ALASKA GROUNDFISH FISHERIES

DRAFT PROGRAMMATIC SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT

EXECUTIVE SUMMARY

United States Department of Commerce

National Oceanic and Atmospheric Administration

National Marine Fisheries Service
Alaska Region

January 2001

Alaska Groundfish Fisheries

Draft Programmatic Supplemental Environmental Impact Statement

EXECUTIVE SUMMARY

VOLUME I

Chapter 1 Purpose and Need for Action
Chapter 2 Alternatives Including the Proposed Action

VOLUME II

Chapter 3 Affected Environment

VOLUME III

Chapter 4 Environmental and Economic Consequences

VOLUME IV

Chapter 4 Environmental and Economic Consequences (Continued)

VOLUME V

Chapter 5 List of Preparers
Chapter 6 List of Agencies, Organizations, and Persons to Whom Copies of Statement are Sent
Chapter 7 Literature Cited

VOLUME VI

Appendix A Bering Sea/Aleutian Islands Fisheries Management Plan Amendment Summaries
Appendix B Gulf of Alaska Fisheries Management Plan Amendment Summaries
Appendix C Regulatory Amendment Summaries
Appendix D Notice of Intent
Appendix E Scoping Notice
Appendix F Scoping Report; Notice of Availability
Appendix G North Pacific Fishery Management Council Comprehensive Management Goals
Appendix H Non-Target Species List

VOLUME VII

Appendix I Sector and Regional Profiles of the North Pacific Groundfish Fisheries

VOLUME VIII

Appendix J Cumulative Impacts Assessment

DRAFT ALASKA GROUNDFISH FISHERIES PROGRAMMATIC SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT EXECUTIVE SUMMARY

INTRODUCTION

This executive summary provides an overview of the findings of the draft Alaska Groundfish Fisheries Programmatic Supplemental Environment Impact Statement (SEIS). For more detailed information, the reader should refer to the draft SEIS and attached appendices.

This programmatic SEIS has multiple purposes. A planning and reference document is needed to accurately describe the current management regime for groundfish fisheries in Alaska. It must also describe and analyze current knowledge about the physical, biological, and human environment in order to assess impacts caused by past and current fishery activities. Significant changes have occurred in the environment since the original environmental impact statements (EISs) for the Gulf of Alaska (GOA) and Bering Sea and Aleutian Islands (BSAI) groundfish fishery management plans were published approximately 20 years ago. While many environmental assessments (EAs) and several EISs have been prepared for fishery plan amendments over the ensuing years, none examined the groundfish fishery management plans (FMPs) at a programmatic level. The National Environmental Policy Act (NEPA) requires preparation of an EIS (or SEIS) when environmental changes have occurred. This SEIS is intended to bring both the decisionmaker and the public up to date on the current state of the environment. In addition, the programmatic SEIS will also serve as the environmental baseline that will be used to shape future management policy and a future range of potential management actions.

Additionally, this SEIS explains to decisionmakers and the public the effects of the current groundfish fishery management regime, as well as selected alternative management regimes, on the human environment to assess whether a different management regime should be implemented. For purposes of this programmatic SEIS, the National Marine Fisheries Service (NMFS) presumes that the Alaska groundfish fisheries result in some significant effects, both positive and negative, to the human and natural environments. This SEIS has been structured in a manner that identifies these effects (direct, indirect, and cumulative) to the extent possible, and explores alternative policies and actions that might serve to mitigate adverse impacts. It is anticipated that future NEPA documents will reference this SEIS when focusing on issues specific to the action being evaluated at that time. This programmatic SEIS may require periodic updates as new information and/or significant changes occur in relation to the fisheries or the environment.

DEFINING THE PROBLEM

A number of pressing issues face those who participate in and manage the Alaska groundfish fisheries. The range of issues includes the effects of the groundfish fisheries on the decline of Steller sea lions and other protected species, the effects of fishing gear on benthic habitat, excess fishing and processing capacity, and the effects of harvesting fish on the North Pacific marine ecosystem. Other notable issues include maintaining sustainable fisheries, reducing bycatch and waste, improving data gathering and enforcement of regulations, and providing economic stability for fishing communities. These ongoing issues have been prioritized by NMFS and the North Pacific Fishery Management Council (the Council) for purposes of research and management focus.

NEPA requires that a significant federal action (such as a federally authorized fishery) be evaluated for its potential effects on the natural and human environment. It is intended that this programmatic SEIS serve as the central environmental planning document for both the BSAI and GOA Groundfish FMPs. This goal will be achieved by:

- updating the original EISs by providing a historical review of how the groundfish fisheries and the environment have changed since publication of the original EISs;
- describing how new scientific and fishery information is being utilized;
- building upon the analysis contained in the 1998 SEIS for setting total allowable catch (TAC) by broadening its scope;
- describing the cumulative effects of past, present, and reasonably foreseeable future groundfish fisheries management on the marine ecosystem and the environment (to the extent possible); and
- analyzing the current and alternative management regimes to determine the potential impacts on the human environment.

WHAT IS A PROGRAMMATIC EIS?

A programmatic EIS is typically a broad, big picture environmental evaluation that examines a program such as fisheries management on a large scale. Federal agencies have been encouraged to develop "multi-tiered" EISs to streamline the NEPA process. This approach avoids repetition by referencing broad, program-oriented issues analyses in the programmatic SEIS when preparing subsequent EAs or EISs that focus on specific proposed federal actions. A programmatic EIS is usually prepared at the onset of a new federal program. In this case, the GOA and BSAI FMPs have been in place for approximately 20 years and this programmatic SEIS is being prepared to provide a comprehensive review of the FMPs.

