally, the annual average change in catch ($\overline{\Delta}$) was computed as:

$$\overline{\Delta} = \sum_{t=1}^{n-1} \frac{\left|C_t - C_{t+1}\right|}{C_t} (n-1)^{-1}.$$

This is a simple measure of how much year-to-year catch variability one can expect expressed as a percentage of the current year's catch. The impact of the BSAI 2 million mt OY was not considered in the analysis.

4.1.2 Simulation model

A second approach for evaluating the alternatives was developed using simulations. The purpose of the simulation study was to evaluate general patterns and trends for these alternatives. The current assessment information (compiled in 2001) was used to form the starting point for the simulations.

An extension of the single-species numerical simulation model (NMFS 2001c) used for all age-structured groundfish stocks was developed to evaluate Alternatives 2 and 4 relative to Alternative 1. Under Alternatives 2 and 4, the projected ABC estimates were those as computed from previous years. For example, under Alternative 2 in year *t,* the procedure was as follows:

1) Compute the fishing mortality associated with the ABC as computed in year *t-2*
2) Project abundance to year *t+1* and compute the fishing mortality associated with the ABC as computed in year *t-1;*
3) Project the population from *t+1* to year *t+2* assuming fishing mortality estimated from 2);
4) Compute the ABC value for year *t+2* using Amendment 56 harvest control rules. This ABC value is later used as the actual catch, e.g., as in steps 1) and 2).

Under Alternative 4, the procedure is the same but extended to reflect the increase in time horizon. Therefore the last two steps are :

4) Project the population from *t+2* to year *t+3* assuming fishing mortality estimated from 3);
5) Compute the ABC value for year *t+3* using Amendment 56 harvest control rules. This ABC value is later used as the actual catch, e.g., as in steps 1) and 2).

For Alternative 1, the ABC values were computed using the current procedures as outlined under Amendment 56.

For each species considered, a single time series simulation was conducted for 1,000 years. Because the primary interest in this analysis was a characterization of the different lag-times between the assessment and quota specifications, the alternatives were simulated for single long-time horizon (1,000) projections to minimize the impact of the phase-in period. For a given species, each alternative was simulated using the same random recruitment sequence.

In interpreting these results, the following factors need to be recognized:

1) These simulations fail to capture the effect of management interactions with other regulations and general bycatch issues.

2) The simulations begin with the assumption that we know precisely the current state of the populations considered.

3) The simulations do not reflect future (unknown) assessment estimation problems.

4) These simulations fail to anticipate the action that may be taken by the Council in establishing TAC in relation to ABC, which may reduce adverse effects. The Council has a history of recommending more conservative ABC and TAC levels as uncertainty increases. The actual catches are likely to be less than ABC shown.

5) The BSAI 2 million mt OY constraint was not used in this analysis.

6) For pollock, Pacific cod and Atka mackerel, the Steller sea lion protection measure harvest control rule was not accounted for in the model.

Diagnostics for evaluating the simulation results include: catches (assuming the full ABC recommendations would be harvested), full-selection fishing mortality rates, spawning biomass (females only unless otherwise indicated), annual average change in catch, the average age of the population, the frequency (similar to probability) that the catch will exceed the long-term expected $F_{40\%}$ catch level, the frequency that the spawning biomass will be above the B_{msy} level (assuming $B_{35\%}$ as a proxy), and the frequency that the fishing mortality rate exceeds the F_{OFL} level (as defined in Amendment 56). The first three results are presented as means with coefficients of variation. The others are presented as relative probability of population responses under the different alternatives. The frequency that the fishing mortality rate exceeds the F_{OFL} is presented as a relative indication only.

The simulation model predictions are based on future projections. Ideally, they would be validated using historical inputs for example, inputting known historical starting age structure and recruitment and then comparing simulation results with actual historical values of ABC.

A comparison of the mean levels of ABC generated by the simulation models with historical Plan Team ABCs suggests that, at least for pollock, the model predicts levels of ABC that are higher than those achieved historically. For EBS pollock, the average Plan Team ABC from 1991 to 2002 was 1.39 million metric tons. The Alternative 1 ABC, reflecting a similar TAC setting process, produced TAC estimates of about 1.5 million metric tons. The simulations for Alternatives 2 and 4, admittedly using a different TAC setting process, produced average ABCs of about 1.47 and 1.45 million metric tons. (Figure 4.1) Similarly, in the GOA pollock fishery, the average Plan Team ABC from 1991 to 2002 was about 105,000 metric tons. The simulation for Alternative 1 produced an average ABC of 162,000 metric tons. The simulations for Alternatives 2 and 4 produced estimates of about 145,000 and 136,000 metric tons. (Figure 4.2) These results suggest that the simulation results may be more useful as indicators of the direction of change from one alternative to another than of the absolute levels of ABC and harvest under an alternative.

Figure 4.1 **EBS pollock TAC and ABC, 1980 to 2002, compared to mean Alternative 1, 2, and 4 ABC projections from the simulation model**

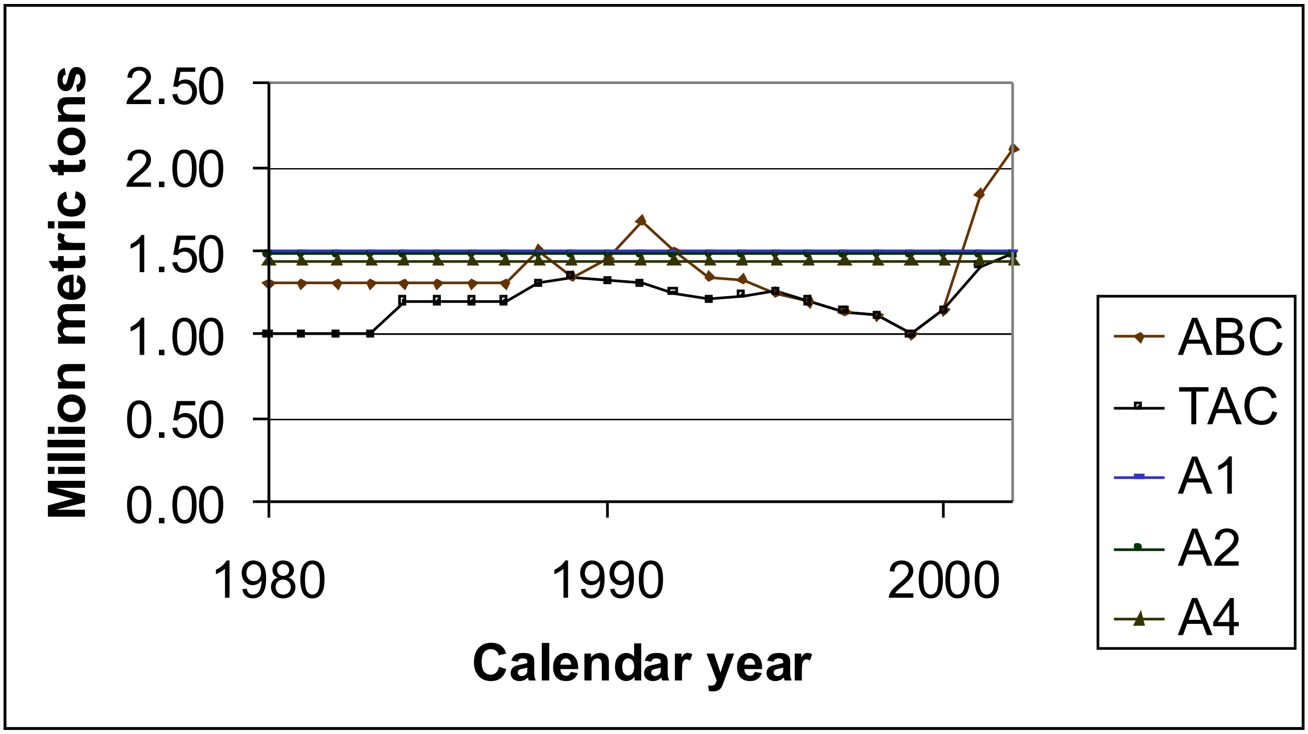
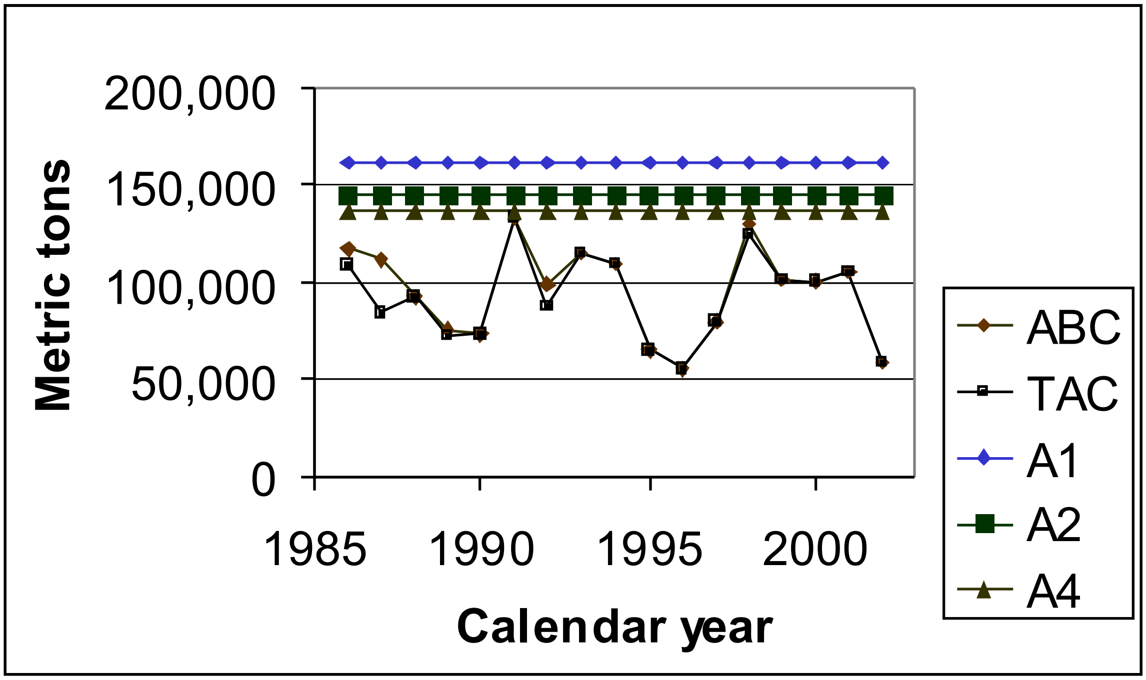


Figure 4.2 **EBS pollock TAC and ABC, 1980 to 2002, compared to mean Alternative 1, 2, and 4 ABC projections from the simulation model**



4.1.3 Results and Discussion

For the retrospective analysis, it was not always possible to obtain an ABC recommendation under Alternative 2 in exactly the same way as under Alternative 1. In some years the ABC recommendation was revised (e.g., by the SSC) for the coming year but not the subsequent year, as would be required under Alternative 2. For example, in one projection for EBS pollock the Alternative 2 ABC was 1.54 million tons whereas for Alternative 1 it was 1.13 million tons. In some years for some stocks, it was not possible to project the Council recommendations explicitly and only the projected ABC levels were possible. In these cases, it may have been possible to exceed the 2-million ton cap for the BSAI, consequently, the realized hypothetical catches would have been lower.

With these caveats in mind, the results are presented in Figure 4.3 and Table 4.1-1. For the four stocks where retrospective examinations were possible, the pattern of recommended catch levels are quite similar under the two alternatives but with a regular lag. Under Alternative 2, the declines and increases often follow similar trends found in Alternative 1, but one year later. The variability of catch is greater for two out of the four stocks under Alternative 2, while the average annual change in catch is greater for all four stocks.

Similar patterns were observed for the simulation model results. The variability in catch generally increases under Alternatives 2 and 4 relative to Alternative 1 (Figs. 4.4-4.9; Table 4.1-2). The Gulf of Alaska pollock, BSIA Pacific cod (although only slightly), and Atka mackerel catch simulations under Alternative 4 were less variable than under Alternative 2. This was presumably due in part to the fact that, unlike the other stocks, these stocks are modeled with a steeply declining selectivity at the oldest ages.

Among the different stocks, the simulations revealed that the inherent life-history characteristics are an important factor in how stocks respond under different alternatives. Pollock, Pacific cod and Atka mackerel live to a maximum of approximately 20 years while Pacific Ocean perch may live to 90 years. All 4 of the relatively fast-growing, high natural mortality species (EBS and GOA pollock, Pacific cod, and Atka mackerel) were quite sensitive to Alternatives 2 and 4 while the effect on BSAI Pacific ocean perch was minimal. Sablefish was intermediate between these categories. While all stocks considered exhibit considerable recruitment variability, the impact of this variability on the exploitable stock is much more gradual for the longer-lived species. The average catch (and fishing mortality) is predicted to decrease under Alternatives 2 and 4, even though the probability of exceeding the OFL increases. This may seem contradictory. However, this characteristic is due to the effect of lagging information on the year class variability. I.e. having to substitute average values of recruitment instead of using available information on whether recruitment is going to be above or below average. The average biomass is also expected to increase under Alternatives 2 and 4; presumably this would be a benefit to predators. However, the model-predicted increase in population variability may impact on the predators. The magnitude of these potential impacts are unknown.

Under Alternative 1 (status quo), there is always uncertainty in stock status from which ABC and OFL recommendations are derived. The harvest control rules under Amendment 56 allow for a modest amount of error in the measurement of stock size without resulting in estimated ABC exceeding true OFL (assuming F_{msy} is estimated correctly = F). It is possible to unknowingly exceed the "true" OFL with Alternative 1 ABC recommendations. If OFL was exceeded on a long-term basis, the average stock sizes would be expected to be below B_{msy}. Such overfishing would have to be very drastic (i.e., much greater than our current OFL definitions) to result in stock sizes that would be unsustainable.

In general, it is difficult, if not impossible, to model the full process of setting TACs under these alternatives. The retrospective analysis approach taken here was to examine historical patterns in ABC recommendations under the Alternative 1 and (quasi) Alternative 2 scenarios. This approach reflects to some degree the full Council process but is limited in the number of applicable stocks and our ability to assess long-term expectations. For a more extensive analyses of how the population dynamics of the stocks would be affected, a simple simulation scenario was constructed which allowed comparison of more stocks and also Alternative 4. Under Alternatives 2 and 4, the variability in catch was expected to increase and the potential to exceed overfishing (as currently assessed) was expected to increase. In practice, these effects are likely to moderated somewhat by the Council and NMFS' tendency to recommend TACs that are less variable than ABC recommendations. Overall, it is likely that the TACs established under Alternative 2 or 4 will be less than the TACs under Alternative 1 as the Council and NMFS set TACs conservatively. Added variability with Alternatives 2 and 4 would likely be small in comparison to the natural environmental variability these fish populations already experience. It is unknown what significance this variability may have on prey abundance and if there may be any potential stress on ESA listed species.

The above analyses capture the effect of ABC specifications from the full Council-NMFS TAC setting process (i.e., in the empirical retrospective analysis) and the effect of how different stocks may behave under the different alternatives (i.e., in the simulation analyses). Another aspect remains where the *estimation* efficiency actually will change under the alternatives. That is, under the current Alternative 1 regime, the most recent survey data are used to forecast populations into the next year for setting quotas. These forecasts have a relatively high level of uncertainty about them. Under Alternatives 2 and 4 where the forecasts are further into the future, it is reasonable to expect that this uncertainty will increase. To illustrate this a stock assessment model was selected where the assessment uncertainty (which includes both measurement and, to some extent, process error information) is readily available for future years. The uncertainty (expressed as coefficient of variation) in forecasted EBS pollock spawning biomass based on different (constant) fishing mortality rates are as follows (based on model results from Ianelli et al. 2001):

Year	CV of spawning biomass with $F_{40\%}$	CV of spawning biomass with F_{msy}
2001	39%	39%
2002	43%	46%
2003	48%	81%
2004	59%	90%
2005	74%	93%
2006	82%	100%

This table shows how the uncertainty increases as the time to forecast increases. The difference between the results under the F_{MSY} and $F_{40\%}$ (constant) harvest rate scenarios is due in part because the F_{msy} is estimated with greater uncertainty than the $F_{40\%}$ (note that 2001 catch is pre-specified) and because the F_{msy} harvest rate is somewhat higher (resulting in a lower spawning biomass and hence higher CV). The impact that this would have in a practical, implementation sense would tend towards somewhat lower (on average) absolute catch recommendations. This is because under Amendment 56, fishing specified by an F_{msy} rate requires a "reliable" estimate of the uncertainty in order to compute the harmonic-mean value. Given that the harmonic mean value decreases as the uncertainty increases, the harvest rates projected further into the future are likely to be lower, reducing the frequency of exceeding the OFL.

An evaluation of the impact of Alternative 3 was not amenable to either the retrospective nor the simulation analyses. From a calendar year perspective, the *annual* catch levels would be specified to be the same as under Alternative 1. However, the timing of quota changes occurs from (effectively) December 31st - Jan 1st (under Alternative 1) to June 30th - July 1st (as under Alternative 3). The current assessments are based on calendar years and can retain the same data and model conventions. The computer code that performs standard projections for ABC recommendations will have to be modified slightly to provide projected values that reflect the quota-year (July-June). Note that this modification would also provide calendar-year catch values that may be useful for planning purposes. From a quota-year perspective, the 12-month catches (spanning July-June) will be slightly more variable than Alternative 1 and less variable than Alternative 2. Theoretically, this variability would fall half-way between Alternative 1 and 2 (as would the other variables of interest, e.g., biomass, catch, F etc.).

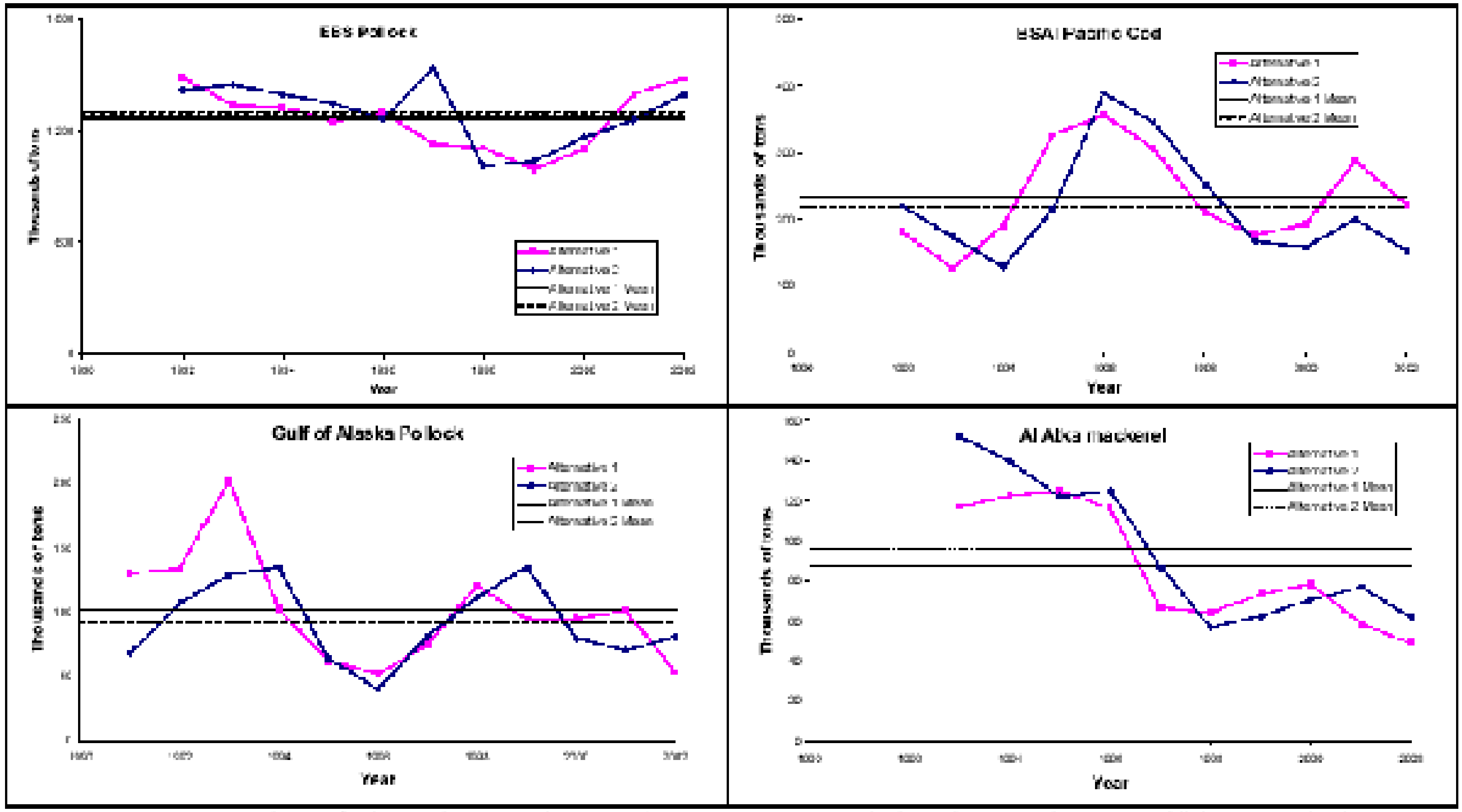


Figure 4.3 Comparison of Alternatives 1 and 2 TAC (or ABC) recommendations for some key groundfish species in the North Pacific. Alternative 2 values were derived from historical stock assessment projections as done historically.

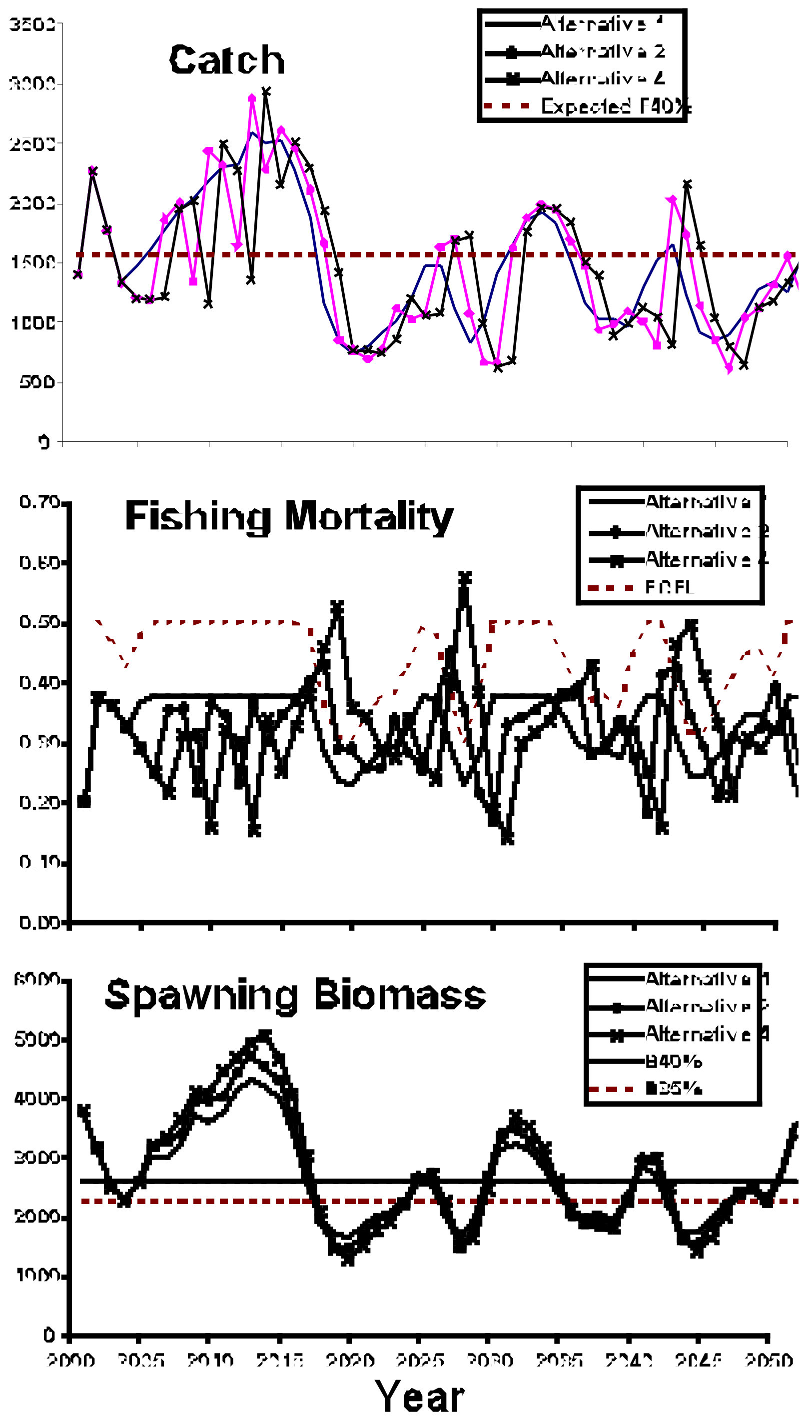


Figure 4.4 Simulated Eastern Bering Sea pollock trajectory showing the first 50 year of catches (top), fishing mortality rates (middle) and spawning biomass under different alternatives relative to some reference points. Catch and biomass are in thousands of metric tons.

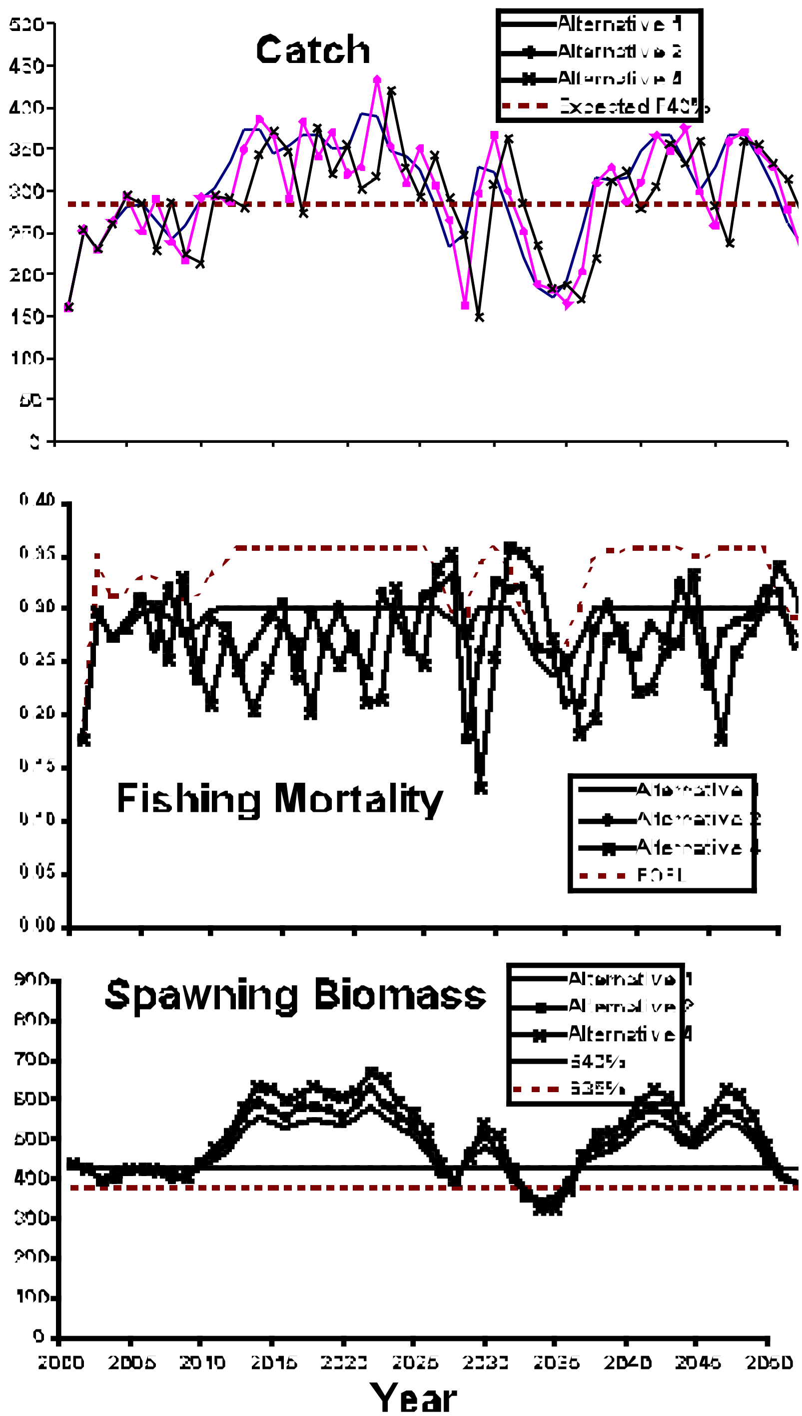


Figure 4.5 Simulated Aleutian Islands/Eastern Bering Sea Pacific cod trajectory showing the first 50 years of catches (top), fishing mortality rates (middle) and spawning biomass under different alternatives relative to some reference points. Catch and biomass are in thousands of metric tons.

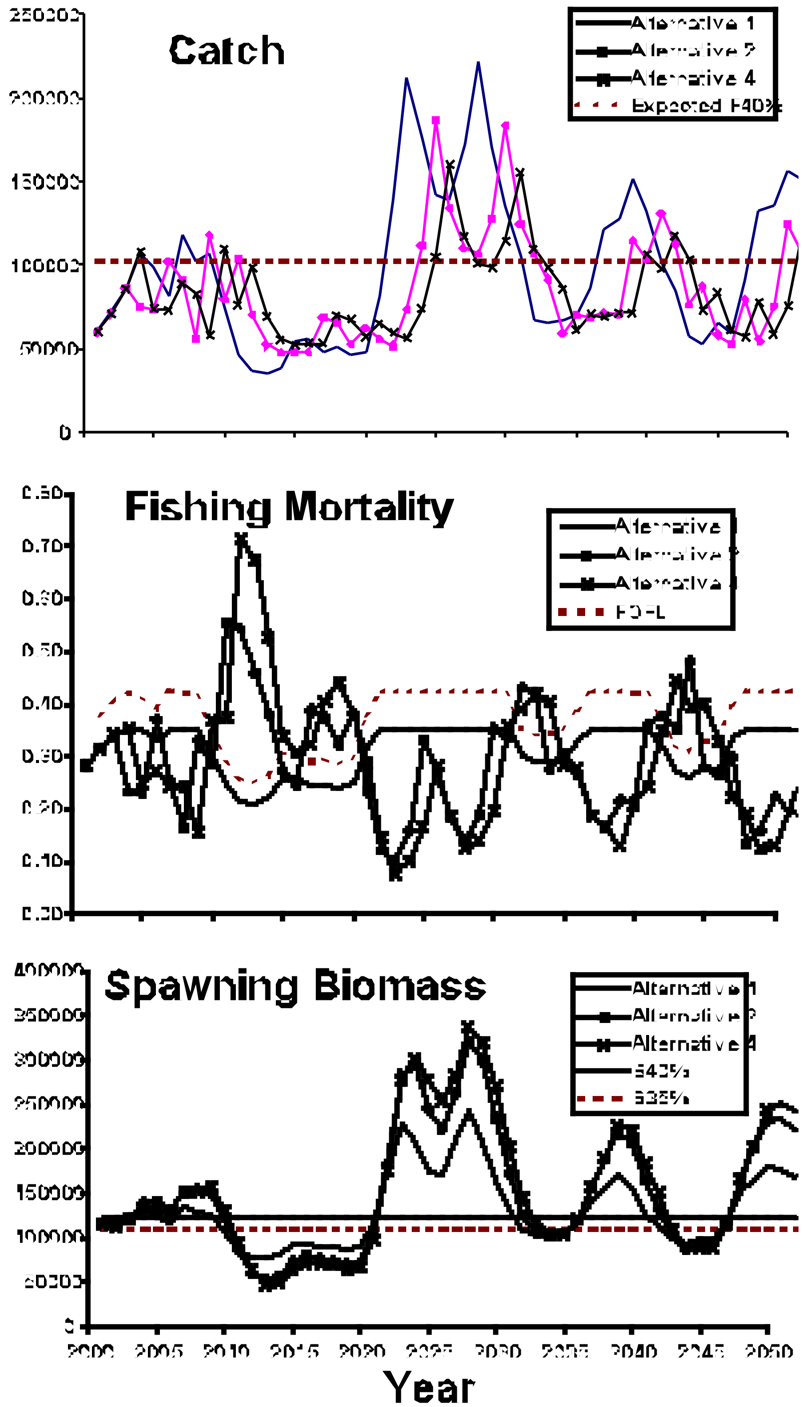


Figure 4.6 Simulated Aleutian Islands atka mackerel trajectory showing the first 50 years of catches (top), fishing mortality rates (middle) and spawning biomass under different alternatives relative to some reference points. Catch and biomass are in metric tons.

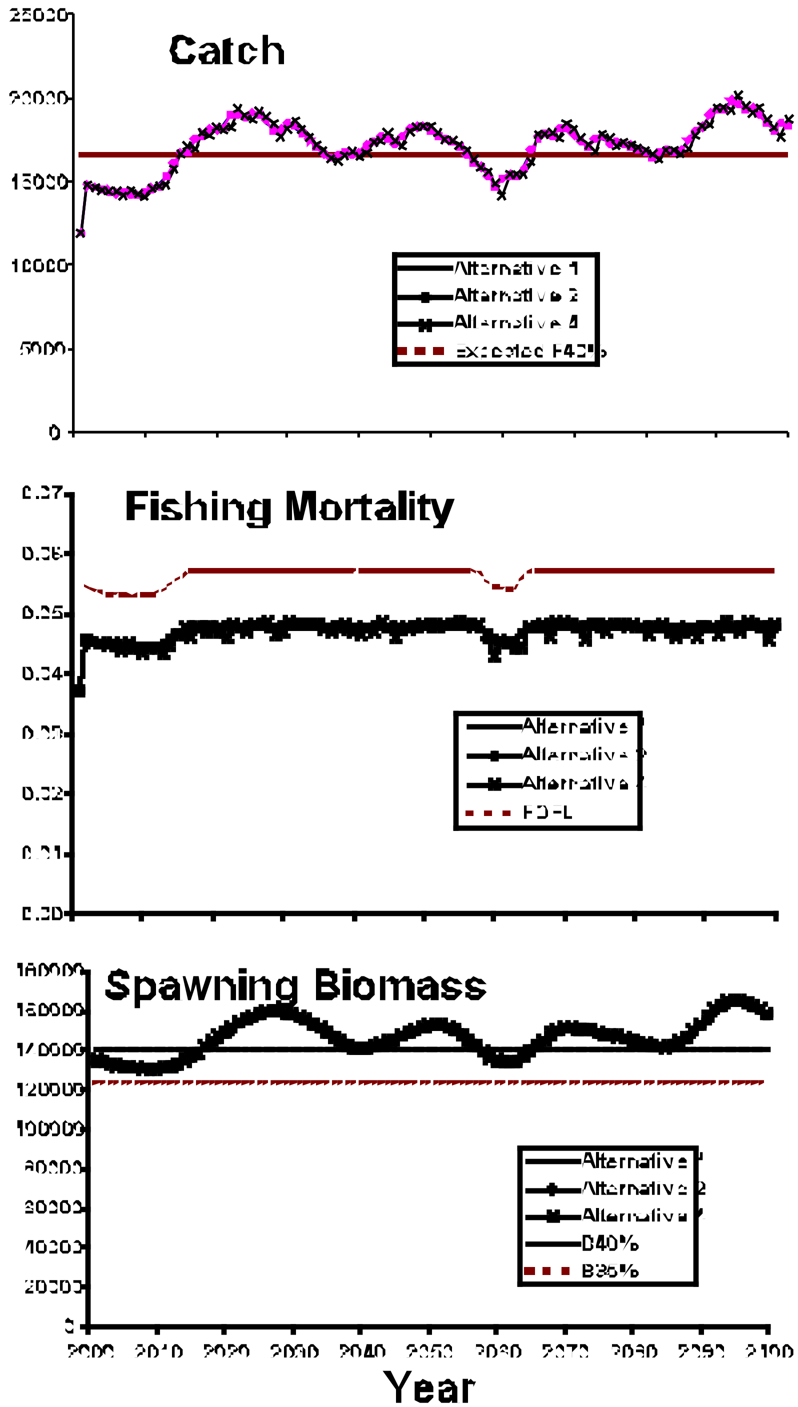


Figure 4.7 Simulated Aleutian Islands/Eastern Bering Sea Pacific ocean perch trajectory showing the first 100 years of catches (top), fishing mortality rates (middle) and spawning biomass under different alternatives relative to some reference points. Catch and biomass are in metric tons.

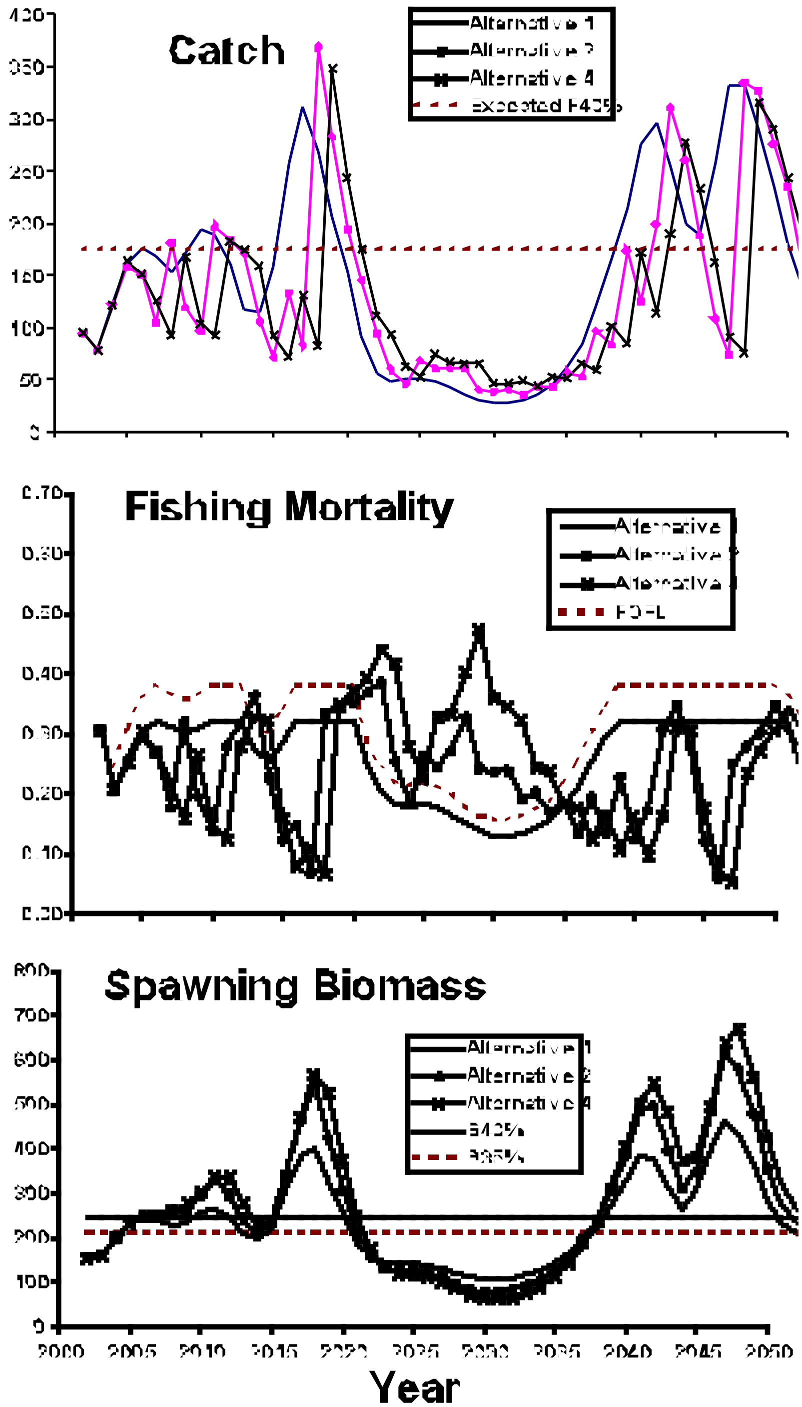


Figure 4.8 Simulated Gulf of Alaska pollock trajectory showing the first 50 years of catches (top), fishing mortality rates (middle) and spawning biomass under different alternatives relative to some reference points. Catch and biomass are in thousands of metric tons.

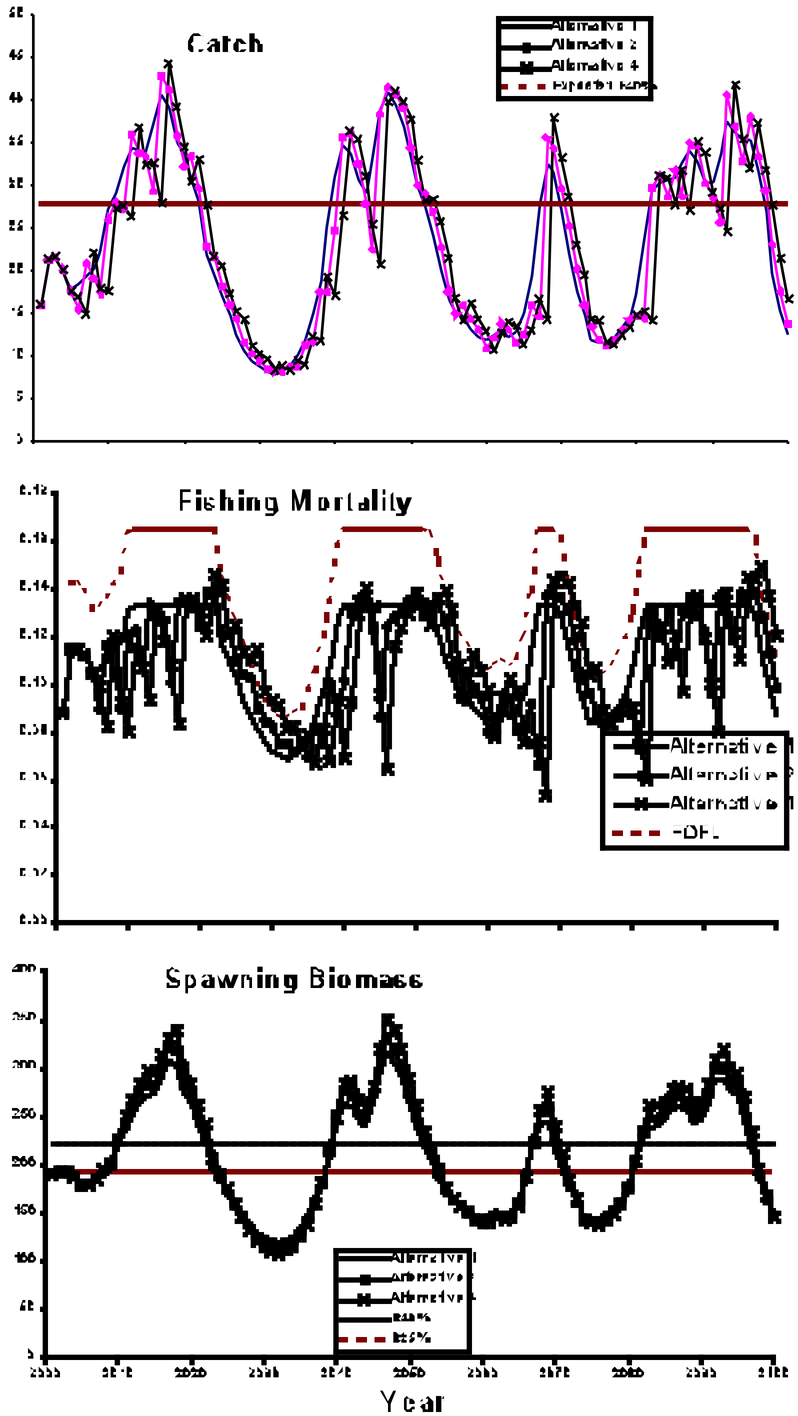


Figure 4.9 Simulated sablefish trajectory showing the first 100 years of catches (top), fishing mortality rates (middle) and spawning biomass under different alternatives relative to some reference points. Catch and biomass are in thousands of metric tons, spawning biomass includes males and females.

Table 4.1-1 Results from retrospective examination of past SAFE documents comparing alternatives 1 and 2. Coefficients of variation are shown in parentheses. Catch (=ABC recommendation) units are in thousands of tons.

	Alternative 1	**Alternative 2**
EBS Pollock		
Mean catch	1,299	1,266
	(15%)	(13%)
Avg. annual catch change	9%	10%
BSAI PCOD		
Mean catch	219	235
	(30%)	(37%)
Avg. annual catch change	29%	32%
Aleutian Islands Atka mackerel		
Mean catch	95	87
	(34%)	(37%)
Avg. annual catch change	14%	16%
GOA Pollock		
Mean catch	92	102
	(41%)	(34%)
Avg. annual catch change	31%	35%

Table 4.1-2 Results from 1,000-year simulations comparing Alternatives 1, 2, and 4. Coefficients of variation are shown in parentheses. Catch and biomass units are in thousands of tons.

EBS Pollock	**Alternative 1**	**Alternative 2**	**Alternative 4**
Mean Catch	1,498	1,474	1,448
	(32.8%)	(38.4%)	(39.0%)
Mean spawning biomass	2,643	2,717	2,784
	(27.4%)	(32.2%)	(35.5%)
Mean fishing mortality	0.337	0.322	0.320
	(14.1%)	(19.7%)	(27.9%)
Avg. annual catch change	13%	29%	32%
Avg. age (equil. F40%=2.27)	2.41	2.42	2.44
Freq catch > F40% catch	41.5%	39.9%	36.8%
Freq spawning biomass > B35%	64.4%	64.6%	65.4%
Freq F > FOFL	0.0%	9.1%	20.5%

BSAI Pacific cod	**Alternative 1**	**Alternative 2**	**Alternative 4**
Mean Catch	278	274	269
	(24.6%)	(26.8%)	(25.8%)
Mean spawning biomass	442	454	469
	(16.7%)	(20.2%)	(24.3%)
Mean fishing mortality	0.283	0.275	0.269
	(8.1%)	(14.2%)	(21.1%)
Avg. annual catch change	10%	19%	21%
Avg. age (equil. F40%=2.61)	2.68	2.69	2.71
Freq catch > F40% catch	45.4%	44.2%	40.6%
Freq spawning biomass > B35%	82.0%	79.7%	78.6%
Freq F > FOFL	0.0%	3.3%	14.9%

Aleutian Islands atka mackerel	**Alternative 1**	**Alternative 2**	**Alternative 4**
Mean Catch	98	88	84
	(41.3%)	(35.4%)	(28.8%)
Mean spawning biomass	128	146	153
	(27.3%)	(40.6%)	(42.4%)
Mean fishing mortality	0.317	0.294	0.288
	(13.5%)	(39.7%)	(49.2%)
Avg. annual catch change	24%	30%	24%
Avg. age (equil. F40%=2.52)	2.67	2.78	2.82
Freq catch > F40% catch	42.6%	29.8%	20.6%
Freq spawning biomass > B35%	68.0%	71.8%	74.0%
Freq F > FOFL	0.0%	25.7%	25.7%

Table 4.1-2 (cont'd).

BSAI Pacific ocean perch	Alternative 1	Alternative 2	Alternative 4
Mean Catch	16	16	16
	(11.2%)	(11.2%)	(11.4%)
Mean spawning biomass	142	142	142
	(7.4%)	(7.4%)	(7.6%)
Mean fishing mortality	0.047	0.047	0.046
	(4.2%)	(4.3%)	(4.6%)
Avg. annual catch change	2%	2%	2%
Avg. age (equil. F40%=9.91)	10.03	10.03	10.04
Freq catch > F40% catch	47.6%	47.8%	47.7%
Freq spawning biomass > B35%	97.1%	97.1%	96.8%
Freq F > FOFL	0.0%	0.0%	0.0%

Gulf of Alaska Pollock	Alternative 1	Alternative 2	Alternative 4
Mean Catch	162	145	136
	(54.8%)	(61.1%)	(56.8%)
Mean spawning biomass	251	289	311
	(38.6%)	(50.3%)	(54.0%)
Mean fishing mortality	0.275	0.242	0.232
	(18.3%)	(36.7%)	(45.6%)
Avg. annual catch change	20%	49%	45%
Avg. age (equil. F40%=2.68)	2.92	3.01	3.07
Freq catch > F40% catch	38.7%	29.2%	23.3%
Freq spawning biomass > B35%	56.4%	64.2%	66.9%
Freq F > FOFL	0.0%	21.1%	24.8%

Sablefish	Alternative 1	Alternative 2	Alternative 4
Mean Catch	26	26	25
	(36.5%)	(39.1%)	(39.2%)
Mean spawning biomass	225	231	238
	(26.2%)	(28.1%)	(30.0%)
Mean fishing mortality	0.120	0.115	0.111
	(13.4%)	(16.6%)	(20.6%)
Avg. annual catch change	9%	17%	20%
Avg. age (equil. F40%=5.27)	5.64	5.71	5.79
Freq catch > F40% catch	44.8%	43.0%	40.9%
Freq spawning biomass > B35%	65.8%	67.6%	69.3%
Freq F > FOFL	0.0%	0.0%	6.0%

4.1.4 Summary of Target Species Effects

The potential direct and indirect effects of the groundfish fisheries on target species are detailed in the draft PSEIS (NMFS 2001c). Direct effects include fishing mortality for each target species and spatial and temporal concentration of catch. Indirect effects include the changes in prey composition and changes in habitat suitability. Indirect effects are not likely to occur with any of the alternatives or the options analyzed because the proposed action does not change overall fishing practices that indirectly affect prey composition and habitat suitability. Potential direct effects are summarized below for each alternative.

Alternative 1. Status Quo

The Status Quo process is not likely to have adverse impacts on groundfish species beyond those analyzed in previous NEPA analyses (NMFS 1998a, 2001c, section 4.4). Alternative 1 differs from the other alternatives in the use of interim TACs at the beginning of the fishing year. Interim TACs make available only a fraction of the Council's proposed TAC, depending on the fishery (25 percent or first seasonal allowance). The 25-percent cap for interim TACs is an artificial constraint on the fishery which may have economic impacts (refer to Section 5.0) but is not likely to have negative environmental impacts, particularly for target species. The interim specifications are based on information from surveys conducted two year previously. The specifications for the current year fishery are not effective until approximately March of the fishing year. Therefore, even under status quo, a portion of the fishing year is conducted based on data approximately 18 months old. The analysis in this section does not reflect the potential effect of this lag or the potential effects of managing a fishery on an interim value.

Alternative 2. Proposed and final specifications before start of fishing year; option for biennial harvest specifications for GOA and BSAI species on biennial survey schedule.

Under Alternative 2, there is some evidence that year-to-year fluctuations in fishing mortality may increase, that average fishing mortality levels may fall, and that fishing mortality levels may have a tendency to inadvertently exceed OFL levels more often. Long term biomass is predicted to increase with the model results compared to Alternative 1.

Alternative 2 increases the lag between the time summer biomass surveys are conducted and the start of the year in which specifications based on that survey are implemented. Under Alternative 1, this lag is four months, under Alternative 2 it rises to 16 months. This increased lag means that a biomass level may have evolved (through recruitment, natural or harvesting mortality, or growth) by a greater amount before fishing takes place under Alternative 2 than under Alternative 1. The TAC may thus be less appropriate for a given biomass in any year under Alternative 2. If the biomass has dropped, the TAC may tend to be higher than it otherwise would have under Alternative 1, exacerbating the drop. If the biomass has risen, the opposite effect may take place. Thus, year-to-year fluctuations in biomass may be greater under Alternative 2 than under Alternative 1. Since harvest specifications are based on biomass estimates, fishing mortality for target species is also likely to become more variable. Analyses performed at the Alaska Fisheries Science Center, and reported in Sections 4.1.3 and 5.10 of this EA/RIR/IRFA provide some support for this proposition, especially for species that have relatively short life spans.

In part because of the increased variability, mean annual fishing mortality is expected to be lower under Alternative 2 than under Alternative 1. The increased variability means that annual biomass levels may trigger harvest control rule induced reductions in harvest rates more often. This may lead to lower fishing mortality in more years than under Alternative 1, and lower mean fishing mortality overall. Moreover, other uncertainties, some connected with avoiding OFLs (discussed below), may also lead to more conservative harvest rates. The analyses performed at the Alaska Fisheries Science Center also provided some support for this result.

The increased variability in the mean annual biomass is also expected to increase the possibility that managers may inadvertently exceed OFLs. This possibility currently exists under Alternative 1, but based on simulations, it would be greater under Alternative 2. In consequence, managers may set harvest specifications in a more conservative manner under Alternative 2 in order to reduce the likelihood of this result. It is possible that the increased probability of exceeding the OFL may be dampened by conservative setting of TAC.

The simulation analysis indicates that the average catch is likely to be lower under Alternative 2 and 4 compared with Alternative 1. This is likely underestimated since the analysis did not take into account extra measures in the TAC setting process that would lead to having the total groundfish TAC fall within the 2 million mt OY cap. The added stock status uncertainty for Alternatives 2 and 4 is likely to lead to additional quota reductions under Amendment 56 harvest control rules (e.g. under Tier 1, the higher the uncertainty, the lower the ABC). Response to population changes will be slower under Alternatives 2 and 4 resulting in increased variability in catch and biomass.

Based on the analyses, Alternative 2 appears likely to lead to lower harvest mortality, greater year-to-year fluctuations in harvest mortality, and an increased possibility of exceeding OFL levels; the sizes of these impacts are unknown. The potential increase in biomass over time may have a beneficial effect on target species but there may also be short term negative effects with the higher potential expected for exceeding the OFL. The analyses did not account for the Council process in establishing TAC, therefore the model results can only be used to indicate general trends in the absence of Council action. Because of the importance of Council process in establishing harvest specifications, we are unable to determine the significance of these model results.

This alternative will not have an effect on the spatial or temporal harvest of target species.

For the potential effects of the option to Alternative 2, see the results below for Alternative 4.

Alternative 3. Issue Proposed and Final Specifications Based on an Alternative Fishing Year Schedule.
Option 1: Set sablefish TAC on a January through December schedule
Option 2: Reschedule the December Council meeting to January

Alternative 3 may cause fishermen to change their fishing behaviors. For example, fishermen may choose to fish conservatively early in the [new] quota fishing year in order to "save up" PSC limits and TAC and maximize their returns during the winter high value roe fishery. Real-time tracking and co-operation among fishery participants might mitigate the possible economic impacts and minimize changes in fishing patterns, which could mitigate the possible environmental impacts. Greenland Turbot and sablefish fisheries may be the most likely to be impacted because their directed fishing season overlaps with the July 1 quota fishing year date. See Tables 5.9-2 and 5.9-3 for fishery specific information. Sablefish issues are also covered in detail in section 4.9.