SEIS Timeline

Notice of Intent	October 1999
Scoping Period and Meetings	October 1999 through December15, 1999
Scoping Report	April 2000
Preparation of Draft SEIS	May through November 2000
Distribution of Draft Programmatic SEIS	January 2001
Public Meetings	To be determined
Completion of Public Review of Draft SEIS	April 26, 2001
Final Programmatic SEIS	To be determined
Record of Decision	To be determined

Scope of this SEIS

NMFS determined this programmatic SEIS for the Alaska groundfish fisheries should provide a broad analysis of the effects of the GOA and BSAI groundfish FMPs on the areas under their management. The SEIS includes a cumulative impact analysis of actions that have occurred as a whole, and examines policies and potential future actions from a variety of environmental perspectives. By its programmatic nature, this SEIS takes a broad look at the issues and the alternatives, and is somewhat qualitative in nature. More case-specific, detailed analyses can be expected in the future as specific proposed management actions are evaluated in subsequent second-level tiered EAs or EISs. This programmatic SEIS provides the agency and the public with

an analytical framework to examine what environmental effects would result from other potential fisheries management regimes. Findings that flow from this analysis could result in FMP amendments that lead to formal rule-making and implementation of changes to the current management regime governing the groundfish fisheries off Alaska.

SEIS Organization

It will be readily apparent that the management of the Alaska groundfish fisheries is a large, complex program that continues to evolve as more information is obtained on the fishery resources, the marine ecosystem, and those that derive benefits from both. The programmatic SEIS provides a means of informing the public about Alaska groundfish management, the current regime, what is known and not known about the ecosystem, and the complex set of laws and regulations that apply to federal fisheries management. To meet these objectives, the document has been organized into a series of chapters and sections.

Chapter 2 provides an overview on fisheries policy, what it means, and how it is currently applied to the groundfish fisheries. Section 2.3.2 is a review of the principal laws that govern fisheries management in the United States. Section 2.4 introduces programmatic alternatives, which emphasize different potential approaches to managing the groundfish fisheries using frameworks that allow management flexibility. Current policy statements of each FMP are reviewed, as well as the actions taken by the Council over the last 10 years. The review of current policy also contrasts alternative policies that emphasize certain sets of fisheries management objectives more heavily than others. This approach captures the range of issues raised during the scoping process.

The federal action of this programmatic SEIS, the Alaska groundfish fisheries, and their management is described in Section 2.7. This section informs the reader about environmental conditions and the state of the groundfish fisheries prior to the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act), and how the FMPs have evolved over time as new issues and new information have come to the forefront of policy decisionmaking. A detailed discussion addresses compliance with the Magnuson-Stevens Act, the BSAI and GOA groundfish FMPs, the characteristics of the commercial fisheries, and the fisheries management Council process. Chapter 2 concludes with summaries of the actions taken to comply with requirements of the Endangered Species Act and the Marine Mammal Protection Act.

Chapter 3 presents a synthesis of current knowledge of the environment affected by the FMPs. Section 3.1 is an overview of the physical environment and Section 3.2 presents what is known about the effects of fishing on that environment. Sections 3.3 through 3.7 describe the groundfish resources involved in the fishery and marine mammals, seabirds, and other fish species found in the Bering Sea and Gulf of Alaska. Section 3.8 provides information on what is known about contaminants in the region, and Section 3.9 is an overview on the interactions of climate, commercial fishing, and the marine ecosystem. Section 3.10 describes the harvesting and processing sector components of the groundfish fisheries, and the regions and communities that support fishing activities.

Chapter 4 is the heart of this SEIS analysis. This section evaluates the effects of groundfish fishing on the environment and how those effects might be altered by changes to the current fisheries management regime. Section 4.1 provides a description of the process NMFS used to develop the range of alternative fishery management regimes that illustrate the general environmental effects

of implementing an FMP. Agency analysts with expertise in fishery science and fisheries management were tasked with developing one or more hypothetical, or model, regimes for each programmatic policy alternative. Using the current FMPs as the baseline, analysts reviewed all of the management tools of the BSAI and GOA groundfish FMPs and tailored a hypothetical suite of actions that could reasonably serve as one method of achieving a particular set of policy objectives. Analysis of these model regimes, and contrasting them with the current or status quo regime, illustrates the general environmental effects of each programmatic policy alternative. This SEIS provides the Council, NMFS, and the public with information that can be used to guide future fishery management policy decisions.

Sections 4.2 through 4.9 evaluate the effects of the current status quo regime, and the hypothetical alternative management regimes from the perspective of key issue areas (e.g., marine mammals, target species, socioeconomic characteristics). Sections 4.10 through 4.12 provide general information on the effects of the alternative regimes on enforcement and management programs, on other environmental issues, and whether they provide opportunities for energy conservation potential. Section 4.13 presents results from the cumulative impacts analysis, and concludes with a chapter summarizing the general findings.

The Federal Action: Management and Authorization of the Alaska Groundfish Fisheries
The federal action in this SEIS is defined as the management of groundfish fisheries and the authorization of groundfish fishery activities off Alaska, pursuant to the *Fishery Management Plan for Groundfish Fishery in the Bering Sea and Aleutian Islands Area* and the *Fishery Management Plan for Groundfish Fishery of the Gulf of Alaska* (Section 1.2).

These FMPs were prepared by the Council and approved by the Secretary of Commerce in 1978 and 1981, respectively. The BSAI FMP has been amended 71 times (Appendix A) and the GOA FMP 62 times (Appendix B). As necessary, rules and regulations were prepared to implement each of the FMP amendments. To comply with NEPA EISs were prepared for the original FMPs when they were approved by the Secretary of Commerce (NPFMC 1978, NPFMC 1981). An EIS or an EA was also prepared for every plan amendment (Appendices A and B). EAs were also prepared each time a regulation was changed. Since 1991, EAs resulting in a finding of no significant impact have been written for each year's TAC specifications (Section 1.6 of the SEIS and Appendix C).

WHAT ARE THE ALASKA GROUNDFISH FISHERIES?

What Fish are Harvested?

The Groundfish FMPs authorize and regulate the commercial harvest of various groundfish species. All of the finfish and invertebrates species in the area subject to the management plan are grouped into five categories: target, prohibited, other, forage fish, and non-specified. Harvest quotas, known as total allowable catches or TACs, are set annually for target species either individually or by species group. Prohibited species catch limits are set for certain species (e.g., salmon, herring, halibut, king crab, and Tanner crab) which are the target of other domestic fisheries, but are taken incidentally by groundfish fishing operations.

Principal groundfish fisheries are directed on walleye pollock, Pacific cod, sablefish, flatfish, Atka mackerel, and rockfish. Gear types used to harvest fish include bottom and pelagic trawls, hook-

and-line (longlines), pot, and jig. About a million metric tons of groundfish are taken annually from the combined BSAI and GOA fisheries (Section 1.6).

Where do the fisheries occur?
The groundfish fisheries occur in the North Pacific Ocean and Bering Sea in the U.S. Exclusive Economic Zone (EEZ) from 3 to 200 nautical miles offshore and between 50°N to 65°N latitude (Figure 1). The subject waters, or the action area, are divided into two management areas; the BSAI and the GOA (Section 1.6).

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, between the eastern Aleutian Islands at 170°W longitude and Dixon Entrance at 132°40'W longitude. The area of the EEZ off Alaska is more than 900,000 square miles, or larger than the combined EEZs of the east and west coasts of the United States. The FMPs encompass those areas directly affected by fishing, and those areas 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.

Who Participates in the Fisheries?
Fishermen and processing workers from the states of Alaska, Washington, and Oregon participate in BSAI and GOA groundfish harvesting and fish processing (Section 3.10). In 1998, exvessel value of groundfish harvest by catcher vessels was $184 million, 40 percent of the total Alaska seafood exvessel value. The 1998 groundfish harvest produced an estimated $1 billion in processed groundfish product value for the catcher/processor and inshore processor/mothership sectors. Approximately 1.2 million metric tons (mt) of groundfish was landed in 1998; approximately 86 percent of the harvest came from the Bering Sea, with the remaining 14 percent from the GOA. Approximately 67 percent of this catch was pollock. Total harvesting and processing employment was estimated at approximately 10,000, with 60 percent of the employment going to Alaska region residents, and most of the remaining employment going to Washington and Oregon residents. Commercial fishing generates other economic activity in all three regions through support services, and generates tax revenue for the State of Alaska and many Alaskan communities.

Catcher Vessels: The harvesting fishing industry sector in 1998 included eight classes of catcher vessels based on primary gear types and fisheries, accounting for nearly 1,200 vessels. The four trawl classes focus on pollock and, to a lesser extent, Pacific cod and flatfish. Trawl catcher vessels deliver the vast majority of their fish to at-sea motherships, Bering Sea pollock shore plants, Alaska Peninsula and Aleutian Island shore plants, and Kodiak Island shore plants. Currently, trawlers generate approximately 70 percent of the exvessel revenue in groundfish fisheries. The remaining four vessel classes all use fixed-gear. Pot catcher vessels, which are primarily crab vessels that also fish part time in Pacific cod fisheries, account for 3.5 percent of exvessel value and payments to labor. Longline catcher vessels focus primarily on high-value sablefish, using longline gear in the GOA, and generate approximately 10 percent of total groundfish exvessel value and labor income. The other two fixed-gear catcher vessel classes (vessels less than 32 feet in length and vessels 33 to 59 feet in length) use longlines, pots, and jig gear and have by far the largest number of operations. Both of these fixed-gear classes participate in the groundfish fisheries to augment income from salmon, herring, and halibut fisheries. The larger of these two classes includes more

than 700 vessels and generates 16 percent of total exvessel revenue, primarily through landings of high-value sablefish and rockfish from the GOA.

Shore Plants and Motherships: Shore plants and motherships buy raw fish from catcher vessels and then process and freeze it for future use. Overall, shore plants and motherships are projected to generate more than $612 million in wholesale product revenues from groundfish, with nearly 60 percent or $361.9 million generated by the four shore plants and two inshore floating processors grouped as Bering Sea pollock inshore plants. In addition, these plants are projected to generate $144 million in payments to labor and more than 2,000 full-time equivalent jobs, annually. Shore plants in the Alaska Peninsula and Aleutian Islands region are the second largest group of shore plants in projected output value ($64 million wholesale), followed closely by Kodiak Island shore plants at $60 million. Shore plants in southcentral and southeast Alaska process much smaller volumes of groundfish (13,000 mt in southcentral and 20,000 mt in southeast). Because they process a large proportion of high-value species such as sablefish and rockfish, both groups are projected to generate more than 5 percent of the total wholesale value and payments to labor. Motherships, which process Bering Sea pollock almost exclusively, are projected to generate $58 million in wholesale value. In 1998, the processing sector included 56 shore-based processors, and four mothership processors (Section 3.10).

Catcher/Processors: In 1998, there were nearly 100 catcher/processor vessels, although the number was subsequently reduced by the American Fisheries Act. There are five classes of catcher/processors based on primary products and gear types. The 89 catcher/processors are projected to generate $594 million in total output (wholesale value), $223 million in payments to labor, and the equivalent of more than 2,000 full-time jobs, annually. Surimi and fillet trawl catcher/processors operate almost exclusively in BSAI pollock fisheries. The 12 surimi vessels are projected to generate more than 47 percent of total product value for catcher/processors, while fillet trawl vessels are projected to add 11 percent. Head-and-gut trawl catcher/processors, which focus more on flatfish, Pacific cod, and other species and do not generally target pollock, are projected to produce $157 million in product. Longline catcher/processors, which generally focus on Pacific cod (some also have large sablefish catches), are projected to generate more than $82 million in product. Pot catcher/processors, which fish for Pacific cod when crab fisheries are closed, are projected to be minor participants, with $4 million in output value.

Regions and Communities that Benefit from Fishing Activities: In addition to vessels and processors, regions that have significant involvement in BSAI and GOA groundfish fisheries include the Alaska Peninsula and Aleutian Islands, Kodiak archipelago, southcentral Alaska, southeast Alaska, Washington inland waters, and the Oregon coast. In general, regional impacts include not only direct effects from harvesting and processing, but also indirect effects generated through tax payments and as income cycles through the regional economies.