In addition, a slight lag in using "the most current information" would be introduced under this Alternative. However, this lag will have no impact on the calendar year catch expectation (from the standpoint of ABC recommendations). This alternative will have quota changing between June and July as compared with status quo where changes occur between December and January. In addition, a change in the quota fishing year will require stock assessment model projections to be modified slightly. However, the current model structure can remain the same.

Table 4.1.3 shows how ABC would be calculated and apportioned under Alternative 3 compared to Alternative 1, for a fishery with a 60% January through June A seasonal apportionment. Assume that the ABC is used as TAC for the fishing year for purposes of the seasonal apportionment. The first four columns provide the background information that is used in the calculations. Each row represents one year of harvest specifications process. This table should be read across the rows to understand the difference in seasonal apportionment between the alternatives. Column 1 in Table 4.1.3 shows a hypothetical Year 1 ABC projection in metric tons for this species. This projection would have been made at the Plan Team meetings in November of the preceding year for the oncoming calendar year (Year 1). Column 2 shows Year 2 ABC projections that would have been made at the same plan team meetings for the year after the oncoming calendar year (Year 2). Column 3 is simply half of the Year 2 ABC projection. Column 4 shows the A season apportionment in the first 6 months of the Year 1 (with the first cell being an assumed value). This amount is subtracted from the Year 1 ABC so that the remaining amount of ABC is applied to the July- December part of the fishing year. This amount is then added to half of the Year 2 ABC to get the full year's ABC for the July through June time period. Column 5 shows the actual calculation of the ABC for the July of Year 1 to June of Year 2 fishing year.

The A seasonal apportionments for the July to June fishing year (Column 6) are set at 60% of the July - June ABC (from Column 5). For Alternative 1, the A seasonal apportionment for the same January through June time period is 60 percent of the Year 2 ABC projection. Columns 6, 7, and 8 compare "A" season (January to June) apportionments under Alternatives 1 and 3. Column 6 shows the "A" season apportionment under Alternative 3. This is equal to 60% of Column 5. Column 7 shows the "A" season apportionment under Alternative 1. This is equal to 60% of Column 2 (the Year 2 ABC). Column 8 is the difference (the Alternative 3 apportionment minus the Alternative 1 apportionment).

Table 4.1.3 shows that there will be a lag between changes in biomass and the setting of seasonal apportionments under Alternative 3, which will likely lead to seasonal apportionments different from those resulting under Alternative 1. Reading across the rows, during periods of falling biomass between Year 1 and Year 2, Alternative 3 is likely to have a higher seasonal apportionment than Alternative 1. Conversely, during periods of rising biomass between Year 1 and Year 2, Alternative 3 is likely to have lower seasonal apportionments than Alternative 1.

Table 4.1-3 Seasonal Apportionment Comparison of Alternative 3 and Alternative 1.

1	2	3	4	5	6	7	8
Yr. 1 ABC projection (mt)	Yr. 2 ABC projection (mt)	+ 50 % Yr. 2 ABC = (Col. 2)/2 (mt)	Previous A season appor. = Col.6 year $_{(x-1)}$ (mt)	July -June ABC = (1-4)+3 (mt)	Alt. 3 A season Apportionment =60 % of col. 5 (mt)	Alt 1 A season apportionment = 60 % of Col. 2 (mt)	Difference = 6-7 (mt)
1200	1400	700	assume 720	1180	708	840	-132
1400	1000	500	708	1192	715 t	600	115
1000	5000	2500	715	2785	1671	3000	-1329
5000	3000	1500	1671	4829	2897	1800	1097
3000	3000	1500	2897	1603	962	1800	-838
3000	3200	1600	962	3638	2183	1920	263
					total = 9844	total = 9960	total = -116

Because it is difficult to predict a potential shift in fishing behavior, it is unknown if Alternative 3 may have an effect on the temporal harvest of target groundfish species. However, it is unlikely that this alternative will be appreciably different from status quo since the annual *calendar year* catches will be essentially identical (with some variability increase between first and second halves of a calendar year). Regarding seasonal allocations, these would be based on the new quota year. For example, if it was considered desirable for 60% of the quota to be allocated to the period July-December, then 40% of the quota year value would be specified for the subsequent year during Jan-June. Harvest levels may be higher and variability lower for Alternative 3 compared to Alternative 2 or 4 because the time lag between data and fishery implementation is less for Alternative 3 compared to Alternatives 2 and 4. It is not possible to fully predict the annual actions that may be taken by the Council and the level of conservation exercised in setting annual harvest specification. It is possible that the Council may conservatively set TAC for target species and species groups, reducing the potential for overfishing due to the variability of biomass data. The effect of this alternative on direct fishing mortality for target species is unknown.

Option 1 to Alternative 3 to set the sablefish TAC for the following January through December time period would allow the sablefish IFQ fishery to be managed with the halibut IFQ fishery. The simulation model indicated that the effect of projecting ABC on sablefish biomass and future harvest is minimal compared to Alternative 1, therefore projecting ABC levels to the following year is not likely to have an impact on sablefish stocks.

Option 2 would allow additional time for the stock assessment scientist to examine data and write reports for Council consideration. This may have a beneficial effect for target species because of the potential improvement in the quality of the assessments which may lead to better management of the stocks. However, this potential improvement is difficult to quantify.

Alternative 4. Biennial harvest specifications

In Alternative 4, the TACs set by the Council for the future years will be based on two year projections from the SAFE reports. As with Alternatives 2 and 3, this has an advantage over interim TACs used under Alternative 1 by basing the TACs on a scientifically derived value rather than an administrative adoption of a percentage of the previous year's TAC. This alternative does not use the most recent catch data for modeling to establish future TACs, which may lead to less accurate ABC projections and possibly less effective management of the groundfish stocks.

In the simulation model above, Alternative 4 has similar effects as Alternative 2 with the variability in catch increased somewhat over Alternative 2 and even more over Alternative 1. Average catch is expected to be lower than under Alternative 2 and the probability of exceeding the overfishing level is expected to be greater. As explained above for Alternative 2, some of this potential effect, may be reduced by conservative recommendations of TAC by the Council, especially for the short-lived species.

Alternative 4 would not allow use of winter pollock biomass distribution survey data collected in the BSAI Bogoslof and GOA Shelikof Strait during the current year. For instance, a winter survey in 2000 would be used for 2002 and 2003 harvest projections. Winter surveys in 2001 and 2002 would be used for harvest projections for 2004 and 2005. With setting TAC for two years, the annual biomass distribution survey results will be used every two years. This is not as much of an issue for the Bogoslof TAC since it is historically set at a level that allows bycatch only. The Shelikof Strait TAC allows for directed pollock fishing. Setting a two year TAC for pollock may not be the most desirable method of managing because of the annual variability of recruitment and the high level of exploitation in the Bering Sea. There is less ability to annually adjust the harvest specifications based on recent catch data, or in the case of the Bogoslof and Shelikof Strait, adjust based on annual winter biomass distribution data. Because of these conditions of the fishery, there is more potential to exceed overfishing levels if TAC was set near the ABC value.[6]

A number of the tier 1-4 target species may have catch information available during the time period between the first and second year TAC. Tier 5 and 6 species will not likely have new information available that could be used in adjusting TAC. New catch information for the tier 1-4 species would not be used while the first and second year TACs are in place. This likely is not a problem since the catch projections used for the tier 1-4 species generally are fairly close to the actual catch amounts realized by the fisheries. Updating the TAC with the new actual catch data is unlikely to make a large difference between the TAC

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[6]Gary Stauffer, Director of Resource Assessment and Conservation Engineering Division, Personal communication. February 22, 2001, NMFS, WASC, Route: F/AKC2, BLDG: 4, RM: 2121, 7600 SANDPOINT WAY NE, SEATTLE, WA 98115-6349

based upon catch projections vs the TAC based upon actual catch data[7]. If this difference is not significant, it may not be appropriate to initiate the process to change the TAC.

For demersal shelf rockfish, biennial submersible line transects are conducted to determine the standing stock. The State of Alaska performs these surveys and provides the information during the November Plan Team meeting recommending the ABC for the following year. Under Alternative 4, the State would need to provide a projection of the ABC for year 2. Currently, the State does not do population modeling for this target species group and has no future plans to do such modeling.[8] For these reasons, the demersal shelf rockfish should not be included in the biennial harvest specifications process under Alternative 4. Separate annual rulemaking may be necessary for this species alone, making the harvest specifications process under this alternative less efficient.

As with Alternative 2, because it is not possible to know what the future recommended TAC levels may be in comparison to the OFL, it is unknown what effect this alternative may have on target species fishing mortality. It is likely that average TACs will be lower and biomass higher under this alternative compared to Alternative 1 and Alternative 2 as the Council makes conservative recommendations to stay below OFL. The potential increase in biomass over time may have a beneficial effect on target species, but there may also be short term negative effects with the higher potential expected for exceeding the OFL. Because of the importance of Council process in establishing harvest specifications, we are unable to determine the significance of the simulation model result for Alternative 4.

This alternative will not have an effect on the spatial or temporal harvest of target species because there is no change in the fishing year or in the location of harvest.

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Options 1 and 2 to this alternative would have no effects on groundfish species since they apply only to the setting of PSC limits.

Option A. Abolish TAC Reserves.

This option is an administrative change to accommodate the practice of releasing nonspecified TAC reserves for the fisheries. Implementation of this option would have no impact on the groundfish target species that differs from the status quo. Given that Option A addresses TAC reserves as a subset of the TAC that is assumed to be available for harvest, the impacts are assessed annually in the analyses that accompany final harvest specifications.

In the past 12 years, only a BSAI flatfish reserve has been released once to allow a harvest amount over the TAC but less than the ABC. The amount of harvest that year did not reach the TAC because of halibut

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[5]Michael Sigler, Mathematical Statistician. Personal communication. February 22, 2001, NMFS, Auke Bay Laboratory, 11305 Glacier Highway , Juneau , AK 99801-8626

[8]Dave Carlile, Biometrician, Personal communication. February 22, 2001, Alaska Dept. of Fish and Game. Alaska Department of Fish and Game, Division of Commercial Fisheries, 1255 W. 8th Street, Juneau, AK 99801

bycatch mortality, the same constraint that is experienced every year by this fishery. The release of the reserves has no effect on the higher volume groundfish fisheries.

Table 4.1-4 Effects of Alternatives 1 through 4 on Target Species

	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Option: Abolish Reserves
Direct Effects					
Fishing Mortality	**N**	**U**	**U**	**U**	**N**
Spatial/Temporal concentration of Catch	**N**	**N**	**U**	**N**	**N**
Indirect Effects					
Prey composition	**N**	**N**	**N**	**N**	**N**
Changes in Habitat Suitability	**N**	**N**	**N**	**N**	**N**

U = unknown
N = no effect

4.2 Effects on Species Prohibited in Groundfish Fisheries Harvest

Catches of Pacific halibut, crabs, salmon, and herring are controlled by PSC limits for the BSAI that are established in regulations as part of the annual specification process. The Council recommends annual GOA Pacific halibut PSC limits for gear types, and further seasonal and fishery target allowances. Additionally as part of the annual specification process the Council recommends apportionments of BSAI PSC limits among seasons and fishery targets. Section 4.3.5 of the SEIS (NMFS 1998a) and the draft PSEIS (NMFS 2001c) analyzes the impacts of fishing over a range of TAC specifications and compares them to impacts of status quo fishing on prohibited species. Each year the final EA for the annual groundfish harvest specifications analyzes the impacts of TAC alternatives on prohibited species.

The final EA prepared for the action of setting the 2002 TACs for the groundfish fisheries off Alaska analyzed the effects of setting the 2002 TACs over a range of levels on prohibited species in section 4.4 (NMFS 2001a). The direct and indirect effects analyzed were the impact of incidental catch of prohibited species in the groundfish fisheries on stocks of prohibited species, the impact of incidental catch of prohibited species in the groundfish fisheries on the harvest levels of those species in their respective directed fisheries, and the effect on levels of incidental catch of prohibited species in the groundfish fisheries. The effects on prohibited species were all determined to be insignificant over a wide range of TACs, except for Alternative 5 which would have set TACs at zero (no fishing for groundfish) and would have resulted in a significant decrease in the levels of incidental catch of prohibited species in the groundfish fisheries (NMFS 2001a). An additional indirect effect of the groundfish fisheries is a potential change to the prey composition as analyzed in the Steller sea lion SEIS (NMFS 2001b) and found to be insignificant for the alternatives analyzed. The significance of the impacts in these analyses were dependent on the level of removals of prohibited species biomass. The alternatives analyzed here are not believed to have an impact on prohibited species not already considered because they do not effect the manner in which TACs or PSC limitations are set, rather the alternatives analyzed here are procedural in nature and would not be expected to change the amount of prohibited species or prey species harvested.

Alternative 1. Status Quo.

Under the status quo, 25 percent of the previous year's PSC limits and fishery apportionments thereof are made available during the interim period, until final specifications are published in the Federal Register. This does not have any adverse impacts on prohibited species unless the annually specified PSC limits are reduced significantly, by more than 75 percent. Therefore, the status quo allocation of 25 percent of the PSC limits as an interim measure "protects" against excessive harvesting of prohibited species. This alternative has no impact on the manner in which prohibited species and PSC limits are established and managed and therefore has no additional direct, indirect, or cumulative impacts on prohibited species not already considered.

Alternative 2. Proposed and Final Specifications before start of fishing year
Option for biennial harvest specifications for GOA and BSAI species on a biennial survey schedule.

Alternative 2, either with or without the option, is not likely to affect the bycatch of prohibited species. Proposed and final specifications, including PSC limits, would be finalized under this alternative before the fishing year started, with the potential for better management of PSC over the status quo. The potential for improvement of PSC management is due to the removal of the limitation of 25 percent of the annual PSC limits during the period the interim specifications are in effect. The Council could then recommend a lesser or greater amount of the annual PSC limit at the beginning of the fishing year during which the interim specifications are normally in effect, depending on the bycatch needs of the directed groundfish fisheries. NMFS does not believe that this would necessarily result in an overall decrease in the annual amount of PSC bycatch, but rather that the same amount of bycatch could be used to harvest a greater amount of the available groundfish resources.

Annual PSC limits for crab in the BSAI are based on a percentage of the estimated abundance (numbers) of crab and annual PCS limits in the BSAI for herring are based on a percentage of estimated spawning biomass (mt). At present these estimates are not available until October or November of the year as is the case with groundfish stock assessments. Thus, the Council's final action on PSC limits in April would be based on the previous year's assessment of crab abundance and spawning biomass of herring. ADF&G has stated that estimates of spawning herring biomass cannot be forecast[9], while the abundance (numbers) of crab

[9] Personal communication with Fritz Funk, Statewide Herring Biometrician, January 24, 2001, Alaska Department of Fish and Game, Division of Commercial Fisheries, 1255 W 8th St., Juneau, AK 99801

estimated by the NMFS trawl survey can vary by 30 percent from one year to the next.[10] The impact of using the previous year's assessment of these stocks for establishing PSC limits on crab and herring stocks is negligible because the PSC limits are by regulation set at extremely low levels; 1 percent of the estimated spawning biomass in herring (in mt) and between 0.1 percent and 2.5 percent of estimated crab abundance (in numbers). This alternative would have minor impacts as described on prohibited species stocks by the manner in which PSC limits are established and managed. Annual PSC limits are not impacted by this alternative and therefore Alternative 2 has no additional direct, indirect, or cumulative impacts on prohibited species not already considered.

Alternative 3. Issue Proposed and Final Specifications Based on an Alternative Fishing Year Schedule.
Option 1: Set sablefish TAC on January through December schedule.
Option 2: Reschedule the December Council meeting to January

Under Alternative 3 the fishing year would begin in July. Proposed and final specifications, including PSC limits, would be finalized under this alternative before the fishing year started. The discussion of the potential benefits of eliminating the 25 percent limit on the annual PSC caps during the period the interim specifications would have been in effect under Alternative 2 would also apply under Alternative 3. As discussed under Alternative 2, biomass estimates of the crab and herring stocks would continue be to updated in October and November. The annual PSC limits for crab and herring would presumably be available over the entire fishing year without adjustments based on new biomass estimates available late in the first half of the fishing year (November), these new estimates however would be the basis for establishing the next year's PSC limits.

It is not known how a change in the opening date of fishing would impact fishing practices such as the amount of effort directed at specific groundfish targets over time and space during the fishing year. The seasons for Atka mackerel, pollock, Pacific cod, rockfish, sablefish (normally concurrent with the Pacific halibut fishery dates) and Greenland turbot are already established by regulation. Since many fisheries are constrained by PSC limits during the course of the year, the manner in which the Council apportions PSC allowances to the gear types over the course of the year by season and fishery target could have the effect of preserving current fishing practices or deliberately altering them. NMFS does not believe that this would necessarily result in an overall decrease in the annual amount of PSC bycatch, but rather that the Council would apportion PSC limits to optimize the harvest of the available groundfish resources. Option 1 to set sablefish TAC on a January through December schedule will keep the halibut and sablefish IFQ fisheries on the same schedule, eliminating any potential increases in halibut bycatch if the sablefish fishery is on a different schedule. Option 2 is unlikely to have any effect on prohibited species since the additional time for analysis will likely be concentrated on target species.

It is likely that the BSAI pollock A season end date and B season beginning date of June 10 will need to be changed to July 1 so that the seasons are not truncated by the fishing year. The June 10 date for this seasonal end point was part of the Steller sea lion protection measures. If the date is changed, there is the

[10] Personal communication with Dr. Robert Otto, Director NMFS RACE lab, March 7, 2002, 301 Research Count, Kodiak, AK 99615.

potential for the pollock fishery to experience higher salmon bycatch rates as the industry pushes fishing effort into the later part of the year. Lower salmon bycatch rates are experience in June compared to October. The average pollock harvest during the June 10 through July 1 time period for 2001 and 2002 was 35, 896 mt. If the harvest of this amount of pollock was made up during October when the bycatch rates are high (ave. .25 during October 2001), the number of additional chinook salmon bycatch may be up to 5,815 salmon.[11] The potential additional amount of bycatch could be reduced if the industry was able to limit the amount of harvest in October, especially towards the end of the month. Whether there would be an effect on the amount of salmon bycatch is dependent on the actions of the industry and therefore the effects on Alternative 3 on salmon bycatch is unknown. This alternative will have no effect on the salmon PSC management measures currently in regulations.

Alternative 3 would have a greater impact on the manner in which annual PSC limits are apportioned and managed throughout the fishing year than the other alternatives considered. Annual PSC limits are not impacted by this alternative and therefore Alternative 3 has no known additional direct, indirect, or cumulative impacts on prohibited species not already considered.

Alternative 4. Biennial harvest specifications.
Option 1: Set PSC limits annually
Option 2: Set PSC limits every two years based on regulations and projected values or rollover from previous year.

After the first year, when the annual OFL, ABC, and TAC levels together with PSC limits would be established by emergency rule, Alternative 4 would follow the same schedule as Alternative 2 for completion of the SAFE reports, Council action, public comment, and proposed, and final rule making. PSC limits for crab and herring under Alternative 4 Option 1, like Alternative 2 would be based on the previous year's assessment and the discussion of impacts on prohibited species under Alternative 2 would apply here. Annual PSC limits are not impacted by this alternative and therefore Alternative 4 Option 1 has no additional direct, indirect, or cumulative impacts on prohibited species not already considered.

Option 2, using projected values, would require that for crab and herring stocks in the BSAI that NMFS and/or the State provide projections of crab and herring biomass one to two years in advance. At this time it is not known if the State and NMFS have the resources or data available to make reliable abundance and spawning biomass projections for the crab and herring stocks. Provided that such stock projections are practical, annual PSC limits under Alternative 4, Option 2 have no additional direct, indirect, or cumulative impacts on prohibited species not already considered.

However if such stock projections are not practical then NMFS recommends that Option 2, using projected values, be withdrawn from further consideration. While Option 2, (rolling over the previous years PSC limits) would not be expected to adversely impact the stocks of prohibited species, but regulations at §679.21(d) and (e) specify that PSC limits in the GOA and BSAI shall be specified annually and be based on estimates of numerical abundance of crab and spawning biomass of herring in the BSAI. This regulation

[11]NMFS Inseason Management salmon bycatch data from www.fakr.noaa.gov/2001/bysalb.txt.

would need to be changed to allow for biennial PSC specifications if Option 2 was selected, but this would not solve the need to set crab and herring PSC limits based on spawning biomass which, with current resources, is only done annually. For this reason NMFS recommends that Option 2, rolling over PSC limits from the previous year, be withdrawn from further consideration.

Option A. Abolish TAC Reserves

This alternative has no impact on prohibited species bycatch, direct, indirect, or cumulative since it only involves an administrative process to remove the need to establish nonspecified TAC reserves in the BSAI and specified reserves in the GOA.

Summary of Effects on Prohibited Species

Table 4.2-1 Effects of Alternatives 1 through 4 on Prohibited Species

Effect	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Option: Abolish Reserves
Incidental Catch of Prohibited Species on Prohibited Species Stocks	**N**	**N**	**N**	**N**	**N**
Harvest Levels in Directed Fisheries Targeting Prohibited Species	**N**	**N**	**N**	**N**	**N**
Harvest Levels of Prohibited Species in Directed Groundfish Fisheries	**N**	**N**	**U***	**N**	**N**
Prey composition	**N**	**N**	**N**	**N**	**N**

N = No effect
U = Unknown
* Due to potential salmon bycatch in the BSAI pollock fishery.

4.3 Forage Species and Nonspecified Species

Direct effects of the groundfish fisheries on forage species and nonspecified species are similar to potential direct effects on prohibited species. Groundfish fisheries remove from the environment forage species and nonspecified species as bycatch. Indirect effects of the groundfish fisheries on forage and nonspecified species include potential changes in prey composition. Because of the lack of data regarding the life history and biomass of the forage and nonspecified species, it is difficult to determine the effects of such removals on these species. Section 4.5 of the draft PSEIS (NMFS 2001c) contains effects information on forage and nonspecified species at a range of harvest management alternatives.

Because the proposed action is the modification of an administrative process for annual harvest management, no direct, indirect or cumulative effects on forage and nonspecified species are expected with this action.

4.4 Effects on Marine Mammals, Sea Birds, and Species Listed as Threatened or Endangered Under the ESA, except Steller sea lions.

The effects of groundfish harvest at various TAC levels on marine mammals, including ESA listed species, are discussed in section 4.2 of the draft PSEIS (NMFS 2001c). Causal relationships between commercial harvesting of groundfish in the EEZ off Alaska and the population status and trends of marine mammals have not been established. The complexity of potential interactions at multiple temporal and spatial scales that might affect foraging behavior, coupled with the paucity of data available to characterize those relationships, inherently limit detection of fisheries effects. Thus, the mechanisms by which fish biomass removals might translate to marine mammal fitness or mortality are largely unknown at this time. The alternatives analyzed in this EA/RIR/IRFA will not change significantly the mechanisms for fish biomass removal and therefore will not likely have any effects on marine mammals beyond those already described in the PSEIS.

Groundfish harvest effects on seabirds, including ESA listed species, are described in section 4.3 of the draft PSEIS (NMFS 2001c). The direct effect is incidental take and the indirect effects include prey availability, benthic habitat disturbances and processing waste and offal discharge. The change in the harvest specifications administrative process will have no effects beyond what is described in the PSEIS because there will be no changes in fishing practices that would alter the direct or indirect effects listed.

ESA listed steelhead have not recently occurred in the BSAI or GOA so no impact is anticipated for this species by any alternative in this EA/RIR/IRFA. ESA listed salmons are directly impacted by the groundfish fisheries through incidental catch. It is unknown whether they may also be indirectly affected by the groundfish fisheries from spatial or temporal concentration of bycatch or prey competition. Because PSC limits are established by regulation each year for salmon and the alternatives do not affect the PSC limits, none of the alternatives is expected to have an impact on ESA listed salmon beyond those identified in the draft PSEIS (NMFS 2001c).

Revising the process by which harvest specifications are established, and eliminating TAC reserves are not expected to affect ESA listed species, marine mammals or seabirds in any way not considered in previous consultations and environmental analyses. The exception may be for Steller sea lions which have been determined to be adversely affected by the groundfish fisheries and have required protection measures in the groundfish fisheries to prevent the likelihood of jeopardy of extinction or adverse modification or destruction of critical habitat for the western distinct population segment. See section 4.5 below. All harvest specification alternatives must comply with the Steller sea lion protection measures currently implemented (67 FR 956, January 8, 2002). Further, none of the alternatives are expected to affect other marine mammals or sea birds that may be present in the GOA or BSAI. The selected alternative for setting the harvest specifications would be subject to consultation under Section 7 of the ESA if it is determined that there is the likelihood of an adverse effect on Steller sea lions or any other ESA listed species. Any reasonable and prudent alternative (RPA) would be implemented by separate rulemaking.

None of the alternatives or options are expected to have an impact on direct incidental takings of marine mammals or sea birds since there will be no significant changes in fishing practices. In all cases in the groundfish fisheries, levels of direct incidental take are low relative to each marine mammal stock's Potential Biological Removal. Two short-tailed albatross were taken in 1998 in the long-line fishery, however, this was within incidental take guidelines and did not prompt the USFWS to re-initiate consultation. The Council adopted additional seabird avoidance measures for implementation in the year 2000. Regulations at 50 CFR §§ 679.24(e) and 679.42(b)(2) contain specifics regarding seabird avoidance measures and additional measures are anticipated by the end of 2002.

Summary of Effects on Marine Mammals, Sea Birds, and Species Listed as Threatened or Endangered Under the ESA, except Steller sea lions.

Table 4.4-1 Effects of Alternatives 1 through 4 on Marine Mammals, Sea Birds, and Species Listed as Threatened or Endangered Under the ESA, except Steller sea lions.

Effect	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Option: Abolish Reserves
Incidental Catch of marine mammals, seabirds, ESA listed species (except Steller sea lions)	N	N	N	N	N
Prey availability	N	N	N	N	N
Benthic Habitat	N	N	N	N	N
Processing waste and Offal discharge (seabirds effect)	N	N	N	N	N

N = No effect

4.5 Effects on Steller sea lions

The groundfish fisheries may have direct impacts on Steller sea lions by incidental catch and entanglement of the animals during groundfish harvest and illegal shooting of the animals. Indirect effects include competition for prey species over time and space, and disturbance of the animals. These effects were analyzed in the Steller sea lion SEIS (NMFS 2001b), Section 4.1.1, for the pollock, Atka mackerel and Pacific cod fisheries. Of these effects, Alternatives 2, 3, and 4 have an unknown potential to have an indirect effect on Steller sea lions from changing the removal of prey over time in relation to biomass and Alternatives 1 and 3 have considerations regarding temporal harvest of prey species. This is further explained below under each alternative.

The Steller sea lion protection measures address in several ways the competition between the groundfish fishery and non-human predators in the marine ecosystem, which is considered by NMFS to be a potential factor in the population decline of Steller sea lions. The protection measures modify the existing harvest control rule to ensure that there are enough prey resources overall and that prey densities are sufficient to supply all competitors on a large scale. The catch of important prey species is distributed over space and time to reduce the effects of localized depletion. Localized depletion is the reduction of prey resources below a threshold necessary to effectively supply predators in a specific area during a specific time period. Fishing is prohibited in areas immediately surrounding rookery and haulout sites and fishing is curtailed for important prey species in significant portions of designated critical habitat to relieve competition in areas considered important to Steller sea lion survival and recovery. The January 8, 2002 regulations (67 FR 956) control available biomass, and temporal and spatial aspects of the pollock, Pacific cod and Atka mackerel fisheries in an attempt to reduce competition for prey species between fishermen and Steller sea lions. Additional information regarding Section 7 consultations for the groundfish fishery for Steller sea lions and all other listed species can be found in the 2001 BiOp (NMFS, 2001b, appendix A) and in the Comprehensive BiOp (NMFS 2000).

Alternative 1. Status Quo

Under Alternative 1, there is no change to the harvest specification setting process and no additional effect on Steller sea lions beyond what has already been described for the groundfish fisheries (NMFS 2001b and c), except for considerations described below regarding interim specifications.

Steller sea lion protection measures require the temporal dispersion of the fishery which is accomplished by seasonal apportionment of annual TAC. Setting the interim TAC at a level higher than is appropriate for the biomass may result in greater harvest than was intended when the Steller sea lion protection measures were enacted. Under current procedures, the interim TAC is calculated starting with the previous year's TAC for each specified groundfish species or species group. If a large change in the biomass between years has occurred, this typically would not be reflected in the interim TAC. Because of this, the interim TAC might be higher or lower than appropriate. This is of a particular concern for the BSAI and GOA pollock and Atka mackerel fisheries which have interim TAC equal to their first seasonal allowances (40, 25, and 50 percent, respectively). If the ABC has fallen between years, the interim TAC would be based on the higher ABC and the level of harvest in the first season could exceed the seasonal apportionment that is specified in final specifications.

The change in biomass and corresponding ABC would have to be quite large before what is taken during the interim period exceeds the annual TAC. In 2001 the TAC for GOA pollock was 95,875 mt. A large drop in projected biomass in 2002 resulted in TAC of 58,250 mt. If the 2001 TAC had been used to calculate the interim TAC in 2002, the interim value would have been 23,969 mt (25 % of 95,875 mt for the first seasonal apportionment). The interim 2002 TAC would have been 41percent of the 2002 TAC and would have allowed the possible exceedence of the 25 percent 2002 A season apportionment. Any overages in one season can be subtracted from the following seasons. Therefore, even in this situation where a difference of 40 percent ABC occurred between years, it would be unlikely that the annual TAC would have been exceeded if interim specifications were applied.

Even though the annual TAC is unlikely to be exceeded using interim TAC, the use of interim TAC does not ensure the appropriate seasonal apportionment of the annual TAC. In the case of GOA pollock in 2002, if the interim TAC had been used, 41 percent of the annual TAC could have been harvested during the beginning of the year, exceeding the 25 percent seasonal apportionment and concentrating the pollock harvest during a critical time for juvenile Steller sea lions. Therefore, harvest of interim specifications levels for Atka mackerel or pollock may undermine the temporal dispersion of the fisheries in times of decreasing biomass.

To avoid this potential problem with the interim TACs, the ABCs may be based on a scientifically derived value rather than rollovers of the previous year's harvest level. For example, proposed ABCs could be based on projections from the SAFE document from two years earlier. If the projection is an accurate reflection of what is known about the stocks, then it would likely result in an interim TAC that is appropriate for the known biomass. If new information indicates that the stock biomass is declining and this is not reflected in the projection from two years earlier, he or she may select either a SAFE projection or a rollover, choosing the more conservative value. Because of the flexibility in determining the proposed ABC recommendation, it is possible that the interim TACs will be set closer to a level that is appropriate to the biomass. Therefore, the potential for effects on the temporal dispersion of harvest of prey species is unknown.

Alternative 2. Proposed and Final Specifications

Under Alternative 2, the execution of the fishery will not be changed, only the process in implementing harvest specifications. There is an increased potential for setting TAC over the OFL for shorter lived species, such as pollock, compared to Alternative 1 (See analysis in section 4.1.). This potential effect may be offset by the projected overall increase in average spawning biomass and by conservative TAC amounts recommended each year by the Council. Because it is not possible to predict how the Council will set future TACs, the impact of Alternative 2 on prey availability is unknown.

The harvest levels set for this time period would be based on stock assessment data that are 16 months old, increasing the possibility that the quota being managed at that point in time may not be set optimal for the current biomass. The available biomass of Atka mackerel, Pacific cod and pollock were identified as a critical element in the Comprehensive BiOp (NMFS 2000). If the biomass had unexpectedly dropped in the time period between when harvest specifications went into effect and were fished, the removals might be higher than desirable. If more recent information indicates that the level of TAC set is too high for the biomass, regulatory action may be taken to adjust the TAC to a more appropriate level. The simulation models used in section 4.1 indicated that the fishing mortality under this alternative would be less than Alternative 1. Also, the average biomass over time would be greater than Alternative 1. This may have a beneficial effect for Steller sea lions if the additional biomass is available as prey.

No other potential direct or indirect effects on Steller sea lions or on their critical habitat are anticipated from this alternative beyond what has already been described for the groundfish fisheries (NMFS 2001b and c).

Implementation of the option for this alternative would have similar effects to those described below for Alternative 4.

Alternative 3. Issue Proposed and Final Specifications Based on an Alternative Fishing Year Schedule.
Option 1: Set sablefish TAC based on January through December schedule.
Option 2: Reschedule the December Council meeting to January

Alternative 3 may pose some difficulties in executing the fisheries in the framework of the Steller sea lion protective measures because of starting the fishing year at a later date. The Steller sea lion protection measures specify beginning and ending dates for seasonal allocations for BSAI and GOA pollock and Pacific cod and BSAI Atka mackerel. Tables 5.9-2 and 5.9-3 in Section 5.9 show that seasons for EBS pollock and BSAI Pacific cod trawl fisheries directly conflict with a July 1- June 30 fishing year. Pacific cod nontrawl fisheries are not affected because halibut PSC amounts are not apportioned during the June 10 through August 15 time period. Therefore, Pacific cod nontrawl fisheries activities would not overlap fishing years. The C season for the BSAI Pacific cod trawl fishery begins on June 10 and would over lap fishing years under Alternative 3. Adjustments to the seasons and the impacts on Steller sea lions would need to be analyzed before this alternative could be implemented. It is possible that shifting the June 10 seasonal date to July 1 would have little or no effect on Steller sea lions.[12] With a later fishing year, the end of the fishing year would be in the January-March time period, which is also a period of major activity in the Atka mackerel, Pacific cod and pollock fisheries.

The annual harvest levels set for this time period would be based on stock assessment data that are 10 months (September to July) old compared to approximately 7 months (September to February) under status quo for the beginning of the fishing year, thus increasing the possibility that the quota being managed at that point in time may not be set optimal for the current biomass. This potential is greater than with Alternative 1 (if the interim specifications are not considered), but less than with Alternatives 2 and 4. The available biomass of Atka mackerel, Pacific cod and pollock were identified as a critical element in the Comprehensive BiOp (NMFS 2000). If the biomass had unexpectedly dropped in the time period between when harvest specifications went into effect and were fished, the removals might be higher than desirable. If more recent information indicates that the level of TAC set is too high for the biomass, regulatory action may be taken to adjust the TAC to a more appropriate level. It is also likely that the biomass will be greater under this alternative than under Alternative 1 as TAC are adjusted downward to address uncertainty, as in Alternatives 2 and 4, only not as much.

Table 4.1.3 compared Alternatives 3 and 1 to show the potential effects on seasonal apportionments in conditions of falling and rising biomass. Under Alternative 3, a lag exists between the biomass information and the adjustment of TAC to reflect the new biomass level. If the changes in biomass are minor or increasing, this lag is not likely to have an effect on Steller sea lions. If the biomass rapidly drops, this may be of a concern because higher amounts of harvest may be authorized than is appropriate for the biomass level. The potential effect of this is unknown because of actions that the Council may recommend to prevent this situation from causing an adverse effect, including emergency action before the beginning of the A season fishery.

[12]Shane Capron, Personal Communication. May 16, 2002. Fisheries Biologist. Division of Protected Resources, NMFS, 709 W. 9th St. Juneau, AK 99081.

To the extent authorized under the Steller sea lion protection measures, the participants in the Atka mackerel, pollock and Pacific cod fisheries may also alter their fishing practices to "save" their fishing allocation towards the end of the fishing year, when product price is higher. This may cause excess removal rates if not carefully monitored to meet Steller sea lion protection measures.

Option 1 should have no effect on Steller sea lions since it is limited to the sablefish fishery and sablefish is not a main prey species for Steller sea lions (NMFS 2000). Option 2 may lead to better management of the target species, including Steller sea lion prey, which may indirectly benefit Steller sea lions.

Alternative 4. Biennial Harvest Specifications

The potential effects of Alternative 4 on Steller sea lions is similar to Alternative 2, only potentially more adverse if conservative Council action is not assumed. This alternative has a potential for greater variability in biomass than Alternatives 2 and 3 because of the projection of TACs from stock assessment data that are up to 28 months old. This could have an effect on Steller sea lions if future TAC are set too high for the available biomass. The possibility of setting the future TAC at a level that is too high for the biomass over time may be reduced by conservative action taken by the Plan Teams and Council in setting harvest limits. Setting of TAC at a level higher than what is appropriate for the biomass may increase competition for prey between the Steller sea lions and the commercial fisheries. Any possible effects on prey availability are likely to be short term because the Plan Teams and Council will be assessing stock conditions biennially. Any excess of amount of harvest in one year will likely lead to a downward adjustment in future harvest, if future stock assessment information indicates this is necessary. If more recent information indicates that the level of TAC set is too high for the biomass, regulatory action may be used to adjust the TAC to a more appropriate level during the biennial harvest specifications process. Also under this alternative, the average biomass over time is projected by the simulation model in section 4.1 to be greater than Alternative 1 or 2 due to reductions in fishing mortality because of uncertainty with projections. This may be beneficial to Steller sea lions if the biomass is available as prey for Steller sea lions.

The selection of either option for PSC limits has no effect on Steller sea lions because it would not effect the harvest of prey species or the interaction between Steller sea lions and groundfish fishery participants.

Option A. Elimination of TAC Reserves

This alternative should have no effect on Steller sea lions since it is only a change in regulations on the management of reserves and has no effect on the current fisheries practices or on the final level of TAC.

Because of the unknown effects of Alternatives 2, 3 and 4 on groundfish target species harvest, the effects on Steller sea lions by harvest of prey is also unknown. Action by the Council in setting TAC is a critical component to the harvest specifications and was not included in the analysis used for predicting groundfish effects. Also the analysis was compared to historical information and shown to overestimate the amount of harvest for Eastern Bering Sea pollock. Alternatives 1 and 3 also has unknown effects on the temporal concentration of harvest.

Table 4.5-1 Summary of Effects of Alternatives on Steller Sea Lions

	Alternatives			
	1	2	3	4
Direct Effects				
illegal shooting	**N**	**N**	**N**	**N**
Incidental take/Entanglement	**N**	**N**	**N**	**N**
Indirect effects				
harvest of prey	**N**	**U**	**U**	**U**
Spatial/temporal conc. of harvest	**U**	**N**	**U**	**N**
disturbance	**N**	**N**	**N**	**N**

N = No effect
U = unknown

4.6 Effects on Essential Fish Habitat and Benthic Communities

Direct effects from groundfish fisheries on essential fish habitat and benthic communities include the removal of organisms by fishing gear and the modification of substrate by fishing gear. Indirect effects could be the change in biodiversity from fishing activity removals or various organisms. The management areas where the fisheries take place are identified as essential fish habitat (EFH) for all the managed species listed in the fishery management plans. The proposed action would potentially involve all BSAI and GOA species noted in the environmental assessment prepared for EFH (NPFMC, 1999c). The impacts of fishing gear on substrates and benthic communities were analyzed in the draft PSEIS (NMFS 2001c), section 4.7. NMFS prepared an assessment of impacts to essential fish habitat and received a letter of consultation in reply regarding 2002 TAC specifications (Meyers 2001). In that letter, NMFS stated it concurs with the assessment that fishing may have adverse impacts on EFH for managed species but concluded that any adverse effects have been minimized to the extent practicable. No EFH recommendations were offered.

This action changes procedures for establishing harvest specifications and no effects by any alternative on EFH or benthic communities are anticipated beyond those already identified in other NEPA documents for Alternative 1. Changing temporal patterns of fishing may occur under Alternative 3, although this effect, to the extent that it occurs, would be assessed annually. Effects on EFH, target and non-target species, and associated species such as prey species, resulting from harvest specifications will be assessed annually in supporting documents for those actions.

4.7 Coastal Zone Management Act

Implementation of any of the alternatives would be conducted in a manner consistent, to the maximum extent practicable, with 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.

4.8 Effects on State Managed Fisheries

The Alaska Department of Fish and Game manages a number of fisheries in the BSAI and GOA areas. The herring, crab, and salmon fisheries are not affected by the method of setting harvest specifications[13] and will not be further analyzed in this EA/RIR/IRFA. The State fisheries which could be affected are: 1) The parallel groundfish fisheries occurring in state waters which could be affected by those alternatives which change the season opening dates; 2) The state waters seasons established for Pacific cod in the GOA and sablefish in the AI. The GHLs for these fisheries are based upon a percentage of the federal ABC, and in some areas the open season dates are determined by the closing dates of the federal seasons; 3) The demersal shelf rockfish fishery which could be effected by those alternatives which change the season opening dates; and 4) The Prince William Sound (PWS) pollock fishery. The PWS pollock fishery itself would not be affected in any manner by any of the alternatives considered. However the GHL established for the PWS pollock has a direct effect on the ABC established for the pollock fishery in the WYK/C/W area of the GOA. Specifically the GHL for the pollock fishery in PWS is deducted from the combined pollock ABC for the federal WYK/C/W area of the GOA.

The final EA prepared for the action of setting the 2002 TACs for the groundfish fisheries off Alaska analyzed the effects of setting the 2002 TACs over a range of levels on the State of Alaska state waters seasons and parallel fisheries for groundfish in section 4.9 (NMFS 2001a). The direct effect analyzed was the impact over a range of TAC levels on harvest levels in the state managed groundfish fisheries. The effects on harvest levels in state managed fisheries were all determined to be insignificant over a wide range of TACs, except for Alternative 3 which would have reduced the harvest level of Pacific cod in the state waters seasons. and Alternative 5 which would have reduced harvest levels of groundfish in the Pacific cod and sablefish in the state waters seasons and of all groundfish in the parallel seasons. Harvests in these state managed fisheries would have been reduced by more than 50 percent and the effect was deemed significantly adverse (NMFS 2001a). Each year the final EA for the annual groundfish harvest specifications analyzes the impacts of TAC alternatives on state managed fisheries.

The alternatives analyzed here are not believed to have an impact on the state managed groundfish fisheries not already considered, with the possible exception of Alternative 3, because they do not impact the manner in which ABCs, TACs or PSC limitations are set, rather the alternatives analyzed here are procedural in nature and should not change the harvest levels in state managed groundfish fisheries. Alternative 3 may have a direct impact on the management of the state fisheries because of the shifting of the fishing year, as further explained below.

Alternative 1. Status Quo

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[13] Personal Communication with Herman Savikko, Extended Jurisdiction/Fishery Biologist, April 26, 2001, Alaska Department of Fish and Game, Division of Commercial Fisheries, 1255 W. 8th Street, Juneau, AK 99801

Under Alternative 1 there would be no effects on any of the state fisheries, with the exception of the parallel state groundfish fisheries which could close prematurely if during the period the interim specifications are in effect, 25 percent of the annual groundfish TACs are harvested prior to the effective date of the final annual specifications. Such closures (if any) would be modified when the final specifications become effective. Alternative 1 has no additional direct, indirect, or cumulative effects on state managed fisheries not already considered (NMFS 2001a).

Alternative 2. Proposed and Final Specifications before start of fishing year
Option for biennial harvest specifications for GOA and AI species

Alternative 2 and the option for biennial harvest specification for the GOA and AI would not change the seasonal dates of the fisheries and therefore would have no effect on the state managed fisheries. The establishment of the PWS pollock GHL for the next year(s) would be available in a timely manner and so would have no effect on the annual or biennial establishment of the pollock ABC for the combined WYK/C/W area in the GOA. The elimination of the interim specifications would have no effect on state managed fisheries with the exception that the state's parallel groundfish fisheries (along with the federal groundfish fisheries) would not be faced with potential closures while the interim specifications are in effect. This would also be the case for Alternatives 3 and 4 which also eliminate interim specifications. Alternative 2 has no additional direct, indirect, or cumulative effects on state managed fisheries not already considered.

Alternative 3. Issue Proposed and Final Specifications Based on an Alternative Fishing Year Schedule.
Option 1: Set sablefish TAC for January through December time period.
Option 2: Reschedule the December Council meeting to January

Alternative 3 would have the greatest potential for effects on state managed fisheries of those alternatives considered. The state's parallel groundfish fisheries would be affected in the same manner as the federal groundfish fisheries discussed in section 4.1 of this EA.

Alternative 3 may have impacts on the state waters seasons for Pacific cod in management areas where the opening date is dependent upon the closing date of adjacent federal A season Pacific cod fisheries in the GOA. In 2002, those areas are the PWS, Cook Inlet, Chignik, Kodiak, and the South Alaska Peninsula areas. The state's Pacific cod fisheries in the GOA are based on up to 25 percent of the ABC for the GOA and are restricted to jig and pot gear only. Table 4.8-1 shows the end date of the State Pacific cod harvests by area and gear in PWS and the Central and Western GOA for 2000.

Table 4.8-1 Ending dates for harvest of State Pacific cod fisheries in 2000 (ADF&G, 2001)

Gear Type	PWS	Cook Inlet	Kodiak	Chignik	S. Alaska Peninsula
Pot	12/31	12/31	6/10	5/27	4/22
Jig	12/31	12/31	7/29	12/31	7/11

In 2000, the parallel seasons in state waters were concurrent with the federal seasons which had the effect of splitting the seasons in the state waters in some areas. Beginning in 2001, once the state water season opened in an area, it remained open until the GHL for that area was harvested or December 31. In 2001, PWS, Cook Inlet, Kodiak and Chignik remained open from the end of the federal fishing through December. South Alaska Peninsula annual Pacific cod fishery closed on April 8 for pot gear and June 19 for jig gear as the GHL apportionments were reached. Effort in the Chignik state waters season for Pacific cod concluded in the last week of May and effort in the Kodiak pot and jig fishery was mostly completed by the end of June. The GHLs were not reached in these areas and the fisheries remained open through December, 2001.

Under Alternative 3 the federal season for Pacific cod would not open in the GOA until September 1. There likely would not be enough time between the end of the federal fishery and the present ending date (December 31) of the State fishery to allow the GHL to be fully harvested within the one year cycle. As seen in Table 4.8-1, the state waters seasons for the Pacific cod fisheries generally extend beyond late April so that the full GHL may be harvested within the annual TAC period. With 2000 as an example, only the South Alaska Peninsula pot fishery would be able to reach its harvest allocation if the annual TAC was allocated between May 1 and April 30. If the annual time period was shifted, this may result in less harvest of Pacific cod in the state water seasons. The state waters season for sablefish in the AI opens May 15. Harvests in this fishery could also be reduced by a change in the dates of the annual fishing year unless Option 1 is also adopted.

Table 4.8-2 shows the amount of harvest that may be lost with the shift in fishing year under Alternative 3. The values are an over estimation of the net value because of the cost of harvesting the fish is not considered. This loss of harvest may create economic hardship for those that depend on the spring season State Pacific cod fishery and create State management difficulties.

Table 4.8-2 Amount in gross value of State P. cod harvested during State Waters Seasons in the ADF&G Westward Region April 30 to July 1 by area in 2000

Gear Type	Kodiak	Value*	S. Alaska Peninsula	Value	Chignik	Value*
pot	211.5 mt	$285,377	na	na	276.5 mt	$373,081
jig	961.4 mt	$1,297,217	226.6 mt	$305,751	na	na

* based upon $1,349.30 per round wt. mt of pot catcher processor wholesale value in the second half 1999 (Hiatt, 2001).

During 2001, the State Board of Fish (BOF) reviewed issues related to state and federal management of Pacific cod fisheries, including the state waters seasons and parallel state fisheries. For the 2002 season the BOF established an opening date for the Chignik District state waters Pacific cod season of March 1, 2002. This action was taken primarily to insure that participants in the fishery would have a greater opportunity to harvest the GHL. If Alternative 3 were implemented, it would likely result in the BOF adjusting the season dates and possibly other management measures for the state waters seasons for other areas in the

GOA and sablefish in the AI as well. While such actions could mitigate the adverse effects on the state waters Pacific cod seasons in the GOA and AI it would entail additional administrative costs to the State.

The State also manages the demersal shelf rockfish (DSR) fishery in the GOA based on an annual TAC allocation. During the calendar year, a small amount of directed fishing for DSR is allowed until the opening of the halibut and sablefish IFQ fisheries approximately March 15. DSR is then placed on bycatch for the remainder of the IFQ fishery until November 1 so that the halibut fishery will not be constrained by DSR bycatch. After closure of the IFQ fishery, the DSR directed fishery may be reopened to finish harvest of the remaining TAC.

With a shift in the fishing year under Alternative 3, the State would be unable to determine how much directed fishing would be allowed for DSR until after the closure of the IFQ fisheries in November. The DSR directed fishery would have to be limited to the time period between November 1 and approximately March 15. This may cause difficulty in the DSR directed fishery if participants need to know what amount they can harvest for planning purposes at the beginning of the calendar year.

Option 1 to set the sablefish TAC on a January through December schedule would eliminate the potential effects on the State sablefish fishery and DSR fishery described above.

Under Alternative 3, the effects on the state's parallel groundfish and DSR fisheries are unknown due to potential changes in fishing effort seasonally and spatially, the potential effects could be mitigated by Council action in setting directed fishing seasons and PSC apportionments for the federal groundfish fisheries which would likewise affect these state managed fisheries. The impacts on the state waters seasons for Pacific cod are also unknown as potential adverse effects could be mitigated by BOF action to adjust season opening dates and other management measures. Under Alternative 3 the annual GHL established for the PWS pollock fishery would have no effect on the federal pollock fishery in the WYK/C/W area of the GOA. In summary the direct, indirect, and cumulative effects on state managed fisheries under Alternative 3 are unknown.

Option 2 may have an indirect beneficial effect on State fisheries, if the additional time provided scientist results in improved management of target species stock.

Alternative 4. Use Stock Assessment Projections for Biennial Harvest Specifications. For the BSAI and GOA set the Annual Harvest Specifications Based on the Most Recent Stock Assessment and Set Harvest Specifications for the Following Year Based on Projected OFL and ABC Values.

Option 1: Set PSC Limits Annually

Option 2: Set PSC Limits Every Two Years Based on Regulations and Projected Values or Rollovers

Alternative 4 would have the same impacts on the state's parallel groundfish fisheries, the DSR fishery, and the state waters seasons for Pacific cod as on federal groundfish fisheries discussed in Section 4.1 of this EA. The State conducts biennial surveys of the pollock resource during the summers months of odd numbered years, most recently in 2001. The assessment results become available later in the year to establish GHLs for the next two years, most recently 2002 and 2003. If Alternative 4 were adopted to begin setting the TACs in an even numbered year then the ABCs for the WYK/C/W area of the GOA would not be effected. If Alternative 4 were adopted to begin setting the TACs in an odd numbered year then ABCs and TACs for the area would need to be adjusted between the publication of the proposed and final specifications once every two years if the GHL for the pollock fishery were to change. This would likely be a minor adjustment as the PWS pollock GHL has recently averaged 2 percent of the WYK/C/W area ABC. Changes in the GHL have averaged less 1 percent of the WYK/C/W area ABC between assessments. Alternative 4 and its options for setting PSC limits would have no additional direct, indirect, or cumulative effects on state managed fisheries not already considered (NMFS 2001c).

Option A: Abolish TAC Reserves

This option would have would have no additional direct, indirect, or cumulative effects on state managed fisheries not already considered because it has no effect on fishing practices or the amounts of harvest.

Table 4.8-3 Effects of Alternatives 1 through 4 on Harvest Levels in State Managed Groundfish Fisheries

Fishery	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Option A: Abolish Reserves
Pollock PWS (SWS)	N	N	N	N	N
Pacific cod GOA (SWS) Sablefish AI (SWS)	N	N	U	N	N
DSR in SEI	N	N	U	N	N
Parallel Seasons in BSAI and GOA	N	N	U	N	N

N = No effect, U = Unknown SWS = State Waters Seasons

4.9 Effects on the Sablefish and Halibut IFQ and Halibut CDQ programs

Alternative 3 is the only alternative that may have an impact on these programs by shifting the fishing year to start in July. Pacific halibut and sablefish IFQs and CDQ halibut are harvested under an individual fishing quota program managed by NMFS. Since the start of the program in 1995, the harvest time period under these programs has been mid March through mid November, established annually by the IPHC for halibut and adopted by NMFS for the sablefish fishery. These fisheries are conducted concurrently to reduce the amount of discard for both species and for fishing efficiency. Conducting both fisheries at the same time also reduces the resource needs for NMFS Enforcement and Restricted Access Management. The International Pacific Halibut Commission (IPHC) is currently analyzing the potential to change or extend the halibut retention season.

NMFS requires approximately six weeks to conduct an administrative permit process before fishing can occur under any new or revised TAC allocation, regardless of when an allocation becomes effective. Currently, NMFS uses the time period between the end of the fishing year (December 31) and the start of the IFQ season (mid March) to perform a number of management steps. These steps include: 1) establish final TACs, 2) stabilize accounts (landings completed, corrections made and quota transfers are stopped), 3) calculate, print, and mail permits, 4) allow for fair start, and 5) collect IFQ fees. TAC setting requires review and publication in the Federal Register for sablefish, and Governmental approval and publication of the halibut regulations established by the IPHC for halibut. The permit calculation process cannot start until all fishing has stopped and the IFQ accounts are stable because new year's permits are a function of the final account balances from the previous permits. Halibut may not be retained, and directed fishing for IFQ sablefish stops, in mid November although sablefish bycatch which accrues against IFQ permits occurs through December. Some vessels, especially larger freezer vessels, may take 2 to 3 weeks before completing their last landings after the close of the fishery. After landings are completed and information is stable, NMFS calculates overages and underages which apply to next year's IFQ accounts; and also distributes the new TAC to all current quota share holders. New year IFQ permit calculations are completed on or about January 31 at which time the printing and distribution steps begin. The participants in the IFQ fisheries normally are mailed their permits in February so that permits can be received and all participants, even those in remote locations, are able to participate on the opening date of the fishery, which historically has yielded the highest exvessel prices. The processes of implementing TACs, account stabilization; calculating, printing, issuing, and mailing permits; and collecting fees, takes approximately six weeks of time when no fishing may occur between the fishing years. This intermission is also needed to implement revised reporting and recordkeeping requirements and new electronic reporting software; to issue registered buyer permits, and to process IFQ leases and hired skippers applications.

If Alternative 3 was implemented, the annual TAC would be established to be effective with the new fishing year, in July. The "intercession" period would have to occur just prior to that, at a time when the fishing weather and opportunity was best; and the safety issues at a minimum. If the sablefish season were intended to start concurrent with the halibut season in March just after a closed period, there would be two periods during the year in which no sablefish could be harvested. If the sablefish season were not concurrent with the halibut IFQ (and CDQ) season, waste and discard of halibut would occur in the sablefish fishsery; and of sablefish in the halibut fishery. In particular, it is undesirable to allow sablefish fishing in winter, when halibut are deep and have a much more spatial overlap with sablefish, increasing halibut bycatch potential[14]. While the sablefish fishery dates can be adjusted by NMFS with the Council's recommendation, halibut fishing seasons are established by the IPHC and may not coincide with any changes made to the sablefish fishery.