The Alaska Peninsula and Aleutian Islands region is in several respects the center of the Alaska groundfish fishery, accounting for more than four times the volume of groundfish processed inshore than in the other Alaska regions combined during 1991–1999. Relative dependence on the groundfish fishery varies: four of Alaska's top five groundfish landing ports are in this region, but some communities have little, if any, direct involvement. Fish tax from groundfish is an important underpinning of the regional economy, and groundfish vessel owners though few in number are important contributors to the economies of local communities. Kodiak is the dominant region for

groundfish in the GOA, but is also an important region for salmon, halibut, and other species. Groundfish accounts for roughly 30 to 45 percent of local processing and fish tax revenues. Participation in the groundfish fishery in southcentral and southeast Alaska is much more limited than in the Alaska Peninsula and Aleutian Islands and Kodiak Island regions. Both southcentral and southeast Alaska have significantly more diversified economies and relatively greater involvement in non-groundfish fisheries compared to the other two Alaska regions.

Regions in the Pacific Northwest also have important links to Alaska's groundfish fisheries. The Washington inland waters region as a whole, especially the greater Seattle area, is engaged in all aspects of the North Pacific groundfish fishery. While Washington is distant from the harvest areas, it is the organizational center of much of the industrial activity that comprises the human components of the fishery-specific industry sectors based in or linked to Seattle are substantially engaged in or dependent on the groundfish fishery. In terms of vessel and processor ownership, involvement in the Alaska groundfish fishery is arguably greater for Seattle than for any other community. However, if the size and diversity of Seattle's overall economy are considered, the groundfish fishery may be less important or vital for Seattle than for the other communities considered in the SEIS. The Oregon coast region has long had significant involvement in the fishery, from the development of joint ventures through the present catcher vessels that participate in a variety of fisheries across the Alaska regions.

In addition, six western Alaska Community Development Quota Groups (CDQs), representing 65 rural Alaskan villages, receive a share of the fisheries allocation to facilitate economic development in rural Alaska. CDQs have provided up to 1,000 jobs annually for western Alaska residents with annual wages of about $5–8 million; they have also used revenues to fund acquisition of vessels and seafood-related businesses, and to fund infrastructure improvements in western Alaska communities.

HOW ARE THE FISHERIES MANAGED?

The Magnuson-Stevens Act established the primary legal framework for the management of the BSAI and GOA groundfish fisheries. FMPs are intended to satisfy the requirements of the Act as well as other federal mandates including NEPA and Executive Order 12866 on Environmental Justice. The Magnuson-Stevens Act contains 10 national standards that serve as overarching policy goals for federal fisheries management. The Council was established by the Magnuson-Stevens Act to serve as a policy advisor to the Secretary of Commerce. Its many responsibilities include the preparation of FMPs for each fishery that requires fisheries conservation and management, as well as amendments to each plan. The Council employs a very public-oriented process. Its principal job is to make recommendations while attempting to balance sometimes conflicting policy objectives contained in the Magnuson-Stevens Act with those objectives contained in other federal laws. Fishery issues, information, and public proposals are brought to the Council. A system of scientific and industry experts review and advise the Council on how best to manage the fisheries and address management problems that arise. For a more detailed overview of the Magnuson-Stevens Act, other applicable federal laws, and the Council process, see Sections 2.3.2, 2.3.3, and 2.7.8, respectively.

Regulations specifically governing the groundfish fisheries in the EEZ off Alaska appear at 50 CFR 679. FMPs, amendments to FMPs, and regulatory amendments are developed by the Council,

submitted to the Secretary of Commerce for review, and, if approved or partially approved, implemented by federal regulations. Once the regulations are put into effect, NMFS has responsibility for the day-to-day management of the fisheries. Enforcement of the regulations is carried out jointly by NMFS and the U.S. Coast Guard. In cases where groundfish are harvested and processed in both the EEZ and state waters, these fisheries are cooperatively managed by NMFS and the Alaska Department of Fish & Game. For detailed information on how these resources are managed, see Section 2.7.

What are the environmental issues?

The first step in the SEIS preparation process is scoping. Scoping is designed to provide an opportunity for the public, other federal and state agencies, non-governmental organizations, and other interested groups to provide input on potential issues associated with the federal action. As described in the Scoping Report (NMFS 2000a), a review of all the scoping comments suggested 26 issue categories for purposes of consolidating comments and considering how best to address them in the SEIS. However, the review of public comments clearly indicated that among the 26 issue categories, a subset of nine issues was mentioned more frequently, suggesting that these issues are most important to the public (Section 1.7).

NMFS used the following key issues to develop the programmatic policy alternatives considered in the SEIS and to organize Chapter 4:

- effects on marine mammals,
- effects on seabirds,
- effects on target groundfish species,
- effects on nontarget groundfish species,
- effects on prohibited species,
- effects on essential fish habitat,
- effects on social economics of the fishery,
- effects on the marine ecosystem, and
- cumulative effects of the groundfish fisheries.

How do the current management plans address these issues?

Over the last 20 years, the fisheries regulations have been modified numerous times to address environmental and economic issues. Such actions include the establishment of:

- bottom trawl closure areas in the GOA and BSAI based on historic king crab abundance to reduce bycatch and enhance the recovery of depressed crab stocks;
- a domestic observer program for the purposes of collecting important fishery information;
- a GOA Pacific ocean perch rebuilding program;
- overfishing definitions to protect target groundfish stocks;
- a moratorium on new entry into the groundfish fisheries;
- specific allocations to inshore and offshore processing sectors to prevent preemption and provide economic stability to Alaska coastal communities;
- closure areas around Steller sea lion rookeries to protect these marine mammals from adverse effects of commercial groundfish fishing;
- prohibited species catch limits to reduce bycatch;

- an Individual Fishing Quota Program for the sablefish fishery;
- allocations of Pacific cod among the various gear types to promote economic stability, and
- closed areas to protect sensitive marine habitat.

A more detailed summary of the actions can be found in Section 2.4.1.3.

The Council and NMFS are not the only ones that have taken action. The U.S. Congress has also prioritized research, expanded programs, and developed measures that have addressed problems including the phase-out of foreign fishing, and the overcapacity of the groundfish harvesting and processing sectors.

WHAT ARE THE FISHERIES MANAGEMENT ALTERNATIVES CONSIDERED IN THE SEIS?

This programmatic SEIS examines six thematic alternative policy statements, each presented in a standard framework that provides management flexibility and allows for adaptation as new information on the ecosystem and the fisheries is obtained. Analyzing environmental impacts of fisheries management policies requires knowing what specific actions could be taken to implement them. Policies are, by definition, high-level, overall statements or plans embracing the general goals and procedures of a government body. Goals and objectives are often used to frame a policy, make it clearer and easier to understand, and provide specific directions for implementation through FMP amendments. Still, determining how a policy might affect the human environment is difficult to analyze without some indication of how it might be implemented.

In this SEIS, the programmatic alternatives are introduced, beginning with a presentation of current management policies, or the status quo regime. This management regime has evolved over the last 20 years and continues to be revised as new issues arise or new scientific information becomes available. This regime would continue to evolve if no additional policy actions were taken. Therefore, the programmatic alternatives in this SEIS consider potential changes in policy direction for fisheries management.

NMFS believes that the programmatic alternatives must provide an appropriate range of policy objectives so as to sharply define the fisheries management issues and provide a clear basis for choice among the alternatives. Each programmatic alternative focuses on a particular subset of policy objectives, which were selected to reflect issues raised in public comments. The environmental consequences that have been evaluated under a particular alternative regime (Chapter 4) serve to illustrate the general effects of those prioritized policy objectives. Given the range of policy alternatives in this SEIS, the outcome of emphasizing one set of objectives over others will illustrate the expected range of environmental effects that result from those decisions. Such effects could be offset, or reduced in terms of intensity, should NMFS or the Council choose to combine sets of objectives or measures to create a modified policy emphasizing a different set of policy objectives than those presented in this analysis. Likewise, NMFS or the Council could choose to mitigate any significant effects without requiring a formal change in policy. In either case, NMFS expects that many of the management actions taken during the next five years will likely fall within the broad range of effects described in this programmatic SEIS. The SEIS then serves as an

overarching impact assessment of the Alaska groundfish fisheries on the natural and human environment.

Alternative 1 (Status Quo): Continue with Existing Management Policy

The current management policy of the Council and stated in the BSAI and GOA groundfish FMPs can be summarized as:

- Conform to the National Standards of the Magnuson-Stevens Act and to the Council's Comprehensive Fishery Management Goals;
- Promote conservation while providing for the optimum yield from the region's groundfish resources;
- Ensure that commercial, recreational, and subsistence benefits from the resources may be obtained on a continuing basis;
- Promote, where possible, efficient use of the fishery resources, but not solely for economic purposes;
- Promote fair and equitable allocation of identified available resources in a manner such that no particular group acquires an excessive share of the privileges;
- Base the fishery management plan on the best scientific information available;
- Minimize the chances of irreversible or long-term adverse effects on fishery resources and the marine environment;
- Make sure that multiple options are available with respect to future uses of the resources, and
- Develop regulations that will be long-term and stable with changes kept to a minimum.

The policy statements included in both groundfish FMPs are somewhat lengthy, complex, and include a number of secondary policy objectives. There are at least partially conflicting policy goals and objectives listed in the BSAI and GOA FMPs, reflecting guidance provided in the Magnuson-Stevens Act which requires the decisionmaker to strike an appropriate balance between protecting the biological resources, maintaining sustainable fisheries, and maximizing the social benefit of the fisheries. The FMPs and their implementing regulations describe a "management regime." The current regime is described in Section 2.7 as the "Federal Action of this Programmatic SEIS."

Evaluating New Policy Frameworks: The Common Denominator Among Alternatives to the Status Quo

To fulfill the purpose and need of this programmatic SEIS, NMFS has selected 14 policy objectives as the basis of the alternative management frameworks. These policy objectives were derived from a review of the Magnuson-Stevens Act, the NOAA Fisheries Strategic Plan, NOAA's National Bycatch Plan, the Endangered Species Act, the Marine Mammal Protection Act, the Council's Comprehensive Fishery Management Goals, and the Council's working definition for ecosystem-based management. For purposes of analysis, NMFS has identified specific primary objectives to define the policy emphasis of each programmatic alternative. By constructing each alternative around a different policy emphasis, the environmental issues raised during scoping can be clearly defined and examined. Such a presentation of alternatives also illustrates the flexibility of the policy framework to address particular environmental issues. It is the "common denominator" of Alternatives 2–6. The specific policy emphasis contained within each alternative regime presents a marked contrast to the other alternatives. If adopted, the new or changed policy emphasis could restrict the range of future management actions. Combining two or more suites of alternative

policy objectives could similarly result in changes (though possibly less distinct from the status quo) to how the fisheries are managed and regulated compared to the status quo.

Each of the following alternatives is subject to four broad goals based on the requirements of the Magnuson-Stevens Act. These goals will serve the Council and NMFS as a measure of progress toward achievement of long-term fishery management objectives:

- Provide sound conservation of living marine resources.
- Provide socially and economically viable fisheries.
- Prevent human-caused threats to protected species.
- Maintain a healthy living marine resource habitat.

Alternative 2: Adopt a New Fisheries Management Policy Framework that Emphasizes Increased Protection to Marine Mammals and Seabirds

This policy places greater management emphasis to reduce conflicts and adverse interactions between groundfish fishing activities and marine mammals and seabirds. Objectives which provide greater emphasis in shaping policy decisions under Alternative 2 (e.g., to increase protection to Steller sea lions, other marine mammals, short-tailed albatross, and seabirds) are listed below:

- Emphasize protection of marine mammals and seabirds by reducing potential adverse impacts of groundfish harvesting; adverse impacts may include direct take, competition for prey, disturbance, and degradation of habitat (primary objective).
- Recover and maintain protected species populations.
- Reduce fishing conflicts that involve protected species and seabirds.
- Conform to the Magnuson-Stevens Act National Standards and the Council's Comprehensive Goals.