It is possible that the IFQ permits could be issued on the proposed TAC rather than the final TAC. If the TAC and/or area allocations changed between the proposed and final rulemaking and new permits would need to be processed and issued. This is the worst possible scenario due to the potential for two sablefish permitting processes in one year and the additional down time that would be required. There also is a potential for exceeding a quota if the final annual TAC decreased, yet fishing in excess of that had already

[14]Gregg Williams, Senior Biologist, Personal Communication, April 25, 2002, International Pacific Halibut Commission, P.O. Box 95009, Seattle, WA 98145-2009, U.S.A.

occurred. There is also a potential for exceeding an area allocation or even the entire TAC if by the time the final annual TAC was known to decrease, fishing in excess of that amount had already occurred.

Under the current IFQ program, a number of regulation changes may mitigate some of the difficulties of having inadequate time for intercessions between different allocation periods. Multiyear permitting and other program changes could reduce the time needed, or reduce the frequency of stand down periods. Numerous regulation changes may also be made such as: shifting cost recovery program reporting and payment schedules, adjusting the date before which IFQ permits may not be calculated, and revising logbook submission dates. Removing the provision for applying overages and underages to the following year's IFQ permits would mean the following year's IFQ permits could be calculated based solely on quota shares held and the new year's TACs; only transfer activity would need to halt temporarily. If Alternative 3 was implemented, significant management and regulation changes to the IFQ program would be necessary to ensure the sablefish and halibut IFQ programs are implemented concurrently, fairly, and with little disruption.

Option 1 to Alternative 3, setting sablefish TAC on a January through December schedule, would allow NMFS to manage the sablefish IFQ fishery consistent with the halibut IFQ fishery. Option 1 would result in no effect from Alternative 3 on the Pacific halibut and sablefish IFQ and CDQ halibut programs. Option 2 would also have no effect since it only deals with the timing of the Council meeting for final harvest specifications recommendations.

4.10 Effects on the American Fisheries Act Fisheries

An EIS analyzing the impacts of the AFA fisheries was completed in the February 2002 (NMFS 2002). Section 2, Alternative 3 of the AFA EIS describes the action proposed to manage the AFA fisheries (66 FR 65028, December 17, 2001). A final rule is expected to be published in the summer of 2002.

Under the AFA, close to 100 percent of the BSAI directed pollock fishery has been allocated to fishery cooperatives. In all three sectors of the BSAI pollock fishery, cooperatives function as a form of privately-operated individual fishing quota program. Within each cooperative, member vessels are granted an allocation of pollock based on their catch history and are free to lease their quota to other members of the cooperative, or acquire quota from other members to harvest. The catcher/processor and mothership sector cooperatives operate at the sector level in that NMFS makes a single allocation to the sector and the cooperatives are responsible for dividing up the quota among individual participants in the sector. Inshore sector cooperatives are organized around each processor and NMFS makes individual allocations to each cooperative rather than to the inshore sector as a whole.

Alternative 1. Status Quo

The AFA cooperative pollock fishery has been operating under the no-action alternative since 1999 in the catcher/processor sector and since 2000 in the inshore and mothership sectors. While cooperatives have been able to form and function under the no-action alternative, the ability of cooperatives to establish efficient markets for pollock quota has been hampered, to some extent, by the lack of certainty about quotas prior to the start of the fishing year. In 2000 and 2001 NMFS started the fishing year under interim pollock TACs which meant that cooperative allocations also were issued on an interim basis. This meant that each cooperative member had some degree of uncertainty about the total value of his pollock allocation in metric tons. While cooperative members started the fishing season with the knowledge of the Council's final TAC recommendations from its December meeting, they did not have absolute certainty that NMFS would ultimately implement the Council's recommendations, especially given the uncertainty surrounding Steller sea lion management measures.

Alternative 2. Proposed and Final Specifications before start of fishing year
Option for biennial harvest specifications for GOA and AI species

Alternative 2 would represent an improvement over the no-action alternative because final annual co-op allocations could be established prior to the start of the fishing year. Co-op members would have greater certainty that pollock quota leased prior to the start of the fishing year would actually represent quota that could be harvested during the fishing year. As a general rule, greater advance notice of final TAC amounts will result in greater efficiency in the cooperative markets in pollock quota. Implementation of the option to this alternative would have no effect beyond those without the option.

Alternative 3. Issue Proposed and Final Specifications Based on and Alternative Fishing Year Schedule.
Option 1: Set sablefish TAC on a January through December schedule.
Option 2: Reschedule the December Council meeting to January

Alternative 3 would have mixed effects on the management of the AFA pollock fishery. On the one hand, final pollock quotas would be established prior to the start of any pollock fishing which should lead to greater efficiency in cooperative management. However, changing the fishing year would have greater effects on the AFA pollock management regime which is currently based on the calendar fishing year. Adoption of Alternative 3 would affect existing regulations that establish application deadlines for AFA pollock cooperatives and reporting deadlines for annual co-op reports. Initially these changes would be more disruptive than adoption of Alternative 2. Option 1 to this alternative would have no effect because it is limited to the sablefish fishery. Option 2 would provide less time to the AFA pollock industry for planning before the fishing year, but it is unlikely that there would be an effect on the industry with a planning time period reduction from 6 months to 5 months.

This alternative also has the potential to effect the capability to harvest pollock during the B season. Less time will be available in the B season, which may be a problem in years of high TAC. This is covered in more detail in section 5.9 of this document.

Alternative 4. Use Stock Assessment Projections for Biennial Harvest Specifications. For the BSAI and GOA set the Annual Harvest Specifications Based on the Most Recent Stock Assessment and Set Harvest Specifications for the Following Year Based on Projected OFL and ABC Values.

Given that the harvest specifications setting process under Alternative 4 would follow the same schedule as Alternative 2, the effects on the AFA pollock fishery are likely to be the same as for Alternative 2. Implementation of Options 1 or 2 would have no effect on the AFA fisheries because the options affect PSC limits only.

Option A. Abolish TAC Reserves

The AFA provides for the full allocation of the pollock TAC, and therefore, this option will have no effect on the AFA fisheries.

4.11 Summary of Environmental Impacts and Conclusions

To determine the significance of impacts of the actions analyzed in this EA, NMFS is required by NEPA and 50 CFR § 1508.27 to consider the following:

Context: The setting of the action is the groundfish fisheries of the BSAI and GOA. Any effects of the action are limited to these areas. The effect on society within these areas is isolated to the direct and indirect participants in the groundfish fisheries of the BSAI and the GOA. The proposed action has no major changes to fishing practices nor to total allowable harvest amounts and management measures, only administrative changes to the process of setting harvest specifications.

Intensity: A listing of considerations to determine intensity of the impacts are in 50 CFR § 1508.27 (b) and in NOAA Administrative Order 216-6 Section 6. Each consideration is addressed below in order as it appears in the regulations and administrative order.

1. Beneficial and adverse impacts are required to be considered in this action. Environmental components that may be affected by this action include groundfish target species, prohibited species, Steller sea lions, State and AFA fisheries. Retrospective and simulation analyses on the effects of Alternatives 2 and 4 on target species indicated that the level of catch for several groundfish species is likely to decrease but the potential for exceeding the overfishing level is likely to increase compared to the Status Quo. Alternative 3 would likely have an effect between the potential effects from Alternative 1 and Alternative 2. Because the analyses did not take into account mitigation factors such as the Council process and the OY limit for the BSAI, it is unknown if Alternatives 2 through 4 will have an adverse effect on groundfish target species and component of the environment that depend on groundfish target species, such as Steller sea lions. Further, specific impacts resulting from the harvest specifications would be assessed annually in a NEPA document.

Alternative 3 (change in fishing year) could alter fishing patterns which has unpredictable results for the groundfish and State fisheries and may pose difficulties to the BSAI pollock fisheries in times of high TAC regarding meeting the B season allocations and potential higher salmon bycatch levels. However, those changes would be assessed in an annual EA that accompanies the harvest specifications. The Council, State and industry may be able to modify fishing management measures and practices lessening the potential effects of shifting the year and seasons, and in the pollock fishery to ensure full harvest of the B season TAC, and avoid high salmon bycatch. Option 1 to Alternative 3 would remove potential effects on the sablefish IFQ and halibut fisheries.

Because the harvest of groundfish species may have an indirect effect on Steller sea lions, it is also unknown if Alternatives 2 through 4 may have an adverse impact on Steller sea lions. The harvest of groundfish under Alternatives 1 and 3 may not be temporally dispersed as required by Steller sea lion protection measures, if new information indicates that the biomass is less than expected. If adverse effects are expected, emergency rule making can be used to adjust the harvest to a more appropriate level, therefore the potential effect is unknown.

None of the considered alternatives is expected to have an adverse impact on essential fish habitat or on other ESA listed species because regulations currently exist that control fishing effort and practices to mitigate adverse impacts on listed species. No significant impacts are expected on marine mammals, seabirds and ESA listed species, other than Steller sea lions, for Alternatives 1 through 4 beyond those already identified in previous NEPA analyses.

No effects are expected from Option A, to eliminate certain TAC reserves.

2. Public Health and Safety: All alternatives, except Alternative 3, have no new, additional effects on public health and safety. Alternative 3 during years of high TAC for pollock, has the potential to shift fishing activities into October as the industry attempts to harvest all of the B season allocated pollock. The industry may be able to concentrate harvest in the July 1 through August 31 time period to avoid fishing in deteriorating weather in October and therefore the effect on safety may be avoid.

3. This action takes place in the geographic areas of the Bering Sea, Aleutian Islands and Gulf of Alaska. Even though these areas contain cultural resources and ecologically critical areas, no effects on the unique characteristics of these areas are anticipated to occur with any alternative considered with this action.

4. This action may or may not be controversial depending upon which alternative is chosen and level of public concern. At this time a preferred alternative is not identified.

5. The risks to the human environment by implementing the BSAI and GOA groundfish fisheries are described in detail in the PSEIS (NMFS 1998a) and in the draft PSEIS (NMFS 2001c). Because the action analyzed in this EA is an administrative process, conducted consistently with the Steller sea lion protection measures, and does not change basic fishing practices, there are no additional known risks to the human environment, beyond those already analyzed, by taking this action.

6. Future actions related to the setting of harvest specifications may result in significant impacts on the groundfish fisheries and environment. The setting of specifications is an annual process that includes a NEPA analysis with each regulatory action. NMFS has released for public review and comment a draft PSEIS to address the BSAI and GOA groundfish fishery FMPs Future EAs analyzing the setting of harvest specifications will be tiered from this PSEIS once it is finalized.

7. Cumulatively significant impacts are unknown to result with this action because all components of the environment have no known effects from the alternatives and options, beyond those already analyzed. Cumulative effects are those effects that may result from the action and any past, present, or reasonably foreseeable future actions. Cumulative effects may occur if a direct or indirect effect from an action is identified. The harvest specifications process is an annual or biennial process under the alternatives in this EA/RIR/IRFA. Reasonably foreseeable future actions are the continued Federal and State groundfish fisheries. Past actions include the foreign fleet fisheries and other fisheries in the BSAI and GOA. Present

actions include the State fisheries as described in Section 4.8. Details of cumulative impacts of the groundfish fisheries are in Section 4.13 of the draft PSEIS (NMFS 2001c).

Section 4.13 of the Steller sea lion SEIS (NMFS 2001b) contains detailed information on cumulative effects of the Steller sea lion protection measures on the human environment. Alternative 4 in the Steller sea lion SEIS is similar to the current groundfish management regime that would be implemented by the process described in each alternative in this EA/RIR/IRFA. Conditionally significant negative cumulative effects identified with Alternative 4 in the Steller sea lion SEIS include: removal and damage of habitat of particular concern (HAPC) by mobile and fixed gear and substrate modification, spatial and temporal prey removal for Steller sea lions, benthic biodiversity, introduction of nonindigenous species and various socioeconomic effects.

8. Because this is primarily an administrative process, this action will have no effect on districts, sites, highways, structures, or objects listed or eligible for listing in the National Register of Historic Places, nor cause loss or destruction of significant scientific, cultural, or historical resources. This consideration is not applicable to this action.

9. NEPA required NMFS to determine the degree an action may affect threatened or endangered species under the ESA. The only ESA listed species that may be adversely affected by the proposed action Steller sea lion. Alternatives 2 through 4 may affect available biomass of prey species. Alternatives 1 and 3 may affect the temporal dispersion of harvest of prey species. Alternative 1 uses interim specifications during the early part of the fishing year which are based on two year old data. New information available immediately before the commencement of the interim fishery may indicate that the interim harvest levels are not appropriate for seasonal allocation of the annual TAC. The interim value could be adjusted through emergency action if adverse effects on Steller sea lions is anticipated based on new information showing less biomass.

Alternative 3 may posed some difficulties in executing the fisheries in the framework of the Steller sea lion protective measures because of starting the fishing year at a later date. Steller sea lion protection measures specify beginning and ending dates (June 10) for seasonal allocations for BSAI pollock and Pacific cod trawl in a way which may conflict with beginning a fishing year, July 1. With a later fishing year, the end of the fishing year would be in the January-March time period, which is also a period of major activity in the Pacific cod and pollock fisheries. To the extent authorized under the current Steller sea lion protection measures (67 FR 956, January 8, 2002), the participants in the pollock and Pacific cod fisheries may also alter their fishing practices to "save" their fishing allocation towards the end of the fishing year, when it is most profitable. This may cause localized depletion if not carefully monitored to meet Steller sea lion protection measures.

The available biomass of Pacific cod, Atka mackerel, and pollock were identified as a critical element in the Biological Opinion for the 2002 groundfish fisheries and Steller sea lion protection measures. Under Alternatives 1 through 4, the annual harvest levels would be based on stock assessments using data from 7 to 28 months earlier than the fishing year, increasing the possibility that the TAC may not be set at an appropriate level for the current biomass. If information indicates that the biomass is unexpectedly lower in the time period between setting TAC and commencement of the fishing year, harvest levels may be set too high for the current biomass. TAC set too high for the biomass may increase competition between the

Steller sea lions and commercial fisheries. Because the final levels of TAC are dependent on several mitigating factors not taken into account in the analysis used to predict effects on groundfish biomass, it is not possible to know if the predicted concerns from the groundfish effects analysis described above may actually occur. The Division of Sustainable Fisheries is currently consulting with the Division of Protected Resources on the potential adverse effects on listed species that may result from the implementation of Alternatives 2 through 4.

10. This action poses no known violation of Federal, State, or local laws or requirements for the protection of the environment. Section 1.3 describes the legal consideration of tiering this EA off of the PSEIS for the groundfish fisheries (NMFS 1998a). A draft PSEIS (NMFS 2001c) for the BSAI and GOA groundfish fisheries FMPs is available for public review and is a revised draft is expected to be release in the Fall 2002.

11. This action poses no effect on the introduction of nonindigenous species into the BSAI and GOA because it involves the change of an administrative process and not actual fishing practices that may lead to the introduction of nonindigenous species.

5.0 REGULATORY IMPACT REVIEW

5.1 Introduction

This Regulatory Impact Review (RIR) examines the benefits and costs of alternatives to the process by which the North Pacific Fishery Management Council (NPFMC) specifies the annual allowable biological catches (ABCs) overfishing limits (OFLs), total allowable catches (TACs), and prohibited species caps (PSCs) for the groundfish fisheries in the Gulf of Alaska (GOA) and the Bering Sea and Aleutian Islands (BSAI). This review addresses the requirements of Presidential Executive Order 12866.

5.2 What is a Regulatory Impact Review?

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

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

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

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

5.3 Statutory authority

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

5.4 Purpose and need for action

See Section 1.0 of this analysis for a discussion of the purpose and need for this action. In summary, each year proposed groundfish harvest specifications for the Bering Sea and Aleutian Islands area (BSAI) and Gulf of Alaska (GOA) are published in the Federal Register in December. These proposed specifications, recommended for the following year by the North Pacific Fishery Management Council (Council) at its October meeting, list total allowable catch (TAC), acceptable biological catch (ABC), overfishing level (OFL), and prohibited species catch (PSC) limits, and apportionments thereof, based upon specifications effective for the current fishing year. Final specifications based on public comment on the proposed specifications and information made available at the December Council meeting are published in the Federal Register during February or early March. So that fishing may begin January 1, interim regulations are published in the Federal Register in December that authorize the release of one-fourth of each proposed TAC and apportionment thereof, one-fourth of each PSC and apportionment thereof and the first seasonal allowance of pollock and Atka mackerel. These interim specifications are superceded by the final specifications.

The existing harvest specification process is problematic for several reasons. The public is notified and given the opportunity to comment on proposed specifications that often are outdated by the time they are published. The publication of proposed specifications each year can confuse the public, because incomplete and outdated information is provided due to the need to adhere to a strict time line in order to comply with all relevant regulations. Because the interim specifications are based on the proposed specifications, they do not take into account the recommendations contained in the Groundfish Plan Teams' final SAFE documents or the recommendations coming from public testimony, the Science and Statistical Committee, the Advisory Panel, and the Council (at its December meeting). One fourth of the initial TAC and PSC amounts have been found to be an inadequate amount for those fisheries that attract the greatest amount of effort at the beginning of the fishing year. Under the current process, administrative inefficiency exists in taking the regulatory actions necessary to set interim, proposed and final specifications. For these reasons, NMFS seeks to revise the harvest specification process.

The objectives of the proposed action are: (1) to manage fisheries based on best scientific information available, (2) to provide for adequate prior public review and comment to the Secretary on Council recommendations, (3) to provide for additional opportunity for Secretarial review, (4) to minimize unnecessary disruption to fisheries and public confusion, and (5) to promote administrative efficiency.

Market failure rationale

U.S. Office of Management and Budget guidelines for analyses under E.O. 12866 state that

> ...in order to establish the need for the proposed action, the analysis should discuss whether the problem constitutes a significant market failure. If the problem does not constitute a market failure, the analysis should provide an alternative demonstration of compelling public need, such as improving governmental processes or addressing distributional concerns. If the proposed action is a result of a statutory or judicial directive, that should be so stated.[15]

The Secretary determines the ABCs, OFLs, and TACs in the groundfish fisheries in the GOA and the BSAI in response to the statutory mandates of the Magnuson-Stevens Act (MSA). The requirements of the MSA in turn represent a management response to the open access and common property rights that prevail in the GOA and BSAI groundfish fisheries. This action does not, however, address a common property problem per se; it does improve government processes.

5.5 The Four Alternatives

Four alternatives (and associated options) were discussed in detail in Section 2.1. While the reader should refer to that section for detailed descriptions of the alternatives, summaries of the alternatives and options are presented here. To make the discussion more concrete, the summaries presented here are described in terms of their hypothetical impact on the 2004 specifications (assuming the alternatives were in place - that is, the hypothetical dates in this description of the alternatives do not reflect the transitional process by which the Council would move from the status quo to one of these alternatives).

Alternative 1: the Status Quo

Under the status quo alternative, proposed and interim specifications would be published in November or December 2003. The proposed specifications would be based on the actual harvest specifications in 2003. The interim specifications would be equal to one/fourth of the actual specifications in 2003. Note that the interim specifications at the start of the fishing year are based on survey data

[15] Memorandum from Jacob Lew, OMB director, March 22, 2000. "Guidelines to Standardize Measures of Costs and Benefits and the Format of Accounting Statements," Section 1.

that are 16 months old (in this instance 2003 interim specifications will be based on survey data from August 2001). The final specifications that replace the interim specifications will be based on data about 6 months old (from August 2002).

The final specifications would be based on updated information compared to the proposed specifications. The annual biological surveys for 2003 would be completed in August 2003. These data would be supplied by the Resource Assessment and Conservation Engineering (RACE) Division to the Resource Ecology and Fisheries Management (REFM) division, analyzed by assessment authors, and reviewed by the plan teams. The plan teams would finalize the SAFE documents by late November 2003. These would be used by the Council in its early December meeting as the raw material from which it would construct its own 2004 harvest specifications. Following Council approval, the final rule would be prepared by NMFS, and published in February or March 2004, supplanting the interim regulations.

Alternative 2

Under this alternative, the Council would recommend its proposed harvest specifications for 2004 in February, 2003. (Note that this is long before the summer 2003 harvest survey information becomes available. The last survey data used in this instance would be the survey data from summer 2002. The SAFE reports based on this data would become available in January 2003 and would be the input into the Council's February decision.) The Council would make its final decision on the specifications in April 2003.

Following the Council's final decision, NMFS would publish its proposed regulations in June or July 2003. After a public comment period, NMFS would publish final harvest specifications by December 1, 2003. December 1, 2003 is the last date on which the regulations could be published if they are to become effective on January 1, 2004, since a 30 day delayed effective period is required before a published final rule becomes effective under the APA.

Alternative 2 has one option. This option would require determination of the GOA and AI target species TACs biennially. Currently, resource surveys in the GOA and AI are done biennially. Under this option, the stock assessment and rulemaking process for the biennially surveyed species would be done every other year and the ABC recommendations and stock specifications would be established for two years at a time. The GOA summer trawl surveys were last conducted in the summer of 2001, while the AI summer trawl surveys were last conducted in the summer of 2002. Under this option, the AI summer survey in 2002 would be used as the basis for a SAFE report in January 2003 and would serve as the basis for specifications for 2004 and 2005. The GOA summer survey in 2003 would be used as the basis for specifications in 2005 and 2006. Then the next AI survey, in the summer of 2004, would be used for specifications in 2006 and 2007.

Alternative 3

Under Alternative 3, the assessment authors, the plan teams, the SSC, AP and Council, would develop specifications under the Alternative 1 schedule. RACE would provide survey data in September or October, 2003, the assessment authors would report to the Council's plan teams in November, 2003, and the SSC, AP and Council would meet in early December, 2003. The Council would make its specifications recommendations in December, 2003. NMFS would then begin preparation of proposed specifications for publication in January or February, 2004. Final regulations would be published in May or June, 2004. The new fishing year would begin on July 1, 2004.

This would differ from Alternative 1 in several ways. Most notably, the fishing year would begin on July 1 instead of January 1. There would be no interim specifications. The proposed specifications would be published in January or February, 2004, instead of October 2003.

Alternative 3 has one option to set sablefish TAC on a January through December schedule. This option would allow the sablefish IFQ program to be managed concurrently with the halibut IFQ program. A second option would move the December Council meeting to January to provide stock assessment scientists additional time to analyze data and produce reports.

Alternative 4

Under this alternative, the annual survey data would be compiled in the summer of 2002. The plan teams would receive it in September 2002 and begin to prepare the SAFE documents. Preliminary SAFE documents would become available to the Council in January 2003, and the Council would prepare proposed harvest specifications for 2004 and 2005 in February 2003. Final SAFE documents would be prepared for the April meeting and the Council would produce its final specifications for 2004 and 2005 at that meeting. NMFS would then publish the proposed specifications in June or July 2003 and publish a final rule no later than December 1, 2003. The proposed specifications would take effect on January 1, 2004.

These proposed specifications would be in effect for 2004 and 2005. There would be no specifications setting process in 2004. However, during 2005 a specifications process would produce rules for the period 2006 and 2007.

Alternative 4 has two options: (1) set prohibited species catch (PSC) limits annually; (2) set PSC limits every two years based on regulations and for crab and herring use either projected values or rollovers from the previous year.

Options A and B[16]

[16]Options A and B may be applied to any of the four alternatives. These are not the options referred to as Options 1 and 2 to Alternatives 3 and 4.

Under Option A, NMFS would no longer set aside nonspecified TAC reserves in the BSAI and would no longer set aside TAC for GOA reserves. CDQ reserves would be established as a set allocation of the total TAC. This option is independent of the four alternatives or their options, and may be adopted or not adopted with any of them.

Option B would update language in certain sections of the BSAI and GOA FMPs to remove references to foreign fishing and to allocation to foreign fishing, and to update the description of the harvest specification process for the Plan Teams regarding PSC limits apportionments, and allocations. This option will remove obsolete references to foreign fishing in the Introduction, Goals and Objectives, Stock and Area Description, and Management Measures sections of the FMPs. This option is a housekeeping option and is independent of the four alternatives or their options, and may be adopted or not adopted with any of them.

5.6 Description of the groundfish fishery

As noted earlier in the EA, detailed descriptions of the social and economic backgrounds of the groundfish fisheries may be found in the following reports:

Alaska Groundfish Fisheries. Draft Programmatic Supplemental Environmental Impact Statement (NMFS, 2001a). This report contains detailed fishery descriptions and statistics in Section 3.10, "Social and Economic Conditions," and in Appendix I, "Sector and Regional Profiles of the North Pacific Groundfish Fisheries."

"Economic Status of the Groundfish Fisheries off Alaska, 2000" (Hiatt, Felthoven and Terry, 2001), also known as the "2001 Economic SAFE Report." This document is produced by NMFS and updated annually. The 2001 edition contains 49 historical tables summarizing a wide range of fishery information through the year 2000.

Steller Sea Lion Protection Measures Final Supplemental Environmental Impact Statement (NMFS, 2001b. Referred to as "DSEIS" in the remainder of this section) contains several sections with useful background information on the groundfish fishery (although the majority of information provided is focused on three important species - pollock, Pacific cod, and Atka mackerel). Section 3.12.2 provides extensive background information on existing social institutions, patterns, and conditions in these fisheries and associated communities, Appendix C provides extensive information on fishery economics, and Appendix D provides extensive background information on groundfish markets.

Final Environmental Impact Statement for American Fisheries Act Amendments 61/61/13/8 (NMFS 2002) provides a survey of the Bering Sea and Aleutian Islands groundfish fishery paying particular attention to the pollock fishery and the management changes introduced into it following the American Fisheries Act. The information is contained in Section 3.3, "Features of the human environment."

General significance of the groundfish fisheries off of Alaska

In 2000, the most recent year covered by the Groundfish Economic SAFE report, the fishing fleets off Alaska produced an estimated $564.9 million in ex-vessel gross revenues from the groundfish resources of the Bering Sea and Gulf of Alaska. In 2000, groundfish accounted for just over half of the $1,098.5 billion in ex-vessel gross revenues generated off of the Alaska by all fisheries. (Hiatt, *et al.* , 2001, Table 2).

The two most economically important groundfish species were pollock and Pacific cod. Pollock catches generated estimated ex-vessel revenues of $255.8 million and accounted for 45.3 percent of all ex-vessel revenues.[17] Pacific cod was the next most significant groundfish species, measured by the size of gross revenues. Pacific cod generated an estimated $162.8 million in ex-vessel gross revenues and accounted for about 28.8% of all groundfish gross revenues. (Hiatt, *et al.* , 2001, Table 21.

Other groundfish species were economically important as well. These included sablefish ($80.4 million in estimated ex-vessel gross revenues), flatfishes (as a group of species generated $43 million in estimated ex-vessel gross revenues), rockfishes (as a group generated $$9.9 million), and Atka mackerel generating $9.4 million. (Hiatt, *et al.* , 2001, Table 21.

At the first wholesale level, the gross revenue generated by the groundfish fisheries off of Alaska were estimated to be in excess of $1.36 billion. Over half of this, $686.6 million, came from catcher/processors and motherships operating in the Bering Sea and Aleutian Islands (BSAI). Another $399.4 million was generated by shoreside processors operating in the BSAI. In the Gulf of Alaska (GOA) $41.6 million was generated by catcher/processors and $199.1 million was generated by shoreside processors. (NMFS 2001, Table 23).

Information on net returns is scanty since there is little information available on costs. A rough estimate can be made for the BSAI pollock fishery, an important part of the overall fishery. The Alaska Department of Commerce and Economic Development (ADCED) reports that in 2000 the average royalty paid, per metric ton of pollock quota, by commercial operators to CDQ groups was $292.34 (ADCED, page 27). The first wholesale value of retained pollock harvests in the BSAI was about $806 per metric ton in 2000 (Hiatt, pers. comm.). This suggests that royalty payments to CDQ groups were about 36% of the first wholesale price of a metric ton of pollock in the Bering Sea in 2000.

Extrapolating this percent to the gross first wholesale value of the BSAI pollock harvest in 2000, (i.e., $798.1 million dollars [Hiatt, *et al.,* 2001, Table 36]), suggests that resource quasi-rents from the pollock fishery might have totaled about $290 million in 2000. This would be a high estimate of the social value of the pollock fishery that year; an estimate of the true social return would have to make deductions for (a) uncompensated government support expenditures, (b) the excess burden of the taxes supporting the government expenditures; (c) potential depreciation of ecosystem capital (if

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

any); (d) potential threats to endangered species; and (e) income accruing to residents of other countries.

Extrapolation of the royalty percentage to other segments of the groundfish fleet is almost certainly inappropriate. The BSAI pollock fishery operates under the CDQ and AFA programs and is almost certainly more efficient than the other fleet segments. Further, the measure of returns estimated above corresponds roughly to the economists' measure of "producers surplus." This will exceed the actual profits of fishing operations by their annual fixed costs.

Catcher/Processors

Catcher/processors carry the equipment and personnel they need to process the fish that they themselves catch. In some cases catcher/processors will also process fish harvested for them by catcher vessels and transferred to them at sea. There are many types of catcher/processors operating in the BSAI and GOA groundfish fisheries. They are distinguished by target species, gear, products, and vessel size.

Pollock catcher/processors in the BSAI. These vessels (which use trawl gear) are referred to as the "AFA catcher/processors" because of the role played by the American Fisheries Act (AFA) of 1998 in structuring the fishing sector. The AFA: (1) recognized pollock trawl catcher/processors as a distinct industry segment, (2) limited access to the fleet, (3) modified the historical allocation of the overall pollock TAC that the fleet had received, and (4) created a legal structure that facilitated the formation of a catcher/processor cooperative.[18] The pollock at-sea processing fleet has two fairly distinct components - the fillet fleet, which concentrates on fillet product, and the surimi fleet, which produces a combination of surimi products and fillets. Both of these sectors also produce pollock roe, mince, and to varying degrees fish meal.

Trawl Head And Gut (H&G) catcher/processors. These factory trawlers do not process more than incidental amount of fillets. Generally they are limited to headed and gutted products or kirimi. In general, they focus their efforts on flatfish, Pacific cod, and Atka mackerel. Trawl H&G catcher/processors are generally smaller than AFA catcher/processors and operate for longer periods than the surimi and fillet catcher/processor vessels that focus on pollock. A fishing rotation in this sector might include Atka mackerel and pollock for roe in January; rock sole in February; rock sole, Pacific cod, and flatfish in March; rex sole in April; yellowfin sole and turbot in May; yellowfin sole in June; rockfish in July; and yellowfin sole and some Atka mackerel from August to December. The target fisheries of this sector are usually limited by bycatch regulations or by market constraints and only rarely are able to catch the entire TAC of the target fisheries available to them.

[18] There are non-pollock factory trawlers in the BSAI, about 25 'head and gut', or H&G factory trawlers, which target species other than pollock. Those vessels are not covered in this description.

Pot catcher/processors. These vessels have been used primarily in the crab fisheries of the North Pacific, but increasingly are participating in the Pacific cod fisheries. They generally use pot gear, but may also use longline gear. They produce whole or headed and gutted groundfish products, some of which may be frozen in brine rather than blast frozen. Vessels in the pot catcher/processor sector predominantly use pot gear to harvest Bering Sea and GOA groundfish resources. The crab fisheries in the Bering Sea are the primary fisheries for vessels in the sector. Groundfish harvest and production are typically secondary activities. Vessels average about 135 feet LOA and are equipped with deck cranes for moving crab pots. Most pot vessel owners use their pot gear for harvesting groundfish. However, some owners change gear and participate in longline fisheries.

Longline catcher/processor. These vessels, also known as freezer longliners, use longline gear to harvest groundfish. Most longline catcher/processors are limited to headed and gutted products, and in general are smaller than trawl H&G catcher/processors. The longline catcher/processor sector evolved because regulations applying to this gear type provide more fishing days than are available to other gear types. Longline catcher/processor vessels are able to produce relatively high-value products that compensate for the relatively low catch volumes associated with longline gear. These vessels average just over 130 feet LOA. In 1999, there were 40 vessels operating in this sector. These vessels target Pacific cod, with sablefish and certain species of flatfish (especially Greenland turbot) as important secondary target species. Many vessels reported harvesting all four groundfish species groups each year from 1991 through 1999. Most harvesting activity has occurred in the Bering Sea, but longline catcher/processor vessels operate both the BSAI and GOA.

Motherships

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

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

Catcher vessels

Catcher vessels harvest fish, but are not themselves equipped to process it. They will deliver their product at sea to a mothership or catcher/processor, or to an inshore processor. There are a wide variety of catcher vessels, distinguished by target species, delivery mode (i.e., at sea or inshore) and gear type.

AFA-qualified trawl catcher vessels Vessels harvesting BSAI pollock deliver their catch to shore plants in western Alaska, large floating (mothership) processors, and to the offshore catcher/processor fleet. Referred to as catcher vessels, these vessels comprise a relatively homogenous group, most of which are long-time, consistent participants in a variety of BSAI fisheries, including pollock, Pacific cod, and crab, as well as GOA fisheries for pollock and cod. There are 107 eligible trawl vessels in this sector, and they range from under 60 feet to 193 feet, though most of the vessels fishing BSAI pollock are from 70-130 feet. The AFA established, through minimum recent landings criteria, the list of trawl catcher vessels eligible to participate in the BSAI pollock fisheries. There is significant, and recently increasing, ownership of this fleet (about a third) by onshore processing plants.

Non-AFA trawl catcher vessel (greater than or equal to 60 feet in length) Includes all catcher vessels greater than or equal to 60 feet LOA that used trawl gear for the majority of their catch but are not qualified to fish for pollock under the AFA. They are ineligible to participate in Alaska commercial salmon fisheries with seine gear because they are longer than 58 feet. The value of 5 tons of Pacific cod at $0.20 per pound is about $2,200. Non-AFA trawl catcher vessels greater than or equal to 60 feet also tend to concentrate their efforts on groundfish, obtaining more than 80 percent of ex-vessel value from groundfish harvests. Harvests of pollock by these vessels are substantially lower than those of the AFA qualified vessels, because they have not participated in the BSAI fisheries in recent years.

Pot catcher vessel These vessels are greater than or equal to 60 feet LOA and rely on pot gear for participation in both crab and groundfish fisheries. All vessels included in the class are qualified to participate in the crab fisheries under the Crab LLP. Some of these vessels use longline gear in groundfish fisheries. Pot catcher vessels traditionally have focused on crab fisheries, but have recently adopted pot fishing techniques for use in the Pacific cod fishery, which provide a secondary source of income between crab fishing seasons. Historically, the pot fishery in Alaska waters produced crab. Several factors, including diminished king and tanner crab stocks, led crabbers to begin to harvest Pacific cod with pots in the 1990s. The feasibility of fishing Pacific cod with pots was also greatly enhanced with the implementation of Amendment 24 to the BSAI FMP, which allocated the target fishery between trawl and fixed gear vessels.

Longline catcher vessel Vessels greater than 60 feet LOA that use primarily longline gear. None of these vessels are qualified for the BSAI Crab LLP. A large majority of the longliner catcher vessels in this class operate solely with longline fixed gear, focusing on halibut and relatively high-value groundfish such as sablefish and rockfish. Both fisheries generate high value per ton, and these vessels often enter other high-value fisheries such as the albacore fisheries on the high seas. The reliance of these vessels on groundfish fisheries sets them apart from smaller fixed gear catcher vessels permitted to operate in Alaska salmon fisheries with multiple gear types. Overall, this fleet is quite diverse. Most vessels are between 60 and 80 feet long with an average length of about 70 feet.

The larger vessels in this class can operate in the Bering Sea during most weather conditions, while smaller vessels can have trouble operating during adverse weather.

Shoreside Processors

AFA inshore processors There are six shoreside and two floating processors eligible to participate in the inshore sector of the BSAI pollock fishery. Three AFA shoreside processors are located in Dutch Harbor/Unalaska. The communities of Akutan, Sand Point, and King Cove are each home to one AFA shoreside processor. The shoreside processors produce primarily surimi, fillets, roe, meal, and a minced product from pollock. Other products such as oil are also produced by these plants but accounted for relatively minor amounts of the overall production and revenue. These plants process a variety of species including other groundfish, halibut, and crab, but have historically processed very little salmon. In total, the inshore processors can take BSAI pollock deliveries from a maximum of 97 catcher vessels, as of June 2000, according the regulations implemented by the AFA. The two floating processors in the inshore sector are required to operate in a single BSAI location each year, and they usually anchor in Beaver Inlet in Unalaska. However, one floating processor has relocated to Akutan. The two floating inshore processors have historically produced primarily fillets, roe, meal, and minced products.

Non-AFA inshore processors Inshore plants include shore-based plants that process Alaska groundfish and several floating processors that moor nearshore in protected bays and harbors. This group includes plants engaged in primary processing of groundfish and does not include plants engaged in secondary manufacturing, such as converting surimi into analog products (imitation crab), or further processing of other groundfish products into ready-to-cook products. Four groups of non-AFA inshore processors are described below. The groupings are primarily based on the regional location of the facilities: (1) Alaska Peninsula and Aleutian Islands, (2) Kodiak Island, (3) Southcentral Alaska, and (4) Southeast Alaska.

Alaska Peninsula and Aleutian Islands Inshore Plants. In 1999, ten Alaska Peninsula and Aleutian Islands plants participating in the groundfish fishery. Between 1991 and 1999, almost all of the facilities reported receiving fish every year from the BSAI. In 1999, these facilities processed 66,635 round weight tons, of which 43,646 tons (66 percent) was pollock and 19,402 tons (30 percent) was Pacific cod. Also in 1999, 36,652 tons (55 percent of the total) came from the western Gulf of Alaska (WG) and 21,643 tons (32 percent) came from the BSAI.

Kodiak Island inshore plants Most Kodiak plants process a wide range of species every year, although generally fewer plants process pollock than process other species. The facilities processed a total of 101,354 round weight tons of groundfish in 1999, 51 percent of which was pollock and 30 percent of which was Pacific cod. All of the plants receive fish from the central Gulf (CG) subarea every year. Most of the plants also receive fish from the WG and eastern Gulf (EG) subareas.

Southcentral Alaska inshore plants. This group includes governmental units that border the marine waters of the GOA (east of Kodiak Island), Cook Inlet, and Prince William Sound. There have been 16 to 22 Southcentral Alaska inshore processors participating in the BSAI and GOA groundfish fishery every year since 1991. In 1999, there were 18 plants in Southcentral Alaska processing groundfish. All 18 plants reported processing Pacific cod, flatfish, and other species in 1999. In addition, 16 of the 18 reported processing pollock. The facilities processed a total of 10,846 round weight tons of groundfish, 42 percent of which was other species and 31 percent of which was Pacific cod. Virtually all of the plants receive fish from the CG subarea every year. Many also receive fish from the EG subarea, and some receive fish from the WG subarea. In 1998 and 1999, fewer than four processors took deliveries from catcher vessels operating in the BSAI.

Southeast Alaska inshore plants. This group includes plants that border the GOA east of Prince William Sound, and which operate in the inside waters of Southeast Alaska. The Southeast Alaska area has accounted for relatively small amounts of groundfish production, and these have come almost entirely from Petersburg, Sitka, and Yakutat. The main groundfish fisheries are rockfish and sablefish.

Markets

Markets for three of the most important species, pollock, Pacific cod, and Atka mackerel, have been described in detail in by Northwest Economic Associates and Knapp in Appendix D of the *Steller Sea Lion Protection Measures Final Supplemental Environmental Impact Statement* (NMFS, 2001b).[19] The reader is referred to that document for a more detailed report on these markets. The following discussion abstracts Section 5.3.2 ("Prices") of that appendix. This discussion focuses on pollock, Pacific cod and Atka mackerel because (a) the recent research for Appendix D has made information on these species relatively more available than information for other species, and (b) these three species together account for about 83% of groundfish first wholesale revenues in 2000 (Hiatt *et al.,* Table 36).

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

Conditions are different in the market for fillets. Fillets tend to be sold into the relatively competitive U.S. market where there are relatively closer substitutes. Prices received for pollock fillets in that market may be relatively less responsive to changes in the quantity supplied. In this market, price changes would not tend to offset the revenue impacts of quantity changes.[20]

[19]Available on the Internet at the URL given in the references.

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

Pacific cod has a relatively close substitute in Atlantic cod and its price is unlikely to be strongly responsive to quantity changes. Atka mackerel from Alaska is a popular product in Japan and South Korea where most of it is consumed, and has relatively few strong substitutes. Its price is likely to be responsive to quantity changes. Thus Pacific cod price changes are relatively unlikely to modify quantity changes, while Atka mackerel prices are likely to modify quantity changes.

Safety

Commercial fishing is a dangerous occupation. Lincoln and Conway of the National Institute of Occupational Safety and Health (NIOSH) estimate that, from 1991 to 1998, the occupational fatality rate in commercial fishing off Alaska was 116/100,000 (persons/full time equivalent jobs), or about 26 times the national average of 4.4/100,000.[21] Fatality rates were highest for the Bering Sea crab fisheries. Groundfish fatality rates, at about 46/100,000 were the lowest for the major fisheries identified by Lincoln and Conway. Even this relatively lower rate was about ten times the national average.(Lincoln and Conway, page 692-693).[22] The danger inherent in commercial groundfish fishing was underscored by two accidents in March and April of 2001. In March, two men were lost when the 110 foot cod trawler Amber Dawn sank in a storm near Atka Island. In April, 15 men were lost when the 103 foot trawler-processor Arctic Rose sank about 200 miles to the northwest of St. Paul Island in the Bering Sea, while fishing for flathead sole.

However, during most of the 1990s commercial fishing appeared to become safer. While annual vessel accident rates remained relatively stable, annual fatality per incident rates (case fatality rates) dropped. The result was an apparent decline in the annual occupational fatality rate.[23] From 1991 to 1994, the case fatality rate averaged 17.5% a year; from 1995 to 1998 the rate averaged 7.25% a year. Lincoln and Conway report that "The reduction of deaths related to fishing since 1991 has been associated primarily with events that involve a vessel operating in any type of fishery other than crab." (Lincoln and Conway, page 693.) Lincoln and Conway described their view of the source of the improvement in the following quotation.

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

[22]The NIOSH study does not cover 1999-2001. Results updated through 1999 should be published in the summer of 2001; however, these results are not available at this writing. (Lincoln, pers. comm.). The rates are based on an estimate of 17,400 full time employees active in the fisheries. This estimate of the employment base was assumed constant over the time period. However, various factors may have affected this base, including reductions in the size of the halibut and sablefish fleets due to the introduction of individual quotas. These estimates must therefore be treated as rough guides. The updated results due in the summer of 2001 should include an updated estimate of the number of full time equivalent employees as well.

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

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

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

Nevertheless, despite these implications, the exact determinants of incident rates, fatality rates, and other measures of fishing risk, remain poorly understood. In the current instance, reductions in the TAC would reduce fishing operation profitability and could lead fishermen to skimp on safety expenditures and procedures. Conversely, reduced profitability may reduce the number of active fishing operations and the numbers of vessel and fishermen placed at risk. The net impacts are difficult to untangle with our existing state of knowledge.[24]

*CDQ*s

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% 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% of the remaining groundfish TACs, 7.5% of the prohibited species catch limits, and 7.5% of the crab guidelines harvest levels were added to the CDQ program.

5.7 Introduction to cost and benefit analysis

The stocks of groundfish in the waters off of Alaska are a capital asset belonging to the people of the United States. Each year these stocks provide a number of different types of "income" to the people of the United States; this income includes the net revenues generated by the commercial fisheries, annual net benefits to sport, subsistence, and personal use fishermen off of Alaska, and the value of the set of ecological services (for example, Steller sea lion prey) that the fish stocks provide each

[24] A more detailed discussion of safety issues may be found in Section 1.3.3.4 of Appendix C to the Steller Sea Lion Protection Measure DSEIS.

year. The annual income through time associated with the resource stock has an associated present value.[25] Different sets of management decisions by the North Pacific Management Council and the Secretary of Commerce will produce different time paths for the groundfish stocks, and these will have different associated present values.

The alternatives considered in this EA/RIR/IRFA will have varying impacts on decision making by the NPFMC and the Secretary. They will affect the quality of the scientific information available, the opportunities and the value of the public input received through the Council and mandated notice and comment processes, and the amount of time available to decision makers to review this information. The impacts on the decision making process may affect the quality of those decisions, and through this means, may produce changes in the present value of the groundfish stocks, when compared to the baseline present value. These changes in present value are the appropriate conceptual measure for the benefits flowing from the different alternatives.

It is impossible to do a monetary benefit-cost analysis based on this conceptual scheme. The state of the available biological and economic knowledge does not permit it. On the economic side alone, we do not have the cost information, the models of operational behavior, or the demand studies that would allow us to estimate net returns and changes in net returns. Moreover, and extremely importantly, this is an action to change the institutional context within which responsible persons (assessment authors, Council Plan Teams, SSC and AP committees, the NPFMC, and the Secretary of Commerce) will make future decisions. The decisions these persons may make are free acts - not known to us at this time. The benefits or costs of the action will depend crucially on these decisions and cannot therefore be determined. For these reasons, this RIR focuses its attention on a set of outcomes from this action that may affect the benefits and costs. In some cases it has been possible to indicate quantitative and monetary dimensions of these outcomes. These are reported where available.

This RIR reviews the outcomes of the alternatives under three general headings. First, some of the benefits and costs will flow from changes in the process by which the specifications are determined. For example, alternatives differ in the scope they provide for APA mandated rulemaking notice and comment. These procedural effects are discussed in Section 5.8, on "Impacts on the harvest specifications process." Second, Alternative 3 changes the fishing year. This alternative may impose costs and benefits by producing changes in fishing patterns. These potential impacts are discussed in Section 5.9, on "Change in fishing year under Alternative 3." Third, some of the alternatives may have implications for future harvests and stock sizes. A discussion of the reasons

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[25]The benefits and costs from alternative courses of action are often felt at different points in time. One alternative may have somewhat lower net benefits, but may produce them sooner, while another alternative may have larger net benefits but at a later date. Present value analysis is necessary to make benefits and costs at different times comparable. Economists typically discount sums of income received in future years in order to convert them to present value equivalents. This is necessary since current income usually is considered more valuable than income in the future. After all, $100 dollars received now could be invested, perhaps at 5% a year, and be worth $105 a year from now. Discounting adjusts these sums into equivalents. For example, in the case just discussed, $105 a year from now might be worth ($105/1.05) = $100 now. That is, $100 invested at 5% now would be worth $100*1.05 = $105 a year from now.

for this, a description of two modeling exercises meant to see if the potential impact is practically significant, and a discussion of the benefits and costs, may be found in Section 5.10, on "Changes in harvests and biomass under Alternatives 2, 3, and 4."

5.8 Impacts on the harvest specification process

The current harvest specifications process is described in Section 1.2 of this EA/RIR/IRFA. An additional description can be found in Section 2.7.3 of the Alaska Groundfish Fisheries Draft Programmatic Supplemental Environmental Impact Statement.[26] (NMFS 2001c)

Alternatives 2, 3 and 4 would alter the process by which the harvest specifications are developed and implemented in ways that may affect the transparency of the process, the opportunities for public input, and the quality of the analysis and decision making. These different elements are discussed below under the following headings: (1) opportunities for scientific analysis; (2) opportunities for public notice and comment; (3) environment for decision-making; (4) cost changes associated with these opportunities; (5) private sector planning horizons; (6) increased forecast uncertainty.

Opportunities for scientific analysis

For the purposes of this discussion, the annual analytical process behind the specifications is assumed to start when the data from the annual summer biomass surveys conducted and reported by the NMFS Alaska Fisheries Science Center's Resource Assessment and Conservation Engineering (RACE) Division are delivered to the Center's Resource Ecology and Fisheries Management (REFM) Division for analysis. The surveys are assumed to be completed in August, with data delivery in September or October, under each of these four alternatives. The annual process formally ends with publication of the final harvest specifications in the Federal Register. However, for the purpose of this discussion of the scientific analysis, the practical end is assumed to take place when the Council makes its final recommendations for specifications (additional analysis past this point - for example public review and comment or the preparation of the Final Regulatory Flexibility Analysis (FRFA) - is treated here implicitly as a part of the Secretarial decision-making and rulemaking process).

Figure 5.8-1 illustrates the changes in time available for analysis under the different alternatives. The analytical process takes the same amount of time under Alternatives 1 and 3 (although, Option 2 to Alternative 3 would provide one additional month compared to Alternative 1). Four additional months are available under Alternatives 2 and 4 .

[26]Available on the Internet at the following URL: http://www.fakr.noaa.gov/sustainablefisheries/seis/intro.htm

Figure 5.8-1 Period from summer survey to final Council action under each alternative

Alt.	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.
1	Summer survey	Survey data starts to become availabl e.Prelim inary Plan Team Meeting.	Survey data available; ; Draft EA/ IRFA; Council's proposed specs. Prelim. SAFE	Final Plan team meeting	Final SAFE; Draft EA/RIR/ IRFA; Council's final specs.				
2	Summer survey	Survey data starts to become available in September. Data analysis and model review				Plan Team Meeting. Prelim. SAFE; Draft EA/RIR/ IRFA	Council's proposed specs.	Plan Team Meeting	Final SAFE; Council's final specs.
							Revisions to EA/RIR/IRFA		
3	Summer survey	Survey data starts to become availabl e .Prelimi nary Plan Team Meeting.	Survey data available; Prelim. SAFE; Draft EA/IRFA; Council's proposed specs.	Final Plan team meeting	Final SAFE; Draft EA/RIR/ IRFA; Council final specs.	**Option 2:** Final SAFE; Draft EA/RIR/ IRFA; Council final specs.			
4	Summer survey	Survey data starts to become available in September. Data analysis and model review				Plan Team meeting. Prelim. SAFE; Draft EA/RIR/ IRFA	Council's proposed specs.	Plan Team Meeting	Final SAFE; Council's final specs.
							Revisions to EA/RIR/IRFA		
Notes: Based on Tables 2.2 and 2.3, and the description of Alternative 3 in this EA/RIR/IRFA.									

It is assumed that the RACE survey data will continue to be delivered in the early fall. Currently the RACE Division generally releases final biological survey data in this time frame. When released, the RACE data typically have gone through the normal editing/checking process, and are generally close to the final survey data and will remain the same for many years. Alternatives 2, 4, and (to some extent) Option 2 to Alternative 3 would provide RACE some flexibility to provide the data sets at a later point in time if that were necessary, and may provide some benefits compared to Alternatives 1 and 3. However, because RACE is currently able to provide carefully audited data in a timely manner, these benefits are assumed to be relatively small.

Under Alternative 1, (the status quo), and Alternative 3, stock assessment analysts in the Alaska Center's REFM Division use the RACE data to prepare the Stock Assessment and Fisheries Evaluation (SAFE) reports updating biological models with the latest survey data, and providing recommendations on appropriate ABC and OFL levels for the individual stocks. The preparation of these reports needs to be done quickly, since the survey data may only become available in September or October, and the stock assessment reports must be completed for the NPFMC's Plan Teams for their November meetings.

In November, these reports are peer reviewed at the final meetings of the NPFMC's Plan Teams. These teams make ABC and OFL recommendations to the Council for its December meeting. Additional scientific peer review is done at the Council meeting by the Council's Scientific and Statistical Committee (SSC). Peer review at the November plan team meeting and the December SSC meeting may be constrained to some extent by the short lead time with which the stock assessment analyst's reports are delivered. Option 2 to Alternative 3 would move the December Council meeting to January. This would provide the stock assessment authors additional time to analyze data and produce reports for Council consideration.

Under Alternatives 2, 4, and Option 2 to Alternative 3, more time is available for the analysts to use in conducting their analyses, preparing the SAFE reports, and for review by the members of the NPFMC's groundfish plan teams prior to their meetings. This may permit more careful analysis and more detailed peer review. The advantages for SSC peer review may be somewhat less since the SSC currently receives the SAFE analyses several weeks in advance of their meetings. Nevertheless, there may be some advantage for this part of the peer review process as well.

Several different types of environmental and socio-economic analysis of the specifications are called for under different statutes and executive orders. The National Environmental Policy Act (NEPA) calls for evaluation of the impacts of the specifications on the human environment. This includes the impacts on nature and on the human activities that are affected by the natural impacts. The Magnuson-Stevens Act has several national standards that address the socio-economic considerations. The Regulatory Flexibility Act calls for an evaluation of the impact of the specifications on small entities. Executive Order 12866 calls for a cost-benefit analysis of the specifications. All of these acts and orders require a review of a set of alternatives.

Two aspects of Alternative 1 (the status quo) make these analyses difficult to complete in a timely manner, and limit their usefulness. First the proposed specifications, published in the Federal Register in November, may be weakly related to the final specifications that will be published following the December Council meeting. The proposed specifications for a new year simply "carry forward" the specifications for the preceding year; they do not account for new information obtained from biomass surveys and observers during the past year. The final specifications will. As noted in Section 1.3 of this EA/RIR/IRFA, there can often be differences between these two sets of specifications. Environmental and socio-economic analysis prepared for the Council's October meeting and for the publication of the proposed rule, will not address the specifications that may actually be adopted, and would be of limited usefulness. Time constraints makes it difficult to integrate NEPA and the other required analyses earlier into the decision making process. The agency is currently investigating methods for regulatory streamlining. Efforts to incorporate NEPA analyses into earlier stages of decision making are an important component of regulatory streamlining.

Second, the time period between the Council plan team's ABC and OFL recommendations and the Council's December decision-making meeting is very short. The formal delivery of the plan teams' recommendations to the Council for distribution to the SSC, the AP, and its membership, takes place almost immediately after the Plan Teams' meeting, but this only leaves the Council, SSC and AP about two weeks to review these documents. This short time frame makes detailed analysis extremely difficult and does not allow additional time for analysis of data that may be unusual.

Alternative 3 does not address this issue in a meaningful way and does not provide benefits over Alternative 1. Under Alternative 3, analysis would need to be completed by the December Council meeting. There would be no additional time to produce a socio-economic analysis following the November plan team meetings. Option 2 to Alternative 3 does provide an additional month for the Plan Teams to prepare their SAFE documents, more analytical benefit than Alternative 1 but less than Alternatives 2 and 4.

Alternatives 2 and 4 lengthen the time available for analyses considerably. If the plan team meetings change to January, there would be at least an additional month to complete the individual stock assessments for the preliminary SAFE documents. Moreover, the documents prepared at this time would better reflect specifications alternatives which would actually underlie the decision-making process of the Council in February and April.

Opportunities for public notice and comment

The four alternatives may affect the opportunities for notice and comment in two ways. First, the alternatives have different implications for the quality of the information provided to the public and on which they may comment. Second, the alternatives affect the time and opportunities for public input into the decision-making process. Alternatives 2 and 4 provide the best opportunities for notice and comment on meaningful specifications, followed by Alternative 3, and then Alternative 1.