Alternative 3: Adopt a New Fisheries Management Policy Framework that Emphasizes Increased Protection to Target Groundfish Species

Alternative 3 places greater management emphasis on objectives aimed at preventing overfishing, maintaining healthy fish stocks of target species, and rebuilding depressed stocks of target species while providing the benefits of diverse and self-sustaining living marine resources. Those objectives used to provide greater emphasis (e.g., to increase protection to target groundfish species) in shaping policy decisions under Alternative 3 are listed below:

- Provide additional or improved protection for target species while also providing for sustainable fisheries (primary objective);
- Maintain healthy stocks important to commercial, recreational, and subsistence fisheries;
- Prevent overfishing and rebuild depressed stocks important to commercial, recreational, and subsistence fisheries;
- Increase long-term economic and social benefits to the nation from living marine resources;
- Protect, conserve, and restore living marine resource habitat;
- Establish minimum stock size thresholds for all managed groundfish stocks based on the best scientific information available;

- Maintain a margin of safety in recommending acceptable biological catches when the information concerning the resource is questionable, and obtain additional biological and socioeconomic data in such instances;
- Use the precautionary approach when making decisions; and
- Conform to the Magnuson-Stevens Act National Standards and NPFMC Comprehensive Goals.

Alternative 4: Adopt a New Fisheries Management Policy Framework that Emphasizes Increased Protection to Nontarget and Forage Species

This policy alternative places greater management emphasis on maintaining healthy fish stocks of nontarget and forage fish, reducing bycatch and bycatch mortality, reducing discards, and using a precautionary approach when making decisions while providing the benefits of diverse and self-sustaining living marine resources. Those objectives used to provide greater emphasis (e.g., to increase protection to nontarget groundfish species) in shaping policy decisions under Alternative 4 are listed below:

- Prevent overfishing, maintain healthy stocks, and rebuild depressed stocks of nontarget species (primary objective).
- Maintain healthy stocks important to commercial, recreational, and subsistence fisheries.
- Prevent overfishing and rebuild depressed stocks important to commercial, recreational, and subsistence fisheries.
- Increase long-term economic and social benefits to the nation from living marine resources.
- Protect, conserve, and restore living marine resource habitat.
- Minimize discards of fish harvested by developing management measures that encourage the use of gear and fishing techniques that minimize discards.
- Use the precautionary approach when making decisions.
- Conform to the Magnuson-Stevens Act National Standards and the Council's Comprehensive Goals.

Alternative 5: Adopt a New Fisheries Management Policy Framework that Emphasizes Increased Protection to Habitat

This policy alternative places greater emphasis on objectives to protect, conserve, and restore living marine resource habitat while providing the benefits of diverse and self-sustaining living marine resources. Those objectives used to provide greater emphasis (e.g., to increase protection to habitat, including essential fish habitat) in shaping policy decisions under Alternative 5 are listed below:

- Protect and restore essential fish habitat while accruing benefits to marine ecosystems (primary objective).
- Protect, conserve, and restore living marine resource habitat.
- Use the precautionary approach when making decisions.
- Conform to the Magnuson-Stevens Act National Standards and the Council's Comprehensive Goals.

Alternative 6: Adopt a New Fisheries Management Policy Framework that Emphasizes an Increase in Socioeconomic Benefits

Two distinct alternative management strategies are illustrated under Alternative 6. Alternative 6.1 is much broader than 6.2, in terms of both the range of socioeconomic benefits that would be considered and the time period over which benefits would be considered. Alternative 6.1 would place greater emphasis on increasing the long-term net economic benefits from the commercial groundfish fisheries. It seeks to increase socioeconomic benefits without increasing total allowable catch (e.g., get more value from what is currently harvested). Alternative 6.2 emphasizes a narrower policy that increases economic benefits in the short-term by adopting a more aggressive harvesting strategy.

Alternative 6.1: Those objectives that provide greater emphasis under Alternative 6.1 are listed below:

- Increase the long-term net economic benefits from the commercial groundfish fisheries to those who harvest and process groundfish, to the associated fishing communities, and to those who consume groundfish seafood products.
- Prevent preemption of one sector or fishing community by another.
- Maintain or increase levels of protection for protected species, target species, nontarget species, and their habitat.
- Conform to the Magnuson-Stevens Act National Standards and the Council's Comprehensive Goals.

Alternative 6.2: This narrower alternative policy places greater emphasis on the objective of increasing the short-term net economic benefits from the commercial groundfish fisheries to those who harvest and process groundfish, to the associated fishing communities, and to those who consume groundfish seafood products by allowing a substantially more aggressive harvest strategy. Those objectives that provide greater emphasis in shaping policy decisions under Alternative 6.2 are listed below:

- Maximize harvest of groundfish stocks while preventing overfishing (primary objective).
- Prevent overfishing and rebuild depressed groundfish stocks important to commercial, recreational, and subsistence fisheries.
- Maintain or increase levels of protection for protected species, target species, nontarget species, and their habitat.
- Conform to the Magnuson-Stevens Act National Standards and the Council's Comprehensive Goals.

POSSIBLE EFFECTS OF FISHERY MANAGEMENT ALTERNATIVES

Potential impacts of the six programmatic policy alternatives in this SEIS are analyzed in terms of fisheries management actions that could be taken to implement each policy alternative. At least one hypothetical, or model management regime was developed for each policy alternative for purposes of analysis and comparison to the current, or status quo, regime. Each alternative contains a number of specific management actions that could serve as a potential amendment to the groundfish FMPs. These model regimes were developed by agency analysts with expertise in a particular environmental issue, for the purpose of evaluating at least one strategy for achieving a

particular policy emphasis. A description on how these regimes were developed, modeled, and the results of their analysis can be found in Chapter 4 of the SEIS.

Analysis of these model regimes is intended to illustrate the types of environmental effects that can be anticipated should specific fisheries management actions be pursued in the future. Many potential combinations of management actions could comprise an alternative management regime. Relying on agency experts and public comments received during the scoping of this SEIS led to the development of these alternative regimes for analytical purposes; they are not intended to represent all possible combinations of actions. As a planning document, this programmatic SEIS provides the decisionmakers and the public with a broad range of potential policy objectives and potential management actions. The direct, indirect, and cumulative effects analyzed in this SEIS illustrate the environmental consequences associated with emphasizing certain policy objectives more heavily than others. However, the SEIS does not prevent the Council or NMFS from taking other management actions. In such cases, the accompanying NEPA analysis would fully evaluate a specific proposed action and its environmental impacts.

Analytical Approach to Evaluating Alternatives

The analytical approach for simulating current groundfish management in the North Pacific U.S. EEZ involves considering interactions among a large number of species (including target, nontarget, and prohibited), areas, and gear types. To evaluate the consequences of alternative management regimes selected in this SEIS, modeling was used to predict the likely outcome of management decisions using statistics on historical catch of different species by gear types and areas. Management of the Alaska groundfish fisheries is complex given the large numbers of species, areas, and gear types. The managers schedule fisheries openings and closures to maximize catch subject to catch limits and other constraints. These management actions are based on expectations about the array of species likely to be captured by different gear types and the cumulative effect that each fishery has on the allowable catch of each individual target species and other species groups. Management decisions were simulated by an in-season management model that predicts capture of target and nontarget species by different fisheries based on historical catch data by area and gear type. The groundfish population abundance for each alternative regime was forecast for a five-year period beginning from the present. This approach provides a reasonable representation of the current fisheries management practice for dealing with the multi-species nature of catch in target fisheries. In addition to the model and its projected results, agency analysts also used the scientific literature, ongoing research, and the professional opinion of fishery experts in their respective fields to perform qualitative assessments.

More detailed information on the analytical approach used by the agency analysts in preparing this SEIS can be found in Section 4.1.6.

Summary of Environmental Consequences

Table 1 presents a summary of the environmental consequences for each of the six alternatives. The table format is organized by categories of effects on the natural environment and human environment (e.g., marine mammals, seabirds, target species, non-target species, prohibited species, habitat, ecosystem, and socioeconomic), and allows for a comparison of potential effects between alternatives. For each category of the natural and socioeconomic environment, a number of potential effects were chosen for analysis based on issues identified during scoping and the expertise of the SEIS analysts. The potential direct and indirect effects are summarized, followed

by a summary of cumulative effects. For Alternative 1 (the status quo alternative), potential effects are described as either significant (beneficial or adverse), conditionally significant (beneficial or adverse), not significant, or unknown. The term conditionally significant is used because in many cases, the likelihood and magnitude of effects is based on specific assumptions and limited data. The term unknown is used when not enough information is available to reach a conclusion of any kind on the likelihood and magnitude of effects. Alternatives 2 through 6 are evaluated in comparison to the status quo alternative, and whether conditions for each of the natural and socioeconomic environment categories were better, worse, or similar. In Chapter 4, a ranking system using values from -2 to +2 was used to compare Alternatives 2 through 6 to Alternative 1.

The basic concept behind cumulative effects assessment is that proposed fishery management actions are evaluated in association with other events, providing a bigger picture that includes the additive result of other actions, each exerting its beneficial or adverse environmental influence over time. Cumulative effects take into account the accumulation and/or combination of all identified direct and indirect effects generated by two or more actions affecting a given resource, ecosystem, or human community. Identifying relevant external factors (including human activities and natural events, such as other fisheries, subsistence harvests, commercial shipping, oil and gas leasing, climatic shifts, etc.) that could act in combination with the direct and indirect effects of the alternatives being considered is a key step in assessing cumulative effects. For more information on the cumulative effects analysis, see Section 4.13 of the SEIS and Appendix J.

Comparison of Effects of Management Alternatives Compared to Status Quo

Table 2 provides a summary of the rankings for each effect relative to the status quo by alternative and class of resources or human use characteristic. (e.g., marine mammals, seabirds, target species, non-target species, prohibited species, habitat, ecosystem, and socioeconomic). The marine mammal class was further partitioned into two sub-classes to distinguish effects of the alternative on primary pinnipeds that more frequently interact with groundfish fisheries (Steller sea lion, northern fur seal, and harbor seal) from effects on other marine mammals. The socioeconomic class was divided into effects on fishing industry sectors and consumers, and effects on regions and communities.

The rankings for each resource or characteristic class are presented in the table. A single ranking value was used for three analysis classes: habitat, ecosystem, and socioeconomic. The remaining analysis classes included several species groups (species or species complexes). As a result the table reflects the percentage of groups that were ranked as being worse than the status quo (value less than +0), similar to the status quo (+0), or better than the status quo (value greater than +0). The rankings in Table 2 should not be confused with statements regarding the significance of the effects since they only represent a direction of change relative to the status quo. The table is color coded to highlight the direction of change between each of Alternatives 2 through 6, and the status quo (conditions worse than status quo = orange, conditions similar to status quo = yellow, and conditions better than status quo = green). Where an analysis class contained several species groups, cells are color coded when 40 percent or more of the species or resources fell into one of the three possible ranking categories (<0, 0, or >0).

The use of colors in Table 2 for each of the alternatives illustrates that there are environmental consequences for any management action taken. Management of the groundfish fisheries off Alaska under the FMPs is a reflection of the Council's attempt to strike a balance among sound

conservation of living marine resources, socially and economically viable fisheries, protected species, and maintaining a healthy marine ecosystem. This is the fundamental premise of the Magnuson-Stevens Act. Given the diversity of the environment and the complexity of the fisheries, any change in fisheries management is likely to benefit certain aspects of the natural and human environment, and adversely affect other aspects to some degree.

WHAT ARE THE NEXT STEPS IN THE SEIS PROCESS?

This executive summary is a snapshot of the contents of the Alaska Groundfish Fisheries Draft Programmatic SEIS published in January 2001. Comments on the draft SEIS will be accepted January 26, 2001 through April 26, 2001. Everyone is invited to submit comments to NMFS. During the comment period, public hearings will be held at various locations in Alaska and the Pacific Northwest. These meetings will offer a forum to meet members of the SEIS team, ask questions, and provide an opportunity for the public to express concerns and recommendations. Comments received at the hearings and in writing will be addressed in the Final Programmatic SEIS.

Your Opportunity to Contribute

The future of the Alaska groundfish fisheries is important to everyone. The public has been involved in the management of the groundfish fisheries at the Council level for more than 20 years and has been involved in the NEPA process from the beginning of this SEIS in the fall of 1999. From the scoping meetings conducted in January 2000 through the comment period on the scoping report, NMFS has solicited and incorporated public comments into this SEIS and the decision process.