Under Alternative 1, proposed specifications for a year, published following the October Council meeting, and prior to the preparation of the plan team SAFE reports, are generally developed by rolling over the specifications used in the previous year. For example, the actual 2002 specifications become the proposed specifications for 2003. Final regulations are published in late February or March, following the recommendations by the Plan Teams and the Council in December. However, as detailed in Section 1.3, the final regulations are not based on the same annual stock survey data as the proposed regulations. This means that the public comment period that follows the publication of the proposed specifications (and the associated IRFA) provides little or no actual opportunity to comment on these regulations. Moreover, as noted above, the time constraints and limited information available before the publication of the proposed specifications mean that it is very difficult for analysts to prepare useful environmental or socio-economic analyses of the proposed specifications, or of the final recommendations from the November Plan Teams meetings, for the Council to use for its decision-making in December.

Alternatives 2 and 4 provide improved opportunities for public comment on the decision making process. Under these alternatives, more time will be available for the preparation of the SAFE documents and associated environmental and socio-economic analyses. While final SAFE documents are now due in November, the preliminary SAFE documents and associated draft analyses would become available in January under these alternatives. These preliminary documents would be available before the SSC, the AP, and the Council take up the proposed specifications in February. Opportunities would exist for the Council to require revision of these documents before release to the public. The public should have opportunities to review these documents before scheduled final action by the Council in the April meeting. The proposed specifications, published in the Federal Register following the Council's April meeting would reflect mature consideration by the Council about what it wanted to adopt and associated analyses should be of a high quality. A public notice and comment period would be provided on harvest specifications that reflect the Council's recommendations for final harvest specifications.

Alternative 3 falls between Alternatives 2 and 4, and Alternative 1. Under Alternative 3, the proposed specifications would be adopted by the Council at its December meeting following an analysis of survey data similar to that followed under Alternative 1. NMFS would be able to publish the proposed specifications in January or February, allowing public comment on proposed specifications directly related to the final specifications. Publication of final specifications would be expected in May or June.
Option 2 to Alternative 3 would postpone the December Council meeting, and Council recommendations of specifications, from December to January. Since the Plan Team meetings would still take place in November, this would increase the time between the Plan Team meetings and the Council meeting by one month. The Plan Team meetings are public meetings and are attended by members of the public and representatives of industry and environmental groups. The one month delay in the Council meeting will therefore give these interested persons an additional month for informal consideration of information used by the Plan Teams to develop the SAFE documents.

Environment for decision-making

The four alternatives may affect the environment for decision-making in two ways. Through their effects on opportunities for analysis and notice and comment, they may affect the quality of the information available to decision makers. Second, the alternatives affect the time and opportunities for decision makers to consider the available options. The improved notice and comment opportunities should ensure that decision-makers receive the fullest input from interested and knowledgeable stakeholders and provide additional opportunity for the provision of new scientific information, and review of information already provided.

The alternatives also have implications for the time available to decision-makers to consider the consequences of their actions. Alternative 1 (status quo) does not increase the available time. Alternatives 2 and 4 do. Under Alternatives 2 and 4, the Council will review realistic specifications alternatives in February and April. The Secretary will receive the Council's recommendations following the April meeting and will have time for mature consideration during a complete notice and comment process. Alternative 3 provides additional time for notice and comment, but not as much as Alternatives 2 and 4. Option 2 to Alternative 3 would reduce the amount of time for rule making by one month, by shifting the time into the analysis part of the process. Less time would be available to consider comments before the specifications are final. Alternative 3 requires a final rule in May or June, while Alternatives 2 and 4 do not require the final rule until the end of November.

Alternatives 2 and 4 offer some prospect of taking account of biomass surveys in the year before the specifications year. Technically, for the fishing year 2004, these alternatives would involve specifications based on the biomass surveys in 2002. The year 2003 would be spent on Council deliberations and rulemaking for the 2004 specifications. However, the 2003 summer survey information should become available in September or October 2003. This information could become available before the October Council meeting, and would become available before the final specifications had to be published. If the Council chose to respond to this new information by making substantive changes to the specifications, these changes would required regulatory action. Under NMFS policy, an emergency rule may be used to adjust TAC if there is a potential for overfishing or for an economic emergency (62 FR 4421, August 21, 1997). Use of an emergency rule for adjustments is more likely for purposes of stock conservation than for other reasons due to statutory responsibilities to protect fish stocks.

Because Alternative 3 adjusts the fishing year to July through June, there is the potential for new information to become available during the fishing year (in October) that may lead to a mid year adjustment in harvest specifications for the January through June time period. The change would need to be significant enough to justify an emergency action under the Magnuson-Stevens Act.

Additional regulatory action would take up analytical resources, occupy the Council at its October and December meetings, and impose a new rulemaking responsibility on NMFS Sustainable Fisheries. The costs associated with this activity would offset some gains from the longer rulemaking lead time. Furthermore, the additional regulatory action would offset some of the gains obtained from greater opportunities for notice and comment. It is possible that the annual opportunity to revise specifications that are too high for biological reasons would impose a responsibility on the REFM and RACE scientists at the Alaska Fisheries Science Center to review the current year survey data faster and more carefully than contemplated under Alternatives 2 through 4. This would increase the analytical burden.

Cost changes associated with these opportunities

The Option for Alternative 2, and Options 1 and 2 for Alternative 4 all involve alternative timing for a portion of the harvest specifications. The Alternative 2 Option would include biennial TAC rulemaking for target species on a biennial survey schedule. Also Option 2 to Alternative 4 would set PSC limits biennially instead of annually, as in Option 1 to Alternative 4. The Alternative 2 Option and Option 2 to Alternative 4 may lead to reduction in analytical, decision making, and regulatory inputs to the harvest specifications process.[27] Option 1 to Alternative 4 would establish annual PSC limits, requiring annual rulemaking for this portion of the harvest specifications. Additional resources would be required for the annual PSC limits, diminishing the resource savings that could be realized with the biennial harvest specifications process under Alternative 4.

Alternatives 2, and 4, and less so Option 2 to Alternative 3 provide additional time for completion of survey analysis and data modeling. Either the existing analysis would be stretched over this additional period, without the application of additional person-hours to complete the analysis, or advantage would be taken of the additional time to do increased data analysis. If additional person-hours are used, the cost of completing the analysis will be higher than otherwise.

There are administrative costs associated with Option 2 to Alternative 3. The Council schedules its meetings up to three years in advance. Changing the December Council meeting to January would require rescheduling with meeting facilities and meeting participants. Some meeting locations could potentially be changed which may result in loss of deposits on cancelled reservations. The Council may also chose to maintain at least two months between Council meetings, which would require rescheduling February, April and June meetings to March, May and July, compounding the problem of rescheduling meetings over a three year period. The International Pacific Halibut Commission also meets in January. At least one member of the Council is also a member of the IPHC, and Council meeting attendees may also need to attend the IPHC meeting.

Increased forecast uncertainty

Under Alternatives 2, 3 and 4, the time period between receipt of the most recent survey data and the specifications year will be increased. Assuming that the most recent data is the best available data, this increases the uncertainty of biomass forecasts for the specifications year. The increase in the time period will be least for Alternative 3 (about six months), somewhat greater for Alternative 2 (9 months), and greatest of all for the two year projections under Alternative 4 (9-21 months). This increased forecast uncertainty may have important implications for annual harvest and biomass levels, particularly under Alternatives 2 and 4. However, note that under Alternatives 2 and 4, the prospect of taking additional regulatory action late in the year while the final harvest specifications are actually published may reduce this source of uncertainty. These are discussed in detail below in Section 5.9.

Private sector planning horizons

Table 5.8-2 illustrates the planning horizons available to entities affected by the specifications process under the different alternatives. These entities include the fishing firms harvesting the quotas, processors to whom they deliver, coastal governmental entities depending on a share of State of Alaska raw fish tax revenues, CDQ groups and communities harvesting CDQ allocations, AFA harvesting co-ops, and other entities. Alternative 1 would provide the shortest planning horizons

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[27] These changes raise issues with respect to the interaction of long term harvest projections and fishery biomass trends which are discussed in detail in the Section 5.10 on "Costs."

available to these entities.   Under Alternative 1, the Council would determine its final specifications in early December, and the fishing year would begin in the following January.

Alternative 3 would extend this planning horizon somewhat. The Council would recommend its final specifications in December, as under Alternative 1, but the fishing year would not begin until the following July. Affected entities would have six months in which to plan. Option 2 to Alternative 3 would reduce this planning period by one month. Alternatives 2 and 4 would extend the planning period considerably. Under Alternative 2, the Council would recommend its final specifications in April for a fishing year beginning the following January. The planning horizon is extended to eight to nine months. Under Alternative 4, the planning horizon for the first year is eight to nine months, while the planning horizon for the second is 20 to 21 months.

Table 5.8-2 **Number of months between final Council action and start of the fishing year**

Alternative	Month of final Council action	Start of fishing year	Months difference
1	December	January	less than one*
2	April	January	almost nine
3	December	July	seven
3, Option 2	January	July	six
4	April	January	Depends on year, almost nine for first year, almost 21 for second year

* Even though the fishing year begins in January, the first 3 months of the year is managed using interim specifications based on the previous year's TACs. In reality, the management of the fishing year based on the Council's recommendations does not occur until the final regulations are effective in late February or March.

Longer planning horizons could be a benefit to many entities. For example, Alternatives 2, 3, and 4 may be an improvement over the no-action alternative because final annual American Fisheries Act (AFA) co-op allocations or CDQ allocations could be established prior to the start of the fishing year. Co-op or CDQ group members would have greater certainty that pollock quota leased prior to the start of the fishing year would actually represent quota that could be harvested during the fishing year. As a general rule, greater advance notice of final TAC amounts will result in greater efficiency in the cooperative markets in pollock quota. Alternative 4 would have similar effects.

One factor that may limit the benefits to these entities is the potential willingness of the Council and the Secretary to intervene late in the process or even during the fishing year given new information under Alternatives 2 through 4. This possibility was discussed above. If this became a common practice, it would offset some of this enhanced planning capability

5.9 Changes in fishing year under Alternative 3

Changes in starting dates for groundfish fishing year

Alternative 3 is very similar to Alternative 1, except that, by beginning the fishing year on July 1 rather than on January 1, the need to publish interim specifications is avoided and the notice and comment period is made more meaningful.

A hypothetical example is used here to review the details of Alternative 3. Under Alternative 3, survey data would be received from the RACE Division in September or October of a year such as

2005. Assessment authors would work with these results and generate assessment reports for review in Council plan team meetings in November 2005. In early December 2005, the plan team reports would be reviewed by the SSC, AP and the Council at the Council meeting and the Council would prepare its preferred specifications alternative.

The Alternative 1 and Alternative 3 approaches will already have diverged by this point. Under Alternative 1, NMFS would have published proposed specifications in October, essentially rolling over the 2005 specifications into 2006. By January 2006, NMFS would also have published interim specifications allowing fishermen to harvest one-fourth of the proposed specifications. However, under Alternative 3, none of this would have happened.

Under Alternative 3, NMFS would publish proposed specifications following the December 2005 Council meeting (rather than in October) and a set of final harvest specifications in May or June 2006. These final specifications would be effective on July 1, 2006. There would be no interim specifications under Alternative 3. Option 2 to Alternative 3 would require the Council to postpone its December meeting until January, and to make its specifications recommendation actions then.

Alternative 3 has some advantages over Alternative 1 because it avoids the interim specifications, because it permits proposed specifications that are based on assessment author, plan team, SSC, AP and Council decision-making for the coming year, and because it provides improved opportunities for notice and comment. However, it does create problems that are unique to it (among the alternatives).

Under Alternatives 2 and 4 the fishing year remains unchanged. As under Alternative 1, the fishing year will begin in January and end in December. However, Alternative 3 changes the date during the year at which the fishing year begins; Alternative 3 will begin the fishing year on July1. The difference between Alternatives 1, 2, and 4 and Alternative 3 is shown below in Table 5.9-1.

Table 5.9-1 Comparison of fishing years under Alternatives 1, 2, and 4, Alternative 3, and halibut/sablefish IFQ season (in 2006 and 2007).

Al t.	Jan '06						Jul '06						Jan '07					June '07
1,2,4																		
3																		
IFQ																		

Notes: Uniformaly shaded areas show fishing years under Alternatives 1 and 2. Variable shading shows halibut and sablefish IFQ seasons.

This may have important implications. Under Alternatives 1, 2, and 4 the fishing year corresponds to the calendar year. Within the calender year there are actually many different fishing seasons for different groundfish species. However, under these alternatives, none of these seasons (or their associated allowable harvests) fall within two fishing years. Under Alternative 3, the fishing year begins in the middle of the calendar year and in the middle of the BSAI pollock and Pacific cod fishing seasons. The potential effects of the seasonal overlaps are further explained below in this section.

Fishing seasons and the fishing year

If current fishing seasons, and the division of specifications between the seasons, naturally match the new fishing year, or can be made to match the new year, there may be little problem. Table 5.9-2 discusses the seasons for the most important directed groundfish fisheries in the BSAI and discusses the implications for the proposed July-June fishing year, while Table 5.9-3 does so for the GOA.

Table 5.9-2 Timing of directed fishing seasons for major BSAI groundfish stocks with respect to a July-June fishing year

Species	
Pollock	Currently (2002) there is a fishery in the EBS, but under current Council recommendations fishing will also be allowed in the AI in 2003. Steller sea lion measures constrain the fishery to an "A"/"B" 40/60 TAC split. The "A" season ends, and the "B" season begins on June 10. Active "B" season pollock fishing begins on June 10 and lasts through October creating a conflict with a fishing year that begins on July 1. However, until recently the "B" season began at the end of July or in August. The June 10 starting date is a recent innovation associated with Steller sea lion protection measures, limited portions of the TAC have been taken in June in recent years (0.28% in 2000 and 2.1% in 2001). In years of high TAC, there may be difficulties with harvesting the full B season apportionment before the end of October, otherwise a change to July 1 may not impose a serious burden on the fishermen.
Pacific cod	This TAC is divided among a large number of fleet segments with "A" and "B" seasonal apportionments that vary by fleet segment. The "A" season ends for most of these fisheries on June 10, but the harvests will generally have actually been completed in April. The "B" season for pot gear vessels begins on September 1 and therefore creates no conflicts with a July-June fishing year. However, "B" seasons for hook and line catcher/processors, hook and line catcher vessels, trawl catcher vessels, and trawl catcher/processors all begin on June 10. While these seasons and seasonal TAC allocations overlap the proposed fishing year start date, halibut PSC limits constrain the hook-and-line fishery so that no fishing takes place around July 1. Halibut PSC releases occur on January 1, June 10, and August 15. The January release is used by June 10. Currently, no halibut are actually released on June 10, so no fishing takes place. The next actual halibut release takes place on August 15, and that is when fishing resumes. Moreover, while trawl fishermen could fish in late June and early July, they do not to any great extent. A July 1 fishing year may thus not impose serious costs. The seasons for pot CDQ fishermen and for small boat fixed gear are continuous through the year. The allocation of the CDQ share of the TAC among the CDQ groups is similar to the operation of an IFQ program. As discussed earlier, the choices these groups make about when to harvest their allocations should not be affected by the start date for the fishing year. The case is not clear with respect to small boat fixed gear operations.
Sablefish	Managed under IFQs. The fishing season opens in mid-March and closes in mid-November. The July-June fishing year may impose important costs on this fishery due to the need for a long no-fishing period between fishing years and to the convenience of having this period in the winter months. The option to Alternative 3 would eliminate these potential costs. This issue is discussed at length in Section 4.9 of this EA/RIR/IRFA, and also below in this section.

Species	Seasons
Atka mackerel	This AI TAC has an A/B seasonal apportionment with a 50/50 split. The first season runs from January 20 to April 15, and the second season runs from September 1 to November 1. The proposed fishing year should not affect the management of this fishery directly. The CDQ fishery is not subject to the seasonal allotments; fishing can take place continuously all year long. However, the allocation of the CDQ share of the TAC among the CDQ groups is similar to the operation of an IFQ program. As discussed earlier, the choices these groups make about when to harvest their allocations should not be affected by the start date for the fishing year.
Yellowfin sole	This fishery is driven by halibut prohibited species caps. These are allocated to the fishery in four increments during the year. The fourth increment is due for release on July 1. Because of this, the proposed fishing year should not affect the management of this fishery directly.
Greenland turbot	Opens May 1 for hook and line gear. No seasonal allocations. May close due to harvest of TAC or PSC. Open season may continue through July 1, so a change in the fishing year may create a problem.
Flatfish (rock sole, flathead sole, other soles, Alaska plaice)	Openings and closings in these fisheries are driven by halibut prohibited species caps. These are allocated to the fishery in three increments during the year. The third increment is due on July 1. Because of this, the proposed fishing year should not affect the management of this fishery directly.
Pacific Ocean perch	This fishery opens on July 1. Closings in this fishery are driven by harvest of TAC and by harvest of halibut prohibited species caps. The fishery is open continuously until one of these conditions is met, but the condition is usually met within a month. Because of the opening date, the proposed fishing year should not affect the management of this fishery directly.

Table 5.9-3 Timing of directed fishing seasons for major GOA groundfish stocks with respect to a July-June fishing year

Species	
Pollock	"A-B" season from January to the end of May; "C-D" season from late August to the start of November. Each season receives a separate TAC allotment. Because this fishery has two seasons, with their own TACs, one of which ends before the proposed July 1 opening date, and one of which opens many weeks after it, the proposed fishing year should not affect the management of this fishery directly.
Pacific cod	"A" season from January to June 10; "B" season from September 1 to the end of December (closing in early November for trawl gear). A season receives 60% of the TAC, B season receives 40% of the TAC. The Pacific cod hook-and-line and trawl fisheries would normally close well before June, either because the "A" season TAC allotment was taken, or because the PSC was reached. The proposed fishing year should not directly affect the management of this fishery.

Species	Seasons
Sablefish	Managed under IFQs. The fishing season opens in mid-March and closes in mid-November. The July-June fishing year may impose important costs on this fishery due to the need for a long no-fishing period between fishing years and to the convenience of having this period in the winter months. The option to Alternative 3 would eliminate these potential costs. This issue is discussed at length in Section 4.9 of this EA/RIR/IRFA, and also below in this section.
Demersal shelf rockfish	Two directed fishing seasons. 70% of TAC available from January 1 to March 15, 30% available from November 15 to December 31. In this fishery deductions are made from an annual TAC for halibut and groundfish bycatch, and the remainder is divided between the two seasons above. The bycatch harvest is not currently monitored and doesn't affect the two seasonal TACs. A July-June fishing year may not affect the management of these fisheries.
Deep water flatfish	These species are all exploited by trawl gear. There are no seasonal allocations, only one annual allocation. The harvests from these fisheries are limited by PSC allocations which are released in five annual increments to the fishermen. The second PSC allotment is released on April 1, and the third PSC allocation would be released on or about June 30. Trawl fishing is usually closed before June due to harvest of the PSC allocation. Because harvests normally cease due to PSC limits before June, and a new PSC allotment is released about June 30 (or July 1) a new July-June fishing year may not affect these fisheries directly.
Rex sole	
Flathead sole	
Shallow water flatfish	
Arrowtooth flounder	
Pacific Ocean perch	These are usually managed by their TAC. The rockfish fishery opens by regulation around July 1. The trawl fleet also gets a halibut allocation around July 1, which they need to fish rockfish.
Northern rockfish	
Pelagic shelf rockfish	

Are there fisheries which may not readily adapt?

In general, Tables 5.9-2 and 5.9-3 suggest that the July to June fishing year under Alternative 3 may not directly conflict with existing fishing seasons in many fisheries. However, the sablefish fishery in the BSAI and in the GOA, and the BSAI pollock fishery may be exceptions.

The possible impacts of Alternative 3 on the sablefish fishery were described in detail in Section 4.9 of this EA/RIR/IRFA. Although the sablefish fishery is managed with IFQs, the interactions between the sablefish fishery and the halibut fishery, the need for a closed fishing period between fishing years in this IFQ program, and the potential losses from placing the closure during the good weather in the spring, all created important problems for this fishery under Alternative 3.

Currently, the halibut and sablefish IFQ fisheries are closed to directed fishing between mid-November and mid-March. This closed period is important in the management of the fishery. This is a period of time in which the "books are cleared" and administrative groundwork is laid for the coming season.

The annual IFQ calculation process for the new fishing year cannot start until all fishing and deliveries for the current year have stopped and the IFQ accounts are stable, because the new year's permits are a function of the final account balances from the previous permits. Halibut may not be retained, and directed fishing for IFQ sablefish stops, in mid November although sablefish bycatch which accrues against IFQ permits occurs through December. Some vessels, especially larger freezer vessels, may take 2 to 3 weeks before completing their last landings after the close of the fishery.

NMFS uses the time period between the end of the fishing year (December 31) and the start of the IFQ season (mid March) to perform a number of management steps. These steps include: 1) establish final TACs, 2) stabilize accounts (landings completed, corrections made and quota transfers are stopped), 3) calculate, print, and mail permits, 4) allow for fair start, and 5) collect IFQ fees. TAC setting requires review and publication of sablefish harvest specifications in the Federal Register, and Governmental approval and publication of the halibut regulations established by the IPHC for halibut. After landings are completed and information is stable, NMFS calculates overages and underages which apply to next year's IFQ accounts; and also distributes the new TAC to all current quota share holders. New year IFQ permit calculations are completed on or about January 31 at which time the printing and distribution steps begin. The participants in the IFQ fisheries normally are mailed their permits in February so that permits can be received and all participants, even those in remote locations, are able to participate on the opening date of the fishery, which historically has yielded the highest exvessel prices. The processes of implementing TACs, account stabilization; calculating, printing, issuing, and mailing permits; and collecting fees, takes approximately six weeks of time when no fishing may occur between the fishing years. This intermission is also needed to implement revised reporting and recordkeeping requirements and new electronic reporting software; to issue registered buyer permits, and to process IFQ leases and hired skippers applications.

As discussed in Section 4.9, a number of problems are created if the closed period in the fishery is shifted from its current mid-November to mid-March period to the four month period prior to a July 1 opening (March to June). The new opening would occur during some of the best weather conditions of the year, when fishing was productive and safety issues were at a minimum. Moreover, a winter fishery from November through February would take place at a time when halibut were found in deeper waters and there was more spatial overlap with sablefish, increasing potential bycatch problems.

While the sablefish fishery dates can be adjusted by NMFS with the Council's recommendation, halibut fishing seasons are established by the IPHC and may not coincide with any changes made to the sablefish fishery. If the sablefish season were not concurrent with the halibut IFQ (and CDQ) season, waste and discard of halibut would occur in the sablefish fishery; and of sablefish in the halibut fishery. In particular, it is undesirable to allow sablefish fishing in winter, when halibut are deep and have a much more spatial overlap with sablefish, increasing halibut bycatch potential[28].

[28] Gregg Williams, Senior Biologist, Personal Communication, April 25, 2002, International Pacific Halibut Commission, P.O. Box 95009, Seattle, WA 98145-2009, U.S.A.

IFQ permits could be issued on the proposed TAC rather than the final TAC. If the TAC and/or area allocations changed between the proposed and final rulemaking, new permits would need to be processed and issued. This scenario raises the possibility of two sablefish permitting processes in one year and the additional down time that would be required. There also is a potential for: (a) exceeding a quota if the final annual TAC decreased, yet fishing in excess of that had already occurred, and (b) exceeding an area allocation or even the entire TAC if by the time the final annual TAC was known to decrease, fishing in excess of that amount had already occurred.

Under the current IFQ program, a number of regulation changes may mitigate some of the difficulties of having inadequate time for intercessions between different allocation periods. Multi year permitting and other program changes could reduce the time needed, or reduce the frequency of stand down periods. Numerous regulation changes may also be made such as: shifting cost recovery program reporting and payment schedules, adjusting the date before which IFQ permits may not be calculated, and revising logbook submission dates. Removing the provision for applying overages and underages to the following year's IFQ permits would mean the following year's IFQ permits could be calculated based solely on quota shares held and the new year's TACs; only transfer activity would need to halt temporarily. If Alternative 3 was implemented, significant management and regulation changes to the IFQ program would be necessary to ensure the sablefish and halibut IFQ programs are implemented concurrently, fairly, and with little disruption. These changes and potential problems can be avoided if the option (set sablefish TAC for the January through December time period) to Alternative 3 is implemented.

As noted in Section 4.10, under the AFA, close to 100% of the BSAI directed pollock fishery has been allocated to fishery cooperatives. In all three sectors of the BSAI pollock fishery, cooperatives function as a form of privately-operated individual fishing quota program. Within each cooperative, member vessels are granted an allocation of pollock based on their catch history and are free to lease their quota to other members of the cooperative, or acquire quota from other members to harvest. The catcher/processor and mothership sector cooperatives operate at the sector level in that NMFS makes a single allocation to the sector and the cooperatives are responsible for dividing up the quota among individual participants in the sector. Inshore sector cooperatives are organized around each processor and NMFS makes individual allocations to each cooperative rather than to the inshore sector as a whole.

Alternative 3 would have mixed effects on the management of the AFA pollock fishery. On the one hand, final pollock quotas would be established prior to the start of any pollock fishing which should lead to greater efficiency in cooperative management. However, changing the fishing year would have greater effects on the AFA pollock management regime which is currently based on the calendar fishing year. Adoption of Alternative 3 would affect existing regulations that establish application deadlines for AFA pollock cooperatives and reporting deadlines for annual co-op reports. Initially these changes would be more disruptive than adoption of Alternative 2.

The AFA pollock fishery may also experience a number of additional potential problems with the shifting of the seasonal end date from June 10 to July 1 under Alternative 3. During years of high TAC, it may be difficult to harvest the 60 percent allocation in the B season because the time available would be reduced by 3 weeks. Also, the effort of fishing would be shifted out of June which is a time of low salmon bycatch toward later in the year when salmon bycatch rates are higher. There may also be difficulties in processing all of the TAC in the second season if the markets for surimi and fillets are not strong and the plants would operate less efficiently by not simultaneously processing these products. The pollock processing facilities are also used for crab processing which begins in mid October, so it is desirable to have the pollock fishery completed before the crab fishery begins.[29]

"Rollovers" under Alternative 3

Sometimes fishermen are unable to completely harvest amounts of fish seasonally available to them. Often, in these instances, NMFS in-season managers are able to "rollover" some or all of the unfished portion to a subsequent fishing season during the same fishing year, giving fishermen a second chance to harvest it. Rollovers can take place within a gear group, or from one gear group to another. Currently, the opportunity exists to rollover fish that are not harvested in the January to June period to the second half of the year, July through December. Fish not harvested in the second half of the year are lost when the new fishing year begins in the following January.

Under Alternative 3, the period from July to December will be the first season of the fishing year, and the period from January to June will be the second season. Any fish not harvested from January to June will be lost when the new fishing year begins in July. In the past, these fish might have been rolled over to the following season. Moreover, the Steller sea lion protection measures establish a fixed amount of harvest in the first season (January through February, April or June, depending on the species and area). Under current protection measures, managers will not be able to rollover fish not harvested from July to December into the season starting in January.

The Steller sea lion protection measures establish seasonal apportionments for pollock, Atka mackerel, and Pacific cod, and these are the only groundfish fisheries that may be affected by changes in the ability to do rollovers. These species are unusually important to both the Steller sea lions and fishermen during the first part of the year. They are an important source of food for the Steller sea lions during an environmentally stressful period, and they have an unusually high value for the fishermen due to their high roe content at this time. The seasonal specifications set for the harvests of these species in the first half of the year are set so as to ensure that the prey available to the Steller sea lions will not drop to low levels that would jeopardize Steller sea lion survival or adversely modify their critical habitat. Harvests above these levels, for example, to harvest fish rolled over from the previous season, may cause the temporal depletion of Steller sea lion prey and could not be considered without reconsultation on the current biological opinion.

The directed pollock fishery in the BSAI is conducted under cooperative arrangements introduced by the AFA. The cooperatives maintain careful control over their harvests, and are likely to be able to arrange their operations so as to harvest seasonal quotas. Rollover issues are not expected to be important in the directed fishery. Pollock incidental catch allowances (ICA) may be of more

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[29]Christian Asay, Catcher Vessel Fleet Manager /Coop Manager, Personal Communication, August 13, 2002, Trident Seafoods, 5303 Shishole Ave., Seattle, WA 98107

concern. Usually, the unused ICA is reallocated to the pollock fishery after the A season. Between 1999 to the present, approximately an average of 8,000 mt of pollock ICA has been rollover to the B season. About a third of the pollock bycatch occurs in March and April, after the important pollock roe season, and if the industry does not fully use the ICA, it may be lost to the fishery.

In the BSAI Pacific cod fishery the rollover occurs from trawl & jig gears to hook-and-line and pot gear in September. The BSAI cod hook-and-line gear rollover in September depends on the January through April trawl fishery needs for the directed fishery and trawl bycatch needs in other non-cod fisheries. The bycatch needs in other trawl fisheries are fairly consistent. The major Pacific cod trawl and hook-and-line fisheries in the January to June period occur in March and April, when the Pacific cod are concentrated in spawning condition, and after other roe fisheries have slowed down. If trawlers are unable to fully harvest their allocations in March and April, there is an opportunity to rollover the fish to a hook-and-line fishery in May and June. With the Pacific cod directed trawl fishery occurring at the end of the fishing year, and a very limited opportunity for hook- and-line gear sector to fully harvest rollover amounts in May and June, some fish may be lost. It is also not clear that the hook-and-line fishermen would be fully able to take advantage of the rollover due to high halibut by-catch at that time of year. Therefore, there is a good chance that, if the trawl fishermen are unable to fully harvest their allocation, the fish will not be harvested in that year.

Rollovers from the September-November season to the January - April season for the Atka mackerel fishery would not be possible because of the 50 percent seasonal apportionment required in the Steller sea lion protection measures. This type of rollover would concentrate more of the Atka mackerel fishery in the time period important for foraging Steller sea lions. Atka mackerel not harvested in the fall would likely be lost to the industry.

In the case of the Gulf of Alaska pollock fishery, under the new system with the August and October fisheries occurring first, managers could have either more fish than expected in the January or March fishery, or less, depending on the in-season management of the late summer and fall fisheries. Current Steller sea lion protection measures allow for rollover of unharvested pollock from one season to the next as long as no more than 30 percent of the annual TAC is apportioned to any one season. Rollover from the D season (October to November) to the A season (January to February) will not be allowed because of the 25 percent limit established by Steller sea lion protection measures for the first season. The Steller sea lion protection measures allowed for rollovers from seasons in the early part of the calendar year to later seasons. The analysis in the 2001 Biological Opinion was based on a fixed amount of harvest in the early part of the calendar year (NMFS 2001b). Because of the 30 percent limitation on the amount of rollover and the number of seasons, rollovers in the GOA pollock fisheries are possible under Alternative 3. Therefore, Alternative 3 is less likely to have an effect on the GOA pollock fishery.

Presently there is a directed GOA Pacific cod fishery of 60% of the annual TAC in January through June. If 40% were harvested in the fall, then the directed fishery could not be allowed to take the full 60% since it would be necessary to set aside some of the TAC for incidental catch through the end of June. This consideration will affect the timing of the closure of the directed fishery in February or March. The closure must be timed to leave sufficient Pacific cod quota for bycatch needs in the April and May flatfish fisheries in the GOA. If too much Pacific cod quota is left for bycatch needs, it would be lost when the fishing year ended in June. It is unclear if unused Pacific cod quota in the fall can be used for bycatch in the January through June time period. NMFS Sustainable Fisheries Division is currently consulting with the Protected Resources Division to determine if rollover used for bycatch purposes during the A season poses Steller sea lion concerns.

Limited time for rulemaking

While Alternative 3 calls for a fishing year that begins on July 1, the time required to prepare and publish a Federal regulation may make it hard to meet this deadline. The elements of the rulemaking process are described in Section 1.2 of this EA/RIR/IRFA.

Following the Council's December meeting, the proposed rule containing the specifications, along with its preamble and supporting documents, must be prepared by the NMFS Sustainable Fisheries Division. The annual specifications rule is complicated, and it can take several weeks after the Council meeting to prepare. Before the proposed rule can be published, it must be reviewed by several offices within the Alaska Region including NOAA Enforcement, NMFS Protected Resources, and NOAA General Counsel. It must also be reviewed by several offices in Washington, D.C. including NOAA General Counsel, and the Department of Commerce General Counsel. As noted in Section 1.2, in future years, the Federal Office of Management and Budget is more likely to treat the annual specifications as a "significant" document within the terms of E.O. 12866. This means OMB may require its own review of the proposed rules (which can take up to 90 days) before the proposed rule can be published.

A 15 to 60 day notice and comment period is required following publication of the proposed rules. Once this period ends, NMFS Sustainable Fisheries must address the comments received and prepare a final rule. Any changes in the final rule from the proposed rule must go through an internal NMFS vetting process. Under the APA, the final rule cannot become effective for 30 days following its publication in the Federal Register, unless good cause exists to waive all or a portion of this cooling off period.

It is possible to complete this process between the end of the December Council meeting and the July 1 opening date. However, there are also a number of uncertainties in this process which may make it difficult to implement the final regulations by July 1.

5.10 Changes in harvests and biomass under Alternatives 2, 3, and 4

Truncation of harvest by interim specifications

In the past, interim TACs have been set based on 25 percent of the recommended TAC for some fisheries. This 25 percent level is an artificial constraint which could deny access to the full amount of the annual quota by fishermen who, for market, product, or logistical reasons, fish intensely early in the year (before final specifications are issued).

Retention of the status quo alternative could, therefore, result in a closure of one or more of the groundfish fisheries in the BSAI and GOA management areas if, for example, NMFS cannot publish final specifications before the interim TAC levels are reached. This would result in severe negative economic impacts on all those dependent upon the fishery or fisheries in question, especially for those fishery participants who concentrate fishing effort early in the fishing year. In particular, pollock and fixed gear cod fisheries have a high probability of attaining interim TACs in any given year, under the status quo alternative. This potential attainment of the interim TACs and subsequent short-term closure of important fisheries could have a significant adverse impact on vessels, processors, and the affiliated industries and communities that support and are supported by them.

In addition, PSC limits (which can result in closure of fisheries with resulting social and economic impacts) may be limiting during the interim period, particularly to the BSAI rock sole fishery which operates early in the fishing year, under the status quo alternative. If the interim 25 percent PSC limitations restrict fisheries, fishermen would forego potential revenues during the interim period, perhaps without the ability to subsequently recoup those losses.

TACs lag biomass longer

Alternatives 2, 3, and 4, all increase the period of time between a summer biomass survey and the opening of the fishing season whose specifications are based on that survey. The changes in the elapsed time between the summer surveys and these fishing seasons are shown in Table 5.10–1. Under Alternative 1, the 2006 fishing season once final regulations are in place, would be based on a biomass survey made in the summer of 2005. (It is important to note that under the status quo, interim specifications in 2006 would reflect a biomass survey in 2004, not in 2005 (since the interim specifications would be based on a rollover of 2005 specifications)). Under Alternative 2, the 2007 fishing season would be based on a survey done in 2005, under Alternative 3, the 2006-2007 fishing season would be based on a survey done in 2005 (introducing a half-year lag), and under Alternative 4, the 2007 and 2008 fishing seasons would be based on a survey done in 2005.

Table 5.10-1 Elapsed time between August 2005 summer survey and specifications year under different alternatives

	A	2005	2006	2007	2008
1					
2					
3					
4					
4					

Notes: Alternative 1 in the first 3 months is actually managed through interim specifications, therefore the management of the fishery based on the latest Council recommendation does not occur until approximately March, resulting in a 7 month lag time between available information and implementation of the fishery.

The different lags between the summer biomass surveys and the fishing year specifications based on those surveys introduce additional uncertainty into the specifications process. The actual biomass in the fishing year may be higher or lower than the biomass measured in the summer survey, and as the lag between the survey and fishing year increases, the potential for discrepancy between the measured biomass underlying the specifications decisions and the actual biomass during the fishing year also increases. Since ABCs and TACs adjust to biomass fluctuations with a lag, biomass tends to change by larger amounts before changes are offset by harvest adjustments.

The uncertainties are greater for species that have shorter life spans. In these instances, the biomass will contain relatively smaller numbers of year classes. Each year's recruitment of a new year class to the biomass will have a relatively bigger impact on the size of the biomass. Thus, the biomass size (the weight of all existing age classes) is likely to fluctuate more for a species with a short life span than for a species with a longer life span, even if the variability in recruitment is the same for the two species.

Two analyses carried out at the Alaska Fisheries Science Center[30] suggest that these theoretical considerations may have practical implications for the alternatives. These analyses are described in the following two sections of this discussion as (a) the retrospective analysis, and (b) the simulation model.

The retrospective analysis draws conclusions by "looking back" at the period from 1991 to 2002. The simulation model simulates the results of the specifications setting process 1,000 separate times and evaluates the means and variations from these simulations. The retrospective analysis captures some of the elements of Council specifications setting, while the simulation model focuses to a greater extent on the impact of increased forecasting lead times on biological modeling.

The retrospective analysis

As they prepare their annual SAFE analyses, assessment authors often generate ABC estimates for the coming year and project estimates even further into the future. In the "Retrospective analysis," second year ABC projections from this process for four important species are treated as Alternative 2 specifications, and are compared to the ABCs generated for the SAFE analysis in the following year, which are treated as Alternative 1 specifications. Both sets of ABC estimates are implicitly treated as estimates of TACs resulting from the specifications process.

Concretely, in the fall of 2000, assessment authors would have produced ABC estimates for the 2001 specifications. They would also have projected an estimated ABC for the following year, 2002. This projection was not a specification for 2002, and in fact would be superceded in the specifications process for 2002 by an ABC estimate to be produced in the fall of 2001. In this retrospective analysis, the 2002 projection made in 2000 is treated as an Alternative 2 specification for 2002 and is compared to the 2002 specification made in 2001, which is treated as an Alternative 1 specification for 2002.

The second year projections do not correspond exactly to the ABC estimates that would be prepared under Alternative 2. The second year projections used here were prepared under the time constraints of Alternative 1, and are subject to the limitations imposed by those constraints. They do not, for

[30] The retrospective analysis and simulation model described below were developed by Dr. James Ianelli of the Alaska Fisheries Science Center REFM Division in the spring of 2002.

example, reflect recent catch data to the same extent ABC specifications developed under Alternative 2 might. Moreover, these second year projections are the assessment authors' projections, and do not reflect changes that might have been made in the SSC and the Council.

The retrospective analysis was performed for four species: (1) Eastern Bering Sea (EBS) pollock; (2) Bering Sea and Aleutian Islands (BSAI) Pacific cod; (3) Aleutian Islands (AI) Atka mackerel; (4) Gulf of Alaska (GOA) pollock. These species were chosen because of their importance in the fisheries, and because the ABCs and TACs in these fisheries are often relatively close together (although high EBS pollock ABCs are associated with large discrepancies between ABC and TAC during this period).[31]

Some results of this comparison are summarized in Table 5.10-2 below.[32] The table shows the change in metric tons associated with the substitution of Alternative 2 for Alternative 1.

Table 5.10-2 Estimated change in metric tonnage associated with Alternative 2 under the retrospective analysis

Species	ABC in metric tons under Alternative 1	Change in annual metric tons under Alt. 2.	Percent change in ABC
EBS pollock	1,299,000	-33,000	-2.5%
BSAI Pacific cod	219,000	+16,000	7.3%
AI Atka mackerel	95,000	-8,000	-8.4%
GOA pollock	92,000	+10,000	10.9%
Notes: The metric tonnages from which these changes were derived may be found in Table 4.1-1 of this EA/RIR/IRFA.			

Applying 2000 first wholesale prices to the changes in TAC from the retrospective model implies a net impact on gross revenues from these four species of about +$2 million.[33] A net impact of this size is so small that it is not practically meaningful, given the other large sources of revenue

[31]The estimates were based on observations from 1991 to 2002 for GOA pollock (12 observations), from 1992 to 2002 for EBS pollock and BSAI Pacific cod (11 observations), and from 1993 to 2002 for AI Atka mackerel (10 observations).

[32]Figures showing the paths of the specifications under the two alternatives and another table summarizing the results may be found in Section 4.1.3 of this EA/RIR/IRFA.

[33]The revenue estimates were made using estimates of first wholesale prices per metric ton of landed round weight provided by Terry Hiatt in a personal communication. For EBS pollock these prices were $1,041 for the first half of the year and $555 for the second half. For BSAI Pacific cod they were $1,392 in the first half and $1,250 in the second half. For Atka mackerel they were $474 in the first half and $480 in the second half. For BSAI Pacific Ocean perch it was an annual average of $514. For GOA pollock it was an annual average of $870. For sablefish it was an annual average of $4,997.

fluctuation in these fisheries, the extent of the fisheries not considered here, and the large sources of uncertainty in the model itself.

However, the results for individual species can have a meaningful impact. The absolute values of the percentage changes in the ABC/TAC vary between 2.5% for the EBS pollock, and 11% for the GOA pollock. The dollar value changes can be large. For EBS pollock and BSAI Pacific cod they are in the tens of millions of dollars (although one change is an increase in revenues and one is a decrease).

Table 4.1.1 in Section 4.1.3 of this EA/RIR/IRFA reports coefficients of variation for the ABCs under the retrospective analyses. These showed little pattern. In two instances they increased, in two they decreased. The results do suggest that the alternatives may affect the variability as well as the level of the specifications.

The simulation model[34]

The simulation model is focused on the biological interactions between the fish stocks and the stock assessment procedures for determining ABCs. The simulation model permits a more detailed investigation of the interaction of biology and assessment determination and makes it possible to look at more species. While the simulation model has certain advantages over the retrospective model, it doesn't consider the Council context within which the specifications were determined as well as the retrospective approach does.

Simulation models were run for EBS pollock, BSAI Pacific cod, AI Atka mackerel, BSAI Pacific Ocean perch, GOA pollock, and BSAI/GOA sablefish. Separate simulations were performed for each of these species for Alternatives 1, 2, and 4. Simulations were not run for Alternative 3, but the results for this Alternative should fall between those for Alternatives 1 and 2. The implications of these simulations for Alternative 3 are discussed later. The operation of the simulation model for Alternative 2 is described immediately below; and a discussion of the modifications necessary for the simulation models under Alternatives 1 and 4 follows. The simulation models for the different species were the models used by the assessment authors when they prepared their 2002 ABC and OFL recommendations in the Fall of 2001. In other words, these models use the equations and parameter estimates used at that time.

Under Alternative 2, in a typical simulation year such as 2007, the model receives several inputs and generates several outputs for future years. The important inputs include: (a) random recruitment into the fish stock generated using the mean and variance of historical recruitment for that stock; (b) an ABC set in the previous year (2006 in this example) based on stock biomass estimates from the year before (2005 in this example); (c) an actual stock biomass and age structure produced as an output from the simulation for the previous year (again, 2006 in this example).

The model simulates the impacts of these inputs on the fishery in 2007. Recruitment adds a new year class of a certain size to the fish stock. The biomass for each age class at the start of the year

[34]Another description of this model may be found in Section 4.1 of this EA/RIR/IRFA.

(aside from the recruited age class) is determined by outputs from the end of the previous year's simulation. Age class specific parameters for growth and mortality, built into the model structure, act on each age class to determine its year-end biomass. In a crucial simulation element, the ABC that was an input into the year's simulation is used as an estimate of the harvest during 2007, and each age class is reduced appropriately to account for this harvest.

Each year's simulation produces two important outputs that serve as inputs into the simulations for subsequent years: (a) a biomass and age structure for the stock that is input into the next year's (2008 in this case) simulation; and (b) a biomass structure that determines the ABC for the fishery two years out (2009 in this case).

The simulations were begun with the 2001 fishing year and were run for 1,000 years. Each year's recruitment was generated by a randomly chosen number, specific to that year. The random number sequence was the same for each alternative's series of annual simulations. The random numbers reflected the historical mean and variance of recruitment in the fishery. The historical period began in 1978 and continued through the most recent (that is "well estimated") year class. The most recent year class varied by species. For example, for EBS pollock, the most recent well estimated year class was the 2000 year class.

The simulations for Alternatives 1 and 4 have the same basic structure, but the connection between the years whose biomass information is used to set the specifications (referred to hereafter as a "biomass information year"), and the year for which the specifications are determined (hereafter the "specifications year"), differ. Under Alternative 1, the biomass information year is the year before the specifications year. So in the 2007 example above, the biomass information year would be 2006 (instead of 2005 as under Alternative 2). Under Alternative 4, specifications are determined for two years into the future. Assuming that 2005 was the biomass information year, the specifications would be determined for 2007 and 2008.[35]

The discussion in Section 4.1 of this EA/RIR/IRFA points out that the simulation model predictions have not been tested by simulating the model with historical inputs and comparing the model results with historical results, and that they have not received peer review. A comparison of simulation pollock ABCs with historical pollock ABCs showed that the simulation ABCs for all alternatives were generally higher than historical ABCs. The implication was that the levels of ABCs projected by the models were less reliable than the directions of change in ABC that they indicated.

The discussion of the simulation model results that follows will review estimated impacts on ABCs (used in the model as harvest estimates), spawning biomass levels, and year-to-year variation in ABCs and spawning biomass levels. The discussion will actually begin with year-to-year variation in spawning biomass levels. This is done because the factor apparently driving the model is the increased lag which impacts this variability. Increased spawning biomass variability in turn affects the ABC and harvest level, which impacts the size of the spawning biomass.

[35]The relationship between the year for which the biomass information is available and the specifications year is illustrated in Table 5.10-1, above.

The simulations suggest that mean spawning biomass fluctuates more as the lag between the biomass information year and the specifications year grows. The spawning biomass fluctuations tend to be greater for Alternative 2 than for Alternative 1, and greater for Alternative 4 than for Alternative 2. The fluctuations for Alternative 3 are believed to lie between those for Alternatives 1 and 2. Moreover, the fluctuations appear to be systematically related to the biological characteristics of the fish species. The option to Alternative 3 to set the sablefish TAC on a January through December schedule is similar to Alternative 2 for sablefish. The simulation model showed that for sablefish, a longer lived species, there was little additional effect on biomass or harvest levels with projections of ABC under Alternative 2 compared to Alternative 1.

Table 5.10-3 uses coefficients of variation to show how the spawning biomass variability changes for Alternatives 1, 2, and 4. Larger coefficients indicate greater variability relative to the mean biomass. Each of these simulations is run for 1,000 years. The coefficient of variation for each alternative and species combination is equal to the standard deviation of the annual spawning biomasses divided by the mean annual spawning biomass for those 1,000 yearly observations. The coefficient of variation provides an index of the variability of the spawning biomass compared to its average value. Increases in the index suggest that the variability increases compared to the mean spawning biomass. Table 5.10-3 shows that the coefficient of variation tended to increase for each species as the length of time between the biomass information year and the specifications year increased.

Table 5.10-3 Coefficients of variation calculated for the spawning biomass under Alternatives 1, 2 and 4.

Species	Alternative 1	Alternative 2	Alternative 4
EBS pollock	.274	.322	.355
BSAI Pacific cod	.167	.202	.243
AI Atka mackerel	.273	.406	.424
BSAI Pacific ocean perch	.074	.074	.076
GOA pollock	.386	.503	.540
Sablefish	.262	.281	.300
Notes: These CV estimates are summarized from Table 4.1-2 of this EA/RIR/IRFA			

The increases in the coefficients differed among the species. The difference was small for Pacific Ocean perch and larger for EBS pollock, BSAI Pacific cod, GOA pollock, and AI Atka mackerel. The increase for sablefish fell between the extremes. The differences tended to be greater for species that had relatively short life spans.

As discussed earlier, spawning biomass is likely to become more variable under alternatives that increase the period between the biomass information year and the specifications year. ABCs and TACs specified further into the future will be based on biomass estimates that will be lower or higher than appropriate given the actual biomass (in the future). This causes the biomass to increase or decrease even more than it otherwise would have before the ABCs and TACs adjustments, leading to increased spawning biomass variability.

This increase in the variability of the biomass under Alternatives 2 and 4 leads to a reduction in the average ABC. Under the simulation model the average ABCs (treated as equivalent to average harvests in this discussion) decreased with the length of time between the collection of the biomass survey data and the start of the fishing year whose ABC was based on it. The averages were largest for Alternative 1, smaller for Alternative 2, and smallest for Alternative 4. Alternative 3, which has a lag between those for Alternatives 1 and 2, is assumed to have an ABC reduction greater than that for Alternative 1, but less than that for Alternative 2.

As with the impacts on spawning biomass, these changes in ABC levels are systematically related to the biological characteristics of the stocks; stocks with shorter life spans have a relatively larger reduction in ABCs (which are treated in the model as proxies for harvest). The reductions in ABCs are a direct result of the increased biomass variability just discussed.

A key reason for this reduction in ABCs was the increased variability of the fishable biomass under Alternatives 2, 3, and 4 and the interaction of this variation with the harvest control rules (HCR) used in some of these fisheries. Fishing rates and ABCs in the fisheries discussed here depend to some extent on an HCR which lowers the acceptable fishery mortality rate as the estimated biomass is reduced. With the larger year-to-year variation in the biomass estimates, the low end of the spawning biomass relative to the unfished level will be lower more often, and will trigger reduced ABCs associated with lower fishery mortality rates more often.

A second key reason is the use of median recruitment (rather than mean recruitment) for projecting biomass to the specification years. This will result in somewhat lower ABC specifications but does reflect common practice in North Pacific groundfish stock assessments. That is, deterministic projections are often done with a conservative (e.g., median) recruitment assumption.

Changes in the average level of harvest would change the gross revenues and profits accruing to industry. To some extent, the impact of changes in harvest would be mitigated by offsetting shifts in product prices. For example, all other things equal, a reduction in pollock harvest would be expected to lead to an increase in the price of pollock. To some extent, this offsetting price shift would tend to mitigate the negative revenue impacts in this case. Similarly, higher pollock harvests would be associated with somewhat lower prices, offsetting the potential for revenue increases to some extent.

The simulation model results for changes in the average annual level of harvest under Alternative 2 are summarized in Table 5.10-4. This table shows the ABC under Alternative 1, the average change in the level of harvest from Alternative 1 to Alternative 2, and the percentage change in the harvest. Similar results for Alternative 4 are shown in Table 5.10-5 which immediately follows Table 5.10-4.

Table 5.10-4 Estimated change in ABC associated with Alternative 2 from simulation analysis

Species	ABC in metric tons under Alt 1	Change in ABC in annual metric tons under Alt. 2	Percentage change in ABC
EBS pollock	1,498,000	-24,000	-1.6%
BSAI Pacific cod	278,000	-4,000	-1.4%
AI Atka mackerel	98,000	-10,000	-10.2%
BSAI Pacific ocean perch	16,000	0	0
GOA pollock	162,000	-17,000	-10.5%
Sablefish	26,000	0	0
Notes: These estimates are summarized from Table 4.1-2 of this EA/RIR/IRFA			

Table 5.10-5 Estimated change in ABC associated with Alternative 4 from simulation analysis

Species	ABC in metric tons under Alt 1	Change in annual metric tons under Alt. 4	Percentage change in ABC
EBS pollock	1,498,000	-50,000	-3.3%
BSAI Pacific cod	278,000	-9,000	-3.2%
AI Atka mackerel	98,000	-14,000	-14.3%
BSAI Pacific ocean perch	16,000	0	0
GOA pollock	162,000	-26,000	-16.0%
Sablefish	26,000	-1,000	-3.8%
Notes: These estimates are summarized from Table 4.1-2 of this EA/RIR/IRFA			

These results must be read cautiously. Their interpretation is complicated by several factors. As noted earlier, the magnitudes of these values may be less important than the direction of change. A second issue is that in some instances, for example BSAI pollock under Alternative 2, the percentage change in the ABC is small. Third, and related to this, variances of the simulation results around the mean estimates are large. The coefficients of variation for these results may be found below in Table 5.10-7. These large variances reflect the high degree of natural variability characteristic of some groundfish stocks. Hence, the difference found between alternatives is swamped by the expected variability within all alternatives. Statistical tests between the alternatives based on the simulations are inappropriate since the sample size could simply be increased by running more simulations.

The results do show systematic patterns which add to their credibility. Mean ABCs tend to get smaller as the length of time between the biomass information year and the specifications year gets longer for these species. Moreover, the effect tends to be greater the shorter the life span of the species. This was expected for reasons discussed earlier.

The simulation models suggest that Alternative 2 harvests are lower than those under Alternative 1, and that Alternative 4 harvests are even lower. The reductions range from 0% for BSAI Pacific Ocean perch and sablefish to 10.5% for GOA pollock under Alternative 2, and from 0% for Pacific Ocean perch to 16% for GOA pollock under Alternative 4.

Although the tonnage reductions often appear modest compared to Alternative 1 tonnages, the dollar magnitudes may be significant. If these tonnage changes in Tables 5.10-4 and 5.10-5 were multiplied by first wholesale prices for 2000 [36] (the most recent year with the price information as of May 2002) the impact under Alternative 2 would be about $40 million dollars, while the total dollar impact under Alternative 4 would be about $80 million dollars.[37] [38] Given the limitations of the model, these amounts should be treated as indicators rather than predictions. The bulk of these reductions in value are coming from the pollock fisheries in the EBS and GOA. Small percentage changes in the EBS pollock catches can translate into large dollar values.

The reductions in ABCs under Alternatives 2 and 4 projected by the simulation model may understate the reductions we could expect. For example, although the simulation model suggests that average harvests will be lower under Alternatives 2 and 4, the model also suggests that, in the absence of any offsetting changes, the fishery will tend to inadvertently exceed the overfishing (OFL) level more often. While the OFL level might also be exceeded inadvertently under Alternative 1[39], it is likely to be exceeded more often under Alternatives 2 and 4. This may seem like a contradictory result: the average harvests are lower, but the OFL is exceeded in more years. This, however, is a result of increased variance in harvests under Alternatives 2 and 4. While the mean is lower, the variation around the mean is larger, and the OFL tends to be exceeded more often. The implication of this, however, is that the Council will behave more conservatively than would be implied by the straight biological model of specification determination, and will set TACs lower than they otherwise would have. Thus actual harvests might be lower than implied in Tables 5.10-4 and 5.10-5.

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[36]The first wholesale prices used to produce these revenue estimates were described in a footnote to the discussion of the retrospective model.

[37]The retrospective model suggested different results for Alternative 2 (the retrospective model was not run for Alternative 4). In the retrospective model BSAI Pacific cod and GOA pollock tonnages actually increased by relatively large amounts compared to the Alternative 1 levels. The net revenue impact obtained by multiplying the tonnage changes by the 2000 first wholesale prices could be in the tens of millions of dollars (including possible increases) for individual species, but for the four species examined, taken together, it was very small.

[38]Although, as noted, price changes might be expected to mute some of the fluctuations in gross revenues, the information needed to estimate the changes in price is not available. Therefore, these revenue changes do not incorporate price impacts.

[39]One shortcoming of the simulation model is that it cannot identify the instances when the OFL would be exceeded under Alternative 1.

However, there may also be factors that lead the model to overstate the negative impacts. This model does not focus on the Council deliberations through which the ABCs and TACs are set. As noted in Section 5.8, under Alternatives 2 and 4 NMFS and the Council would have an opportunity in the fall of the year prior to the specifications year to examine new survey data. If these data showed low harvest levels for some species, NMFS could address the problem by regulatory action. These actions may be more likely in cases where very low stock levels would raise concerns about stock conservation. If this sort of action tends to offset the impact of the lag that would otherwise be introduced by Alternatives 2 and 4, the year-to-year biomass fluctuation would be less than currently projected in the simulations. This would reduce the number of years in which low biomass levels triggered low harvest rates through the sliding scale and may tend to increase average ABCs from what the simulation model might have predicted.

The lower ABCs and associated harvests also have an implication for the mean size of the spawning biomass: since fewer fish are being harvested, mean annual spawning biomass sizes are larger. Table 5.10-6 shows the model estimates of mean spawning biomass under Alternatives 1, 2 and 4.

Table 5.10-6 Mean spawning biomass under Alternatives 1, 2 and 4

Species	Alternative 1	Alternative 2	Alternative 4
EBS pollock	2,643	2,717	2,784
BSAI Pacific cod	442	454	469
AI Atka mackerel	128	146	153
BSAI Pacific ocean perch	142	142	142
GOA pollock	251	289	311
Sablefish	225	231	238
Notes: These estimates are summarized from Table 4.1-2 of this EA/RIR/IRFA			

The simulation results also suggest that Alternatives 2 and 4 (and to some extent Alternative 3) may result in somewhat more year-to-year variation in ABCs, as well as lower average ABCs. The changes in the year-to-year variation are illustrated by simulation "coefficients of variation" in Table 5.10-7. The coefficient of variation is a statistical measure of relative variation. It is equal to the ratio of the standard deviation of simulation results to the mean of the simulation results. The standard deviation is itself a measure of variability. The coefficient of variation is used here because it provides a measure of the relative variability. In general, the increases appear to be modest. The year-to-year variation in ABC even appears to decline for AI Atka mackerel. This decline in variability appears to be related to the fact that the age-selectivity for the oldest Atka mackerel is quite low.

Table 5.10-7 Coefficient of variation calculated for the harvests under Alternatives 2 and 4

Species	Alternative 1	Alternative 2	Alternative 4
EBS pollock	32.8	38.4	39.0
BSAI Pacific cod	24.6	26.8	25.8
AI Atka mackerel	41.3	35.4	28.8
BSAI Pacific ocean perch	11.2	11.2	11.4
GOA pollock	54.8	61.1	56.8
Sablefish	36.5	39.1	39.2
Notes: These estimates are summarized from Table 4.1-2 of this EA/RIR/IRFA			

In summary, there appear to be four impacts on harvest and biomass levels: (1) biomass levels are more variable; (2) ABCs and harvest levels are smaller; (3) ABCs and harvests are more variable; and (4) biomass levels are higher.

These impacts appear likely to have several classes of economic impacts: (1) reduced fishery revenues and profits; (2) increased costs and reduced profits flowing from increased year-to-year harvest fluctuations; (3) impacts on valued elements of the ecosystem.

Revenue impacts have already been discussed. Potential revenue impacts suggested by the model results are summarized in Section 5.10. As noted, the revenue impacts are ambiguous. The retrospective model suggests there may be significant positive and negative impacts by species. The net impact for the four species examined were almost zero, but this could change with the introduction of more species. The simulation model suggests that ABC setting based on the models used by assessment authors might push the process towards lower ABCs and harvests. However, the simulation modeling approach only looked at a part of the overall specifications process and the results were associated with great uncertainty.

Changes in the variability of year-to-year harvests may have social costs. These do not have to do with short-run projections of TACs and planning by organizations. As noted earlier, these planning horizons should be lengthened under Alternatives 2, 3 and 4, since the longer decision making process should provide reliable information about each year's TACs somewhat earlier. However, the TACs about which stakeholders would have earlier knowledge would (except for Atka mackerel) be changing by somewhat larger amounts from year-to-year.

Increased year-to year variability of harvests can contribute to market instability and increase the importance of inventories, perhaps increasing the average size of the inventories that are held. Increased inventories would be associated with increased storage and interest expenses for the firms holding them. Increased year-to-year fluctuations in harvests may increase the risk associated with fishing businesses and increase the interest rates they must pay for capital. Increased year-to-year fluctuations in income may impose a burden on persons trying to maintain a consistent standard of living from one year to another. Increased year-to-year variability in harvests may also impact the public sector by increasing the year-to-year fluctuations in raw fish tax revenues earned by the State of Alaska and by shoreside fishing communities.

The changes in the fish stock biomass may also have impacts on ecosystem services that persons value. Biomass is expected to be higher, but more variable. The net implications of these changes for an ecosystem component such as Steller sea lions are unknown. However, persons place a value on the survival of the sea lions, whose western distinct population segment is endangered. Biomass changes that enhanced the survival prospects for the sea lions would create a benefit, while changes that reduced those prospects would create a cost.

5.11 Options to Alternatives

Alternative 2 has one option: for those GOA and BSAI target species on a biennial survey schedule, set TAC biennially. The species on a biennial survey schedule include all of the target species in the Aleutian Islands, Bering Sea sablefish, and all GOA target species, except for sablefish. Currently, the resource surveys in these areas are done every two years. ABCs are recommended based on the most recent survey data which may have been collected one or two years in the past. The specifications process for Alternative 2 would be the same under this option, except that the stock assessment and rulemaking process for the biennially surveyed species would be completed every other year with ABC recommendations and harvest specifications established for two years. As noted in Section 4.1.4 of this EA/RIR/IRFA, under these circumstances, Option 2 is very similar (for these species) to Alternative 4.

Alternative 3 has two options : 1) set sablefish TAC on a January through December schedule and 2) Reschedule the December Council meeting to January. The purpose of Option 1 is to maintain the management of the sablefish IFQ program on the same annual schedule as the halibut IFQ program. Stock assessment information would be used to project the TAC to the following calendar year. For instance, 2000 stock assessment information would be used to establish TAC for all species, except sablefish, for July 2001 through June 2002. Sablefish TAC would be established with 2000 stock assessment information for January 2002 through December 2002.

Option 2 to Alternative 3 which moves the Council's decision making process from December to January, has the advantage of providing assessment authors and plan teams with more time to prepare their ABC and OFL recommendations for the Council. Science Center staff have indicated that this additional time may be helpful, particularly in instances when new survey data have unexpected information, and staff scientists need additional time to assimilate it into their models and projections. This option would require considerable adjustment on the part of the Council community, and would also seriously reduce the time available to move from the Council's specifications recommendations to a final rule.

Alternative 4 has two options: (1) set PSC limits annually, and (2) set PSC limits every two years based on regulations and for crab and herring use either projected values or rollovers from the previous year. Under Option 1, the PSC apportionments would need to be recommended annually by the Council, and NMFS would implement the PSC limits with proposed and final rulemaking under the same schedule used under Alternative 2. As discussed in Section 4.2 of this EA/RIR/IRFA, under

Alternative 2 there is potential for improved PSC management due to the end of the 25 percent of the annual PSC limits restriction during the period the interim specifications are in effect. Overall annual PSC limits are not likely to be affected by this option. Option 2 would put the PSC limit specifications on the same two year schedule as the other harvest specifications. As discussed in Section 4.2, Option 2 may be considered if the State of Alaska and NMFS have the resources, and if the biomass assessments are reliable enough to project crab and herring PSC limits. Currently resources are only available for annual biomass estimates for these species. Unless additional resources can be made available, NMFS recommends that Option 2 be withdrawn from further consideration.

There are two options that may be used with any of the four alternatives. Option A would abolish non-specified TAC reserves and Option B would update the language in portions of the FMPs. As discussed in Sections 1.4.1, 1.4.2, and 4.1.4 of this EA/RIR/IRFA, the reserves system was designed to meet management needs for flexibility when fishing and processing were performed by foreign fleets or under joint ventures. While conceptually, the unspecified reserves can allow managers to adjust the harvests of different species somewhat, this option has only been used once since 1991. The flexibility provided by the unspecified reserves can be achieved in other ways, while the system itself can increase confusion regarding which numbers are currently available for harvest and increase the administrative burden on fisheries managers. The elimination of the unspecified reserves is assumed to provide modest benefits at no cost. The effect of Option B is described in detail in Section 1.5 of this EA/RIR/IRFA. Option B would update FMP language to more accurately describe the current responsibilities of the Council plan teams and to eliminate references to foreign fishing (which no longer takes place). This option also is expected to provide modest benefits at no cost.

5.12 Summary of benefit-cost analysis

The purpose of a benefit cost analysis is to summarize the tradeoffs between different alternatives in a systematic way.[40] Summarization of the information in estimated monetary net benefits for each alternative is very helpful when it can be done, but has been impossible in this instance. In order to facilitate the comparison of the tradeoffs among the alternatives, in the absence of monetary net benefit estimates, the qualitative, quantitative, and monetary costs and benefits that it has been possible to identify are summarized below in Table 5.11.[41]

[40]This is an important difference between a cost-benefit analysis required under E.O. 12866, and a NEPA EA assessment. A NEPA EA or EIS assessment compares each alternative to a defined level of environmental significance; it is not meant to provide a summary or valuation of the tradeoffs between alternatives.

[41]These impacts are discussed more carefully in Sections 5.8 ("Impacts on the harvest specification process"), 5.9 ("Changes in fishing year under Alternative 3"), and 5.10 ("Changes in harvests and biomass under Alternatives 2, 3, and 4"). The final section of the RIR, Section 4.12, summarizes the implications for the E.O. 12866 significance analysis. These proposals are not believed to be significant within the meaning of E.O. 12866.

Table 5.12 Summary of costs and benefits of the alternatives

	Alt 1	Alt 2		Alt 3				
	No action, baseline. Specifications based on previous years surveys	*Specifications based on surveys two years before*	Option *Specifications based on surveys two years before. Biennial TAC for species on biennial survey schedule.*	*Start the fishing year on July1*	Option 1 *Sablefish on 1/1-12/31 year*	Option 2 *Dec. Council Meeting moved to Jan.*	Option 1 *Determine specifications for two years at a time. Annual PSC limits.*	
	Opportunity for analysis and peer review of survey data. Notice and comment not based on specifications that will eventually be adopted. Little time for Secretarial review. Potential for public confusion given tenuous relationship between proposed and final specifications. Not administratively efficient.	Improved opportunity for analysis of survey results and peer review before use. Use of increasingly lagged survey results. Ppotential to address new information through additional rulemaking. Provides significantly enhanced opportunities for notice and comment and Secretarial review. Promotes administrative efficiency.	Improved opportunity for analysis of survey results and peer review before use. Use of increasingly lagged survey results. Potential to address new information through additional rulemaking. Provides significantly enhanced opportunities for notice and comment and Secretarial review. Promotes administrative efficiency.	No improvement in the quality of scientific information over Alt. 1, unless Option 2 is adopted. Does provide improved opportunities for public notice and comment and Secretarial review. Without Option 1, the change in the fishing year has the potential to disrupt the sablefish fishery fisheries. The change may create temporary public confusion. The adjustments to deal with sablefish issues would not contribute to administrative efficiency, unless the Option 1 is adopted.			Improved opportunity for analysis of survey results and peer review before use. Use of increasingly lagged survey results. Potential to address new information through additional rulemaking. Provides significantly enhanced opportunities for notice and comment and Secretarial review. Promotes administrative efficiency.	Improved opportunity for analysis of survey results and peer review before use. Use of increasingly lagged survey results. Potential to address new information through additional rulemaking. Provides significantly enhanced opportunities for notice and comment and Secretarial review. Promotes administrative efficiency.

	Alt 1	Alt 2		Alt 3				
			Option		Option 1	Option 2	Option 1	
	No action, baseline. Specifications based on previous years surveys	*Specifications based on surveys two years before*	*Specifications based on surveys two years before. Biennial TAC for species on biennial survey schedule.*	*Start the fishing year on July1*	*Sablefish on 1/1-12/31 year*	*Dec. Council Meeting moved to Jan.*	*Determine specifications for two years at a time. Annual PSC limits.*	
Opportunities for analysis and scientific peer review (from Section 5.8)	Baseline and status quo (currently about two months available)	More time (three to four months)	More time (three to four months)	Little change from baseline (about two months) Option 2 provides an additional month for analysis and review.			More time (three to four months)	More time (three to four months) May require additional resources (over those required for Option 1) to make crab and herring biomass projections two years in advance. Unless these reources are forthcoming NMFS recommends that this alternative be withdrawn from further consideration.
Opportunities for notice and comment (from Section 5.8)	Baseline and status quo	Better information on which to comment. More time for the process.	Better information on which to comment. More time for the process.	Better information on which to comment. More time for the process.(But **not to the same extent as Alternatives 2 and 4**) Less time under Option 2.			Better information on which to comment. More time for the process.	Better information on which to comment. More time for the process.
	Baseline and status quo	Better information on which to make decisions - more time for the process.	Better information on which to make decisions - more time for the process.	Better information on which to make decisions - more time for the process. (But **less than under Alternatives 2 and 4**) Less time to consider comments under Option 2.			Better information on which to make decisions - more time for the process.	Better information on which to make decisions - more time for the process.

	Alt 1	Alt 2		Alt 3				
	No action, baseline. Specifications based on previous years surveys	*Specifications based on surveys two years before*	Option *Specifications based on surveys two years before. Biennial TAC for species on biennial survey schedule.*	*Start the fishing year on July1*	Option 1 *Sablefish on 1/1-12/31 year*	Option 2 *Dec. Council Meeting moved to Jan.*	Option 1 *Determine specifications for two years at a time. Annual PSC limits.*	
	Baseline and status quo	Additional analysis time, notice and comment, and decision making time may increase administrative costs and time invested by public.	Additional analysis time, notice and comment, and decision making time may increase administrative costs and time invested by public. Biennial specifications for biennially surveyed species may reduce costs of specifications process over Alt2 without the option.	Additional analysis time, notice and comment, and decision making time may increase administrative costs and time invested by public.			Additional analysis time, notice and comment, and decision making time may increase administrative costs and time invested by public. Biennial specifications may reduce administrative costs.	Additional analysis time, notice and comment, and decision making time may increase administrative costs and time invested by public. Biennial specifications may reduce administrative costs. However, additional resources may not be available for two year crab and herring biomass projections.

	Alt 1	Alt 2		Alt 3			Alt 4	
	No action, baseline. Specifications based on previous years surveys	*Specifications based on surveys two years before*	Option *Specifications based on surveys two years before. Biennial TAC for species on biennial survey schedule.*	*Start the fishing year on July1*	Option 1 *Sablefish on 1/1-12/31 year*	Option 2 Dec. Council Meeting moved to Jan.	Option *Determine specifications for two years at a time. Annual PSC limits.*	Option 2 *Determine specifications for two years at a time. Set PSC limits every two years.*
Private sector planning horizons (from Section 5.8)	Status quo and baseline (less than one month)	About nine months	About nine months	Six or seven months			About nine months for first year, almost 21 for second year	About nine months for first year, almost 21 for second year

	Alt 1	Alt 2		Alt 3				
	No action, baseline. Specifications based on previous years surveys	*Specifications based on surveys two years before*	Option *Specifications based on surveys two years before. Biennial TAC for species on biennial survey schedule.*	*Start the fishing year on July1*	Option 1 *Sablefish on 1/1-12/31 year*	Option 2 Dec. Council Meeting moved to Jan.	Option *Determine specifications for two years at a time. Annual PSC limits.*	
Fishing year induced changes in fishing behavior (from Section 5.9)	Baseline and status quo	None	None	Potential costs, many of which could be addressed by changes in fishing seasons, changes in distribution of PSC limits, and other measures. Limited opportunities for rollovers. Serious problems may occur for sablefish and related halibut fishing, if Option 1 not adopted.			None	None
Impact on projected harvests (from Section 5.10)	Baseline and status quo	Possibility of reduction in mean harvests and increased variability in harvests.	Possibility of reduction in mean harvests and increased variability in harvests.	Possibility of reduction in mean harvests and increased variability in harvests. These impacts would be **smaller than those for Alternative 2.**			Possibility of reduction in mean harvests and increased variability in harvests. These impacts would be **greater than those for Alternative 2.**	Possibility of reduction in mean harvests and increased variability in harvests. These impacts would be **greater than those for Alternative 2**.
	Baseline and status quo	Possibility of increased mean spawning biomass with increased variability in spawning biomass	Possibility of increased mean spawning biomass with increased variability in spawning biomass	Possibility of increased mean spawning biomass with increased variability in spawning biomass. These impacts would be **smaller than those for Alternative 2**.			Possibility of increased mean spawning biomass with increased variability in spawning biomass. These impacts would be **greater than those for Alternative 2**.	Possibility of increased mean spawning biomass with increased variability in spawning biomass. These impacts would be **greater than those for Alternative 2**.

	Alt 1	Alt 2		Alt 3				
	No action, baseline. Specifications based on previous years surveys	*Specifications based on surveys two years before*	Option *Specifications based on surveys two years before. Biennial TAC for species on biennial survey schedule.*	*Start the fishing year on July1*	Option 1 *Sablefish on 1/1-12/31 year*	Option 2 Dec. Council Meeting moved to Jan.	Option *Determine specifications for two years at a time. Annual PSC limits.*	
Net benefits	Baseline and status quo Not possible to monetize net benefits. This alternative does not appear to meet the objectives of the proposed action.	Not possible to monetize net benefits This alternative (along with Alt. 4) may come closest to meeting the objectives of the proposed action. However, it may be costly because of less harvest.	Not possible to monetize net benefits This alternative (along with Alt. 4) may come closest to meeting the objectives of the proposed action. However, it may be costly because of less harvest.	Not possible to monetize net benefits This alternative improves notice and comment. Should be less costly than Alternative 2 in terms of potentially lower ABCs and harvests. Requires more systematic revision of fishing season due to new fishing year. This may create serious problems for the sablefish IFQ fishery, if the option is not adopted			Not possible to monetize net benefits. This alternative (along with Alt. 2) may come closest to meeting the objectives of the proposed action. However, it may be costly because of less harvest.	Not possible to monetize net benefits This alternative (along with Alt. 2) may come closest to meeting the objectives of the proposed action. However, it may be costly because of less harvest.
	Baseline and status quo	Does not appear to be significant with respect to considerations in this RIR. Impact appears to be less than $100 million.	Does not appear to be significant with respect to considerations in this RIR. Impact appears to be less than $100 million.	Does not appear to be significant with respect to considerations in this RIR. Impact appears to be less than $100 million.			Does not appear to be significant with respect to considerations in this RIR. Impact appears to be less than $100 million.	Does not appear to be significant with respect to considerations in this RIR. Impact appears to be less than $100 million.

5.13 Summary of E.O. 12866 significance criteria

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

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

NMFS does not expect that any of the proposals will have an annual effect on the economy of $100 million or more, or will adversely affect in a material way the economy, a sector of the economy, productivity, competition, jobs, the environment, public health or safety, or state, local or tribal governments. As described in Section 5.6 of this EA/RIR/IRFA, the aggregate value of groundfish production from groundfish fisheries in the GOA and the BSAI at the first wholesale level[42] was about one billion dollars in 2000 (Hiatt, *et al.*, 2001, Tables 24 and 25, pages 54 and 56).

An alternative would have to have to increase or decrease the first wholesale value of the product by 10% per year in order to trigger the first significance criterion. However, as noted in Table 5.10-5, the average percentage reductions suggested by the simulation model under Alternative 4, perhaps the most systematically one-sided and costly results generated by the analysis, only two species had negative impacts over 10%. The important EBS pollock, BSAI Pacific cod, and sablefish species had negative impacts of harvest between 3% and 5%. To some extent these reductions in production would be offset by price increases.

Moreover, as noted in the discussion of the impacts of the alternatives, the changes contemplated are primarily procedural, and are expected to have no direct impact on the total volume, timing, or species composition of fish harvested and processed. Any impact on the value of the product, such as that just discussed, would occur as a result of new Federal decisions and actions taken under the new specifications process to specify annual or biennial ABCs, OFLs, and TACs. These actions may lead to changes in ABCs, OFLs and TACs because the increased time frames for analysis, public notice and comment, and decision making lead to better decisions about optimal harvest rates. These actions could only be taken following new NEPA, E.O. 12866, and RFA analyses.

NMFS has not identified any factors that would "Create a serious inconsistency or otherwise interfere with an action taken or planned by another agency." The actions proposed may reduce the

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[42]The first wholesale level means the first sale of processed product by onshore processors, catcher/processor vessels, or motherships.

likelihood that future specifications decisions would interfere with actions taken or planned by another agency because the longer time period available for analysis, notice and comment, and decision making, provides more opportunities for input from the public and other agencies in any given rulemaking.

NMFS has not identified any factors that would: (a) "Materially alter the budgetary impact of entitlements, grants, user fees, or loan programs or the rights and obligations of recipients thereof"; or (b) "Raise novel legal or policy issues arising out of legal mandates, the President's priorities, or the principles set forth in the executive order."

In summary, it does not appear to meet these criteria for a "significant regulatory action".

6.0 INITIAL REGULATORY FLEXIBILITY ANALYSIS

6.1 Introduction

This Initial Regulatory Flexibility Analysis (IRFA) evaluates alternative regulatory actions that would change the way the annual harvest specifications are determined for the groundfish fisheries managed by the Federal government in the GOA and the BSAI. This IRFA examines the impacts of the alternative actions on small fishing entities, and meets the statutory requirements of the Regulatory Flexibility Act (RFA) of 1980, as amended by the Small Business Regulatory Enforcement Fairness Act (SBREFA) of 1996 (5 U.S.C. 601-612).

6.2 The purpose of an IRFA

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

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

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

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

6.3 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.

6.4 What is a small entity?

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

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

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

The SBA has established "principles of affiliation" to determine whether a business concern is "independently owned and operated." In general, business concerns are affiliates of each other when one concern controls or has the power to control the other, or a third party controls or has the power to control both. The SBA considers factors such as ownership, management, previous relationships with or ties to another concern, and contractual relationships, in determining whether affiliation exists. Individuals or firms that have identical or substantially identical business or economic interests, such as family members, persons with common investments, or firms that are economically dependent through contractual or other relationships, are treated as one party with such interests aggregated when measuring the size of the concern in question. The SBA counts the receipts or employees of the concern whose size is at issue and those of all its domestic and foreign affiliates, regardless of whether the affiliates are organized for profit, in determining the concern's size. However, business concerns owned and controlled by Indian Tribes, Alaska Regional or Village Corporations organized pursuant to the Alaska Native Claims Settlement Act (43 U.S.C. 1601), Native Hawaiian Organizations, or Community Development Corporations authorized by 42 U.S.C.

9805 are not considered affiliates of such entities, or with other concerns owned by these entities solely because of their common ownership.

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

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

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

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

6.5 What is this action?

Detailed descriptions of each alternative analyzed in this EA/RIR/IRFA can be found in Section 2.1.[43] The management alternatives and an option that may be implemented with any alternative are:

Alternative 1. Status Quo (NO ACTION ALTERNATIVE).

Alternative 2: Eliminate publication of interim specifications. Issue Proposed and Final Specifications Prior to Start of the Fishing Year. (Preliminary Preferred Alternative) Option: For the GOA and BSAI target species on a biennial survey schedule, set harvest specifications biennially.

Alternative 3: Issue Proposed and Final Harvest Specifications based on an alternate fishing year schedule. (July 1-June 30) Option 1: Set sablefish TAC on a January through December schedule. Option 2: Reschedule the December Council Meeting for January.

[43] Alternatives considered, but not analyzed in this EA/RIR/IRFA are listed in Section 2.3.

Alternative 4: Use Stock Assessment Projections for biennial harvest specifications. For the BSAI and GOA set the annual harvest specifications based on the most recent stock assessment and set harvest specifications for the following year based on projected OFL and ABC values. Option 1: Set PSC limits annually. Option 2: Set PSC limits every two years based on regulations and projected values or rollover from previous year

These options may be implemented with any of the above alternatives:

Option A: Abolish TAC Reserves.

Option B: Update FMP language to incorporate new harvest specifications administrative process
and to remove references to foreign fishing.

6.6 Reason for considering the proposed action

The reasons for the proposed action are discussed in detail in Sections 1.3, 1.6, and 5.4 of this EA/RIR/IRFA. In brief, the status quo provides a very compressed period of time in which to develop and implement harvest specifications for the coming year. The key biomass survey data only becomes available in September and October. The fishing year begins on the following January 1. This leaves only a short time to assess the survey data and update fishery models, obtain peer review of this work, obtain the input from the Council's SSC and AP, develop the Council's recommendations, provide for notice and comment, publish a final rule, and meet the APA requirement for a 30 day period between publication of a final rule and its effective date. The alternatives considered in this EA/RIR/IRFA improve this process in different ways.

6.7 Objectives of, and legal basis for, the proposed action

The objectives of the proposed action are discussed in detail in Sections 1.6, and 5.4 of this EA/RIR/IRFA. In summary, they are to: (1) manage fisheries based on best scientific information available, (2) provide for adequate prior public review and comment to the Secretary on Council recommendations, (3) provide for additional opportunity for Secretarial review, (4) minimize unnecessary disruption to fisheries and public confusion, and (5) promote administrative efficiency.

The legal basis for the proposed action was discussed in Section 1.0 of this EA/RIR/IRFA and in Section 5.3. In summary, the National Marine Fisheries Service manages the U.S. groundfish fisheries of the Gulf of Alaska management area in the Exclusive Economic Zone under the Fishery Management Plan (FMP) for that area. The North Pacific Fishery Management Council prepared the FMP under the authority of the Magnuson-Stevens Fishery Conservation and Management Act. Regulations implement the FMPs at §50 CFR part 679. General regulations that also pertain to U.S. fisheries appear at subpart H of §50 CFR part 600.

6.8 Number and description of small entities affected by the proposed action

What are the regulated entities?

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

Number of small regulated entities

Table 6.8-1 shows the estimated numbers of small and large entities in the BSAI and GOA groundfish fisheries. The reasoning behind these estimates is summarized in the paragraphs which follow the table.

Table 6.8-1 Estimated numbers of small entities in the BSAI and GOA groundfish fisheries

Fleet segment	Number small entities	Number large entities	Total number of entities
Catcher vessels	1,353	13 (70 vessels)	1,366
Catcher processors	33	46 (57 vessels)	79
Motherships	0	3	3
Shoreside processors	36	13 (32 plants)	49
CDQ groups	6	0	6

Notes: In some cases, the number of entities is smaller than the number of vessels or shoreplants because at least some entities have multiple vessels or plants. The estimated numbers of vessels and plants have been placed in parentheses. Catcher vessel and catcher/processor estimates prepared from fishtickets, weekly processor reports, product price files, and intent-to-operate listing. The methodology used probably overstates the numbers of small entities. Shoreside processors prepared by comparing a list of processors producing groundfish in 2000 with data on monthly employment by processing firm in 2000 obtained from Alaska Department of Labor. All CDQ groups are non-profits and are therefore treated as small.

Fishing vessels, both catcher vessels and catcher/processors, are small if they gross less than $3.5 million in a year. Table 6.8-2 provides estimates of the numbers of catcher vessels and catcher/processors with less than $3.5 million in gross revenues from groundfish fishing in the BSAI and GOA.[44] Estimates of the numbers of vessels are provided by year and gear type from 1996 to

[44]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 that an entity's 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.

2000.[45] Estimates are also broken out for the GOA, the BSAI, and for all of Alaska. Table 6.8-3, provides similar information for catcher vessels and catcher/processors grossing more than $3.5 million.

Table 6.8-2 indicates that, in 2000, there were 1,264 small catcher vessels in the GOA and 301 in the BSAI. There were 1,422 small vessels in total. These numbers suggest that 143 vessels must have operated in both the BSAI and the GOA. Table 6.8-2 implies that each of the small catcher vessels is treated as a separate small entity. This may overstate the number of separate entities since there is probably not a strict one-to-one correspondence between vessels and entities; some persons or firms may [46]own more than one vessel.

It is possible to draw on analysis done recently for the American Fisheries Act amendments (61/61/13/8) to add somewhat more precision to the estimates of small catcher vessel entities in the BSAI (NMFS 2002). The FRFA prepared for those amendments provides the most detailed current picture of the affiliations and sizes of the catcher vessel entities active in the BSAI pollock fisheries. This FRFA reports that 112 catcher vessels were active in the pollock fisheries covered by the American Fisheries Act. 100 of these delivered to inshore processing plants, 7 delivered to catcher/processors offshore, and 5 delivered only to motherships (a total of 20 delivered to motherships, but 15 of these also delivered to onshore processors and these 15 are included here with the onshore processing group). While Table 6.8-2 suggests that all but one of these had gross revenues under $3.5 million, the FRFA indicates that 69 of them had affiliations with large entities and should be considered large under the SBA criteria. (NMFS 2002, pages 4-176 to 4-181) Adjusting the numbers of small entities in light of these considerations, the number for the BSAI drops from 301 to 232 and the total for the BSAI and GOA drops from 1,422 to 1,353. The change in the GOA alone can't be determined.

The number of large catcher vessel entities from Table 6.8-1 is 1. In addition, the 69 pollock catcher vessels determined to be large based on their affiliations in the AFA FRFA were associated with an estimated 12 entities.[47] (NMFS 2002, pages 4-176 to 4-181). Thus the total number of large catcher vessel entities is estimated to be 13.

These affiliation issues are not reflected in the counts in Tables 6.8-2 and 6.8-3. Catcher/processor affiliations are addressed in the text.

[45]The product price information that would permit estimates of gross revenues for 2001 is not yet (May 2002) available.

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

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

Table 6.8-2 indicates that, in 2000, there were 16 small catcher/processors in the GOA and 31 in the BSAI. There were 33 small catcher/processors in total. These numbers suggest that 14 catcher/processors must have operated in both the BSAI and the GOA. Table 6.8-2 implies that each of the small catcher/processors is treated is a separate small entity. This may overstate the number of separate entities since there is probably not a strict one-to-one correspondence between vessels and entities; some persons or firms may [48]own more than one vessel. The AFA FRFA used above for the catcher vessel analysis indicates that in 2000, 20 large catcher/processors owned by 9 companies were authorized to fish for pollock in the BSAI under the AFA. (NMFS 2002, pages 4-176 to 4-181) For the purposes of this IRFA, there were an estimated 33 small catcher/processor entities, and 46[49] large entities, for a total of 79 total catcher/processor entities. These may be underestimates of the numbers of large entities, and overestimates of the numbers of small entities, for the reasons discussed above in the catcher vessel paragraph.

The estimates of large and small shoreside processors in Table 6.8-1 were made by comparing a list of processors and the gross revenues each generated from groundfish products in 2000, with data from the Alaska Department of Labor on numbers of employees per month for each processing facility. The employees data counted each employee, treating part-time and full-time employees alike. If a plant employed more than 500 persons in any month it was considered to be a large plant. Multiple plants that could be connected to a single processing firm were treated as a single entity in the counts. This procedure may overstate the number of small entities somewhat, since there are many interconnections between processing facilities in Alaska, and they are not well known.

The three motherships are believed to be large entities. The six Community Development Quota (CDQ) groups are treated as small entities because they are non-profit entities supporting the community development objectives of 65 Western Alaska communities.

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

[49]46 large entities = (57 vessels with gross revenues over $3.5 million) minus (20 vessel affiliated with companies) plus (the nine companies with which they were affiliated).

Table 6.8-2 Number of vessels that caught or caught and processed less than $3.5 million ex-vessel value or product value of groundfish by area, catcher type and gear, 1996-2000.

	Gulf of Alaska			Bering Sea and Aleutian			All Alaska		
	Catcher Vessels	Catcher process	Total	Catcher Vessels	Catcher process	Total	Catcher Vessels	Catcher process	Total
1996									
All gear	1190	30	1220	311	52	363	1317	55	1372
H & L	984	23	1007	114	35	149	1015	38	1053
Pot	146	1	147	88	15	103	203	15	218
Trawl	152	7	159	116	8	124	203	9	212
Oth. & unk.	4	1	5	0	0	0	4	1	5
1997									
All gear	1186	29	1215	264	51	315	1265	52	1317
H & L	949	19	968	94	35	129	961	36	997
Pot	145	1	146	74	9	83	191	9	200
Trawl	166	9	175	100	10	110	194	10	204
Oth. & unk.	24	0	24	0	0	0	24	0	24
1998									
All gear	1111	18	1129	226	40	266	1187	40	1227
H & L	865	14	879	72	29	101	883	29	912
Pot	170	0	170	71	7	78	215	7	222
Trawl	164	4	168	102	6	108	197	6	203
Oth. & unk.	35	0	35	0	0	0	35	0	35
1999									
All gear	1164	29	1193	274	31	305	1272	34	1306
H & L	905	16	921	75	18	93	929	21	950
Pot	204	10	214	89	12	101	258	12	270
Trawl	154	3	157	116	4	120	194	4	198
Oth. & unk.	21	1	22	0	0	0	21	1	22
2000									
All gear	1264	16	1280	301	31	332	1422	33	1455
H & L	1011	8	1019	105	18	123	1050	19	1069
Pot	252	4	256	91	11	102	304	12	316
Trawl	127	4	131	113	6	119	205	7	212
Oth. & unk.	21	0	21	0	1	1	21	1	22

Note: Includes only vessels that fished part of Federal TACs.
Source: Fishtickets, weekly processor reports, product price files, NMSF permits.
National Marine Fisheries Service, P.O. Box 15700, Seattle, WA 98115-0070.

Table 6.8-3 Number of vessels that caught or caught and processed more than $3.5 million ex-vessel value or product value of groundfish by area, catcher type and gear, 1996-2000.

	Gulf of Alaska			Bering Sea and Aleutian			All Alaska		
	Catcher Vessels	Catcher process	Total	Catcher Vessels	Catcher process	Total	Catcher Vessels	Catcher process	Total
1996									
All gear	1	33	34	2	62	64	2	62	64
H & L	0	4	4	0	9	9	0	9	9
Trawl	1	29	30	2	53	55	2	53	55
1997									
All gear	1	21	22	1	56	57	1	56	57
H & L	0	4	4	0	8	8	0	8	8
Pot	0	0	0	0	1	1	0	1	1
Trawl	1	17	18	1	48	49	1	48	49
1998									
All gear	0	25	25	0	59	59	0	59	59
H & L	0	5	5	0	14	14	0	14	14
Trawl	0	20	20	0	44	44	0	44	44
Oth. & unk.	0	0	0	0	2	2	0	2	2
1999									
All gear	0	28	28	0	57	57	0	57	57
H & L	0	13	13	0	21	21	0	21	21
Pot	0	1	1	0	3	3	0	3	3
Trawl	0	14	14	0	36	36	0	36	36
Oth. & unk.	0	0	0	0	1	1	0	1	1
2000									
All gear	0	26	26	1	57	58	1	57	58
H & L	0	12	12	0	25	25	0	25	25
Pot	0	0	0	0	1	1	0	1	1
Trawl	0	14	14	1	33	34	1	33	34

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

Source: Fishtickets, weekly processor reports, NMFS permits, annual processor survey. National Marine Fisheries Service, P.O. Box 15700, Seattle, WA 98115-0070.

Description of small regulated entities

Section 5.6 of this EA/RIR/IRFA provides a description of the fishery participants. The section also lists other reports with detailed descriptions of the fishery. This section focuses on the average revenues of small entities, absolutely, and in comparison with the revenues of large entities.

Tables 6.8-4 and 6.8-5 provide estimates of average gross revenues from groundfish production in the BSAI and GOA for small and for large vessels.[50] Considering activity in both the BSAI and the GOA, small catcher vessels grossed an average of about $170,000 in 2000. This average conceals variation by fishery management area and gear type. Small hook and line gear vessels (longline and jig) in the BSAI had the smallest average gross revenues at about $30,000, while small trawlers in the BSAI had the largest at $920,000. The overall average gross revenues for all small vessels active in the GOA were $100,000, while the overall average gross revenues for all small vessels active in the BSAI was $380,000. Corresponding average gross revenues for large entities for these gear types and areas may be found in Table 6.8-5.

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, products, and vessel size. The 33 small catcher/processor vessels had aggregate first wholesale gross revenues of about $46 million in 2000; average revenues were about $1.4 million. The 57 large catcher/processor vessels had aggregate first wholesale gross revenues of about $606 million in 2000; average revenues were about $10.6 million.(gross revenue data, Hiatt T., pers. comm 2-28-02.)

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

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

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

of about $63.2 million in 2000 (Alaska Department of Community and Economic Development 2001, page 25); average gross revenues were thus about $10.5 million.

Table 6.8-4 Average revenue of vessels that caught or caught and processed less than $3.5 million ex-vessel value or product value of groundfish by area, catcher type and gear, 1996-2000. ($ millions)

	Gulf of Alaska			Bering Sea and Aleutian			All Alaska		
	Catcher Vessels	Catcher process	Total	Catcher Vessels	Catcher process	Total	Catcher Vessels	Catcher process	Total
1996									
All gear	.08	.55	.10	.30	1.23	.43	.15	1.45	.20
H & L	.06	.47	.07	.02	1.32	.33	.06	1.50	.12
Pot	.05	-	.05	.08	.49	.14	.07	.49	.10
Trawl	.21	.72	.23	.71	1.29	.75	.56	1.71	.61
Oth. & unk.	.00	-	.00	-	-	-	.00	-	.00
1997									
All gear	.09	.59	.10	.38	1.23	.52	.17	1.53	.22
H & L	.06	.56	.07	.03	1.44	.41	.07	1.69	.13
Pot	.06	-	.06	.07	.40	.11	.07	.40	.09
Trawl	.23	.67	.25	.93	.90	.93	.67	1.51	.71
Oth. & unk.	.00	-	.00	-	-	-	.00	-	.00
1998									
All gear	.07	.62	.08	.31	1.34	.46	.13	1.61	.17
H & L	.05	.55	.05	.02	1.26	.37	.05	1.52	.09
Pot	.05	-	.05	.05	.83	.12	.06	.83	.08
Trawl	.19	.85	.21	.63	1.86	.70	.49	2.43	.54
Oth. & unk.	.00	-	.00	-	-	-	.00	-	.00
1999									
All gear	.08	.49	.09	.35	.96	.41	.15	1.25	.18
H & L	.05	.46	.06	.02	1.00	.21	.05	1.21	.07
Pot	.08	.55	.10	.09	.87	.18	.09	1.33	.15
Trawl	.23	-	.23	.75	.30	.74	.63	.30	.63
Oth. & unk.	.00	-	.00	-	-	-	.00	-	.00
2000									
All gear	.10	.69	.10	.38	1.13	.45	.17	1.40	.19

H & L	.07	.52	.07	.03	1.33	.22	.07	1.48	.09
Pot	.08	.31	.08	.09	.34	.12	.09	.41	.10
Trawl	.27	1.43	.31	.92	1.23	.93	.67	1.88	.71
Oth. & unk.	.00	-	.00	-	-	-	.00	-	.00

Note: Includes only vessels that fished part of Federal TACs.
Categories with fewer than four vessels are not reported.

Source: Fishtickets, weekly processor reports, product price files, NMSF permits.
National Marine Fisheries Service, P.O. Box 15700, Seattle, WA 98115-0070.

Table 6.8-5 Average revenue of vessels that caught or caught and processed more than $3.5 million ex-vessel value or product value of groundfish by area, catcher type and gear, 1996-2000. ($ millions)

	Gulf of Alaska		BSAI		All Alaska	
	Catcher process	Total	Catcher process	Total	Catcher process	Total
1996						
All gear	.97	.97	9.24	9.24	9.75	9.75
H & L	.81	.81	3.69	3.69	4.05	4.05
Trawl	.99	.99	10.18	10.18	10.72	10.72
1997						
All gear	.76	.76	10.09	10.09	10.37	10.37
H & L	.60	.60	3.98	3.98	4.28	4.28
Trawl	.80	.80	11.11	11.11	11.39	11.39
1998						
All gear	.70	.70	8.30	8.30	8.61	8.61
H & L	.33	.33	4.40	4.40	4.51	4.51
Trawl	.80	.80	9.55	9.55	9.91	9.91
1999						
All gear	.91	.91	9.56	9.56	9.99	9.99
H & L	.56	.56	4.00	4.00	4.34	4.34
Trawl	1.24	1.24	12.81	12.81	13.29	13.29
2000						
All gear	1.16	1.16	10.11	10.11	10.64	10.64
H & L	.91	.91	4.27	4.27	4.71	4.71
Trawl	1.38	1.38	14.22	14.22	14.80	14.80

Notes: Includes only vessels that fished part of Federal TACs.
Categories with fewer than four vessels are not reported.

Source: Fishtickets, weekly processor reports, NMFS permits, annual processor survey.
National Marine Fisheries Service, P.O. Box 15700, Seattle, WA 98115-0070.

6.9 Impacts on regulated small entities

Impact on cash flow or profitability

As discussed in Sections 4.1 and 5.10, alternatives which lengthen the period of time between a biomass survey year and its associated specifications year have the potential to reduce fish harvests. Some of the modeling results suggest that these costs could amount to a few tens of millions of dollars under Alternative 2, considerably more under Alternative 4, and less under Alternative 3. These results have a high degree of uncertainty associated with them.

Alternatives that reduce the level of harvest from the fisheries would have an adverse impact on the cash flow and profitability for small entities. It is not possible to estimate the magnitudes of these impacts. The models that identify the impacts for the whole fishery do not provide a high level of precision at that level. It is not possible to make any predictions with the available models about the distribution of adverse impacts among vessel classes or large and small entities.

In addition to changes in the average levels of harvests, some of the modeling results suggest that year-to-year fluctuations in groundfish harvests may increase under the Alternatives 2, 3, and 4 compared to Alternative 1. The increase is likely to be largest under Alternative 4, less under Alternative 2, and even less under Alternative 3, and least under Alternative 1. These increased year-to-year fluctuations may result in increased year-to-year variability in gross revenues. This increased variability may result in higher interest rates, higher carrying costs for inventory, and an increased need to borrow money to tide operations over short-term harvest reductions. All of these factors may increase operating costs for small entities. It is impossible to estimate the size of these operating increases.

Does the preferred alternative impose a disproportionate burden on regulated small entities

A preferred alternative has not been selected for this action at this time (September 2002). Regardless, the answer to this question is unknown. As noted, the projections of changes in the mean harvest and in the year-to-year variability of the harvest, and its distribution among fleet sectors are unknown. It is not possible to make definite statements about the impacts on small entities in comparison with those on large entities. For example, while small entities may be less diversified and more vulnerable than large entities to an annual reduced harvest in any one species, some modeling results suggest that a large part of reduced revenues may come from the EBS pollock fishery, which is dominated by large entities. It is not possible to make a definitive statement on whether or not these results will bear disproportionately on small entities.

Other important impacts[51]

[51]The following non-adverse impacts are introduced to provide a full summary of the impacts on small regulated entities. There is no implication that do, or do not, offset the adverse impacts.

Alternatives 2 and 4, and to a lesser extent Alternative 3, provide better opportunities for analysis, a fuller notice and comment on process, and an improved environment for decision-making. For reasons discussed in Section 5.8, these may improve access to the decision making process for small entities and their representatives and improve small business input into the decision making process. If improvements in notice and comment on proposed rulemaking head off lawsuits that might disrupt fisheries, this would also be a benefit to small entities.

6.10 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.

6.11 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.

6.12 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."

The alternatives have been described in detail in Sections 2.1 and 5.5 of this EA/RIR/IRFA. Tables 6.12-1 below lists each alternative, indicates its impact on directly regulated small entities (so far as is known) and describes why the alternative was not chosen. The "Why not chosen..." column for Alternatives 2 and 3 will be completed when a preferred alternative is selected.

Table 6.12-1 Alternatives subjected to detailed study

Alternative		Description	Impact on directly regulated small entities	Why not chosen if better for directly regulated small entities?
Alt 1		Publish proposed specifications, followed by interim and final specifications	This is the status quo and the baseline scenario. This alternative is the most constraining of the alternatives with respect to small business access to the decision-making process. It is likely to be associated with somewhat larger harvests than other alternatives, and thus somewhat higher average revenues for small entities.	No preferred alternative at this time
Alt 2	Opt 1	Eliminate interim specifications. Issue proposed and final specs. Prior to start of fishing year.	These two options improve opportunities for small business access to the decision making process. The two options for this alternative may be associated with reductions in groundfish harvests and with increased year-to-year variation in harvests. These changes would reduce small entity revenues, but it is not clear if there would be a disproportionate impact on small entities.	No preferred alternative at this time
	Opt 2	Eliminate interim specifications. For GOA and BSAI target species on a biennial survey schedule set harvest specs biennially. Remaining species on annual harvest spec. schedule		No preferred alternative at this time
Alt 3	Opt. 1	Use status quo time line. Eliminate interim specs. Issue proposed and final specs. Begin fishing year in July. Sable fish remain on a 1/1-12/31 schedule.	Alternative 3 will shift the start of the fishing year until after the current beginning of the halibut and sablefish individual quota (IFQ) fisheries in the GOA and the BSAI. . Either preliminary IFQs would have to be issued prior to the fishery and updated after the fishery began (reducing many of the benefits of an IFQ program) or disruptive regulatory actions would have to be taken to change the halibut and sablefish IFQ fishing seasons. Option 1 would eliminate this problem	No preferred alternative at this time
	Opt. 2	Fishing year on 7/1-6/30 schedule. December Council meeting rescheduled for January		
Alt 4	Opt 1	Use stock assessment projections for biennial harvest specs. Set PSC limits annually.	These two options will improve opportunities for small business access to the decision making process. The two options for this alternative are associated with the larger potential reductions in harvests than Alt 2, and with more potential year-to-year variation in harvests. The changes would reduce small entity revenues, but it is not clear if there would be a disproportionate impact on small entities.	No preferred alternative at this time
	Opt 2	Use stock assessment projections for biennial harvest specs. Set PSC limits every two years.		No preferred alternative at this time

Notes: A more detailed discussion of the impacts on small entities may be found in Section 6.9 of this EA/RIR/IRFA.

7.0 COMMUNITY IMPACTS

Standard 8 of the Magnuson-Stevens Act requires that "Conservation and management measures shall, consistent with the conservation requirements of this Act (including the prevention of overfishing and rebuilding of overfished stocks), take into account the importance of fishery resources to fishing communities in order to (A) provide for the sustained participation of such communities, and (B) to the extent practicable, minimize adverse economic impacts on such communities." (16 U.S.C. 1851) The term fishing community is described in the statute as "…a community which is substantially dependent on or substantially engaged in the harvest or processing of fishery resources to meet social and economic needs, and includes fishing vessel owners, operators, and crew and United States fish processors that are based in such community." (16 U.S.C. 1802)

This section analyzes the social impacts of the final actions on fishing communities. The BSAI and GOA groundfish FMPs (NPFMC, 1999a and 1999b) have additional information regarding socioeconomic characteristics of fishing communities that depend to some extent on the harvesting of Alaska groundfish. General information regarding the impacts of TAC specifications on communities can be found in section 4.4.4 of the SEIS (NMFS, 1998a) and section 4.8.7 of the draft PSEIS (NMFS 2001c).

Table 7-1 below summarizes the impacts of the alternatives on fishing communities. All results in this table compare "action" alternatives to the "no-action" alternative (Alternative 1).

Table 7-1 Community impacts of the alternatives

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
	No action, baseline. Specifications based on previous years surveys	*Specifications based on surveys two years before*	*Start the fishing year on July 1*	*Determine specifications for two years at a time.*
Involvement in decision process	No action, baseline	Better information supports public notice and comment. Better notice and comment opportunities on expected final specifications.	Better notice and comment opportunities on expected final specifications. No additional time for environmental or economic analysis of proposed specifications, (except for one additional month under Option 2.)	Better information supports public notice and comment. Better notice and comment opportunities on expected final specifications.
Change in fishing seasons	No action, baseline	None	Change of season to July 1 can cause problems for conduct of sablefish IFQ fishery. Option 1 would eliminate this impact.	None
Mean revenues	No action, baseline	Possible decline in mean revenues from groundfish fishery, although the result is tentative. If it occurs, there could be reduced incomes in fishing communities.	Possible overall decline in mean revenues from groundfish fishery, although the result is tentative. If it occurs, there could be reduced incomes in fishing communities. Any decline would be **smaller** than under Alt 2.	Possible overall decline in mean revenues from groundfish fishery, although the result is tentative. If it occurs, there could be reduced incomes in fishing communities. Any decline is likely to be **larger** than under Alt 2.

Table 7-1 Community impacts of the alternatives (Continued)

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Year-to-year variability	No action, baseline	Possible increased year-to-year variability in revenues, although the result is tentative. If it occurs, it may create increased annual fluctuation in fishing community income.	Possible increased year-to-year variability in revenues, although the result is tentative. If it occurs, it may create increased annual fluctuation in fishing community income. Any increase would be smaller than under Alt 2.	Possible increased year-to-year variability in revenues, although the result is tentative. If it occurs, it may create increased annual fluctuation in fishing community income. Any increase would be larger than under Alt 2.
CDQ groups	No action, baseline	Income impacts could affect CDQ groups and communities.	There are sablefish CDQ allocations so CDQ groups might be affected by the change in fishing year.	Income impacts could affect CDQ groups and communities.

8.0 SUMMARY AND CONCLUSIONS

Each year, normally in October, proposed groundfish harvest specifications for the Bering Sea and Aleutian Islands area (BSAI) and Gulf of Alaska (GOA) are published in the Federal Register. These proposed specifications are based upon total allowable catch (TAC), acceptable biological catch (ABC) and prohibited species catch (PSC) amounts, and apportionments thereof, which have been recommended by the North Pacific Fishery Management Council (Council) for the current year. Based on public comment on the proposed specifications and information made available at the December Council meeting, final specifications are published in the Federal Register during February or early March. So that fishing may begin January 1, regulations authorize the release of one-fourth of each proposed TAC and apportionment thereof, one-fourth of each PSC and apportionment thereof and the first seasonal allowance of pollock and Atka mackerel. These interim specifications are based upon the proposed specifications and published in the Federal Register in December and are superceded by the final specifications.

The existing harvest specification process is problematic for several reasons. The public is notified and given opportunity to comment on proposed specifications that often are outdated by the time they are published. The publication of proposed specifications each year can confuse the public, because incomplete and outdated information is provided due to the need to adhere to a strict time line in order to comply with all relevant regulations. Because the interim specifications are based on the proposed specifications, they do not take into account the recommendations contained in the Groundfish Plan Teams' final SAFE documents, or the recommendations coming from public testimony, the Science and Statistical Committee, Advisory Panel, and Council at its December meeting. One fourth of the initial TAC and PSC amounts have been found to be an inadequate amount for those fisheries that attract the greatest amount of effort at the beginning of the fishing year. As fisheries are seasonally apportioned to meet other management needs, (i.e., Steller sea lion protection measures) interim TACs based on one fourth of the annual TAC increasingly compromise other management objectives. Under the current process, administrative inefficiency exists in taking the regulatory actions necessary to set interim, proposed and final specifications. For these reasons, NMFS seeks to revise the harvest specification process.

The objectives of modifying the harvest specifications process are to manage fisheries based on best scientific information available, provide for adequate prior public review and comment to the Secretary on Council recommendations, provide for additional opportunity for Secretarial review, minimize unnecessary disruption to fisheries and public confusion, and promote administrative efficiency.

The management alternatives for amending this process are:

Alternative 1. Status quo. (Publish proposed specifications, followed by interim and final specifications)

Alternative 2: Eliminate publication of interim specifications. Issue proposed and final specifications prior to the start of the fishing year. Option of biennial harvest specification for BSAI and GOA target species on biennial survey schedule.

Alternative 3: Issue Proposed and Final Harvest Specifications based on an alternate fishing year schedule (July 1 to June 30).
Option 1: Set sablefish TAC on a January through December schedule.
Option 2: Reschedule the December Council meeting to January.

Alternative 4: Use Stock Assessment Projections for biennial harvest specifications. For the BSAI and GOA set the annual harvest specifications based on the most recent stock assessment and set harvest specifications for the following year based on projected OFL and ABC values. For setting PSC there are two options:

Option 1: Set PSC limits annually
Option 2: Set PSC limits every two years based on regulations and projected values

Option A: Abolish TAC Reserves
Option B: Update FMPs to reflect current fishing participants and harvest specifications process.

Section 4.12 gives the environmental summary and conclusions. The environmental components that may be affected by the proposed action are the target groundfish species (including the State groundfish fisheries), prohibited species, and Steller sea lions. Results from simulation model and retrospective analysis indicated that under Alternatives 2, 3 and 4 groundfish harvests would be less and several target species biomasses would be more than under the Status Quo. This was primarily due to uncertainty resulting from projecting harvest amounts further into the future than under Alternative 1. Alternative 3 is likely to provides less biomass variability and more likelihood of setting TAC below the OFL compared to alternatives 2 and 4. Alternatives 1 and 3 have potential effects on the temporal dispersion of harvest of Steller sea lion prey species because of the lag between the biomass information used to set harvest specifications and the commencement of the fisheries.

The harvesting effects on groundfish from Alternatives 2, 3 and 4 are unknown due to a number of factors that are not part of the retrospective analysis and simulation model, including the full Council process which can have a substantial effect on the final TAC and has historically been more conservative than the analysis predicted. Potential overfishing identified in the analysis is likely to be mitigated through the Council process and may also be mitigated by additional regulatory action if new information becomes available during the current fishing year that indicates that the level of fishing is inappropriate. Because the effects on groundfish species are unknown, the effects on availability of prey for Steller sea lions are also unknown.

Alternative 3 may also have temporal effects on the groundfish fisheries and potentially conflict with Steller sea lion protection measures. These measures require the temporal dispersion of harvest and current seasons may need to be adjusted for BSAI pollock and Pacific cod trawl fisheries to meet Steller sea lion protection measures and to coincide with the July 1 through June 30 fishing year. During years of high pollock TAC, the BSAI pollock fishery may be conducted into October as the industry attempts to fully harvest the B season allocations, encountering potentially more salmon bycatch and worse weather. Alternative 3 also has the potential for higher levels of harvest in the A season during times of falling biomass than what would occur under the status quo. Because it is not possible to predict if the fishing behavior may change or to predict actions that may be taken by the Council or the State Board of Fish, and because of Steller sea lion protection measures, it is unknown if Alternative 3 could have an effect on target groundfish or Steller sea lions. Option 1 to Alternative 3 to set the sablefish TAC on a January through December schedule would allow the sablefish IFQ program to be managed concurrently with the halibut IFQ program, eliminating any potential effects on these programs from shifting the fishing year.

The Regulatory Impact Review (RIR) meets the requirements of Presidential Executive Order (E.O.) 12866 for a benefit-cost analysis of the proposed action and its alternatives. A complete benefit-cost analysis was not possible. The information is not available to estimate dollar values for many of the benefits and costs. Moreover, the proposed action affects the conditions under which the Council and Secretary will make decisions about future TAC specifications. The actual benefits and costs will depend on the decisions made by the Council and Secretary, and those decisions cannot be predicted at this time. The RIR does examine a set of outcomes from this action that may affect the benefits and costs. Three general categories of outcomes are identified: (1) impacts on the TAC setting process itself, (2) changes in the fishing year under Alternative 3, and (3) changes in harvests and biomass size under Alternatives 2, 3, and 4.

Alternatives 2, 3 and 4, by extending the time within which the TAC setting should take place, will provide additional opportunities for scientific analysis, for peer review of scientific work, for public notice and comment on the proposed specifications regulations, and for consideration by the Council and the Secretary of Commerce. Since these alternatives will provide for public notice and comment on the specifications actually anticipated for the coming fishing year, comments received from the public will be more useful. Alternatives 2 and 4 provide the most time for this process; Alternative 3 increases the amount of time available, but not to the same extent. It may be difficult, moreover, to complete the entire rulemaking process in the time allotted under Alternative 3, especially with Option 2. Option 2 to Alternative 3 would provide additional time for stock assessment scientists to complete analysis but it may be administratively difficult to reschedule the December Council meeting to January.

Alternative 3 changes the fishing year to begin on July 1. A comparison of fishing seasons for different species with the proposed July 1 start date suggests that a shift from a January 1 to a July 1 start date would cause little disruption to many fisheries. The sablefish IFQ fishery in the GOA and BSAI is an important exception to this. A change in fishing year, and associated change in TAC, would be extremely disruptive in the middle of this fishing season, which currently runs from March 15 to November 15. It might be possible to delay the season, so that it started on July 1 with the start of the new fishing year. However, the administration of the individual quotas in this fishery requires a long closed period between the end of one fishing season and the start of the next. Currently the fishery is closed from November 15 to March 15. This closed period is best in the winter time since fishing conditions aren't as good, and there is less potential for bycatch conflicts with the related halibut fishery. However, a July 1 start for the year would mandate a closed period from March through June. Option 1 to Alternative 3, setting sablefish TAC on a January through December schedule, would eliminate this potential problem.

Alternatives 2, 3, and 4 lengthen the time between biomass surveys and the year in which specifications based on the surveys (specifications year) become effective. Under Alternative 1, the time between the survey information and implementation of the annual fishery based on that information is approximately 7 months, because the first three month of the year are managed under interim specification (which are based on the previous years TACs). Alternative 3 increases the period by three months, Alternative 2 increases the period by nine months, and Alternative 4 increases it by an average of 15 months per year (nine months for the first year of the biennial specifications, and 21 months for the second year). As the length of time between the biomass surveys and the specifications year increases, there is some evidence that biomass levels may vary more, ABCs and harvests may become smaller since lower harvest rates are triggered more often by the harvest control rule, mean spawning biomass levels become larger, and harvest variability increases. These results are extremely tentative.

If the harvest levels do decline as suggested by some modeling results, revenues to industry may also decline. Moreover, an increase in the year-to-year variability of harvest, also suggested by some model results, may impose increased interest and inventory carrying costs on industry.

The Initial Regulatory Flexibility Analysis (IRFA) identifies the numbers of small entities that may be regulated by the action, describes the adverse impacts that may be imposed on these small entities, and describes alternatives to the preferred alternative that may minimize the adverse impacts on the small entities and the reasons they weren't chosen. In this case a preferred action has not yet been identified. This IRFA addresses the statutory requirements imposed under the Regulatory Flexibility Act (RFA) of 1980, as amended by the Small Business Regulatory Fairness Enforcement Act (SBREFA) of1996.

The IRFA used the Small Business Administration (SBA) definitions of small entities. Small fishing entities were those that grossed less than $3.5 million, small shoreside processing entities were those employing fewer than 500 persons. Non-profit entities were also considered small. The SBA also requires that an entity's affiliations be considered in determining its size. Large numbers of small entities may be regulated by this action. These include an estimated 1,353 small groundfish catcher vessel entities, 33 small groundfish catcher/processors, 36 shoreside groundfish processors, and six CDQ groups. The total numbers of entities regulated by this action include 1, 366 groundfish catcher vessels, 79 groundfish catcher/processors, three groundfish motherships, 49 shoreside groundfish processors, and six CDQ groups.

There is some evidence that all alternatives compared to Alternative 1 would lead to somewhat reduced revenues, cash flow, and profits for the small entities, although this result is very uncertain. It was not possible to estimate the size of the impact on the small entities, although it was believed to be greatest for Alternative 4, less for Alternative 2, and least for Alternative 3. Increased year-to-year fluctuations in gross revenues may occur, and these also were expected to be greatest for Alternative 4, less for Alternative 2, and least for Alternative 3. The analysis was unable to determine whether or not there would be a disproportionate impact on small entities (compared to large entities). The analysis did identify additional impacts that were not adverse. Alternatives 2 and 4, and to a lesser extent Alternative 3, provide better opportunities for small business input into decision making about specifications since they provide for more informed public notice and comment.

An important component of an IRFA is a review of the alternatives that have not been chosen, but that minimize the burden of the rule on regulated small entities, and an explanation of why each of these has not been chosen. In this case, a preferred alternative has not yet been chosen. Therefore it has not yet been possible to complete this portion of the IRFA.

Environmental impacts and socioeconomic impacts resulting from changing fishing patterns as a result of the preferred alternative would be assessed annually in the EA/RIR/IRFA that accompanies the final harvest specifications.

At this time, a preferred alternative has not been identified. The Council seeks public comments on these alternatives and on the potential impacts on fishery participants and the environment. Alternative 1 appears to have the least potential for environmental effects but does not meet the objectives of this action. Considering administrative procedural aspects, Alternatives 2 is more desirable than Alternatives 1, 3, or 4. More time is provided under Alternative 2 to perform stock assessments, to develop Council recommendations and to allow NMFS to implement proposed and final rule making before the beginning of the fishing year. Alternative 4 for demersal shelf rockfish and option 1 for PSC limits, requires annual rulemaking, reducing the administrative efficiencies that could have been realized with a biennial harvest specifications process. Alternative 3 has the disadvantage of requiring changes to the Sablefish IFQ program to accommodate a new fishing year, potentially affecting the State fisheries, and providing less time for the stock assessment and rulemaking processes compared to Alternatives 2 and 4. Option 1 to Alternative 3 would eliminate the potential problems with the sablefish fisheries.

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Appendix A

Draft Amendment Language for the Fishery Management Plan for the Bering Sea/Aleutian Islands Groundfish, Implementing Alternative 2 and Options A and B

Section 3.0 is modified as follows:

1. The second introductory paragraph is revised to read as follows:

> One feature of the format of this FMP is that such items as Allowable Biological Catch, Expected Annual Harvest and annual catch statistics which are likely to change from time to time have been arranged in Annexes. This should facilitate both the drafting and review process when such changes are made in the future.

2. In Section 3.3, delete definitions 2. and 3. Delete the number 1. for the first definition.

Section 4.0 is revised to read as follows:

1. Delete "4.1 Areas and Stocks Involved"

2. Renumber section 4.1.1 to 4.1

3. Delete sections 4.1.2 through 4.2.2.3, including all figures and tables.

4. Add sections 4.2, 4.3, and 4.4 to read as follows:

4.2 Species of Fish Targeted

The Bering Sea supports about 300 species of fishes, the majority of which are found near or on the bottom (Wilimovsky 1974). Among the pelagic species are the commercially important, or potentially important groups such as the salmon (Oncorhynchus), herring (Clupea), smelts (Osmerus), and capelin (Mallotus). The fish groups of primary concern in this plan are the bottom or near-bottom dwelling forms--the flounders, rockfish, sablefish, cod, pollock, and Atka mackerel. Although not bottom-dwelling, squids (Cephalopoda) are also included in the plan.

There is a general simplification in the diversity of bottomfish species in the Bering Sea compared to the more southern regions of the Gulf of Alaska and Washington to California. As a result, certain species inhabiting the Bering Sea are some of the largest bottomfish resources found anywhere in the world. Relatively few groundfish species in the eastern Bering Sea and Aleutian Islands are large enough to attract target, or target fisheries: walleye pollock, Pacific cod, Pacific ocean perch, sablefish, Atka mackerel, several species of rockfishes and flatfishes. Since the 1960s, pollock catches have accounted for the majority of the Bering Sea groundfish harvest. Yellowfin sole and rock sole currently dominate the flatfish group and has the longest history of intense exploitation by foreign fisheries. Other flounder species that are known to occur in aggregations large enough to form target species or occasional target species are Greenland turbot, Pacific halibut, rock sole, flathead sole, Alaska plaice, and arrowtooth flounder.

Catch History

Catch statistics since 1954 are shown for the Eastern Bering Sea subarea in **Table 4.1a**. The initial target species was yellowfin sole. During the early period of these fisheries, total catches of groundfish reached a peak of 674,000 metric tons (t) in 1961. Following a decline in abundance of yellowfin sole, other species (principally walleye pollock) were targeted upon, and total catches rose to 2.2 million t in 1972. Catches have since varied from one to two million t as catch restrictions and other management measures were placed on the fishery.

Catches in the Aleutian region have always been much smaller than those in the Eastern Bering Sea. Target species have also been different (**Table 4.1b**): In the Aleutians, Pacific ocean perch (POP) was the initial target species. During the early years of exploitation, overall catches of Aleutian groundfish reached a peak of 112,000 t in 1965. As POP abundance declined, the fishery diversified to other species. Total catches from the Aleutians in recent years have been about 100,000 t annually.

Table 4.1.a. Groundfish and squid catches in the eastern Bering Sea, 1954-2001.

Year	Pollock	Pacific Cod	Sable Fish	Pacific Ocean Perch Complex	Other Rock Fish	Yellow Fin Sole	Greenland Turbot
1954						12,562	
1955						14,690	
1956						24,697	
1957						24,145	
1958	6,924	171	6			44,153	
1959	32,793	2,864	289			185,321	
1960			1,861	6,100		456,103	36,843
1961			15,627	47,000		553,742	57,348
1962			25,989	19,900		420,703	58,226
1963			13,706	24,500		85,810	31,565
1964	174,792	13,408	3,545	25,900		111,177	33,729
1965	230,551	14,719	4,838	16,800		53,810	9,747
1966	261,678	18,200	9,505	20,200		102,353	13,042
1967	550,362	32,064	11,698	19,600		162,228	23,869
1968	702,181	57,902	4,374	31,500		84,189	35,232
1969	862,789	50,351	16,009	14,500		167,134	36,029
1970	1,256,565	70,094	11,737	9,900		133,079	19,691
1971	1,743,763	43,054	15,106	9,800		160,399	40,464
1972	1,874,534	42,905	12,758	5,700		47,856	64,510
1973	1,758,919	53,386	5,957	3,700		78,240	55,280
1974	1,588,390	62,462	4,258	14,000		42,235	69,654
1975	1,356,736	51,551	2,766	8,600		64,690	64,819
1976	1,177,822	50,481	2,923	14,900		56,221	60,523
1977	978,370	33,335	2,718	2,654	311	58,373	27,708
1978	979,431	42,543	1,192	2,221	2,614	138,433	37,423
1979	913,881	33,761	1,376	1,723	2,108	99,017	34,998
1980	958,279	45,861	2,206	1,097	459	87,391	48,856
1981	973,505	51,996	2,604	1,222	356	97,301	52,921
1982	955,964	55,040	3,184	224	276	95,712	45,805
1983	982,363	83,212	2,695	221	220	108,385	43,443
1984	1,098,783	110,944	2,329	1,569	176	159,526	21,317
1985	1,179,759	132,736	2,348	784	92	227,107	14,698
1986	1,188,449	130,555	3,518	560	102	208,597	7,710
1987	1,237,597	144,539	4,178	930	474	181,429	6,533
1988	1,228,000	192,726	3,193	1,047	341	223,156	6,064
1989	1,230,000	164,800	1,252	2,017	192	153,165	4,061
1990	1,353,000	162,927	2,329	5,639	384	80,584	7,267
1991	1,268,360	165,444	1,128	4,744	396	94,755	3,704
1992	1,384,376	163,240	558	3,309	675	146,942	1,875
1993	1,301,574	133,156	669	3,763	190	105,809	6,330

Year	Pollock	Pacific Cod	Sable Fish	Pacific Ocean Perch Complex	Other Rock Fish	Yellow Fin Sole	Greenland Turbot
1994	1,362,694	174,151	699	1,907	261	144,544	7,211
1995	1,264,578	228,496	929	1,210	629	124,746	5,855
1996	1,189,296	209,201	629	2,635	364	129,509	4,699
1997	1,115,268	209,475	547	1,060	161	166,681	6,589
1998	1,101,428	160,681	586	1,134	203	101,310	8,303
1999	889,589	134,647	646	609	135	67,307	5,205
2000/d	1,132,736	151,372	742	704	239	84,057	5,888
2001/e	1,381,598	121,357	842	1,144	293	54,325	4,218

Year	Arrow Tooth Flounder	Other Flat Fish/c	Rock Sole/b	Atka Mackerel	Squid	Other Species	Total (All Species)
1954							12,562
1955							14,690
1956							24,697
1957							24,145
1958						147	51,401
1959						380	221,647
1960	a						500,907
1961	a						673,717
1962	a						524,818
1963	a	35,643					191,224
1964	a	30,604				736	393,891
1965	a	11,686				2,218	344,369
1966	a	24,864				2,239	452,081
1967	a	32,109				4,378	836,308
1968	a	29,647				22,058	967,083
1969	a	34,749				10,459	1,192,020
1970	12,598	64,690				15,295	1,593,649
1971	18,792	92,452				13,496	2,137,326
1972	13,123	76,813				10,893	2,149,092
1973	9,217	43,919				55,826	2,064,444
1974	21,473	37,357				60,263	1,900,092
1975	20,832	20,393				54,845	1,645,232
1976	17,806	21,746				26,143	1,428,565
1977	9,454	14,393			4,926	35,902	1,168,144
1978	8,358	21,040		831	6,886	61,537	1,302,509
1979	7,921	19,724		1,985	4,286	38,767	1,159,547
1980	13,761	20,406		4,955	4,040	34,633	1,221,944
1981	13,473	23,428		3,027	4,182	35,651	1,259,666
1982	9,103	23,809		328	3,838	18,200	1,211,483
1983	10,216	30,454		141	3,470	15,465	1,280,285
1984	7,980	44,286		57	2,824	8,508	1,458,299
1985	7,288	71,179		4	1,611	11,503	1,649,109
1986	6,761	76,328		12	848	10,471	1,633,911
1987	4,380	50,372		12	108	8,569	1,639,121
1988	5,477	137,418		428	414	12,206	1,810,470

Year	Arrow Tooth Flounder	Other Flat Fish/c	Rock Sole/b	Atka Mackerel	Squid	Other Species	Total (All Species)
1989	3,024	63,452		3,126	300	4,993	1,630,382
1990	2,773	22,568		480	460	5,698	1,644,109
1991	12,748	30,401	46,681	2,265	544	16,285	1,647,455
1992	11,080	34,757	51,720	2,610	819	29,993	1,831,954
1993	7,950	28,812	63,942	201	597	21,413	1,674,406
1994	13,043	29,720	60,276	190	502	23,430	1,818,628
1995	8,282	34,861	54,672	340	364	20,928	1,745,890
1996	13,280	35,390	46,775	780	1,080	19,717	1,653,355
1997	8,580	42,374	67,249	171	1,438	20,997	1,640,590
1998	14,985	39,940	33,221	901	891	23,156	1,486,739
1999	9,827	33,042	39,934	2,008	393	17,045	1,200,387
2000	12,071	36,813	49,186	239	375	23,098	1,497,520
2001	12,244	26,590	28,524	265	1,758	19,127	1,652,285

a/ Arrowtooth flounder included in Greenland turbot catch statistics.
b/ Includes POP shortraker, rougheye, northern and sharpchin.
c/ Rocksole prior to 1991 is included in other flatfish catch statistics.
d/ Data through December 31, 2000.
e/ Data through October 27, 2001. Does not include CDQ.
Note: Numbers don't include fish taken for research.

Table 4.1.b. Groundfish and squid catches in the Aleutian Islands region, 1962-2001.

Year	Pollock	Pacific Cod	Sable Fish	Pacific Ocean Perch Complex /b	Other Rock Fish	Greenland Turbot	Yellow Fin Sole
1962				200			
1963			664	20,800		7	
1964		241	1,541	90,300		504	
1965		451	1,249	109,100		300	
1966		154	1,341	85,900		63	
1967		293	1,652	55,900		394	
1968		289	1,673	44,900		213	
1969		220	1,673	38,800		228	
1970		283	1,248	66,900		285	
1971		2,078	2,936	21,800		1,750	
1972		435	3,531	33,200		12,874	
1973		977	2,902	11,800		8,666	
1974		1,379	2,477	22,400		8,788	
1975		2,838	1,747	16,600		2,970	
1976		4,190	1,659	14,000		2,067	
1977	7,625	3,262	1,897	8,080	3,043	2,453	
1978	6,282	3,295	821	5,286	921	4,766	
1979	9,504	5,593	782	5,487	4,517	6,411	
1980	58,156	5,788	274	4,700	420	3,697	
1981	55,516	10,462	533	3,622	328	4,400	
1982	57,978	1,526	955	1,014	2,114	6,317	
1983	59,026	9,955	673	280	1,045	4,115	
1984	81,834	22,216	999	631	56	1,803	
1985	58,730	12,690	1,448	308	99	33	
1986	46,641	10,332	3,028	286	169	2,154	
1987	28,720	13,207	3,834	1,004	147	3,066	
1988	43,000	5,165	3,415	1,979	278	1,044	
1989	156,000	4,118	3,248	2,706	481	4,761	
1990	73,000	8,081	2,116	14,650	864	2,353	
1991	78,104	6,714	2,071	2,545	549	3,174	1,380
1992	54,036	42,889	1,546	10,277	3,689	895	4
1993	57,184	34,234	2,078	13,375	495	2,138	0
1994	58,708	22,421	1,771	16,959	301	3,168	0
1995	64,925	16,534	1,119	14,734	220	2,338	6
1996	28,933	31,389	720	20,443	278	1,677	654
1997	26,872	25,166	779	15,687	307	1,077	234
1998	23,821	34,964	595	13,729	385	821	5
1999	965	27,714	565	17,619	630	422	13
2000/c	1,244	39,684	1,048	14,893	601	1,086	13
2001/d	819	33,634	1,033	15,540	605	1,086	15

Table 4.1.b. Continued.

Year	Sole	Rock	Other Flat Fish	Arrow Tooth Flounder	Atka Mackerel	Squid	Other Species	Total (All Species)
1962								200
1963				a				21,471
1964				a			66	92,652
1965				a			768	111,868
1966				a			131	87,589
1967				a			8,542	66,781
1968				a			8,948	56,023
1969				a			3,088	44,009
1970				274	949		10,671	80,610
1971				581			2,973	32,118
1972				1,323	5,907		22,447	79,717
1973				3,705	1,712		4,244	34,006
1974				3,195	1,377		9,724	49,340
1975				784	13,326		8,288	46,553
1976				1,370	13,126		7,053	43,465
1977				2,035	20,975	1,808	16,170	67,348
1978				1,782	23,418	2,085	12,436	61,092
1979				6,436	21,279	2,252	12,934	75,195
1980				4,603	15,533	2,332	13,028	108,531
1981				3,640	16,661	1,763	7,274	104,199
1982				2,415	19,546	1,201	5,167	98,233
1983				3,753	11,585	510	3,675	94,617
1984				1,472	35,998	343	1,670	147,022
1985				87	37,856	9	2,050	113,310
1986				142	31,978	20	1,509	96,259
1987				159	30,049	23	1,155	81,364
1988				406	21,656	3	437	77,383
1989				198	14,868	6	108	186,494
1990				1,459	21,725	11	627	124,886
1991	n/a		88	938	22,258	30	91	117,942
1992	236		68	900	46,831	61	3,081	164,513
1993	318	59		1,348	65,805	85	2,540	179,659
1994	308		55	1,334	69,401	86	1,102	175,614
1995	356		47	1,001	81,214	95	1,273	183,862
1996	371		61	1,330	103,087	87	1,720	190,750
1997	271		39	1,071	65,668	323	1,555	139,049
1998	446		54	694	56,195	25	2,448	134,182
1999	577		53	746	51,636	9	1,633	102,582
2000	480		113	1,157	46,990	8	3,010	110,327
2001	526		96	1,220	61,234	5	3,851	119,664

a/ Arrowtooth flounder included in Greenland turbot catch statistics.
b/ Includes POP shortraker, rougheye, northern and sharpchin rockfish.
c/ Data through December 31, 2000.
d/ Data through October 27, 2001. Does not include CDQ.
Note: Numbers don't include fish taken for research.

4.3 Socioeconomic Characteristics of the Fishery

Subsistence Fishery

The earliest fisheries for groundfish in the eastern Bering Sea and Aleutian Islands were the native subsistence fisheries. The fish and other marine resources remain an important part of the life of native people, and dependence on demersal species of fish may have been critical to their survival in periods of the year when other sources of food were scarce or lacking. Fishing was in near-shore waters utilizing such species as cod, halibut, rockfish, and other species. These small-scale subsistence fisheries have continued to the present time. Although not well estimated, the total catch of groundfish in subsistence fisheries is thought to be minuscule relative to commercial fishery catches.

Recreational Fishery

At this time, there are no essentially recreational fisheries for groundfish species covered under this FMP. Recreational catches of groundfish in the BSAI region would take place in state waters and likely fall under the classification of subsistence fisheries.

Charter Fishery

A limited charter vessel fishery for Pacific halibut is based in Dutch Harbor. Three charter vessels participated in 1999.

Commercial Fishery

The first commercial venture for bottomfish occurred in 1864 when a single schooner fished for Pacific cod in the Bering Sea. This domestic fishery continued until 1950 when demand for cod declined and economic conditions caused the fishery to be discontinued. Fishing areas in the eastern Bering Sea were from north of Unimak Island and the Alaska Peninsula to Bristol Bay. Vessels operated from home ports in Washington and California and from shore stations in the eastern Aleutian Islands. The cod fishery reached its peak during World War I when the demand for cod was high. Numbers of schooners operating in the fishery ranged from 1-16 up to 1914 and increased to 13-24 in the period 1915-20. Estimated catches during the peak of the fishery ranged annually from 12,000-14,000 mt.

Another early fishery targeted Pacific halibut. Halibut were reported as being present in the Bering Sea by United States cod vessels as early as the 1800s. However, halibut from the Bering Sea did not reach North American markets until 1928. Small and infrequent landings of halibut were made by United States and Canadian vessels between 1928 and 1950, but catches were not landed every year until 1952. The catch by North American setline vessels increased sharply between 1958 and 1963 and then declined steadily until 1972.

Several foreign countries conducted large scale groundfish fisheries in the eastern Bering Sea and Aleutian Islands prior to 1991. Vessels from Japan, USSR (Russia), Canada, Korea, Taiwan, and

Poland all plied the waters of the North Pacific for groundfish. In the mid 1950's, vessels from Japan and Russia targeted yellowfin sole, and catches peaked at over 550,000 mt in 1961. In the 1960's, Japanese vessels, and to a lesser extent Russian vessels, developed a fishery for Pacific ocean perch, pollock, Greenland turbot, sablefish, and other groundfish. By the early 1970's over 1.7 million mt of pollock was being caught by these two countries in the eastern Bering Sea annually. Korean vessels began to target pollock in 1968. Polish vessels fished briefly in the Bering Sea in 1973. Tiawanese vessels entered the fishery in 1977. For more information on foreign fisheries in the BSAI, refer to NPFMC (1995), Megrey and Wespestad (1990), and Fredin (1987).

The foreign fleets were phased out in the 1980's. The transition period from foreign to fully domestic groundfish fisheries was stimulated by a quick increase in joint-venture operations. The American Fisheries Promotion Act (the so-called "fish and chips" policy) required that allocations of fish quotas to foreign nations be based on the nations contributions to the development of the U.S. fishing industry. This provided incentive for development of joint-venture operations, with U.S. catcher vessels delivering their catches directly to foreign processing vessels. Joint-venture operations peaked in 1987, giving way to a rapidly developing domestic fleet. By 1991, the entire BSAI groundfish harvest (2,126,600 mt, worth $351 million ex-vessel) was taken by only 391 U.S. vessels.

The commercial groundfish catch off Alaska totaled 1.9 million t in 1998, compared to 2.1 million t in 1997 Based on a preliminary estimate for 1998 that may not be consistent with the estimates for previous years, the ex-vessel value of the catch, excluding the value added by at-sea processing, decreased from $583 million in 1997 to $385 million in 1998. The value of the 1998 catch after primary processing was approximately $1 billion. The groundfish fisheries accounted for the largest share of the ex-vessel value of all commercial fisheries off Alaska in 1998 (40 percent), and approximately 80 percent of this total came from the BSAI management area. The Pacific salmon (*Oncorhynchus* spp.) fishery was second with $243 million or 26 percent of the total Alaska ex-vessel value. The value of the shellfish catch amounted to $219 million or 23 percent of the total for Alaska.

Walleye (Alaska) pollock (*Theragra chalcogramma*) has been the dominant species in the commercial groundfish catch off Alaska. The 1998 pollock catch of 1.25 million t accounted for 67 percent of the total groundfish catch of 1.87 million t. The next major species, Pacific cod (*Gadus macrocephalus*), accounted for 257,900 t or almost 14 percent of the total 1998 groundfish catch. The Pacific cod catch was down about 21 percent from a year earlier. The 1998 catch of flatfish, which includes yellowfin sole (*Pleuronectes asper*), rock sole (*Pleuronectes bilineatus*), and arrowtooth flounder (*Atheresthes stomias*) was 223,100 t in 1998, down almost 35 percent from 1997. Pollock, Pacific cod, and flatfish comprised almost 93 percent of the total 1998 catch. Other important species are sablefish (*Anoplopoma fimbria*), rockfish (*Sebastes and Sebastolobus* spp.), and Atka mackerel (*Pleurogrammus monopterygius*).

Trawl, hook and line (including longline and jigs), and pot gear account for virtually all the catch in the BSAI groundfish fisheries. There are catcher vessels and catcher processor vessels for each of these three gear groups. From 1993-1998, the trawl catch averaged about 91 percent of the total catch, while the catch with hook and line gear accounted for 7.5 percent. Most species are harvested predominately by one type of gear, which typically accounts for 90 percent or more of the catch. The one exception is Pacific cod, where in 1998, 48 percent (123,000 t) was taken by trawls, 43 percent (110,000 t) by hook and line gear, and 9 percent (24,000 t) by pots. During the same period, catcher vessels took 41 percent of the catch and catcher processor vessels took the other 59 percent.

The discards of groundfish in the groundfish fishery have received increased attention in recent years by NMFS, the Council, Congress, and the public at large. The discard rate is the percent of total catch that is discarded. For the BSAI and GOA fisheries as a whole, the annual discard rate for groundfish decreased from 15.1 percent in 1994 to 8.2 percent in 1998 with the vast majority of the reduction occurring in 1998. The 43 percent reduction in the overall discard rate in 1998 is the result of prohibiting pollock and Pacific cod discards in all BSAI and GOA groundfish fisheries beginning in 1998. Total discards decreased by almost 49 percent in 1998 with the aid of a 9.5 percent reduction in total catch. Estimates of total catch, discarded catch, and discard rates by species, area, gear, and target fishery are provided in the annual Economic SAFE document.

The bycatch of Pacific halibut, crab, Pacific salmon, and Pacific herring (*Clupea pallasi*) has been an important management issues for more than twenty years. The retention of these species was prohibited first in the foreign groundfish fisheries. This was done to ensure that groundfish fishermen had no incentive to target these species. For a review of the history of prohibited species bycatch management, refer to Witherell and Pautzke (1997).

Residents of Alaska and of other states, particularly Washington and Oregon, are active participants in the BSAI groundfish fisheries. For the domestic groundfish fishery as a whole, 92 percent of the 1998 catch was made by vessels with owners who indicated that they were not residents of Alaska.

Estimates of ex-vessel value by area, gear, type of vessel, and species are included in the annual Economic SAFE document. The ex-vessel value of the domestic landings in the combined GOA and BSAI groundfish fisheries, excluding the value added by at-sea processing, increased from $425 million in 1993 to $585 million in 1995, decreased in 1996 to $531 million, and increased to $570 in 1997. The distribution of ex-vessel value by type of vessel differed by area, gear and species. In 1997, catcher vessels accounted for 44 percent of the ex-vessel value of the groundfish landings compared to 42 percent of the total catch because catcher vessels take larger percentages of higher priced species such as sablefish which was $2.25 per pound in 1997. Similarly, trawl gear accounted for only 67 percent of the total ex-vessel value compared to 90 percent of the catch because much of the trawl catch is of low priced species such as pollock which was about $0.10 per pound in 1997.

For the BSAI and GOA combined, 82.5 percent of the 1997 ex-vessel value was accounted for by vessels with owners who indicated that they were not residents of Alaska. Vessels with owners who indicated that they were residents of Alaska accounted for 15.5 percent of the total and the remaining 2.0 percent was taken by vessels for which the residence of the owner was not known. The vessels owned by residents of Alaska accounted for a much larger share of the ex-vessel value than of catch (15.5% compared to 8.5%) because these vessels accounted for relatively large shares of the higher priced species such as sablefish.

Employment data for at-sea processors (but not including inshore processors) indicate that in 1998, the crew weeks totaled 106,365 with the majority of them (101,064) occurring in the BSAI groundfish fishery. In 1998, the maximum monthly employment (18,864) occurred in October. Much of this was accounted for by the BSAI pollock fishery.

There are a variety of at least partially external factors that affect the economic performance of the BSAI and GOA groundfish fisheries. They include landing market prices in Japan, wholesale prices in Japan, U.S. imports of groundfish products, U.S. per capita consumption of seafood, U.S. consumer and producer price indexes, foreign exchange rates, and U.S. cold storage holdings of groundfish. Exchange rates and world supplies of fishery products play a major role in international trade. Exchange rates change rapidly and can significantly affect the economic status of the groundfish fisheries.

4.4 Description of Fishing Communities

Traditionally, the dependence of BSAI and GOA coastal communities on the groundfish fisheries and fisheries affected by the groundfish fisheries has resulted from these communities being one or more of the following: 1) the home ports of vessels that participate in these fisheries; 2) the residence of participants in the harvesting or processing sectors of these fisheries; 3) the port of landings for these fisheries; 4) the location of processing plants; and 5) a service or transportation center for the fisheries. With the creation of the pollock, sablefish and halibut community development quota (CDQ) programs for the BSAI in the early to mid-1990s and with the expansion of those programs into the multispecies CDQ program with the addition of all BSAI groundfish and crab by the late 1990s, the dependence now includes the participation of coastal, Western Alaska, Native communities in the CDQ program. The CDQ program has provided the following for the CDQ communities: 1) additional employment in the harvesting and processing sectors of these fisheries; 2) training; and 3) royalty income when the CDQs are used by a fishing company. In many cases, those royalties have been used to increase the ability of the residents of the CDQ communities to participate in the regional commercial fisheries.

Almost 100 Alaskan communities are listed as home ports. For the vast majority of the Alaska home ports, trawl vessels account for none or a very small part of the vessels and the mean length is less than 50 feet. Many of the Alaska home ports had fewer than 5 vessels. The Alaska home ports with typically more than 50 fishing vessels are as follows: Homer (100+), Juneau (200+), Kodiak (100+), Petersburg (50+), and Sitka (100+). For these five home ports, all but Kodiak had non-trawl vessels account for at least 90 percent of the vessels, and in Petersburg and Sitka almost 100 percent were non-trawl vessels. In 1997, the mean vessel lengths were as follow: Homer, 52 feet; Juneau, 54 feet; Kodiak, 61 feet; Petersburg, 52 feet; and Sitka, 44 feet. Sand Point, which typically had more than 30 vessels and a mean vessel length of 47 feet in 1997, was unique among Alaska home ports in that typically trawl vessels accounted for more than 50 percent of its vessels.

From 1991 to 1997, the number of fishing vessels in the BSAI and GOA groundfish fisheries owned by Alaska residents decreased from 1,511 to 916, with most of the decrease occurring in 1992, and the mean length increased from 45 feet to 49 feet. Trawl vessels accounted for fewer than 10 percent of the total in any year and for fewer than 2 percent of the overall decrease in the number of vessels between 1991 and 1997.

The vast majority of the groundfish fishing vessels owned by Alaska residents use hook-and-line gear and operate only in the GOA. For example, of the 894 Alaskan owned fishing vessels that participated in the BSAI and GOA groundfish fisheries in 1996, 852 fished in the GOA compared to only 115 in the BSAI and 752 used hook-and-line gear compared to either 140 for pot gear or 75 for trawl gear. This is explained by the following: 1) the small size of most of the Alaska vessels; 2) the ability of small vessels to use hook-and-line gear effectively and safely, particularly in the GOA; and 3) the greater proximity of GOA fishing grounds to the home ports and owners' residences for the vast majority of the Alaska vessels.

With respect to groundfish fisheries, the hook-and-line vessels owned by Alaska residents have been involved almost exclusively in the sablefish, Pacific cod, and rockfish fisheries. Trawlers owned by Alaska residents principally have been involved in the pollock, Pacific cod and flatfish fisheries. In 1996, 20 of the 75 Alaska owned trawlers participated in the BSAI groundfish fishery compared to 69 of the 752 Alaskan hook-and-line vessels, and 40 of the 140 Alaskan pot boats.

Vessels of residents of Alaska account for a larger percent of the ex-vessel value of the catch than of the weight of the catch. For example, in 1996, these vessels accounted for only 7.9 percent of the BSAI and GOA groundfish catch, but 14.5 percent of its ex-vessel value. This occurs because a larger percent of the catch of these vessels consists of higher priced groundfish species that are taken with hook-and-line gear. These species include sablefish, some of the higher priced rockfish, and Pacific cod .

When the fishing ports are ranked, from highest to lowest, on the basis of their 1997 groundfish landings and value, the first five ports account for in excess of 95 percent of the total Alaska groundfish landings. These are, in rank order:

Port & Ranking	Metric Tons*	Value	Number of Processors
1. Dutch Harbor/Unalaska	224,000	$59,774,500	6
2. Akutan	<120,000	NA	1
3. Kodiak	84,000	$33,488,800	9
4. Sand Point	<45,000	NA	1
5. King Cove	<25,000	NA	1

* estimated total groundfish landings
NA - data cannot be reported due to "confidentiality" constraints

For reference, in 1997, the sixth ranked Alaska groundfish landings port was Seward, Alaska. The total quantity of groundfish landed in Seward was approximately one-third that of King Cove, by far the smallest of the top five Alaska groundfish landings ports, and was dominated by sablefish, the only BSAI and GOA groundfish species managed under an ITQ program. Furthermore, much of the Seward groundfish catch comes from State waters (e.g., Prince William Sound). After Seward, the quantities of groundfish landings drop off even more sharply for the remaining ports. For these reasons, a natural break occurs between the top five ports and the remaining ports. Therefore, the balance of this section will focus on the five primary groundfish ports, listed above.

Dutch Harbor/Unalaska and Akutan are located on the Bering Sea side of the Alaska Peninsula/Aleutian Island chain, while Sand Point and King Cove are on the Gulf of Alaska side and Kodiak Island, where the port and City of Kodiak are located, is in the Gulf. Nonetheless, a substantial portion of the groundfish processed in Sand Point and King Cove is harvested in the Bering Sea, as is a somewhat lesser share of that landed in Kodiak. Historically, relatively small amounts of groundfish harvested in the GOA have been delivered for processing in Dutch Harbor/Unalaska and Akutan.

At present, pollock and Pacific cod are the primary groundfish species landed and/or processed in these five ports. Alaska Department of Fish and Game fish ticket data indicate that in Dutch Harbor/Unalaska and Akutan, pollock represented 83 percent and 76 percent, respectively, of the 1997 total groundfish landings in these ports, with Pacific cod making up virtually all of the balance. In the case of Sand Point, pollock and Pacific cod, respectively, accounted for 69 percent and 29 percent of the total, with fractional percentages of other groundfish species accounting for the rest. In King Cove, this relationship was reversed, with pollock catch-share at 31 percent and Pacific cod at 69 percent of the groundfish total. Kodiak presented the most diversified species complex, with pollock representing 43 percent, Pacific cod 36 percent, assorted flatfishes at 14 percent, and a mix of other groundfish species making up the balance of the total.

Dutch Harbor/Unalaska

Dutch Harbor/Unalaska is located approximately 800 miles southwest of Anchorage and 1,700 miles northwest of Seattle. Unalaska is the 11th largest city in Alaska, with a reported year-round population of just over 4,000. The name Dutch Harbor is often applied to the portion of the City of Unalaska located on Amaknak Island, which is connected to Unalaska Island by a bridge. Dutch Harbor is fully contained within the boundaries of the City of Unalaska, which encompasses 115.8 square miles of land and 98.6 square miles of water (Alaska Department of Community and Regional Affairs 1998).

Unalaska is primarily non-Native, although the community is culturally diverse. Subsistence activities remain important to the Aleut community and many long-time non-Native residents, as well. Salmon, Pacific cod, Dolly Varden, Pacific halibut, sea bass, pollock and flounders are the most important marine species, according to Alaska Department of Fish and Game reports. Sea urchins, razor and butter clams, cockles, mussels, limpets, chiton, crabs, and shrimps make up the shellfish and invertebrates most commonly harvested by subsistence users. Marine mammals traditionally harvested include sea lions, harbor and fur seals, and porpoises. Local residents also harvested reindeer, ducks, geese, sea gull eggs and other bird eggs in great numbers in previous years (NPFMC 1994a).

According to the 1990 U.S. Census, 682 total housing units existed and 107 were vacant. More than 2,500 jobs were estimated to be in the community. The official unemployment rate at that time was 1.0 percent, with 7.8 percent of the adult population not in the work force. The median household income was reportedly $56,215, and 15.3 percent of residents were living below the poverty level.

The majority of homes in the community are served by the City's piped water and sewer system. Sewage receives primary treatment before being discharged into Unalaska Bay. Approximately 90 percent of households are plumbed. Two schools are located in the community, serving 415 students.

Dutch Harbor/Unalaska has been called the most prosperous stretch of coastline in Alaska. With 27 miles of ports and harbors, several hundred local businesses, most servicing, supporting, or relying on the seafood industry, this city is the center of the Bering Sea fisheries.

Dutch Harbor is not only the top ranked fishing port in terms of landings in Alaska, but has held that distinction for the Nation, as a whole, each year since 1989. In addition, it ranked at or near the top in terms of the ex-vessel value of landings over the same period.

Virtually the entire local economic base in Dutch/Unalaska is fishery-related, including fishing, processing, and fishery support functions (e.g., fuel, supply, repairs and maintenance, transshipment, cold storage, etc.). Indeed, Dutch Harbor/Unalaska is unique among Alaska coastal communities in the degree to which it provides basic support services for a wide range of Bering Sea fisheries (Impact Assessment Incorporated 1998). It has been reported that over 90 percent of the population of this community considers itself directly dependent upon the fishing industry, in one form or another (NPFMC 1994a).

Historically, Dutch Harbor/Unalaska was principally dependent upon non-groundfish (primarily king and Tanner crab) landings and processing for the bulk of its economic activity. These non-groundfish species continue to be important components of a diverse processing complex in Dutch Harbor/Unalaska. In 1997, for example, nearly 2 million pounds of salmon, more than 1.7 million pounds of herring, and 34 million pounds of crabs were reportedly processed in this port.

Nonetheless, since the mid-1980s, groundfish has accounted for the vast majority of total landings in Dutch Harbor/Unalaska. Again, utilizing 1997 catch data, over 93.5 percent of total pounds landed and processed in this port were groundfish.

While well over 90 percent of this total tonnage was groundfish, a significantly smaller percentage of the attributable ex-vessel value of the catch is comprised of groundfish. While equivalent processed product values for non-groundfish production are not readily available, Alaska fish ticket data indicate that the ex-vessel value of these species landed in Dutch Harbor/Unalaska was nearly $43 million, in 1997; or about 60 percent of the reported gross product value of the groundfish output. If the value added through processing of these non-groundfish species were fully accounted for, the total would obviously exceed the ex-vessel value of the raw catch.

As suggested, transshipping is an integral component of the local service-based economy of this community, as well. The port serves as a hub for movement of cargo throughout the Pacific Rim. Indeed, the Great Circle shipping route from major U.S. west coast ports to the Pacific Rim passes within 50 miles of Unalaska. The Port of Dutch Harbor is among the busiest ports on the west coast. The port reportedly serves more than 50 domestic and foreign transport ships per month. Seafood products, with an estimated first wholesale value substantially in excess of a billion dollars, cross the port's docks each year and are carried to markets throughout the world.

The facilities and related infrastructure in Dutch Harbor/Unalaska support fishing operations in both the BSAI and GOA management areas. Processors in this port receive and process fish caught in both areas, and the wider community is linked to, and substantially dependent upon serving both the on-shore and at-sea sectors of the groundfish industry.

In a profile of regional fishing communities, published by the NPFMC in 1994, the local economy of Unalaska was characterized in the following way:

> If it weren't for the seafood industry, Unalaska would not be what it is today ... In 1991, local processors handled 600 million lbs. of seafood onshore, and 3 billion lbs. of seafood were processed offshore aboard floating processors that use Dutch Harbor as a land base. Seven shore-based and many floating processors operate within municipal boundaries.

While these figures presumably include both groundfish and non-groundfish species, and current sources identify at least eight shore-based processing facilities, they are indicative of the scope of this community's involvement in, and dependence upon, seafood harvesting and processing.

Because of this high level of economic integration between Dutch Harbor/Unalaska and the fishing industry, any action which significantly reduced the total allowable catch of groundfish from the Bering Sea/Aleutian Islands (and to a lesser extent Gulf of Alaska) management areas would be expected to have a severely negative impact on the port and surrounding community.

While the port continues to be actively involved in support operations for crab, salmon, and herring fisheries, these resources do not hold the potential to offset economic impacts which would be associated with a significant reduction in (especially pollock and Pacific cod) groundfish TACs. Indeed, the newest and largest of the processing facilities in Dutch Harbor/Unalaska are dedicated to pollock surimi production, and could not readily shift production to an alternative species or product form, even if such an opportunity were to exist.

Detailed data on costs, net earnings, capital investment and debt service for the harvesting, processing, and fisheries support sectors in Dutch Harbor/Unalaska are not available. Therefore, it is not possible to quantify the probable net economic impacts on this community attributable to a significant reduction in groundfish TACs for the Bering Sea and Aleutian Islands or Gulf of Alaska management areas. It is apparent, however, that no alternative fisheries exist into which the port might diversify, in order to offset such a reduction in groundfish activity (crab resources remain biologically depressed and those fisheries are fully subscribed. The herring and salmon fisheries are managed by the State of Alaska with limited entry programs. Neither are there prospects (at least in the foreseeable future) for non-fishery related economic activity in Dutch Harbor/Unalaska that could substantially mitigate impacts from a significant reduction in groundfish fishing activity.

While Dutch Harbor has been characterized as one of the world's best natural harbors, it offers few alternative opportunities for economic activity beyond fisheries and fisheries support. Its remote location, limited and specialized infrastructure and transportation facilities, and high cost make attracting non-fishery related industrial and/or commercial investment doubtful (at least in the short-run). Sea floor minerals exploration, including oil drilling, in the region have been discussed. No such development seems likely in the short run, however. Unalaska, also, reportedly expected nearly 6,000 cruise ship visitors in 1996.

Without the present level of fishing and processing activities, it is probable that many of the current private sector jobs in this groundfish landings port could be lost, or at the very least, would revert to highly seasonal patterns, with the accompanying implications for community stability observed historically in this and other Alaska seafood processing locations dependent upon transient, seasonal work forces. It is likely, for example, that the number of permanent, year-round residents of Dutch Harbor/Unalaska would decline significantly. This would, in turn, alter the composition and character of the community and place new, and different, demands on local government.

The municipal government of the City of Unalaska is substantially dependent upon the tax revenues which are generated from fishing and support activities. While a detailed treatment of municipal tax accounts is beyond the scope of this assessment, it is clear that, between the State of Alaska's Fisheries Business Tax and Fishery Resource Landings Tax revenues (both of which are shared on a 50/50 basis with the community of origin), local raw fish sales tax, real property tax (on fishery related property), and permits and fees revenues associated with fishing enterprises, the City of Unalaska derives a substantial portion of its operating, maintenance, and capital improvement budget from fishing, and especially groundfish fishing, related business activities. Should the groundfish harvest in the BSAI management area be substantially reduced, the municipality could experience a very significant reduction in its tax base and revenues (depending upon the species and size of the reduction). Potentially, the magnitude of these revenue reductions could be such that they could not readily be compensated for by the municipal government.

The local private business infrastructure which has developed to support the needs and demands of the fishery-based population of Dutch Harbor/Unalaska would very clearly suffer severe economic dislocation, should the number of employees in the local plants and fishing fleets decline in response to substantial TAC reductions. While insufficient cost and investment data exist with which to estimate the magnitude of probable net losses to these private sector businesses, it seems certain that a substantial number would fail. With no apparent economic development alternative available to replace groundfish harvesting and processing in Dutch Harbor/Unalaska (at least in the short run), there would be virtually no market value associated with these stranded assets.

Akutan

Akutan is located on Akutan Island in the eastern Aleutian Islands, one of the Krenitzin Islands of the Fox Island group. The community is approximately 35 miles east of Unalaska and 766 air miles southwest of Anchorage. Akutan is surrounded by steep, rugged mountains reaching over 2,000 feet in height. The village sits on a narrow bench of flat, treeless terrain. The small harbor is ice-free year-round, but frequent storms occur in winter and fog in summer. The community is reported to have a population of 414 persons, although the population can swell to well over 1,000 during peak fish processing months.

During the 1990 U.S. Census, 34 total housing units existed and 3 were vacant. 527 jobs were estimated to be in the community. The official unemployment rate at that time was .4 percent, with 7.4 percent of all adults not in the work force. The median household income was $27,813, and 16.6 percent of the residents were living below the poverty level. One school is in the community, serving 24 students.

Water is supplied from local streams, treated, and piped into homes. The seafood processing plant operates its own water treatment facility.

Akutan ranks as the second most significant landings port for groundfish on the basis of tons delivered and has been characterized as a unique community in terms of its relationship to these BSAI fisheries. According to a recent social impact assessment, prepared for the NPFMC, while Akutan is the site of one of the largest of the shoreside groundfish processing plants in the region, the community is geographically and socially separate from the plant facility.

Indeed, while the village of Akutan was initially judged to be ineligible to participate in the State of Alaska's CDQ program, based largely upon its being associated with "... a previously developed harvesting and processing capability sufficient to support substantial groundfish participation in the BSAI ...", it was subsequently determined that the community of Akutan was discrete and distinct from the Akutan groundfish processing complex.

As a result, Akutan has a very different relationship to the region's groundfish fisheries than does, for example, Dutch Harbor/Unalaska or Kodiak. While the community of Akutan derives economic benefits from its proximity to the large Trident Seafoods shore plant (and a smaller permanently moored processing vessel, operated by Deep Sea Fisheries, which does only crab), the entities have not been integrated in the way other landings ports and communities on the list have.

As a CDQ community, the community of Akutan enjoys access to the BSAI groundfish resource independently of direct participation in the fishery. The CDQ communities as a group will receive CDQs equal to 7.5 percent of each BSAI groundfish TAC, except for the fixed gear sablefish TACs. The CDQ communities will receive 20 percent of the fixed gear sablefish TACs for the eastern Bering Sea and the Aleutian Islands areas. Therefore, the CDQs available to the CDQ group to which Akutan is a member will change as the BSAI TACs change. As TACs decrease, the value per unit of CDQ would be expected to increase and at least partially offset the effect of the decrease in quantity. However, it is not known whether the total value of the

CDQs would increase or decrease if TACs and, therefore, CDQs decrease. Similarly, the economic benefits the community derives from the local 1 percent raw fish tax from landings at the nearby plant are dependent on BSAI groundfish TACs and the resulting ex-vessel value of groundfish landings. As with the value of CDQs, typically decreases in TACs and landings would be expected to be at least partially offset by increases in ex-vessel prices.

Although this conclusion pertains to the community of Akutan, implications for the groundfish landings port of Akutan are quite different. The Trident plant is the principal facility in the Akutan port and, historically, a number of smaller, mobile processing vessels have operated seasonally out of the port of Akutan. Therefore, a substantial decrease in groundfish landings in this region, in response to decreases in TACs being assessed in this document, could have profoundly negative implications. Akutan does not have a boat harbor or an airport in the community. Beyond the limited services provided by the plant, no an opportunity exists in Akutan to provide a support base for other major commercial fisheries. Indeed, alternative economic opportunities of any kind are extremely limited.

While crab processing was a major source of income for the Akutan plant during the boom years of the late 1970s and early 1980s, with the economic collapse of this resource base in the early 1980s, groundfish processing became the primary source of economic activity. In 1997, for example, State of Alaska and NMFS catch records indicate that, while landings of herring and crabs were reported for the Akutan plant, more than 98 percent of the total pounds landed were groundfish, and these made up more than 80 percent of the estimated total value.

An obvious alternative to groundfish processing which could be developed to offset a significant reduction in groundfish landings in Akutan does not appear. Fisheries for crabs, halibut, salmon, and herring, while important sources of income to the region, are fully developed. Therefore, should the groundfish TAC be significantly reduced, most of the jobs held by employees of the plant would likely disappear (or at a minimum, become seasonal) and people would leave the area (although the exact number is unknown).

No data on cost, net revenues, capital investment and debt structure are available with respect to Trident Seafood's Akutan plant complex. It is not possible, therefore, to quantify probable attributable net impacts to plant owners/operators of a potential reductions in groundfish catches, although as noted above, the Akutan facility is almost completely dependent upon pollock and Pacific cod deliveries. Should TACs for these two species decline significantly, the impacts would be greater than if TACs for other groundfish species were reduced. While some adjustment to alternative groundfish species might be possible, in response to a sharp decline in pollock and/or Pacific cod TACs, the fact that the plant has not become more involved with other groundfish species during the times of the year in which pollock and Pacific cod are not available suggests that the economic viability of such alternatives is limited and certainly inferior for the plant.

While the distribution of impacts across ports would not be expected to be uniform, should, in particular, pollock and/or Pacific cod TACs be reduced, it is likely that there could be substantial stranded capital costs and job losses in the port of Akutan. The size and rate of such losses is largely an empirical question.

Whereas the 1990 U.S. Census reported the population of Akutan at just under 600 (and the Alaska Department of Community and Regional Affairs CIS data places the figure at 414, in 1997), the local resident population is estimated at 80, with the remaining individuals being regarded as non-resident employees of the plant.

The permanent residents of the village are, reportedly, almost all Aleut. While some are directly involved in the cash economy (e.g., a small boat near-shore commercial fishery), many depend upon subsistence activities or other non-cash economic activities to support themselves and their families. The species important for subsistence users reportedly include: salmon, halibut, Pacific cod, pollock, flounders, Dolly Varden, greenling, sea lions, harbor and fur seals, reindeer, ducks and geese and their eggs, as well as intertidal creatures (e.g., clams, crabs, mussels). Berries and grasses are also collected as part of the subsistence harvest (NPFMC 1994a). These activities would be expected to be largely unaffected by any action to reduce the BSAI groundfish TAC.

Kodiak

The groundfish landings port of Kodiak is located near the eastern tip of Kodiak Island, southeast of the Alaska Peninsula, in the Gulf of Alaska. The City of Kodiak is the sixth largest city in Alaska, with a population of 6,869 (Alaska Department of Community and Regional Affairs 1998). The City of Kodiak is 252 air miles south of Anchorage. The port and community are highly integrated, both geographically and structurally. The port and community are the de facto center of fishing activity for the western and central Gulf of Alaska.

Kodiak is primarily non-Native, and the majority of the Native population are Sugpiaq Eskimos and Aleuts. Filipinos are a large subculture in Kodiak due to their work in the canneries. During the 1990 U.S. Census, 2,177 total housing units existed and 126 were vacant. An estimated 3,644 jobs were in the community. The official unemployment rate at that time was 4.4 percent, with 23 percent of the adult population not in the work force. The median household income was $46,050, and 6.2 percent of residents were living below the poverty level. Pillar Creek Reservoir and Monashka Reservoir provide water to the community, which is piped throughout the area. Piped sewage is processed in a secondary treatment plant. All homes are fully plumbed. Eight schools are located in the community, serving 2,252 students.

Kodiak supports at least nine processing operations which receive groundfish harvested from the GOA and, to a lesser extent, the BSAI management areas, and four more which process exclusively non-groundfish species. The port also supports several hundred commercial fishing vessels, ranging in size from small skiffs to large catcher/processors.

According to data supplied by the City:

> The Port of Kodiak is home port to 770 commercial fishing vessels. Not only is Kodiak the state's largest fishing port, it is also home to some of Alaska's largest trawl, longline, and crab vessels.

Unlike Akutan, or even Dutch Harbor/Unalaska, Kodiak has a more generally diversified seafood processing sector. The port historically was very active in the crab fisheries and, although these fisheries have declined from their peak in the late 1970s and early 1980s, Kodiak continues to support shellfish fisheries, as well as significant harvesting and processing operations for Pacific halibut, herring, groundfish, and salmon.

Kodiak processors, like the other onshore operations profiled in this section, are highly dependent on pollock and Pacific cod landings, with these species accounting for 43 percent and 36 percent of total groundfish deliveries, by weight, respectively. The port does, however, participate in a broader range of groundfish fisheries than any of the other ports cited. Most of this activity centers on the numerous flatfish species which are present in the GOA, but also includes relatively significant rockfish and sablefish fisheries.

In fact, Kodiak often ranks near the top of the list of U.S. fishing ports, on the basis of landed value, and is frequently regarded as being involved in a wider variety of North Pacific fisheries than any other community on the North Pacific coast.

In 1997, for example, the port recorded salmon landings of just under 44 million pounds, with an estimated ex-vessel value of over $12 million. Approximately 4.3 million pounds of Pacific herring were landed in Kodiak with an ex-vessel value of more than $717 thousand. Crab landings exceeded 1.1 million pounds and were valued at ex-vessel at more than $2.7 million.

While comparable product value estimates are not currently available for groundfish and non-groundfish production (i.e., first wholesale value), it may be revealing to note that groundfish landings accounted for 79 percent of the total tons of fish and shellfish landed in this port, in 1997.

In addition to seafood harvesting and processing, the Kodiak economy includes sectors such as transportation (being regarded as the transportation hub for southwest Alaska), federal/state/local government, tourism, and timber. The forest products industry, based upon Sitka spruce, is an important and growing segment of the Kodiak economy.

The community is, also, home to the largest U.S. Coast Guard base in the Nation. Located a few miles outside of the city center-proper, it contributes significantly to the local economic base. The University of Alaska, in conjunction with the National Marine Fisheries Service, operates a state-of-the-art fishery utilization laboratory and fishery industrial technology center in Kodiak, as well.

While Kodiak appears to be a much more mature and diversified economy that those of any other of the five primary groundfish landings ports in Alaska, it is likely that a substantial reduction in groundfish TAC in the Gulf, Aleutian Islands, and/or Bering Sea management area(s) could impose significant adverse economic impacts on Kodiak.

The absence of detailed cost, net revenue, capital investment and debt structure data for the Kodiak groundfish fishing and processing sectors precludes a quantitative analysis of the probable net economic impacts of such a TAC change. Nonetheless, one may draw insights from history, as when in the early-1980s king crab landings declined precipitously and Kodiak suffered a severe community-wide economic decline. It was largely the development of the groundfish fisheries which reinvigorated the local economy.

Unfortunately, an alternative fishery resource available to Kodiak fishermen and processors which could ameliorate significant reductions in groundfish landing does not appear. Neither do non-fishery based opportunities appear, at least in the short run, which could be developed to reduce the adverse economic impacts of such a change in groundfish harvesting and processing.

Sand Point and King Cove

These are two independent and geographically separate groundfish 'landings ports' (lying approximately 160 miles from one another), but because each has only a single processor and each community is small and remote, they are described jointly in this section.

Alaska CIS data place Sand Point's 1998 population at 808, while King Cove's population is listed as 897. Sand Point is located on Humboldt Harbor, Popof Island, 570 air miles from Anchorage. Sand Point is described by the Alaska Department of Community and Regional Affairs as "a mixed Native and non-Native community," with a large transient population of fish processing workers. During the April 1990 U.S. Census, 272 total housing units were in existence and 30 of these were vacant. A total of 438 jobs were estimated to be in the community. The official unemployment rate at that time was 2.9 percent, with 32.1 percent of all adults not in the work force. The median household income was $42,083, and 12.5 percent of the residents were living below the poverty level. One school is located in Sand Point, attended by 145 students.

King Cove is located on the Gulf of Alaska side of the Alaska Peninsula, 625 miles southwest of Anchorage. The community is characterized as a mixed non-Native and Aleut village. In the 1990 U.S. Census, 195 total housing units were in existence, with 51 of these vacant. The community had an estimated 276 jobs, with an official unemployment rate of 1.8 percent and 24.0 percent of all adults not in the work force. The median household income was $53,631, and 10 percent of the residents were living below the poverty level. One school is located in the community, attended by 140 students.

Sand Point and King Cove, like Akutan, are part of the Aleutians East Borough. Unlike Akutan, however, neither Sand Point nor King Cove qualify as a CDQ community. Indeed, both Sand Point and King Cove have had extensive historical linkages to commercial fishing and fish processing, and currently support resident commercial fleets delivering catch to local plants. These local catches are substantially supplemented by deliveries from large, highly mobile vessels, based outside of the two small Gulf of Alaska communities.

King Cove boasts a deep water harbor which provides moorage for approximately 90 vessels of various sizes, in an ice-free port. Sand Point, with a 25 acre/144 slip boat harbor and marine travel-lift, is home port to what some have called, "the largest fishing fleet in the Aleutian Islands" (NPFMC 1994a).

For decades, the two communities have principally concentrated on their respective area's salmon fisheries. In 1997, for example, Sand Point and King Cove recorded salmon landings of several million pounds, each. State of Alaska data confidentiality requirements preclude reporting actual quantities and value when fewer than four independent operations are included in a category. Sand Point and King Cove each have one processor reporting catch and production data. In addition, King Cove had significant deliveries of Pacific herring and crabs. Recently, each community has actively sought to diversify its fishing and processing capability, with groundfish being key to these diversification plans.

According to a recent report presented to the Council (Impact Assessment Incorporated 1998):

> In terms of employment, 87 percent of Sand Point's workforce is employed full time in the commercial fishery; for King Cove this figure is more than 80 percent (United States Army Corps of Engineers 1997, and 1998). In both cases, fishing employment is followed by local government (borough and local) and then by private businesses. Seafood processing ranks after each of these other employers, meaning that the vast majority of the workforce at the shore plants are not counted as community residents.

By any measure, these two communities are fundamentally dependent upon fishing and fish processing. In recent years, groundfish resources have supplanted salmon, herring, and crabs as the primary target species-group, becoming the basis for much of each community's economic activity and stability.

Few alternatives to commercial fishing and fish processing exist, within the cash-economy, in these communities by which to make a living. However, subsistence harvesting is an important source of food, as well as a social activity, for local residents in both Sand Point and King Cove. Salmon and caribou are reportedly among the most important subsistence species, but crabs, herring, shrimps, clams, sea urchins, halibut and cod are also harvested by subsistence users. It is reported that Native populations in these communities also harvest seals and sea lions for meat and oil (Impact Assessment Incorporated 1998).

Any action which significantly diminishes the harvest of GOA and BSAI groundfish resources (especially those of pollock and Pacific cod) would be expected to adversely impact these two communities. King Cove is somewhat unique among the five key groundfish ports insofar as it is relatively more dependent upon Pacific cod than pollock, among the groundfish species landed (69 percent and 31 percent, respectively). Sand Point follows the more typical pattern with 69 percent of its groundfish landings being composed of pollock and 29 percent of Pacific cod (in 1997).

Because neither port has significant vessel support capabilities, their links to other groundfish fisheries is less direct than, say, either Kodiak or Dutch Harbor/Unalaska. This may suggest that reductions in TACs for species other than pollock and Pacific cod would have little or no direct impact on these two ports. However, because both compete with the larger ports for deliveries of these two groundfish species, structural changes in one or more of the other principal groundfish landings ports, attributable to TAC reductions for other than pollock and Pacific cod could, indirectly, affect King Cove and Sand Point. This is, however, largely an empirical question.

No data on cost, net revenues, capital investment and debt structure are available with respect to the Sand Point or King Cove plant complexes. It is not possible, therefore, to quantify probable attributable net impacts to plant owners/operators of the potential reductions in groundfish catches and deliveries to these landings ports.

Other Alaska Groundfish Fishing Communities

As noted above, the remaining 5 percent or so of the total groundfish landings made to Alaska fishing ports is distributed over more than twenty different locations (Table 3-44). Very few common characteristics are shared by all these remaining ports. Like virtually every settlement in Alaska (with the exception of Anchorage, population 254,269, in 1998), these landings ports are all relatively small communities. Some are exceedingly small, with year-round resident populations of a few dozen to a couple hundred people (e.g., Chignik - pop. 128; Pelican - pop. 196; St. Paul - pop. 739), while others could be regarded as small to moderate-sized towns, with populations numbering in the several thousands (e.g., Ketchikan - pop. 8,729; Kenai - pop. 6,950; Petersburg - pop. 3,356).

Community Development Communities

The purpose of the CDQ program was to extend the economic opportunities of the developing fisheries in the Bering Sea and Aleutian Islands (especially pollock) to small, rural communities which had otherwise not benefitted from their proximity to these valuable living marine resources.

As initially envisioned, the proposed program would set aside 7.5 percent of the Bering Sea and Aleutian Island's annual TAC for Alaska pollock for allocation to qualifying rural Alaskan communities. The program was initially proposed to run for a period of four year, lasting from 1992 through 1995, but was subsequently extended for an additional three years, carrying it through 1998. In the intervening period, a CDQ program for BSAI halibut and sablefish was implemented in 1995, a CDQ program for BSAI crab was implemented in 1998, the multi-species groundfish CDQ program will be implemented in late 1998, and the Council recommended extending the pollock CDQ allocations by including pollock in the multi-species groundfish CDQ program.

The purpose of the CDQ program is, essentially, to redistribute a portion of the economic and social benefits deriving from the rich fishery resources of the Bering Sea and Aleutian Islands management areas to coastal communities in western Alaska which have not, to date, benefitted from their proximity to these fisheries. This is, historically, an economically depressed region of the Nation. By providing CDQ shares to qualifying communities, the expectation is that investment in capital infrastructure, community development projects, training and education of local residents, regionally based commercial fishing or related businesses can be developed and sustained.

CDQ communities are predominantly Alaska Native villages. They are remote, isolated settlements with few natural assets with which to develop and sustain a viable diversified economic base. As a result, unemployment rates are chronically high. This has led to habitual community instability.

While these communities effectively border some of the richest fishing grounds in the world, they have not been able, for the most part, to exploit their advantageous proximity. The full Americanization of these highly valued offshore fisheries has taken place relatively quickly (i.e., the last participation by foreign fishing vessels ended in the Bering Sea in 1990). But the scale of these fisheries (e.g., 2 million mt groundfish TAC), the severe physical conditions within which the fisheries are prosecuted, and the very high capital investment required to compete in the open-access management environment, all contributed to effectively precluding these villages from participating in this development. The CDQ program serves to ameliorate some of these apparent inequities by extending an opportunity to qualifying communities to directly benefit from the exploitation of these publicly owned resources.

The communities which are currently eligible to participate in the CDQ program include 56 coastal Alaska villages, with a combined population estimated at roughly 24,000. The CDQ-qualifying communities have organized themselves into six non-profit groups (with between 1 and 17 villages in each group). The CDQ-villages are geographically dispersed, extending from Atka, on the Aleutian chain, along the Bering coast, to the village of Wales, near the Arctic Circle. The following lists the current CDQ groups.

Aleutian Pribilof Island Community Development Association (APICDA): The six communities represented by APICDA are relatively small and located adjacent to the fishing grounds. Population of the six communities is approximately 730.

Bristol Bay Economic Development Corporation (BBEDC):BBEDC represents 13 villages distributed around the circumference of Bristol Bay, including Dillingham, the second-largest CDQ community with approximately 2,200 residents and the location of BBEDC's home office. Total population is approximately 3,900.

Central Bering Sea Fisherman's Association (CBSFA): CBSFA is unusual among CDQ groups in that it represents a single community, St. Paul in the Pribilof Islands.

Coastal Villages Region Fund (CVRF): CVRF manages the CDQ harvest for its 17 member villages. The villages are located along the coast between the southern end of Kuskokwim Bay and Scammon Bay, including Nunivak Island.

Norton Sound Economic Development Corporation (NSEDC): Fifteen villages and approximately 8,700 people make up the region represented by NSEDC, which ranges from St. Michael to Diomede.

Yukon Delta Fisheries Development Association (YDFDA): YDFDA represents the four communities, Alakanuk, Emmonak, Kotlik, and Sheldon Point, containing approximately 1, 750 people.

By design, at the time of implementation, CDQ communities could have no current or historical linkage to the fisheries in question. In fact, if a rural coastal community had such a history, it was precluded from receiving a CDQ allocation. Therefore, to derive economic benefit from their respective allocations, it has been necessary (with the exception of some of the halibut CDQs) for each CDQ group to enter into a relationship with one or more of the commercial fishing companies which participate in the open-access fishery. In this way, the CDQ community brings to the relationship preferential access to the fish and the partnering firm brings the harvesting/processing capacity. The nature of these relationships differs from group to group. In every case, the CDQ community receives royalty payments on apportioned catch shares. Some of the agreements also provide for training and employment of CDQ-community members within the partners' fishing operations, as well as, other community development benefits.

Fishing Communities not Adjacent to the Management Areas

Many of the participants in the BSAI and GOA groundfish fisheries are not from the communities adjacent to the management areas. Therefore, many of the fishing communities that are substantially dependent on or substantially engaged in the harvest or processing of BSAI or GOA groundfish fishery resources are not adjacent to the management areas. This is particularly true for the BSAI fishery because the adjacent communities are small and remote. Even in the case of Unalaska and Akutan, the two BSAI communities with large groundfish processing plants, a large part of the processing plant labor force is accounted for by individuals who are neither local nor Alaska residents. In the GOA, local residents play a substantially larger role in the harvesting and processing sectors of the groundfish industry as well as in the support industries.

Vessels that participated in the BSAI and GOA groundfish fisheries had home ports in nine states other than Alaska. However, only three states had home ports for more than 2 vessels. They were: California with fewer than 20 vessels, Oregon with 42 to 75 vessels, and Washington with 310 to 423 vessels. In 1997, 25 of the 48 vessels with Oregon home ports used trawl gear and the mean vessel length of the Oregon vessels was 75 feet. In 1997, 136 of the 331 vessels with Washington home ports used trawl gear and the mean vessel length of the Washington vessels was 115 feet. In comparison, fewer than 10 percent of the vessels with Alaska home ports used trawl gear in 1997 and their mean length was 49 feet.

Almost all of the non-Alaska home ports had fewer than 10 vessels and many had only a few. Seattle, with typically about 300 vessels, was the only non-Alaska port with more than 50 vessels. Next after Seattle, was Newport with 17 vessels in 1997 and Portland with 19 vessels. For Seattle, 122 of the 282 vessels in 1997 were trawlers and the mean length of all vessels was 122 feet. The comparable numbers for Portland and Newport, respectively, are 5 of 19 and 64 feet and 16 of 17 and 91 feet.

Delete Section 5.0

Delete Section 6.0

Delete Section 7.0

Section 8 is revised as follows:

1. Sections 8.3, 8.4, 8.5, 8.6, and 8.7 and Tables 20, 21, and figures 21, 22, 23, and 24 are deleted.

2. Section 8.1 is renumbered 5.1

3. Section 8.2 is renumbered 5.2

4. Section 8.8 is renumbered 5.3.

5. Section 8.9 is renumbered 5.4.

6. Section 8.10 is renumbered 5.5.
7. Section 8.11 is renumbered 5.6.

8. Section 8.12 is renumbered 5.7.

9. Section 8.13 is renumbered 5.8.

10 Section 8.14 is renumbered 5.9.

11. Section 8.15 is renumbered 5.10.

12. Section 8.16 is renumbered 5.11.

13. Section 8.17 is renumbered 5.12.

14. In the new section 5.11, references to section 8.1 and 8.9.1 are changes to 5.1 and 5.4.1, respectively.

Renumber Section 9 to Section 6

Renumber Section 10 to section 7

The new section 7 is modified as follows:

1. In Section 7.1 the following paragraph is added to the end of the section:

The groundfish resources off Alaska have been harvested and processed entirely by U. S.-flagged vessels since 1991. Conservation and management measures contained in this FMP apply exclusively to domestic fishing activities. No portion of the annual optimal yield is allocated to foreign harvesters or foreign processors.

2. In Section 7.3, the introductory paragraphs are revised as follows:

a. Revise the first paragraph to read as follows:

The Secretary, after receiving recommendations from the Council, will determine TACs and apportionments thereof, and reserves for each target species and the "other species" category by January 1 of the new fishing year, or as soon as practicable thereafter, by means of regulations implementing the FMP.

b. In the second paragraph, the reference "13.2.B.2 on page 14-1" is revised to read "8.2.B.2".

c. Revise the third and fourth paragraphs to read as follows:

Prior to making recommendations to the Secretary, the Council will make available to the public for comment as soon as practicable after its February meeting, a preliminary Stock Assessment and Fishery Evaluation (SAFE) report and preliminary specifications of ABC and TAC for each target species and the "other species" category, and apportionments thereof and reserves. At a minimum the SAFE will contain information listed in Section 7.3.1.

At its April meeting, the Council will review comments received. The Council will then make final recommendations to the Secretary.

3. In Section 7.3.1, delete the last sentence.

4. Section 7.3.2 is revised to read as follows:

7.3.2 Reserves

The groundfish reserves at the beginning of each fishing year shall equal the sum of 7.5 % of each target species and the "other species" category TAC, except pollock and hook and line or pot sablefish. When the TAC is determined by the Council, 7.5 % is set aside for the CDQ program as specified under section 8.4.7.3.5.

5. Delete sections 7.3.3, 7.4, 7.5, 7.6, 7.7 and Table 22a.

Delete Section 11.

Delete Section 12

Renumber Section 13 to Section 8.

1. In the new Section 8.2(B)
   a. The reference 4.2.A is revised to read Section 4.0.
   b. In paragraph 1., the reference 14.4.2.F is revised to 9.4.2.F.

2. In the new section 8.4.2 A, the reference to 13.2.B.1 is revised to 8.2.B.1.

3. In the new Section 8.4.2.3,

A. in paragraphs A and B(2), the references to 13.4.2.2 and 13.4.2.2, Part D and 10.3 are revised to read 8.4.2.2 and 8.4.2.2, Part D, and 7.3, respectively.

B. paragraph B(6) is deleted and paragraphs B (1), B(2), B(3), B(4), and B(5) are revised to read as follows:

B. * * *

(1) <u>Prior to the February Council Meeting</u>. The Plan Team will prepare for the Council a preliminary Stock Assessment and Fishery Evaluation (SAFE) report under Section 7.3 which provides the best available information on estimated prohibited species bycatch and mortality rates in the target groundfish fisheries, and estimates of seasonal and annual bycatch rates and amounts. Based on the SAFE report, the Plan Team may provide recommendations for apportionments of PSC limits to target fisheries, seasonal allocations, thereof and an economic analysis of the effects of the PSC limit apportionments or allocations.

(2) <u>February Council Meeting</u>. * * *

(3) <u>Prior to the April Council Meeting</u>. The Plan Team will prepare for the Council a final SAFE report under Section 7.3 which provides the best available information on estimated halibut bycatch rates in the target groundfish fisheries. The Plan Team may provide final recommendations for apportionments of PSC limits among target fisheries, seasonal allocations of fishery bycatch apportionments, and also an economic analysis of the effects of the PSC limit apportionments or seasonal allocations.

(4) <u>April Council Meeting</u>. While recommending final groundfish harvest levels, the Council reviews public comments, takes public testimony, and makes final decisions on apportionments of PSC limits among fisheries and seasons, using the same factors (a) through (g) set forth under Section 8.4.2.3, Part B (seasonal allocations of the PSC limits). The Council also makes final decisions on the exemption of any non-trawl fishery category from halibut bycatch mortality restrictions using the same factors (1) through (8) set forth under Section 8.4.2.2, Part D.

(5) As soon as practicable after the Council's April meeting, the Secretary will publish the Council's final decisions as proposed harvest specifications in the Federal Register. Information on which the final recommendations are based will also be published in the Federal Register or otherwise made available by the Council.

4. In the new paragraph 8.4.2.4, the reference to 13.4.2.2 is revised to 8.4.2.2.

5. In the new paragraph 8.4.7.1.1, the reference to 13.4.7.1 is revised to 8.4.7.1.

6. In the new paragraph 8.4.3, the text "DAP or JVP" is deleted.

7. In the new paragraph 8.4.7.1.5(5), the reference 13.4.8.4(1) is revised to 8.4.8.4(1).

8. In the new paragraph 8.4.7.1.5(5)d., the reference 13.4.7.1.1 is revised to 8.4.7.1.1.

9. In the new paragraph 8.4.7.3.3, the reference 13.4.7.1 is revised to 8.4.7.1.

10. In the new paragraph 8.4.7.3.5, the references 13.4.7.3.3 and 13.4.7.3.4 are revised to 8.4.7.3.3 and 8.4.7.3.4, respectively.

11. In the new paragraph 8.4.8(B), the reference to 13.4.2 is revised to 8.4.2.

12. In the new paragraph 8.4.9.3,
    a. the reference to 13.4.9.2.1 is revised to 8.4.9.2.1.
    b. the reference to 11.3 in the introductory paragraph is revised to 7.3.
    c. In paragraph (a), the reference 13.4.2 is revised to 8.4.2.

13. Delete section 13.5 (Management Measures–Foreign Fisheries)

14. Renumber section 13.6 to 8.5.

15. Renumber section 13.7 to 8.6.

16. Renumber section 13.8 to 8.7.

17. Renumber section 13.9 to 8.8.

Renumber Section 14 to 9

In the second introductory paragraph, reference to Section 14.0 is revised to 9.0.

Renumber Section 15 to 10

Renumber Section 16 to 11

Renumber Section 17 to 12

Add the following references to the new Section 12.1 in alphabetical order:

Alaska Department of Community and Regional Affairs. 1998. "Community Information Summary (CIS)." in Alaska Department of Community and Regional Affairs, P.O. Box 112100, Juneau, AK 99811.

Fredin, R. A. 1987. History of regulation of Alaska groundfish fisheries. National Marine Fisheries Service, NWAFC Processed Report 87-07. 63 p.

Impact Assessment Incorporated. 1998. "Inshore/Offshore 3 - Socioeconomic Description and Social Impact Assessment." in Impact Assessment, Inc, 911 West 8th Avenue, Suite 402, Anchorage, AK.

Megrey, B. A., and V. G. Wespestad. 1990. Alaskan groundfish resources: 10 years of management under the Magnuson Fishery Conservation and Management Act. N. Am. J. Fish. Management 10(2):125-143.

NPFMC. 1994a. "Fishery Management Plan for the Gulf of Alaska Groundfish Fishery." in North Pacific Fishery Management Council, 605 West 4th Avenue, Suite 306, Anchorage, AK 99501.

NPFMC. 1995. "Fishery Management Plan for the Bering Sea/Aleutian Islands Groundfish." in North Pacific Fishery Management Council, 605 West 4th Avenue, Suite 306, Anchorage, AK 99501.

United States Army Corps of Engineers. 1997. "Navigation improvements: detailed project report and environmental assessment, King Cove, Alaska." in U.S. Army Alaska Engineer District, Anchorage, AK.

United States Army Corps of Engineers. 1998. "Harbor improvements feasibility report and environmental assessment, Sand Point, Alaska." in U.S. Army Alaska Engineer District, Anchorage, AK.

Witherell, D., and Pautzke, C. 1997. "A brief history of bycatch management measures for eastern Bering Sea groundfish fisheries." *Marine Fisheries Review.* 59:15-22.

Renumber Section 18 to 13.

Remove and reserve Annex II and Annex III

Appendix B

Draft Amendment Language for the Fishery Management Plan for Groundfish of the Gulf of Alaska, Implementing Alternative 2 and Options A and B

Section 1, first paragraph is revised to read as follows:

This Fishery Management Plan (FMP) has been developed by the North Pacific Fishery Management Council for the groundfish fishery (excluding halibut) of the Gulf of Alaska. In 1978 it replaced the Preliminary Fishery Management Plan for the management of groundfish in the Gulf of Alaska. Since then, the FMP has been amended over sixty times.

Section 2 is revised as follows:

1. Delete definitions for Domestic annual harvest (DAH), Domestic annual processed catch (DAP), Joint venture processed catch (JVP), and Total allowable level of foreign fishing (TALFF).

2. Revise the definitions of Prohibited Species Catch (PSC) and Total allowable catch (TAC) as follows:

Prohibited Species Catch (PSC) is nonretainable catch. It can take the form of a prohibited or nongroundfish species and/or as a fully utilized groundfish species captured incidentally in groundfish fisheries. Such catch must be recorded and returned to sea with a minimum of injury except as provided in the Prohibited Species Donation Program. A PSC limit is an apportioned, nonretainable amount of fish provided to a fishery for bycatch purposes.

Total allowable catch (TAC) is the harvest quota for a species or species group; the retainable catch. TAC will be apportioned by area.

Section 3 is revised as follows:

1. In the section titled Areas and Stocks Involved, (2) is revised to read as follows:

(2) To all fisheries for all finfish, except salmon, steelhead, halibut, herring, and tuna. Harvest allocations and management are based on the calendar year.

2. The fourth paragraph is revised to read as follows:

Diversity of commercial bottomfish species in the Gulf of Alaska is intermediate between the Bering Sea, where fewer species occur, and the Washington-California region, where more species are present. The most diverse species in the Gulf of Alaska is the rockfish group (genus *Sebastes*), of which 30 species have been identified in this area. Several species of rockfish have been of significant commercial interest, including the Pacific ocean perch (*S. alutus*), shortraker rockfish (*S. borealis*), rougheye rockfish (*S. aleutianus*), dusky rockfish (*S. ciliatus*), northern rockfish (S. polyspinus), and yelloweye rockfish (S. ruberrimus). Pacific ocean perch was the subject of a substantial foreign and domestic trawl fishery from the 1960's through mid-1980's. Although Pacific ocean perch is found throughout the Gulf, the biomass and fishery have been concentrated in the Eastern Area. For management purposes rockfish are classified into three distinct assemblages that are based on their habitat and distribution. These assemblages are:

* * * * *

Section 4 is modified as follows:

1. Add the following paragraph to the end of Section 4.1.

* * * * *

The groundfish resources off Alaska have been harvested and processed entirely by U. S.-flagged vessels since 1991. Conservation and management measures contained in this FMP apply exclusively to domestic fishing activities. No portion of the annual optimal yield is allocated to foreign harvesters or foreign processors.

2. Section 4.2.1 is revised as follows:

a. Revise the first paragraph to read as follows:

A procedure has been developed whereby the Council can set annual harvest levels by specifying a total allowable catch (TAC) for each groundfish fishery on an annual basis. The procedure consists of six steps:

b. Delete paragraph (6)

c. Renumber paragraph (7) to (6).

d. In the paragraph following the new (6), the last sentence is revised to read as follows:

Similarly, the attainment of a PSC limit will result in the closure of the appropriate fishery.

e. Section 4.2.1.1 is revised to read as follows:

The Secretary, after receiving recommendations from the Council, will determine TACs and apportionments thereof for each target species and the "other species" category by January 1 of the new fishing year, or as soon as practicable thereafter, by means of regulations implementing the FMP. Notwithstanding designated target species and species groups listed in Section 3.1, the Council may recommend splitting or combining species in the target species category for purposes of establishing a new TAC if such action is desirable based on commercial importance of a species or species group and whether sufficient biological information is available to manage a species or species group on its own merits.

Prior to making recommendations to the Secretary, the Council will make available to the public for comment as soon as practicable after its February meeting, a preliminary Stock Assessment and Fishery Evaluation (SAFE) report and preliminary specifications of ABC and TAC for each target species and the "other species"category, and apportionments thereof. At a minimum the SAFE report will contain information listed in Section 4.2.1.4.

At its April meeting, the Council will review the final SAFE report and comments received. The Council will then make final recommendations to the Secretary.

f. Delete section 4.2.1.3.

g. Renumber section 4.2.1.4 to 4.2.1.3.

h. In the new 4.2.1.3, revised (7) to read as follows:

(7) Information to be used by the Council in establishing prohibited species catch limits (PSCs) for Pacific halibut with supporting justification and rationale.

i. Delete section 4.2.1.5.

3. Delete Section 4.2.2

4. Renumber Section 4.2.3 to 4.2.2., revise the new 4.2.2 as follows:

a. Revise the section reference in the third paragraph from 4.2.3.1 to 4.2.2.1.

b. Revise paragraph 5 as follows:

When a PSC limit is reached, further fishing with specific types of gear or modes of operation during the year is prohibited in an area by those who take their PSC limit in that area. All other users and gear would remain unaffected.

c. Delete paragraph 6.

d. Delete the first sentence of paragraph 7.

e. Renumber paragraph 4.2.3.1 to 4.2.2.1.

f. Revise the section reference in the introductory paragraph of the new 4.2.2.1 from 4.2.3 to 4.2.2.

g. In the new Section 4.2.2.1, delete (3) and revise (1) through the new (5) as follows:

(1) Prior to the February Council Meeting. The Plan Team will prepare for the Council a preliminary Stock Assessment and Fishery Evaluation (SAFE) report under Section 4.2.1 which provides the best available information on estimated halibut bycatch and mortality rates in the target groundfish fisheries, halibut PSCs limits, apportionments and catches thereof by target fisheries and gear types for the previous fishing year.

(2) February Council Meeting. While setting preliminary groundfish harvest levels under Section 4.2.1, the Council will also review the need to control the bycatch of halibut and will, if necessary, recommend preliminary halibut PSC mortality limits (PSCs) and apportionments thereof. The Council will also review the need for seasonal allocations of the halibut PSCs.

* * *

(3) Prior to the April Council Meeting. The Plan Team will prepare for the Council a final SAFE report under Section 4.2.1 which provides the best available information on estimated halibut bycatch rates in the target groundfish fisheries.

(4) April Council Meeting. While recommending final groundfish harvest levels, the Council reviews public comments, takes public testimony, and makes final decisions on annual halibut PSC limits and seasonal allocations, using the same factors (6) through (14) concerning PSC limits, and the same factors, (1) through (7), concerning seasonal allocations of the PSC limits. The Council will recommend its decisions, including no change for the new fishing year, to the Secretary of Commerce for implementation.

(5) As soon as practicable after the Council's April meeting, the Secretary will publish the Council's final decisions as proposed harvest specifications in the Federal Register. Information on which the final recommendations are based will also be published in the Federal Register or otherwise made available by the Council.

5. Renumber section 4.2.4 to 4.2.3. Revise the section reference in the paragraph from 4.2.3.1 to 4.2.2.1.

6. Renumber section 4.2.5 to 4.2.4.

7. Renumber section 4.2.6 to 4.2.5.

8. Delete the title to section 4.3.1

9. Renumber section 4.3.1.1 to section 4.3.1.

10. Renumber section 4.3.1.2 to section 4.3.2

11. Renumber section 4.3.1.2.1 to section 4.3.2.1.

12. Renumber section 4.3.1.2 .2 to section 4.3.2.2.

13. Renumber section 4.3.1.2.3 to section 4.3.2.3

14. Renumber section 4.3.1.3 to section 4.3.3

15. In the new section 4.3.3, delete the fourth paragraph titled <u>Information on processing expectations.</u>

16. Renumber section 4.3.1.4 to section 4.3.4

17. Renumber section 4.3.1.5 to section 4.3.5.

18. Renumber section 4.3.1.6 to section 4.3.6.

19. Renumber section 4.3.1.6.1 to section 4.3.6.1

20. Renumber section 4.3.1.6.2 to section 4.3.6.2.

21. Renumber section 4.3.1.6.3 to section 4.3.6.3.

22. Renumber section 4.3.1.6.4 to section 4.3.6.4.

23. Renumber section 4.3.1.7 to section 4.3.7.

24. Delete section 4.3.2

25. Renumber section 4.3.3 to section 4.3.8.

26. Renumber section 4.3.4. to section 4.3.9.

27. Renumber section 4.3.4.1 to section 4.3.9.1.

28. Renumber section 4.3.4.2 to section 4.3.9.2.

29. Renumber section 4.3.4.3 to section 4.3.9.3.

30. Delete table 4.4 and figures 4.2 and 4.3.

Appendix C

Draft Amendment Language for the Fishery Management Plan for the Bering Sea/Aleutian Islands Groundfish, Implementing Alternative 3 including Option 2 and Options A and B

Section 3.0 is modified as follows:

1. The second introductory paragraph is revised to read as follows:

> One feature of the format of this FMP is that such items as Allowable Biological Catch, Expected Annual Harvest and annual catch statistics which are likely to change from time to time have been arranged in Annexes. This should facilitate both the drafting and review process when such changes are made in the future.

2. In Section 3.3, delete definitions 2. and 3. Delete the number 1. for the first definition.

Section 4.0 is revised to read as follows:

1. Delete "<u>4.1 Areas and Stocks Involved</u>"

2. Renumber section 4.1.1 to 4.1

3. Delete sections 4.1.2 through 4.2.2.3, including all figures and tables.

4. Add sections 4.2, 4.3, and 4.4 to read as follows:

4.2 Species of Fish Targeted

The Bering Sea supports about 300 species of fishes, the majority of which are found near or on the bottom (Wilimovsky 1974). Among the pelagic species are the commercially important, or potentially important groups such as the salmon (<u>Oncorhynchus</u>), herring (<u>Clupea</u>), smelts (<u>Osmerus</u>), and capelin (<u>Mallotus</u>). The fish groups of primary concern in this plan are the bottom or near-bottom dwelling forms--the flounders, rockfish, sablefish, cod, pollock, and Atka mackerel. Although not bottom-dwelling, squids (<u>Cephalopoda</u>) are also included in the plan.

There is a general simplification in the diversity of bottomfish species in the Bering Sea compared to the more southern regions of the Gulf of Alaska and Washington to California. As a result, certain species inhabiting the Bering Sea are some of the largest bottomfish resources found anywhere in the world. Relatively few groundfish species in the eastern Bering Sea and Aleutian Islands are large enough to attract target, or target fisheries: walleye pollock, Pacific cod, Pacific ocean perch, sablefish, Atka mackerel, several species of rockfishes and flatfishes. Since the 1960s, pollock catches have accounted for the majority of the Bering Sea groundfish harvest. Yellowfin sole and rock sole currently dominate the flatfish group and has the longest history of intense exploitation by foreign fisheries. Other flounder species that are known to occur in aggregations large enough to form target species or occasional target species are

Greenland turbot, Pacific halibut, rock sole, flathead sole, Alaska plaice, and arrowtooth flounder.

Catch History

Catch statistics since 1954 are shown for the Eastern Bering Sea subarea in **Table 4.1a**. The initial target species was yellowfin sole. During the early period of these fisheries, total catches of groundfish reached a peak of 674,000 metric tons (t) in 1961. Following a decline in abundance of yellowfin sole, other species (principally walleye pollock) were targeted upon, and total catches rose to 2.2 million t in 1972. Catches have since varied from one to two million t as catch restrictions and other management measures were placed on the fishery.

Catches in the Aleutian region have always been much smaller than those in the Eastern Bering Sea. Target species have also been different (**Table 4.1b**): In the Aleutians, Pacific ocean perch (POP) was the initial target species. During the early years of exploitation, overall catches of Aleutian groundfish reached a peak of 112,000 t in 1965. As POP abundance declined, the fishery diversified to other species. Total catches from the Aleutians in recent years have been about 100,000 t annually.

Table 4.1.a. Groundfish and squid catches in the eastern Bering Sea, 1954-2001.

Year	Pollock	Pacific Cod	Sable Fish	Pacific Ocean Perch Complex	Other Rock Fish	Yellow Fin Sole	Greenland Turbot
1954						12,562	
1955						14,690	
1956						24,697	
1957						24,145	
1958	6,924	171	6			44,153	
1959	32,793	2,864	289			185,321	
1960			1,861	6,100		456,103	36,843
1961			15,627	47,000		553,742	57,348
1962			25,989	19,900		420,703	58,226
1963			13,706	24,500		85,810	31,565
1964	174,792	13,408	3,545	25,900		111,177	33,729
1965	230,551	14,719	4,838	16,800		53,810	9,747
1966	261,678	18,200	9,505	20,200		102,353	13,042
1967	550,362	32,064	11,698	19,600		162,228	23,869
1968	702,181	57,902	4,374	31,500		84,189	35,232
1969	862,789	50,351	16,009	14,500		167,134	36,029
1970	1,256,565	70,094	11,737	9,900		133,079	19,691
1971	1,743,763	43,054	15,106	9,800		160,399	40,464
1972	1,874,534	42,905	12,758	5,700		47,856	64,510
1973	1,758,919	53,386	5,957	3,700		78,240	55,280
1974	1,588,390	62,462	4,258	14,000		42,235	69,654
1975	1,356,736	51,551	2,766	8,600		64,690	64,819
1976	1,177,822	50,481	2,923	14,900		56,221	60,523
1977	978,370	33,335	2,718	2,654	311	58,373	27,708
1978	979,431	42,543	1,192	2,221	2,614	138,433	37,423
1979	913,881	33,761	1,376	1,723	2,108	99,017	34,998
1980	958,279	45,861	2,206	1,097	459	87,391	48,856
1981	973,505	51,996	2,604	1,222	356	97,301	52,921
1982	955,964	55,040	3,184	224	276	95,712	45,805
1983	982,363	83,212	2,695	221	220	108,385	43,443
1984	1,098,783	110,944	2,329	1,569	176	159,526	21,317
1985	1,179,759	132,736	2,348	784	92	227,107	14,698
1986	1,188,449	130,555	3,518	560	102	208,597	7,710
1987	1,237,597	144,539	4,178	930	474	181,429	6,533
1988	1,228,000	192,726	3,193	1,047	341	223,156	6,064
1989	1,230,000	164,800	1,252	2,017	192	153,165	4,061
1990	1,353,000	162,927	2,329	5,639	384	80,584	7,267
1991	1,268,360	165,444	1,128	4,744	396	94,755	3,704
1992	1,384,376	163,240	558	3,309	675	146,942	1,875
1993	1,301,574	133,156	669	3,763	190	105,809	6,330

Year	Pollock	Pacific Cod	Sable Fish	Pacific Ocean Perch Complex	Other Rock Fish	Yellow Fin Sole	Greenland Turbot
1994	1,362,694	174,151	699	1,907	261	144,544	7,211
1995	1,264,578	228,496	929	1,210	629	124,746	5,855
1996	1,189,296	209,201	629	2,635	364	129,509	4,699
1997	1,115,268	209,475	547	1,060	161	166,681	6,589
1998	1,101,428	160,681	586	1,134	203	101,310	8,303
1999	889,589	134,647	646	609	135	67,307	5,205
2000/d	1,132,736	151,372	742	704	239	84,057	5,888
2001/e	1,381,598	121,357	842	1,144	293	54,325	4,218

Year	Arrow Tooth Flounder	Other Flat Fish/c	Rock Sole/b	Atka Mackerel	Squid	Other Species	Total (All Species)
1954							12,562
1955							14,690
1956							24,697
1957							24,145
1958						147	51,401
1959						380	221,647
1960	a						500,907
1961	a						673,717
1962	a						524,818
1963	a	35,643					191,224
1964	a	30,604				736	393,891
1965	a	11,686				2,218	344,369
1966	a	24,864				2,239	452,081
1967	a	32,109				4,378	836,308
1968	a	29,647				22,058	967,083
1969	a	34,749				10,459	1,192,020
1970	12,598	64,690				15,295	1,593,649
1971	18,792	92,452				13,496	2,137,326
1972	13,123	76,813				10,893	2,149,092
1973	9,217	43,919				55,826	2,064,444
1974	21,473	37,357				60,263	1,900,092
1975	20,832	20,393				54,845	1,645,232
1976	17,806	21,746				26,143	1,428,565
1977	9,454	14,393			4,926	35,902	1,168,144
1978	8,358	21,040		831	6,886	61,537	1,302,509
1979	7,921	19,724		1,985	4,286	38,767	1,159,547
1980	13,761	20,406		4,955	4,040	34,633	1,221,944
1981	13,473	23,428		3,027	4,182	35,651	1,259,666
1982	9,103	23,809		328	3,838	18,200	1,211,483
1983	10,216	30,454		141	3,470	15,465	1,280,285
1984	7,980	44,286		57	2,824	8,508	1,458,299
1985	7,288	71,179		4	1,611	11,503	1,649,109
1986	6,761	76,328		12	848	10,471	1,633,911
1987	4,380	50,372		12	108	8,569	1,639,121
1988	5,477	137,418		428	414	12,206	1,810,470
1989	3,024	63,452		3,126	300	4,993	1,630,382

Year	Arrow Tooth Flounder	Other Flat Fish/c	Rock Sole/b	Atka Mackerel	Squid	Other Species	Total (All Species)
1990	2,773	22,568		480	460	5,698	1,644,109
1991	12,748	30,401	46,681	2,265	544	16,285	1,647,455
1992	11,080	34,757	51,720	2,610	819	29,993	1,831,954
1993	7,950	28,812	63,942	201	597	21,413	1,674,406
1994	13,043	29,720	60,276	190	502	23,430	1,818,628
1995	8,282	34,861	54,672	340	364	20,928	1,745,890
1996	13,280	35,390	46,775	780	1,080	19,717	1,653,355
1997	8,580	42,374	67,249	171	1,438	20,997	1,640,590
1998	14,985	39,940	33,221	901	891	23,156	1,486,739
1999	9,827	33,042	39,934	2,008	393	17,045	1,200,387
2000	12,071	36,813	49,186	239	375	23,098	1,497,520
2001	12,244	26,590	28,524	265	1,758	19,127	1,652,285

a/ Arrowtooth flounder included in Greenland turbot catch statistics.
b/ Includes POP shortraker, rougheye, northern and sharpchin.
c/ Rocksole prior to 1991 is included in other flatfish catch statistics.
d/ Data through December 31, 2000.
e/ Data through October 27, 2001. Does not include CDQ.
Note: Numbers don't include fish taken for research.

Table 4.1.b. Groundfish and squid catches in the Aleutian Islands region, 1962-2001.

Year	Pollock	Pacific Cod	Sable Fish	Pacific Ocean Perch Complex /b	Other Rock Fish	Greenland Turbot	Yellow Fin Sole
1962				200			
1963			664	20,800		7	
1964		241	1,541	90,300		504	
1965		451	1,249	109,100		300	
1966		154	1,341	85,900		63	
1967		293	1,652	55,900		394	
1968		289	1,673	44,900		213	
1969		220	1,673	38,800		228	
1970		283	1,248	66,900		285	
1971		2,078	2,936	21,800		1,750	
1972		435	3,531	33,200		12,874	
1973		977	2,902	11,800		8,666	
1974		1,379	2,477	22,400		8,788	
1975		2,838	1,747	16,600		2,970	
1976		4,190	1,659	14,000		2,067	
1977	7,625	3,262	1,897	8,080	3,043	2,453	
1978	6,282	3,295	821	5,286	921	4,766	
1979	9,504	5,593	782	5,487	4,517	6,411	
1980	58,156	5,788	274	4,700	420	3,697	
1981	55,516	10,462	533	3,622	328	4,400	
1982	57,978	1,526	955	1,014	2,114	6,317	
1983	59,026	9,955	673	280	1,045	4,115	
1984	81,834	22,216	999	631	56	1,803	
1985	58,730	12,690	1,448	308	99	33	
1986	46,641	10,332	3,028	286	169	2,154	
1987	28,720	13,207	3,834	1,004	147	3,066	
1988	43,000	5,165	3,415	1,979	278	1,044	
1989	156,000	4,118	3,248	2,706	481	4,761	
1990	73,000	8,081	2,116	14,650	864	2,353	
1991	78,104	6,714	2,071	2,545	549	3,174	1,380
1992	54,036	42,889	1,546	10,277	3,689	895	4
1993	57,184	34,234	2,078	13,375	495	2,138	0
1994	58,708	22,421	1,771	16,959	301	3,168	0
1995	64,925	16,534	1,119	14,734	220	2,338	6
1996	28,933	31,389	720	20,443	278	1,677	654
1997	26,872	25,166	779	15,687	307	1,077	234
1998	23,821	34,964	595	13,729	385	821	5
1999	965	27,714	565	17,619	630	422	13
2000/c	1,244	39,684	1,048	14,893	601	1,086	13
2001/d	819	33,634	1,033	15,540	605	1,086	15

Table 4.1.b. Continued.

Year	Sole	Rock	Other Flat Fish	Arrow Tooth Flounder	Atka Mackerel	Squid	Other Species	Total (All Species)
1962								200
1963				a				21,471
1964				a			66	92,652
1965				a			768	111,868
1966				a			131	87,589
1967				a			8,542	66,781
1968				a			8,948	56,023
1969				a			3,088	44,009
1970				274	949		10,671	80,610
1971				581			2,973	32,118
1972				1,323	5,907		22,447	79,717
1973				3,705	1,712		4,244	34,006
1974				3,195	1,377		9,724	49,340
1975				784	13,326		8,288	46,553
1976				1,370	13,126		7,053	43,465
1977				2,035	20,975	1,808	16,170	67,348
1978				1,782	23,418	2,085	12,436	61,092
1979				6,436	21,279	2,252	12,934	75,195
1980				4,603	15,533	2,332	13,028	108,531
1981				3,640	16,661	1,763	7,274	104,199
1982				2,415	19,546	1,201	5,167	98,233
1983				3,753	11,585	510	3,675	94,617
1984				1,472	35,998	343	1,670	147,022
1985				87	37,856	9	2,050	113,310
1986				142	31,978	20	1,509	96,259
1987				159	30,049	23	1,155	81,364
1988				406	21,656	3	437	77,383
1989				198	14,868	6	108	186,494
1990				1,459	21,725	11	627	124,886
1991	n/a		88	938	22,258	30	91	117,942
1992	236		68	900	46,831	61	3,081	164,513
1993	318	59		1,348	65,805	85	2,540	179,659
1994	308		55	1,334	69,401	86	1,102	175,614
1995	356		47	1,001	81,214	95	1,273	183,862
1996	371		61	1,330	103,087	87	1,720	190,750
1997	271		39	1,071	65,668	323	1,555	139,049
1998	446		54	694	56,195	25	2,448	134,182
1999	577		53	746	51,636	9	1,633	102,582
2000	480		113	1,157	46,990	8	3,010	110,327
2001	526		96	1,220	61,234	5	3,851	119,664

a/ Arrowtooth flounder included in Greenland turbot catch statistics.

b/ Includes POP shortraker, rougheye, northern and sharpchin rockfish.

c/ Data through December 31, 2000.

d/ Data through October 27, 2001. Does not include CDQ.

Note: Numbers don't include fish taken for research.

4.3 Socioeconomic Characteristics of the Fishery

Subsistence Fishery

The earliest fisheries for groundfish in the eastern Bering Sea and Aleutian Islands were the native subsistence fisheries. The fish and other marine resources remain an important part of the life of native people, and dependence on demersal species of fish may have been critical to their survival in periods of the year when other sources of food were scarce or lacking. Fishing was in near-shore waters utilizing such species as cod, halibut, rockfish, and other species. These small-scale subsistence fisheries have continued to the present time. Although not well estimated, the total catch of groundfish in subsistence fisheries is thought to be minuscule relative to commercial fishery catches.

Recreational Fishery

At this time, there are no essentially recreational fisheries for groundfish species covered under this FMP. Recreational catches of groundfish in the BSAI region would take place in state waters and likely fall under the classification of subsistence fisheries.

Charter Fishery

A limited charter vessel fishery for Pacific halibut is based in Dutch Harbor. Three charter vessels participated in 1999.

Commercial Fishery

The first commercial venture for bottomfish occurred in 1864 when a single schooner fished for Pacific cod in the Bering Sea. This domestic fishery continued until 1950 when demand for cod declined and economic conditions caused the fishery to be discontinued. Fishing areas in the eastern Bering Sea were from north of Unimak Island and the Alaska Peninsula to Bristol Bay. Vessels operated from home ports in Washington and California and from shore stations in the eastern Aleutian Islands. The cod fishery reached its peak during World War I when the demand for cod was high. Numbers of schooners operating in the fishery ranged from 1-16 up to 1914 and increased to 13-24 in the period 1915-20. Estimated catches during the peak of the fishery ranged annually from 12,000-14,000 mt.

Another early fishery targeted Pacific halibut. Halibut were reported as being present in the Bering Sea by United States cod vessels as early as the 1800s. However, halibut from the Bering Sea did not reach North American markets until 1928. Small and infrequent landings of halibut were made by United States and Canadian vessels between 1928 and 1950, but catches were not landed every year until 1952. The catch by North American setline vessels increased sharply between 1958 and 1963 and then declined steadily until 1972.

Several foreign countries conducted large scale groundfish fisheries in the eastern Bering Sea and Aleutian Islands prior to 1991. Vessels from Japan, USSR (Russia), Canada, Korea, Taiwan, and

Poland all plied the waters of the North Pacific for groundfish. In the mid 1950's, vessels from Japan and Russia targeted yellowfin sole, and catches peaked at over 550,000 mt in 1961. In the 1960's, Japanese vessels, and to a lesser extent Russian vessels, developed a fishery for Pacific ocean perch, pollock, Greenland turbot, sablefish, and other groundfish. By the early 1970's over 1.7 million mt of pollock was being caught by these two countries in the eastern Bering Sea annually. Korean vessels began to target pollock in 1968. Polish vessels fished briefly in the Bering Sea in 1973. Tiawanese vessels entered the fishery in 1977. For more information on foreign fisheries in the BSAI, refer to NPFMC (1995), Megrey and Wespestad (1990), and Fredin (1987).

The foreign fleets were phased out in the 1980's. The transition period from foreign to fully domestic groundfish fisheries was stimulated by a quick increase in joint-venture operations. The American Fisheries Promotion Act (the so-called "fish and chips" policy) required that allocations of fish quotas to foreign nations be based on the nations contributions to the development of the U.S. fishing industry. This provided incentive for development of joint-venture operations, with U.S. catcher vessels delivering their catches directly to foreign processing vessels. Joint-venture operations peaked in 1987, giving way to a rapidly developing domestic fleet. By 1991, the entire BSAI groundfish harvest (2,126,600 mt, worth $351 million ex-vessel) was taken by only 391 U.S. vessels.

The commercial groundfish catch off Alaska totaled 1.9 million t in 1998, compared to 2.1 million t in 1997 Based on a preliminary estimate for 1998 that may not be consistent with the estimates for previous years, the ex-vessel value of the catch, excluding the value added by at-sea processing, decreased from $583 million in 1997 to $385 million in 1998. The value of the 1998 catch after primary processing was approximately $1 billion. The groundfish fisheries accounted for the largest share of the ex-vessel value of all commercial fisheries off Alaska in 1998 (40 percent), and approximately 80 percent of this total came from the BSAI management area. The Pacific salmon (*Oncorhynchus* spp.) fishery was second with $243 million or 26 percent of the total Alaska ex-vessel value. The value of the shellfish catch amounted to $219 million or 23 percent of the total for Alaska.

Walleye (Alaska) pollock (*Theragra chalcogramma*) has been the dominant species in the commercial groundfish catch off Alaska. The 1998 pollock catch of 1.25 million t accounted for 67 percent of the total groundfish catch of 1.87 million t. The next major species, Pacific cod (*Gadus macrocephalus*), accounted for 257,900 t or almost 14 percent of the total 1998 groundfish catch. The Pacific cod catch was down about 21 percent from a year earlier. The 1998 catch of flatfish, which includes yellowfin sole (*Pleuronectes asper*), rock sole (*Pleuronectes bilineatus*), and arrowtooth flounder (*Atheresthes stomias*) was 223,100 t in 1998, down almost 35 percent from 1997. Pollock, Pacific cod, and flatfish comprised almost 93 percent of the total 1998 catch. Other important species are sablefish (*Anoplopoma fimbria*), rockfish (*Sebastes and Sebastolobus* spp.), and Atka mackerel (*Pleurogrammus monopterygius*).

Trawl, hook and line (including longline and jigs), and pot gear account for virtually all the catch in the BSAI groundfish fisheries. There are catcher vessels and catcher processor vessels for each of these three gear groups. From 1993-1998, the trawl catch averaged about 91 percent of the total catch, while the catch with hook and line gear accounted for 7.5 percent. Most species are harvested predominately by one type of gear, which typically accounts for 90 percent or more of the catch. The one exception is Pacific cod, where in 1998, 48 percent (123,000 t) was taken by trawls, 43 percent (110,000 t) by hook and line gear, and 9 percent (24,000 t) by pots. During the same period, catcher vessels took 41 percent of the catch and catcher processor vessels took the other 59 percent.

The discards of groundfish in the groundfish fishery have received increased attention in recent years by NMFS, the Council, Congress, and the public at large. The discard rate is the percent of total catch that is discarded. For the BSAI and GOA fisheries as a whole, the annual discard rate for groundfish decreased from 15.1 percent in 1994 to 8.2 percent in 1998 with the vast majority of the reduction occurring in 1998. The 43 percent reduction in the overall discard rate in 1998 is the result of prohibiting pollock and Pacific cod discards in all BSAI and GOA groundfish fisheries beginning in 1998. Total discards decreased by almost 49 percent in 1998 with the aid of a 9.5 percent reduction in total catch. Estimates of total catch, discarded catch, and discard rates by species, area, gear, and target fishery are provided in the annual Economic SAFE document.

The bycatch of Pacific halibut, crab, Pacific salmon, and Pacific herring (*Clupea pallasi*) has been an important management issues for more than twenty years. The retention of these species was prohibited first in the foreign groundfish fisheries. This was done to ensure that groundfish fishermen had no incentive to target these species. For a review of the history of prohibited species bycatch management, refer to Witherell and Pautzke (1997).

Residents of Alaska and of other states, particularly Washington and Oregon, are active participants in the BSAI groundfish fisheries. For the domestic groundfish fishery as a whole, 92 percent of the 1998 catch was made by vessels with owners who indicated that they were not residents of Alaska.

Estimates of ex-vessel value by area, gear, type of vessel, and species are included in the annual Economic SAFE document. The ex-vessel value of the domestic landings in the combined GOA and BSAI groundfish fisheries, excluding the value added by at-sea processing, increased from \$425 million in 1993 to \$585 million in 1995, decreased in 1996 to \$531 million, and increased to \$570 in 1997. The distribution of ex-vessel value by type of vessel differed by area, gear and species. In 1997, catcher vessels accounted for 44 percent of the ex-vessel value of the groundfish landings compared to 42 percent of the total catch because catcher vessels take larger percentages of higher priced species such as sablefish which was \$2.25 per pound in 1997. Similarly, trawl gear accounted for only 67 percent of the total ex-vessel value compared to 90 percent of the catch because much of the trawl catch is of low priced species such as pollock which was about \$0.10 per pound in 1997.

For the BSAI and GOA combined, 82.5 percent of the 1997 ex-vessel value was accounted for by vessels with owners who indicated that they were not residents of Alaska. Vessels with owners who indicated that they were residents of Alaska accounted for 15.5 percent of the total and the remaining 2.0 percent was taken by vessels for which the residence of the owner was not known. The vessels owned by residents of Alaska accounted for a much larger share of the ex-vessel value than of catch (15.5% compared to 8.5%) because these vessels accounted for relatively large shares of the higher priced species such as sablefish.

Employment data for at-sea processors (but not including inshore processors) indicate that in 1998, the crew weeks totaled 106,365 with the majority of them (101,064) occurring in the BSAI groundfish fishery. In 1998, the maximum monthly employment (18,864) occurred in October. Much of this was accounted for by the BSAI pollock fishery.

There are a variety of at least partially external factors that affect the economic performance of the BSAI and GOA groundfish fisheries. They include landing market prices in Japan, wholesale prices in Japan, U.S. imports of groundfish products, U.S. per capita consumption of seafood, U.S. consumer and producer price indexes, foreign exchange rates, and U.S. cold storage holdings of groundfish. Exchange rates and world supplies of fishery products play a major role in international trade. Exchange rates change rapidly and can significantly affect the economic status of the groundfish fisheries.

4.4 Description of Fishing Communities

Traditionally, the dependence of BSAI and GOA coastal communities on the groundfish fisheries and fisheries affected by the groundfish fisheries has resulted from these communities being one or more of the following: 1) the home ports of vessels that participate in these fisheries; 2) the residence of participants in the harvesting or processing sectors of these fisheries; 3) the port of landings for these fisheries; 4) the location of processing plants; and 5) a service or transportation center for the fisheries. With the creation of the pollock, sablefish and halibut community development quota (CDQ) programs for the BSAI in the early to mid-1990s and with the expansion of those programs into the multispecies CDQ program with the addition of all BSAI groundfish and crab by the late 1990s, the dependence now includes the participation of coastal, Western Alaska, Native communities in the CDQ program. The CDQ program has provided the following for the CDQ communities: 1) additional employment in the harvesting and processing sectors of these fisheries; 2) training; and 3) royalty income when the CDQs are used by a fishing company. In many cases, those royalties have been used to increase the ability of the residents of the CDQ communities to participate in the regional commercial fisheries.

Almost 100 Alaskan communities are listed as home ports. For the vast majority of the Alaska home ports, trawl vessels account for none or a very small part of the vessels and the mean length is less than 50 feet. Many of the Alaska home ports had fewer than 5 vessels. The Alaska home ports with typically more than 50 fishing vessels are as follows: Homer (100+), Juneau (200+), Kodiak (100+), Petersburg (50+), and Sitka (100+). For these five home ports, all but Kodiak had non-trawl vessels account for at least 90 percent of the vessels, and in Petersburg and Sitka almost 100 percent were non-trawl vessels. In 1997, the mean vessel lengths were as follow: Homer, 52 feet; Juneau, 54 feet; Kodiak, 61 feet; Petersburg, 52 feet; and Sitka, 44 feet. Sand Point, which typically had more than 30 vessels and a mean vessel length of 47 feet in 1997, was unique among Alaska home ports in that typically trawl vessels accounted for more than 50 percent of its vessels.

From 1991 to 1997, the number of fishing vessels in the BSAI and GOA groundfish fisheries owned by Alaska residents decreased from 1,511 to 916, with most of the decrease occurring in 1992, and the mean length increased from 45 feet to 49 feet. Trawl vessels accounted for fewer than 10 percent of the total in any year and for fewer than 2 percent of the overall decrease in the number of vessels between 1991 and 1997.

The vast majority of the groundfish fishing vessels owned by Alaska residents use hook-and-line gear and operate only in the GOA. For example, of the 894 Alaskan owned fishing vessels that participated in the BSAI and GOA groundfish fisheries in 1996, 852 fished in the GOA compared to only 115 in the BSAI and 752 used hook-and-line gear compared to either 140 for pot gear or 75 for trawl gear. This is explained by the following: 1) the small size of most of the Alaska vessels; 2) the ability of small vessels to use hook-and-line gear effectively and safely, particularly in the GOA; and 3) the greater proximity of GOA fishing grounds to the home ports and owners' residences for the vast majority of the Alaska vessels.

With respect to groundfish fisheries, the hook-and-line vessels owned by Alaska residents have been involved almost exclusively in the sablefish, Pacific cod, and rockfish fisheries. Trawlers owned by Alaska residents principally have been involved in the pollock, Pacific cod and flatfish fisheries. In 1996, 20 of the 75 Alaska owned trawlers participated in the BSAI groundfish fishery compared to 69 of the 752 Alaskan hook-and-line vessels, and 40 of the 140 Alaskan pot boats.

Vessels of residents of Alaska account for a larger percent of the ex-vessel value of the catch than of the weight of the catch. For example, in 1996, these vessels accounted for only 7.9 percent of the BSAI and GOA groundfish catch, but 14.5 percent of its ex-vessel value. This occurs because a larger percent of the catch of these vessels consists of higher priced groundfish species that are taken with hook-and-line gear. These species include sablefish, some of the higher priced rockfish, and Pacific cod .

When the fishing ports are ranked, from highest to lowest, on the basis of their 1997 groundfish landings and value, the first five ports account for in excess of 95 percent of the total Alaska groundfish landings. These are, in rank order:

Port & Ranking	Metric Tons*	Value	Number of Processors
1. Dutch Harbor/Unalaska	224,000	$59,774,500	6
2. Akutan	<120,000	NA	1
3. Kodiak	84,000	$33,488,800	9
4. Sand Point	<45,000	NA	1
5. King Cove	<25,000	NA	1

* estimated total groundfish landings

NA - data cannot be reported due to “confidentiality” constraints

For reference, in 1997, the sixth ranked Alaska groundfish landings port was Seward, Alaska. The total quantity of groundfish landed in Seward was approximately one-third that of King Cove, by far the smallest of the top five Alaska groundfish landings ports, and was dominated by sablefish, the only BSAI and GOA groundfish species managed under an ITQ program. Furthermore, much of the Seward groundfish catch comes from State waters (e.g., Prince William Sound). After Seward, the quantities of groundfish landings drop off even more sharply for the remaining ports. For these reasons, a natural break occurs between the top five ports and the remaining ports. Therefore, the balance of this section will focus on the five primary groundfish ports, listed above.

Dutch Harbor/Unalaska and Akutan are located on the Bering Sea side of the Alaska Peninsula/Aleutian Island chain, while Sand Point and King Cove are on the Gulf of Alaska side and Kodiak Island, where the port and City of Kodiak are located, is in the Gulf. Nonetheless, a substantial portion of the groundfish processed in Sand Point and King Cove is harvested in the Bering Sea, as is a somewhat lesser share of that landed in Kodiak. Historically, relatively small amounts of groundfish harvested in the GOA have been delivered for processing in Dutch Harbor/Unalaska and Akutan.

At present, pollock and Pacific cod are the primary groundfish species landed and/or processed in these five ports. Alaska Department of Fish and Game fish ticket data indicate that in Dutch Harbor/Unalaska and Akutan, pollock represented 83 percent and 76 percent, respectively, of the 1997 total groundfish landings in these ports, with Pacific cod making up virtually all of the balance. In the case of Sand Point, pollock and Pacific cod, respectively, accounted for 69 percent and 29 percent of the total, with fractional percentages of other groundfish species accounting for the rest. In King Cove, this relationship was reversed, with pollock catch-share at 31 percent and Pacific cod at 69 percent of the groundfish total. Kodiak presented the most diversified species complex, with pollock representing 43 percent, Pacific cod 36 percent, assorted flatfishes at 14 percent, and a mix of other groundfish species making up the balance of the total.

<u>Dutch Harbor/Unalaska</u>

Dutch Harbor/Unalaska is located approximately 800 miles southwest of Anchorage and 1,700 miles northwest of Seattle. Unalaska is the 11th largest city in Alaska, with a reported year-round population of just over 4,000. The name Dutch Harbor is often applied to the portion of the City of Unalaska located on Amaknak Island, which is connected to Unalaska Island by a bridge. Dutch Harbor is fully contained within the boundaries of the City of Unalaska, which encompasses 115.8 square miles of land and 98.6 square miles of water (Alaska Department of Community and Regional Affairs 1998).

Unalaska is primarily non-Native, although the community is culturally diverse. Subsistence activities remain important to the Aleut community and many long-time non-Native residents, as well. Salmon, Pacific cod, Dolly Varden, Pacific halibut, sea bass, pollock and flounders are the most important marine species, according to Alaska Department of Fish and Game reports. Sea urchins, razor and butter clams, cockles, mussels, limpets, chiton, crabs, and shrimps make up the shellfish and invertebrates most commonly harvested by subsistence users. Marine mammals traditionally harvested include sea lions, harbor and fur seals, and porpoises. Local residents also harvested reindeer, ducks, geese, sea gull eggs and other bird eggs in great numbers in previous years (NPFMC 1994a).

According to the 1990 U.S. Census, 682 total housing units existed and 107 were vacant. More than 2,500 jobs were estimated to be in the community. The official unemployment rate at that time was 1.0 percent, with 7.8 percent of the adult population not in the work force. The median household income was reportedly $56,215, and 15.3 percent of residents were living below the poverty level.

The majority of homes in the community are served by the City's piped water and sewer system. Sewage receives primary treatment before being discharged into Unalaska Bay. Approximately 90 percent of households are plumbed. Two schools are located in the community, serving 415 students.

Dutch Harbor/Unalaska has been called the most prosperous stretch of coastline in Alaska. With 27 miles of ports and harbors, several hundred local businesses, most servicing, supporting, or relying on the seafood industry, this city is the center of the Bering Sea fisheries.

Dutch Harbor is not only the top ranked fishing port in terms of landings in Alaska, but has held that distinction for the Nation, as a whole, each year since 1989. In addition, it ranked at or near the top in terms of the ex-vessel value of landings over the same period.

Virtually the entire local economic base in Dutch/Unalaska is fishery-related, including fishing, processing, and fishery support functions (e.g., fuel, supply, repairs and maintenance, transshipment, cold storage, etc.). Indeed, Dutch Harbor/Unalaska is unique among Alaska coastal communities in the degree to which it provides basic support services for a wide range of Bering Sea fisheries (Impact Assessment Incorporated 1998). It has been reported that over 90 percent of the population of this community considers itself directly dependent upon the fishing industry, in one form or another (NPFMC 1994a).

Historically, Dutch Harbor/Unalaska was principally dependent upon non-groundfish (primarily king and Tanner crab) landings and processing for the bulk of its economic activity. These non-groundfish species continue to be important components of a diverse processing complex in Dutch Harbor/Unalaska. In 1997, for example, nearly 2 million pounds of salmon, more than 1.7 million pounds of herring, and 34 million pounds of crabs were reportedly processed in this port.

Nonetheless, since the mid-1980s, groundfish has accounted for the vast majority of total landings in Dutch Harbor/Unalaska. Again, utilizing 1997 catch data, over 93.5 percent of total pounds landed and processed in this port were groundfish.

While well over 90 percent of this total tonnage was groundfish, a significantly smaller percentage of the attributable ex-vessel value of the catch is comprised of groundfish. While equivalent processed product values for non-groundfish production are not readily available, Alaska fish ticket data indicate that the ex-vessel value of these species landed in Dutch Harbor/Unalaska was nearly $43 million, in 1997; or about 60 percent of the reported gross product value of the groundfish output. If the value added through processing of these non-groundfish species were fully accounted for, the total would obviously exceed the ex-vessel value of the raw catch.

As suggested, transshipping is an integral component of the local service-based economy of this community, as well. The port serves as a hub for movement of cargo throughout the Pacific Rim. Indeed, the Great Circle shipping route from major U.S. west coast ports to the Pacific Rim passes within 50 miles of Unalaska. The Port of Dutch Harbor is among the busiest ports on the west coast. The port reportedly serves more than 50 domestic and foreign transport ships per month. Seafood products, with an estimated first wholesale value substantially in excess of a billion dollars, cross the port's docks each year and are carried to markets throughout the world.

The facilities and related infrastructure in Dutch Harbor/Unalaska support fishing operations in both the BSAI and GOA management areas. Processors in this port receive and process fish caught in both areas, and the wider community is linked to, and substantially dependent upon serving both the on-shore and at-sea sectors of the groundfish industry.

In a profile of regional fishing communities, published by the NPFMC in 1994, the local economy of Unalaska was characterized in the following way:

> If it weren't for the seafood industry, Unalaska would not be what it is today ... In 1991, local processors handled 600 million lbs. of seafood onshore, and 3 billion lbs. of seafood were processed offshore aboard floating processors that use Dutch Harbor as a land base. Seven shore-based and many floating processors operate within municipal boundaries.

While these figures presumably include both groundfish and non-groundfish species, and current sources identify at least eight shore-based processing facilities, they are indicative of the scope of this community's involvement in, and dependence upon, seafood harvesting and processing.

Because of this high level of economic integration between Dutch Harbor/Unalaska and the fishing industry, any action which significantly reduced the total allowable catch of groundfish from the Bering Sea/Aleutian Islands (and to a lesser extent Gulf of Alaska) management areas would be expected to have a severely negative impact on the port and surrounding community.

While the port continues to be actively involved in support operations for crab, salmon, and herring fisheries, these resources do not hold the potential to offset economic impacts which would be associated with a significant reduction in (especially pollock and Pacific cod) groundfish TACs. Indeed, the newest and largest of the processing facilities in Dutch Harbor/Unalaska are dedicated to pollock surimi production, and could not readily shift production to an alternative species or product form, even if such an opportunity were to exist.

Detailed data on costs, net earnings, capital investment and debt service for the harvesting, processing, and fisheries support sectors in Dutch Harbor/Unalaska are not available. Therefore, it is not possible to quantify the probable net economic impacts on this community attributable to a significant reduction in groundfish TACs for the Bering Sea and Aleutian Islands or Gulf of Alaska management areas. It is apparent, however, that no alternative fisheries exist into which the port might diversify, in order to offset such a reduction in groundfish activity (crab resources remain biologically depressed and those fisheries are fully subscribed. The herring and salmon fisheries are managed by the State of Alaska with limited entry programs. Neither are there prospects (at least in the foreseeable future) for non-fishery related economic activity in Dutch Harbor/Unalaska that could substantially mitigate impacts from a significant reduction in groundfish fishing activity.

While Dutch Harbor has been characterized as one of the world's best natural harbors, it offers few alternative opportunities for economic activity beyond fisheries and fisheries support. Its remote location, limited and specialized infrastructure and transportation facilities, and high cost make attracting non-fishery related industrial and/or commercial investment doubtful (at least in the short-run). Sea floor minerals exploration, including oil drilling, in the region have been discussed. No such development seems likely in the short run, however. Unalaska, also, reportedly expected nearly 6,000 cruise ship visitors in 1996.

Without the present level of fishing and processing activities, it is probable that many of the current private sector jobs in this groundfish landings port could be lost, or at the very least, would revert to highly seasonal patterns, with the accompanying implications for community stability observed historically in this and other Alaska seafood processing locations dependent upon transient, seasonal work forces. It is likely, for example, that the number of permanent, year-round residents of Dutch Harbor/Unalaska would decline significantly. This would, in turn, alter the composition and character of the community and place new, and different, demands on local government.

The municipal government of the City of Unalaska is substantially dependent upon the tax revenues which are generated from fishing and support activities. While a detailed treatment of municipal tax accounts is beyond the scope of this assessment, it is clear that, between the State of Alaska’s Fisheries Business Tax and Fishery Resource Landings Tax revenues (both of which are shared on a 50/50 basis with the community of origin), local raw fish sales tax, real property tax (on fishery related property), and permits and fees revenues associated with fishing enterprises, the City of Unalaska derives a substantial portion of its operating, maintenance, and capital improvement budget from fishing, and especially groundfish fishing, related business activities. Should the groundfish harvest in the BSAI management area be substantially reduced, the municipality could experience a very significant reduction in its tax base and revenues (depending upon the species and size of the reduction). Potentially, the magnitude of these revenue reductions could be such that they could not readily be compensated for by the municipal government.

The local private business infrastructure which has developed to support the needs and demands of the fishery-based population of Dutch Harbor/Unalaska would very clearly suffer severe economic dislocation, should the number of employees in the local plants and fishing fleets decline in response to substantial TAC reductions. While insufficient cost and investment data exist with which to estimate the magnitude of probable net losses to these private sector businesses, it seems certain that a substantial number would fail. With no apparent economic development alternative available to replace groundfish harvesting and processing in Dutch Harbor/Unalaska (at least in the short run), there would be virtually no market value associated with these stranded assets.

Akutan

Akutan is located on Akutan Island in the eastern Aleutian Islands, one of the Krenitzin Islands of the Fox Island group. The community is approximately 35 miles east of Unalaska and 766 air miles southwest of Anchorage. Akutan is surrounded by steep, rugged mountains reaching over 2,000 feet in height. The village sits on a narrow bench of flat, treeless terrain. The small harbor is ice-free year-round, but frequent storms occur in winter and fog in summer. The community is reported to have a population of 414 persons, although the population can swell to well over 1,000 during peak fish processing months.

During the 1990 U.S. Census, 34 total housing units existed and 3 were vacant. 527 jobs were estimated to be in the community. The official unemployment rate at that time was .4 percent, with 7.4 percent of all adults not in the work force. The median household income was $27,813, and 16.6 percent of the residents were living below the poverty level. One school is in the community, serving 24 students.

Water is supplied from local streams, treated, and piped into homes. The seafood processing plant operates its own water treatment facility.

Akutan ranks as the second most significant landings port for groundfish on the basis of tons delivered and has been characterized as a unique community in terms of its relationship to these BSAI fisheries. According to a recent social impact assessment, prepared for the NPFMC, while Akutan is the site of one of the largest of the shoreside groundfish processing plants in the region, the community is geographically and socially separate from the plant facility.

Indeed, while the village of Akutan was initially judged to be ineligible to participate in the State of Alaska's CDQ program, based largely upon its being associated with "... a previously developed harvesting and processing capability sufficient to support substantial groundfish participation in the BSAI ...", it was subsequently determined that the community of Akutan was discrete and distinct from the Akutan groundfish processing complex.

As a result, Akutan has a very different relationship to the region's groundfish fisheries than does, for example, Dutch Harbor/Unalaska or Kodiak. While the community of Akutan derives economic benefits from its proximity to the large Trident Seafoods shore plant (and a smaller permanently moored processing vessel, operated by Deep Sea Fisheries, which does only crab), the entities have not been integrated in the way other landings ports and communities on the list have.

As a CDQ community, the community of Akutan enjoys access to the BSAI groundfish resource independently of direct participation in the fishery. The CDQ communities as a group will receive CDQs equal to 7.5 percent of each BSAI groundfish TAC, except for the fixed gear sablefish TACs. The CDQ communities will receive 20 percent of the fixed gear sablefish TACs for the eastern Bering Sea and the Aleutian Islands areas. Therefore, the CDQs available to the CDQ group to which Akutan is a member will change as the BSAI TACs change. As TACs decrease, the value per unit of CDQ would be expected to increase and at least partially offset the effect of the decrease in quantity. However, it is not known whether the total value of the

CDQs would increase or decrease if TACs and, therefore, CDQs decrease. Similarly, the economic benefits the community derives from the local 1 percent raw fish tax from landings at the nearby plant are dependent on BSAI groundfish TACs and the resulting ex-vessel value of groundfish landings. As with the value of CDQs, typically decreases in TACs and landings would be expected to be at least partially offset by increases in ex-vessel prices.

Although this conclusion pertains to the community of Akutan, implications for the groundfish landings port of Akutan are quite different. The Trident plant is the principal facility in the Akutan port and, historically, a number of smaller, mobile processing vessels have operated seasonally out of the port of Akutan. Therefore, a substantial decrease in groundfish landings in this region, in response to decreases in TACs being assessed in this document, could have profoundly negative implications. Akutan does not have a boat harbor or an airport in the community. Beyond the limited services provided by the plant, no an opportunity exists in Akutan to provide a support base for other major commercial fisheries. Indeed, alternative economic opportunities of any kind are extremely limited.

While crab processing was a major source of income for the Akutan plant during the boom years of the late 1970s and early 1980s, with the economic collapse of this resource base in the early 1980s, groundfish processing became the primary source of economic activity. In 1997, for example, State of Alaska and NMFS catch records indicate that, while landings of herring and crabs were reported for the Akutan plant, more than 98 percent of the total pounds landed were groundfish, and these made up more than 80 percent of the estimated total value.

An obvious alternative to groundfish processing which could be developed to offset a significant reduction in groundfish landings in Akutan does not appear. Fisheries for crabs, halibut, salmon, and herring, while important sources of income to the region, are fully developed. Therefore, should the groundfish TAC be significantly reduced, most of the jobs held by employees of the plant would likely disappear (or at a minimum, become seasonal) and people would leave the area (although the exact number is unknown).

No data on cost, net revenues, capital investment and debt structure are available with respect to Trident Seafood's Akutan plant complex. It is not possible, therefore, to quantify probable attributable net impacts to plant owners/operators of a potential reductions in groundfish catches, although as noted above, the Akutan facility is almost completely dependent upon pollock and Pacific cod deliveries. Should TACs for these two species decline significantly, the impacts would be greater than if TACs for other groundfish species were reduced. While some adjustment to alternative groundfish species might be possible, in response to a sharp decline in pollock and/or Pacific cod TACs, the fact that the plant has not become more involved with other groundfish species during the times of the year in which pollock and Pacific cod are not available suggests that the economic viability of such alternatives is limited and certainly inferior for the plant.

While the distribution of impacts across ports would not be expected to be uniform, should, in particular, pollock and/or Pacific cod TACs be reduced, it is likely that there could be substantial stranded capital costs and job losses in the port of Akutan. The size and rate of such losses is largely an empirical question.

Whereas the 1990 U.S. Census reported the population of Akutan at just under 600 (and the Alaska Department of Community and Regional Affairs CIS data places the figure at 414, in 1997), the local resident population is estimated at 80, with the remaining individuals being regarded as non-resident employees of the plant.

The permanent residents of the village are, reportedly, almost all Aleut. While some are directly involved in the cash economy (e.g., a small boat near-shore commercial fishery), many depend upon subsistence activities or other non-cash economic activities to support themselves and their families. The species important for subsistence users reportedly include: salmon, halibut, Pacific cod, pollock, flounders, Dolly Varden, greenling, sea lions, harbor and fur seals, reindeer, ducks and geese and their eggs, as well as intertidal creatures (e.g., clams, crabs, mussels). Berries and grasses are also collected as part of the subsistence harvest (NPFMC 1994a). These activities would be expected to be largely unaffected by any action to reduce the BSAI groundfish TAC.

Kodiak

The groundfish landings port of Kodiak is located near the eastern tip of Kodiak Island, southeast of the Alaska Peninsula, in the Gulf of Alaska. The City of Kodiak is the sixth largest city in Alaska, with a population of 6,869 (Alaska Department of Community and Regional Affairs 1998). The City of Kodiak is 252 air miles south of Anchorage. The port and community are highly integrated, both geographically and structurally. The port and community are the de facto center of fishing activity for the western and central Gulf of Alaska.

Kodiak is primarily non-Native, and the majority of the Native population are Sugpiaq Eskimos and Aleuts. Filipinos are a large subculture in Kodiak due to their work in the canneries. During the 1990 U.S. Census, 2,177 total housing units existed and 126 were vacant. An estimated 3,644 jobs were in the community. The official unemployment rate at that time was 4.4 percent, with 23 percent of the adult population not in the work force. The median household income was $46,050, and 6.2 percent of residents were living below the poverty level. Pillar Creek Reservoir and Monashka Reservoir provide water to the community, which is piped throughout the area. Piped sewage is processed in a secondary treatment plant. All homes are fully plumbed. Eight schools are located in the community, serving 2,252 students.

Kodiak supports at least nine processing operations which receive groundfish harvested from the GOA and, to a lesser extent, the BSAI management areas, and four more which process exclusively non-groundfish species. The port also supports several hundred commercial fishing vessels, ranging in size from small skiffs to large catcher/processors.

According to data supplied by the City:

> The Port of Kodiak is home port to 770 commercial fishing vessels. Not only is Kodiak the state’s largest fishing port, it is also home to some of Alaska’s largest trawl, longline, and crab vessels.

Unlike Akutan, or even Dutch Harbor/Unalaska, Kodiak has a more generally diversified seafood processing sector. The port historically was very active in the crab fisheries and, although these fisheries have declined from their peak in the late 1970s and early 1980s, Kodiak continues to support shellfish fisheries, as well as significant harvesting and processing operations for Pacific halibut, herring, groundfish, and salmon.

Kodiak processors, like the other onshore operations profiled in this section, are highly dependent on pollock and Pacific cod landings, with these species accounting for 43 percent and 36 percent of total groundfish deliveries, by weight, respectively. The port does, however, participate in a broader range of groundfish fisheries than any of the other ports cited. Most of this activity centers on the numerous flatfish species which are present in the GOA, but also includes relatively significant rockfish and sablefish fisheries.

In fact, Kodiak often ranks near the top of the list of U.S. fishing ports, on the basis of landed value, and is frequently regarded as being involved in a wider variety of North Pacific fisheries than any other community on the North Pacific coast.

In 1997, for example, the port recorded salmon landings of just under 44 million pounds, with an estimated ex-vessel value of over $12 million. Approximately 4.3 million pounds of Pacific herring were landed in Kodiak with an ex-vessel value of more than $717 thousand. Crab landings exceeded 1.1 million pounds and were valued at ex-vessel at more than $2.7 million.

While comparable product value estimates are not currently available for groundfish and non-groundfish production (i.e., first wholesale value), it may be revealing to note that groundfish landings accounted for 79 percent of the total tons of fish and shellfish landed in this port, in 1997.

In addition to seafood harvesting and processing, the Kodiak economy includes sectors such as transportation (being regarded as the transportation hub for southwest Alaska), federal/state/local government, tourism, and timber. The forest products industry, based upon Sitka spruce, is an important and growing segment of the Kodiak economy.

The community is, also, home to the largest U.S. Coast Guard base in the Nation. Located a few miles outside of the city center-proper, it contributes significantly to the local economic base. The University of Alaska, in conjunction with the National Marine Fisheries Service, operates a state-of-the-art fishery utilization laboratory and fishery industrial technology center in Kodiak, as well.

While Kodiak appears to be a much more mature and diversified economy that those of any other of the five primary groundfish landings ports in Alaska, it is likely that a substantial reduction in groundfish TAC in the Gulf, Aleutian Islands, and/or Bering Sea management area(s) could impose significant adverse economic impacts on Kodiak.

The absence of detailed cost, net revenue, capital investment and debt structure data for the Kodiak groundfish fishing and processing sectors precludes a quantitative analysis of the probable net economic impacts of such a TAC change. Nonetheless, one may draw insights from history, as when in the early-1980s king crab landings declined precipitously and Kodiak suffered a severe community-wide economic decline. It was largely the development of the groundfish fisheries which reinvigorated the local economy.

Unfortunately, an alternative fishery resource available to Kodiak fishermen and processors which could ameliorate significant reductions in groundfish landing does not appear. Neither do non-fishery based opportunities appear, at least in the short run, which could be developed to reduce the adverse economic impacts of such a change in groundfish harvesting and processing.

Sand Point and King Cove

These are two independent and geographically separate groundfish 'landings ports' (lying approximately 160 miles from one another), but because each has only a single processor and each community is small and remote, they are described jointly in this section.

Alaska CIS data place Sand Point's 1998 population at 808, while King Cove's population is listed as 897. Sand Point is located on Humboldt Harbor, Popof Island, 570 air miles from Anchorage. Sand Point is described by the Alaska Department of Community and Regional Affairs as "a mixed Native and non-Native community," with a large transient population of fish processing workers. During the April 1990 U.S. Census, 272 total housing units were in existence and 30 of these were vacant. A total of 438 jobs were estimated to be in the community. The official unemployment rate at that time was 2.9 percent, with 32.1 percent of all adults not in the work force. The median household income was $42,083, and 12.5 percent of the residents were living below the poverty level. One school is located in Sand Point, attended by 145 students.

King Cove is located on the Gulf of Alaska side of the Alaska Peninsula, 625 miles southwest of Anchorage. The community is characterized as a mixed non-Native and Aleut village. In the 1990 U.S. Census, 195 total housing units were in existence, with 51 of these vacant. The community had an estimated 276 jobs, with an official unemployment rate of 1.8 percent and 24.0 percent of all adults not in the work force. The median household income was $53,631, and 10 percent of the residents were living below the poverty level. One school is located in the community, attended by 140 students.

Sand Point and King Cove, like Akutan, are part of the Aleutians East Borough. Unlike Akutan, however, neither Sand Point nor King Cove qualify as a CDQ community. Indeed, both Sand Point and King Cove have had extensive historical linkages to commercial fishing and fish processing, and currently support resident commercial fleets delivering catch to local plants. These local catches are substantially supplemented by deliveries from large, highly mobile vessels, based outside of the two small Gulf of Alaska communities.

King Cove boasts a deep water harbor which provides moorage for approximately 90 vessels of various sizes, in an ice-free port. Sand Point, with a 25 acre/144 slip boat harbor and marine travel-lift, is home port to what some have called, "the largest fishing fleet in the Aleutian Islands" (NPFMC 1994a).

For decades, the two communities have principally concentrated on their respective area's salmon fisheries. In 1997, for example, Sand Point and King Cove recorded salmon landings of several million pounds, each. State of Alaska data confidentiality requirements preclude reporting actual quantities and value when fewer than four independent operations are included in a category. Sand Point and King Cove each have one processor reporting catch and production data. In addition, King Cove had significant deliveries of Pacific herring and crabs. Recently, each community has actively sought to diversify its fishing and processing capability, with groundfish being key to these diversification plans.

According to a recent report presented to the Council (Impact Assessment Incorporated 1998):

> In terms of employment, 87 percent of Sand Point's workforce is employed full time in the commercial fishery; for King Cove this figure is more than 80 percent (United States Army Corps of Engineers 1997, and 1998). In both cases, fishing employment is followed by local government (borough and local) and then by private businesses. Seafood processing ranks after each of these other employers, meaning that the vast majority of the workforce at the shore plants are not counted as community residents.

By any measure, these two communities are fundamentally dependent upon fishing and fish processing. In recent years, groundfish resources have supplanted salmon, herring, and crabs as the primary target species-group, becoming the basis for much of each community's economic activity and stability.

Few alternatives to commercial fishing and fish processing exist, within the cash-economy, in these communities by which to make a living. However, subsistence harvesting is an important source of food, as well as a social activity, for local residents in both Sand Point and King Cove. Salmon and caribou are reportedly among the most important subsistence species, but crabs, herring, shrimps, clams, sea urchins, halibut and cod are also harvested by subsistence users. It is reported that Native populations in these communities also harvest seals and sea lions for meat and oil (Impact Assessment Incorporated 1998).

Any action which significantly diminishes the harvest of GOA and BSAI groundfish resources (especially those of pollock and Pacific cod) would be expected to adversely impact these two communities. King Cove is somewhat unique among the five key groundfish ports insofar as it is relatively more dependent upon Pacific cod than pollock, among the groundfish species landed (69 percent and 31 percent, respectively). Sand Point follows the more typical pattern with 69 percent of its groundfish landings being composed of pollock and 29 percent of Pacific cod (in 1997).

Because neither port has significant vessel support capabilities, their links to other groundfish fisheries is less direct than, say, either Kodiak or Dutch Harbor/Unalaska. This may suggest that reductions in TACs for species other than pollock and Pacific cod would have little or no direct impact on these two ports. However, because both compete with the larger ports for deliveries of these two groundfish species, structural changes in one or more of the other principal groundfish landings ports, attributable to TAC reductions for other than pollock and Pacific cod could, indirectly, affect King Cove and Sand Point. This is, however, largely an empirical question.

No data on cost, net revenues, capital investment and debt structure are available with respect to the Sand Point or King Cove plant complexes. It is not possible, therefore, to quantify probable attributable net impacts to plant owners/operators of the potential reductions in groundfish catches and deliveries to these landings ports.

Other Alaska Groundfish Fishing Communities

As noted above, the remaining 5 percent or so of the total groundfish landings made to Alaska fishing ports is distributed over more than twenty different locations (Table 3-44). Very few common characteristics are shared by all these remaining ports. Like virtually every settlement in Alaska (with the exception of Anchorage, population 254,269, in 1998), these landings ports are all relatively small communities. Some are exceedingly small, with year-round resident populations of a few dozen to a couple hundred people (e.g., Chignik - pop. 128; Pelican - pop. 196; St. Paul - pop. 739), while others could be regarded as small to moderate-sized towns, with populations numbering in the several thousands (e.g., Ketchikan - pop. 8,729; Kenai - pop. 6,950; Petersburg - pop. 3,356).

Community Development Communities

The purpose of the CDQ program was to extend the economic opportunities of the developing fisheries in the Bering Sea and Aleutian Islands (especially pollock) to small, rural communities which had otherwise not benefitted from their proximity to these valuable living marine resources.

As initially envisioned, the proposed program would set aside 7.5 percent of the Bering Sea and Aleutian Island's annual TAC for Alaska pollock for allocation to qualifying rural Alaskan communities. The program was initially proposed to run for a period of four year, lasting from 1992 through 1995, but was subsequently extended for an additional three years, carrying it through 1998. In the intervening period, a CDQ program for BSAI halibut and sablefish was implemented in 1995, a CDQ program for BSAI crab was implemented in 1998, the multi-species groundfish CDQ program will be implemented in late 1998, and the Council recommended extending the pollock CDQ allocations by including pollock in the multi-species groundfish CDQ program.

The purpose of the CDQ program is, essentially, to redistribute a portion of the economic and social benefits deriving from the rich fishery resources of the Bering Sea and Aleutian Islands management areas to coastal communities in western Alaska which have not, to date, benefitted from their proximity to these fisheries. This is, historically, an economically depressed region of the Nation. By providing CDQ shares to qualifying communities, the expectation is that investment in capital infrastructure, community development projects, training and education of local residents, regionally based commercial fishing or related businesses can be developed and sustained.

CDQ communities are predominantly Alaska Native villages. They are remote, isolated settlements with few natural assets with which to develop and sustain a viable diversified economic base. As a result, unemployment rates are chronically high. This has led to habitual community instability.

While these communities effectively border some of the richest fishing grounds in the world, they have not been able, for the most part, to exploit their advantageous proximity. The full Americanization of these highly valued offshore fisheries has taken place relatively quickly (i.e., the last participation by foreign fishing vessels ended in the Bering Sea in 1990). But the scale of these fisheries (e.g., 2 million mt groundfish TAC), the severe physical conditions within which the fisheries are prosecuted, and the very high capital investment required to compete in the open-access management environment, all contributed to effectively precluding these villages from participating in this development. The CDQ program serves to ameliorate some of these apparent inequities by extending an opportunity to qualifying communities to directly benefit from the exploitation of these publicly owned resources.

The communities which are currently eligible to participate in the CDQ program include 56 coastal Alaska villages, with a combined population estimated at roughly 24,000. The CDQ-qualifying communities have organized themselves into six non-profit groups (with between 1 and 17 villages in each group). The CDQ-villages are geographically dispersed, extending from Atka, on the Aleutian chain, along the Bering coast, to the village of Wales, near the Arctic Circle. The following lists the current CDQ groups.

> Aleutian Pribilof Island Community Development Association (APICDA): The six communities represented by APICDA are relatively small and located adjacent to the fishing grounds. Population of the six communities is approximately 730.
>
> Bristol Bay Economic Development Corporation (BBEDC):BBEDC represents 13 villages distributed around the circumference of Bristol Bay, including Dillingham, the second-largest CDQ community with approximately 2,200 residents and the location of BBEDC's home office. Total population is approximately 3,900.
>
> Central Bering Sea Fisherman's Association (CBSFA): CBSFA is unusual among CDQ groups in that it represents a single community, St. Paul in the Pribilof Islands.
>
> Coastal Villages Region Fund (CVRF): CVRF manages the CDQ harvest for its 17 member villages. The villages are located along the coast between the southern end of Kuskokwim Bay and Scammon Bay, including Nunivak Island.
>
> Norton Sound Economic Development Corporation (NSEDC): Fifteen villages and approximately 8,700 people make up the region represented by NSEDC, which ranges from St. Michael to Diomede.

Yukon Delta Fisheries Development Association (YDFDA): YDFDA represents the four communities, Alakanuk, Emmonak, Kotlik, and Sheldon Point, containing approximately 1, 750 people.

By design, at the time of implementation, CDQ communities could have no current or historical linkage to the fisheries in question. In fact, if a rural coastal community had such a history, it was precluded from receiving a CDQ allocation. Therefore, to derive economic benefit from their respective allocations, it has been necessary (with the exception of some of the halibut CDQs) for each CDQ group to enter into a relationship with one or more of the commercial fishing companies which participate in the open-access fishery. In this way, the CDQ community brings to the relationship preferential access to the fish and the partnering firm brings the harvesting/processing capacity. The nature of these relationships differs from group to group. In every case, the CDQ community receives royalty payments on apportioned catch shares. Some of the agreements also provide for training and employment of CDQ-community members within the partners' fishing operations, as well as, other community development benefits.

Fishing Communities not Adjacent to the Management Areas

Many of the participants in the BSAI and GOA groundfish fisheries are not from the communities adjacent to the management areas. Therefore, many of the fishing communities that are substantially dependent on or substantially engaged in the harvest or processing of BSAI or GOA groundfish fishery resources are not adjacent to the management areas. This is particularly true for the BSAI fishery because the adjacent communities are small and remote. Even in the case of Unalaska and Akutan, the two BSAI communities with large groundfish processing plants, a large part of the processing plant labor force is accounted for by individuals who are neither local nor Alaska residents. In the GOA, local residents play a substantially larger role in the harvesting and processing sectors of the groundfish industry as well as in the support industries.

Vessels that participated in the BSAI and GOA groundfish fisheries had home ports in nine states other than Alaska. However, only three states had home ports for more than 2 vessels. They were: California with fewer than 20 vessels, Oregon with 42 to 75 vessels, and Washington with 310 to 423 vessels. In 1997, 25 of the 48 vessels with Oregon home ports used trawl gear and the mean vessel length of the Oregon vessels was 75 feet. In 1997, 136 of the 331 vessels with Washington home ports used trawl gear and the mean vessel length of the Washington vessels was 115 feet. In comparison, fewer than 10 percent of the vessels with Alaska home ports used trawl gear in 1997 and their mean length was 49 feet.

Almost all of the non-Alaska home ports had fewer than 10 vessels and many had only a few. Seattle, with typically about 300 vessels, was the only non-Alaska port with more than 50 vessels. Next after Seattle, was Newport with 17 vessels in 1997 and Portland with 19 vessels. For Seattle, 122 of the 282 vessels in 1997 were trawlers and the mean length of all vessels was

122 feet. The comparable numbers for Portland and Newport, respectively, are 5 of 19 and 64 feet and 16 of 17 and 91 feet.

Delete Section 5.0

Delete Section 6.0

Delete Section 7.0

Section 8 is revised as follows:

1. Sections 8.3, 8.4, 8.5, 8.6, and 8.7 and Tables 20, 21, and figures 21, 22, 23, and 24 are deleted.

2. Section 8.1 is renumbered 5.1

3. Section 8.2 is renumbered 5.2

4. Section 8.8 is renumbered 5.3.

5. Section 8.9 is renumbered 5.4.

6. Section 8.10 is renumbered 5.5.
7. Section 8.11 is renumbered 5.6.

8. Section 8.12 is renumbered 5.7.

9. Section 8.13 is renumbered 5.8.

10 Section 8.14 is renumbered 5.9.

11. Section 8.15 is renumbered 5.10.

12. Section 8.16 is renumbered 5.11.

13. Section 8.17 is renumbered 5.12.

14. In the new section 5.11, references to section 8.1 and 8.9.1 are changes to 5.1 and 5.4.1, respectively.

Renumber Section 9 to Section 6

Renumber Section 10 to section 7

The new section 7 is modified as follows:

1. In Section 7.1 the following paragraph is added to the end of the section:

The groundfish resources off Alaska have been harvested and processed entirely by U. S.-flagged vessels since 1991. Conservation and management measures contained in this FMP apply exclusively to domestic fishing activities. No portion of the annual optimal yield is allocated to foreign harvesters or foreign processors.

2. In Section 7.3, the introductory paragraphs are revised as follows:

a. Revise the first paragraph to read as follows:

The Secretary, after receiving recommendations from the Council, will determine TACs and apportionments thereof, and reserves for each target species and the "other species" category by July 1 of the new fishing year, or as soon as practicable thereafter, by means of regulations implementing the FMP.

b. In the second paragraph, the reference "13.2.B.2 on page 14-1" is revised to read "8.2.B.2".

c. Revise the third paragraph to read as follows:

Prior to making recommendations to the Secretary, the Council will make available to the public for comment as soon as practicable after its October meeting, a preliminary Stock Assessment and Fishery Evaluation (SAFE) report and preliminary specifications of ABC and TAC for each target species and the "other species" category, and apportionments thereof and reserves. At a minimum the SAFE will contain information listed in Section 7.3.1.

d. If Option 2 is adopted, revise the fourth paragraph to read as follows:

At its January meeting , the Council will review the final SAFE and comments received. The Council will then make final recommendations to the Secretary.

3. In Section 7.3.1, delete the last sentence.

4. Section 7.3.2 is revised to read as follows:

7.3.2 <u>Reserves</u>

The groundfish reserves at the beginning of each fishing year shall equal the sum of 7.5 % of each target species and the "other species" category TAC, except pollock and hook and line or pot sablefish. When the TAC is determined by the Council, 7.5 % is set aside for the CDQ program as specified under section 8.4.7.3.5.

5. Delete sections 7.3.3, 7.4, 7.5, 7.6, 7.7 and Table 22a.

Delete Section 11.

Delete Section 12

Renumber Section 13 to Section 8.

1. In the new Section 8.2(B),

a. the reference to "4.2 A in the introductory paragraph is revised to read "Section 4.0"

b. In paragraph 1., the reference 14.4.2.F is revised to 9.4.2.F.

2. In the new section 8.4.2 A, the reference to 13.2.B.1 is revised to 8.2.B.1.

3. In the new Section 8.4.2.3,

A. in paragraphs A and B(2), the reference to 13.4.2.2 and 13.4.2.2, Part D and 10.3 are revised to read 8.4.2.2 and 8.4.2.2, Part D and 7.3, respectively.

B. paragraph B(6) is deleted and paragraphs B (1), B(2), B(3), B(4), and B(5) are revised to read as follows:

B. * * *

(1) Prior to the October Council Meeting. The Plan Team will prepare for the Council a preliminary Stock Assessment and Fishery Evaluation (SAFE) report under Section 7.3 which provides the best available information on estimated prohibited species bycatch and mortality rates in the target groundfish fisheries, and estimates of seasonal and annual bycatch rates and amounts. Based on the SAFE report, the Plan Team may provide recommendations for apportionments of PSC limits to target fisheries, seasonal allocations, thereof and an economic analysis of the effects of the PSC limit apportionments or allocations.

(2) October Council Meeting. * * *

(3) Prior to the December Council Meeting. The Plan Team will prepare for the Council a final SAFE report under Section 7.3 which provides the best available information on estimated halibut bycatch rates in the target groundfish fisheries. The Plan Team may provide final recommendations for apportionments of PSC limits among target fisheries, seasonal allocations of fishery bycatch apportionments, and also an economic analysis of the effects of the PSC limit apportionments or seasonal allocations.

(4) December Council Meeting. While recommending final groundfish harvest levels, the Council reviews public comments, takes public testimony, and makes final decisions on apportionments of PSC limits among fisheries and seasons,

using the same factors (a) through (g) set forth under Section 8.4.2.3, Part B (seasonal allocations of the PSC limits). The Council also makes final decisions on the exemption of any non-trawl fishery category from halibut bycatch mortality restrictions using the same factors (1) through (8) set forth under Section 8.4.2.2, Part D.

(5) As soon as practicable after the Council's December meeting, the Secretary will publish the Council's final decisions as proposed harvest specifications in the Federal Register. Information on which the final recommendations are based will also be published in the Federal Register or otherwise made available by the Council.

C. If Option 2 is adopted, revised the "December" to " January" in paragraphs B(3), B(4), and B(5) above.

4. In the new paragraph 8.4.2.4, the reference to 13.4.2.2 is revised to 8.4.2.2.

5. In the new paragraph 8.4.3.4, the text "DAP or JVP" is deleted.

6. In the new paragraph 8.4.7.1.1, the reference to 13.4.7.1 is revised to 8.4.7.1.

7. In the new paragraph 8.4.7.1.5(5), the reference 13.4.8.4(1) is revised to 8.4.8.4(1).

8. In the new paragraph 8.4.7.1.5(5)d., the reference 13.4.7.1.1 is revised to 8.4.7.1.1.

9. In the new paragraph 8.4.7.3.5, the references to 13.4.7.3.3 and 13.4.7.3.4 are revised to 8.4.7.3.3 and 8.4.7.3.4, respectively.

10. In the new paragraph 8.4.7.3.3, the reference 13.4.7.1 is revised to 8.4.7.1.

11. In the new paragraph 8.4.8(B), the reference to 13.4.2 is revised to 8.4.2.

12. In the new paragraph 8.4.9.3,
    a. the reference to 13.4.9.2.1 is revised to 8.4.9.2.1.
    b. the reference to 11.3 in the introductory paragraph is revised to 7.3.
    c. In paragraph (a), the reference 13.4.2 is revised to 8.4.2.

13. Delete section 13.5 (Management Measures–Foreign Fisheries)

14. Renumber section 13.6 to 8.5.

15. Renumber section 13.7 to 8.6.

16. Renumber section 13.8 to 8.7.

17. Renumber section 13.9 to 8.8.

Renumber Section 14 to 9

In the second introductory paragraph, reference to Section 14.0 is revised to 9.0.

Renumber Section 15 to 10

Renumber Section 16 to 11

Renumber Section 17 to 12

Add the following references to the new Section 12.1 in alphabetical order:

Alaska Department of Community and Regional Affairs. 1998. "Community Information Summary (CIS)." in Alaska Department of Community and Regional Affairs, P.O. Box 112100, Juneau, AK 99811.

Fredin, R. A. 1987. History of regulation of Alaska groundfish fisheries. National Marine Fisheries Service, NWAFC Processed Report 87-07. 63 p.

Impact Assessment Incorporated. 1998. "Inshore/Offshore 3 - Socioeconomic Description and Social Impact Assessment." in Impact Assessment, Inc, 911 West 8th Avenue, Suite 402, Anchorage, AK.

Megrey, B. A., and V. G. Wespestad. 1990. Alaskan groundfish resources: 10 years of management under the Magnuson Fishery Conservation and Management Act. N. Am. J. Fish. Management 10(2):125-143.

NPFMC. 1994a. "Fishery Management Plan for the Gulf of Alaska Groundfish Fishery." in North Pacific Fishery Management Council, 605 West 4th Avenue, Suite 306, Anchorage, AK 99501.

NPFMC. 1995. "Fishery Management Plan for the Bering Sea/Aleutian Islands Groundfish." in North Pacific Fishery Management Council, 605 West 4th Avenue, Suite 306, Anchorage, AK 99501.

United States Army Corps of Engineers. 1997. "Navigation improvements: detailed project report and environmental assessment, King Cove, Alaska." in U.S. Army Alaska Engineer District, Anchorage, AK.

United States Army Corps of Engineers. 1998. "Harbor improvements feasibility report and environmental assessment, Sand Point, Alaska." in U.S. Army Alaska Engineer District, Anchorage, AK.

Witherell, D., and Pautzke, C. 1997. "A brief history of bycatch management measures for eastern Bering Sea groundfish fisheries." *Marine Fisheries Review.* 59:15-22.

Renumber Section 18 to 13.

Remove and reserve Annex II and Annex III

Appendix D

Draft Amendment Language for the Fishery Management Plan for Groundfish of the Gulf of Alaska, Implementing Alternative 3, including Option 2 and Options A and B

Section 1, first paragraph is revised to read as follows:

This Fishery Management Plan (FMP) has been developed by the North Pacific Fishery Management Council for the groundfish fishery (excluding halibut) of the Gulf of Alaska. In 1978 it replaced the Preliminary Fishery Management Plan for the management of groundfish in the Gulf of Alaska. Since then, the FMP has been amended over sixty times.

Section 2 is revised as follows:

1. Delete definitions for Domestic annual harvest (DAH), Domestic annual processed catch (DAP), Joint venture processed catch (JVP), and Total allowable level of foreign fishing (TALFF).

2. Revise the definitions of Prohibited Species Catch (PSC) and Total allowable catch (TAC) as follows:

Prohibited Species Catch (PSC) is nonretainable catch. It can take the form of a prohibited or nongroundfish species and/or as a fully utilized groundfish species captured incidentally in groundfish fisheries. Such catch must be recorded and returned to sea with a minimum of injury except as provided in the Prohibited Species Donation Program. A PSC limit is an apportioned, nonretainable amount of fish provided to a fishery for bycatch purposes.

Total allowable catch (TAC) is the harvest quota for a species or species group; the retainable catch. TAC will be apportioned by area.

Section 3 is revised as follows:

1. In the section titled Areas and Stocks Involved, (2) is revised to read as follows:

(2) To all fisheries for all finfish, except salmon, steelhead, halibut, herring, and tuna. Harvest allocations and management are based on the calendar year.

2. The fourth paragraph is revised to read as follows:

Diversity of commercial bottomfish species in the Gulf of Alaska is intermediate between the Bering Sea, where fewer species occur, and the Washington-California region, where more species are present. The most diverse species in the Gulf of Alaska is the rockfish group (genus Sebastes), of which 30 species have been identified in this area. Several species of rockfish have been of significant commercial interest, including the Pacific ocean perch (S. alutus), shortraker rockfish (S. borealis), rougheye rockfish (S. aleutianus), dusky rockfish (S. ciliatus), northern rockfish (S. polyspinus), and yelloweye rockfish (S. ruberrimus). Pacific ocean perch was the subject of a substantial foreign and domestic trawl fishery from the 1960's through mid-1980's. Although Pacific ocean perch is found throughout the Gulf, the biomass and fishery have been concentrated in the Eastern Area. For management purposes rockfish are classified into three distinct assemblages that are based on their habitat and distribution. These assemblages are:

* * * * *

Section 4 is modified as follows:

1. Add the following paragraph to the end of Section 4.1.

* * * * *

The groundfish resources off Alaska have been harvested and processed entirely by U. S.-flagged vessels since 1991. Conservation and management measures contained in this FMP apply exclusively to domestic fishing activities. No portion of the annual optimal yield is allocated to foreign harvesters or foreign processors.

2. Section 4.2.1 is revised as follows:

a. Revise the first paragraph to read as follows:

A procedure has been developed whereby the Council can set annual harvest levels by specifying a total allowable catch (TAC) for each groundfish fishery on an annual basis. The procedure consists of six steps:

b. Delete paragraph (6)

c. Renumber paragraph (7) to (6).

d. In the paragraph following the new (6), the last sentence is revised to read as follows:

Similarly, the attainment of a PSC limit will result in the closure of the appropriate fishery.

e. (i) Section 4.2.1.1 is revised to read as follows:

The Secretary, after receiving recommendations from the Council, will determine TACs and apportionments thereof for each target species and the "other species" category by July 1 of the new fishing year, or as soon as practicable thereafter, by means of regulations implementing the FMP. Notwithstanding designated target species and species groups listed in Section 3.1, the Council may recommend splitting or combining species in the target species category for purposes of establishing a new TAC if such action is desirable based on commercial importance of a species or species group and whether sufficient biological information is available to manage a species or species group on its own merits.

Prior to making recommendations to the Secretary, the Council will make available to the public for comment as soon as practicable after its October meeting, a preliminary Stock Assessment and Fishery Evaluation (SAFE) report and preliminary specifications of ABC and TAC for each target species and the "other species" category, and apportionments thereof. At a minimum the SAFE report will contain information listed in Section 4.2.1.4.

At its December meeting, the Council will review the final SAFE report and comments received. The Council will then make final recommendations to the Secretary.

e. (ii) If Option 2 is adopted, in Section 4.2.1.1, "December" is revised to "January" in the revision specified in e.(i) above.

f. Delete section 4.2.1.3.

g. Renumber section 4.2.1.4 to 4.2.1.3.

h. In the new 4.2.1.3, revised (7) to read as follows:

(7) Information to be used by the Council in establishing prohibited species catch limits (PSCs) for Pacific halibut with supporting justification and rationale.

i. Delete section 4.2.1.5.

3. Delete Section 4.2.2

4. Renumber Section 4.2.3 to 4.2.2., revise the new 4.2.2 as follows:

a. Revise the section reference in the third paragraph from 4.2.3.1 to 4.2.2.1.

b. Revise paragraph 5 as follows:

When a PSC limit is reached, further fishing with specific types of gear or modes of operation during the year is prohibited in an area by those who take their PSC limit in that area. All other users and gear would remain unaffected.

c. Delete paragraph 6.

d. Delete the first sentence of paragraph 7.

e. Renumber paragraph 4.2.3.1 to 4.2.2.1.

f. Revise the section reference in the introductory paragraph of the new 4.2.2.1 from 4.2.3 to 4.2.2.

g. In the new Section 4.2.2.1, delete (3) and revise (1) through the new (5) as follows:

(1) Prior to the October Council Meeting. The Plan Team will prepare for the Council a preliminary Stock Assessment and Fishery Evaluation (SAFE) report under Section 4.2.1 which provides the best available information on estimated halibut bycatch and mortality rates in the target groundfish fisheries, halibut PSCs limits, apportionments and catches thereof by target fisheries and gear types for the previous fishing year.

(2) October Council Meeting. While setting preliminary groundfish harvest levels under Section 4.2.1, the Council will also review the need to control the bycatch of halibut and will, if necessary, recommend preliminary halibut PSC mortality limits (PSCs) and apportionments thereof. The Council will also review the need for seasonal allocations of the halibut PSCs.

* * *

(3) Prior to the December Council Meeting. The Plan Team will prepare for the Council a final SAFE report under Section 4.2.1 which provides the best available information on estimated halibut bycatch rates in the target groundfish fisheries.

(4) December Council Meeting. While recommending final groundfish harvest levels, the Council reviews public comments, takes public testimony, and makes final decisions on annual halibut PSC limits and seasonal allocations, using the same factors (6) through (14) concerning PSC limits, and the same factors, (1) through (7), concerning seasonal allocations of the PSC limits. The Council will recommend its decisions, including no change for the new fishing year, to the Secretary of Commerce for implementation.

(5) As soon as practicable after the Council's December meeting, the Secretary will publish the Council's final decisions as proposed harvest specifications in the Federal Register. Information on which the final recommendations are based will also be published in the Federal Register or otherwise made available by the Council.

h. If Option 2 is adopted, revise the new section 4.2.2.1 as specified in g. above, except revise "December" to "January" in paragraphs (3), (4) and (5).

5. Renumber section 4.2.4 to 4.2.3. Revise the section reference in the paragraph from 4.2.3.1 to 4.2.2.1.

6. Renumber section 4.2.5 to 4.2.4.

7. Renumber section 4.2.6 to 4.2.5.

8. Delete the title to section 4.3.1

9. Renumber section 4.3.1.1 to section 4.3.1.

10. Renumber section 4.3.1.2 to section 4.3.2

11. Renumber section 4.3.1.2.1 to section 4.3.2.1.

12. Renumber section 4.3.1.2 .2 to section 4.3.2.2.

13. Renumber section 4.3.1.2.3 to section 4.3.2.3

14. Renumber section 4.3.1.3 to section 4.3.3

15. In the new section 4.3.3, delete the fourth paragraph titled <u>Information on processing expectations.</u>

16. Renumber section 4.3.1.4 to section 4.3.4

17. Renumber section 4.3.1.5 to section 4.3.5.
18. Renumber section 4.3.1.6 to section 4.3.6.

19. Renumber section 4.3.1.6.1 to section 4.3.6.1

20. Renumber section 4.3.1.6.2 to section 4.3.6.2.

21. Renumber section 4.3.1.6.3 to section 4.3.6.3.

22. Renumber section 4.3.1.6.4 to section 4.3.6.4.

23. Renumber section 4.3.1.7 to section 4.3.7.

24. Delete section 4.3.2

25. Renumber section 4.3.3 to section 4.3.8.

26. Renumber section 4.3.4. to section 4.3.9.

27. Renumber section 4.3.4.1 to section 4.3.9.1.

28. Renumber section 4.3.4.2 to section 4.3.9.2.

29. Renumber section 4.3.4.3 to section 4.3.9.3.

30. Delete table 4.4 and figures 4.2 and 4.3.

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mnbrown 4/30/01, 4/26/02, 8/23/02
jIanelli: 5/8/02
bmuse: 5/9/02 , 8/28/02