Choosing a preferred alternative is a difficult task. This programmatic SEIS has served as an environmental review of the BSAI and GOA groundfish FMPs. The SEIS describes the evolution of fisheries management in Alaska and identifies the environmental issues that could face managers and the stakeholders of these resources in the future. Five alternative fishery management policy frameworks have been crafter around the key environmental issues and emphasized policy objectives as a basis for hypothetical model management regimes used in the SEIS analysis. These environmental consequences are discussed in detail in this SEIS.

NMFS intends to recommend a preferred programmatic alternative in the Final SEIS. Please provide your comments on the issues presented in this summary and the Alaska Groundfish Fisheries Draft Programmatic Supplemental Environmental Impact Statement. This SEIS is a large document and contains a large amount of information regarding Alaska groundfish fisheries management. The complexities of the fishery itself have required a similarly complex program for effective management. We hope you take the time to review the information contained in this document and that you find it to be a useful planning and reference tool.

For more information...

Through April 26, 2001, you can request more information about this SEIS, be added to the SEIS mailing list, learn more about the project, submit your comments, and become involved in the process by:

- Visiting the NMFS Alaska Region website at: www.fakr.noaa.gov

- Mailing your comments to:
  National Marine Fisheries Service
  Alaska Regional Office
  P.O. Box 21668
  Juneau, AK 99802
  Attn: Lori Gravel

- Faxing your comments to:
  National Marine Fisheries Service
  Alaska Regional Office
  (907) 586-7249
  Attn: Lori Gravel

Dates and locations of the public meetings will be announced. Visit the website or contact NMFS to be sure to receive notice of these meetings.

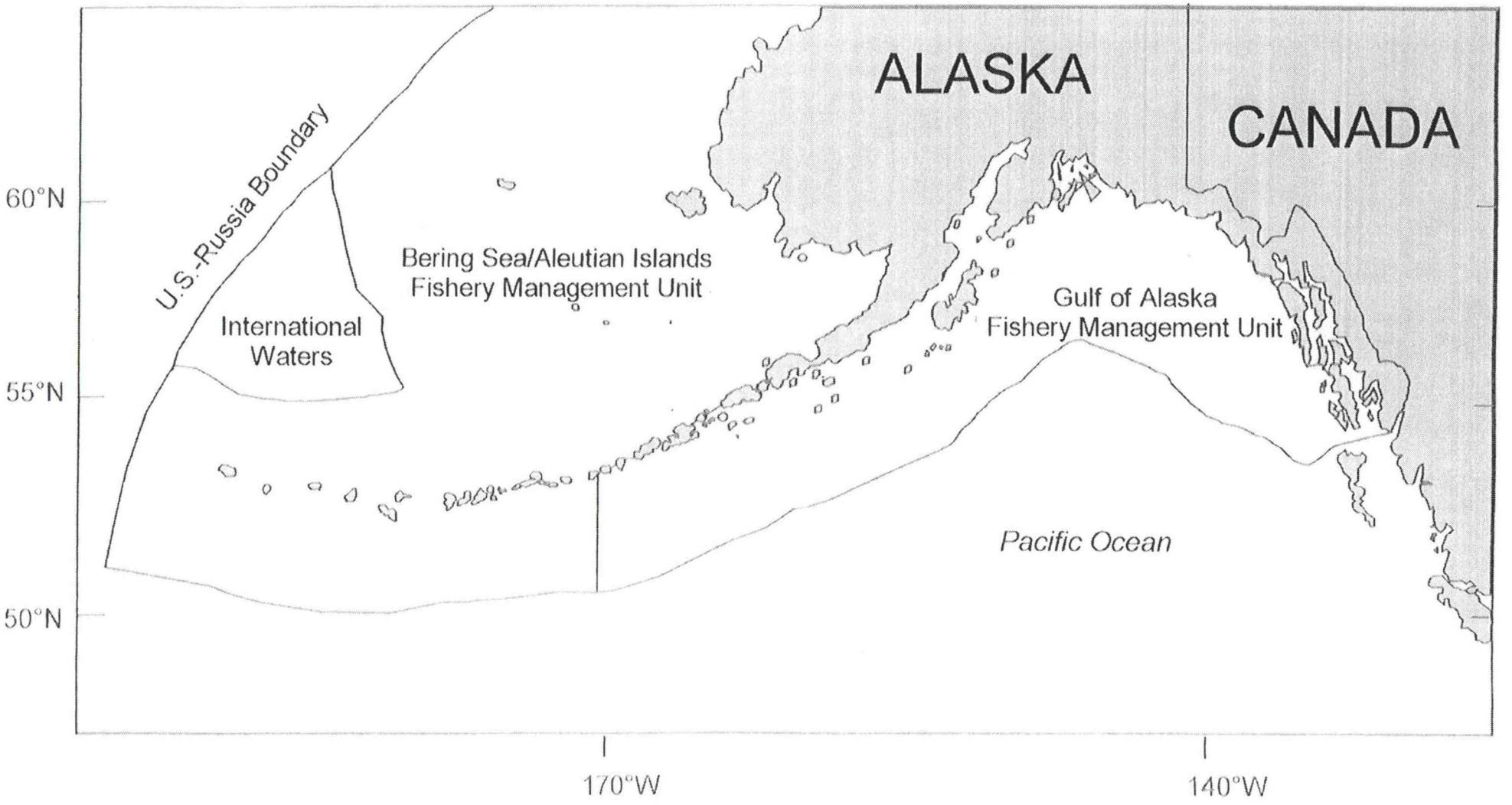

Figure 1. Fishery management units studied in the SEIS -- the Bering Sea and Aleutian Islands region and the Gulf of Alaska.

TABLE 1 SUMMARY OF ENVIRONMENTAL CONSEQUENCES

ALTERNATIVE 1 (NO ACTION) CONTINUE WITH EXISTING MANAGEMENT POLICY	ALTERNATIVE 2.1 LOW & SLOW HARVESTING STRATEGY- INCREASED PROTECTION TO MARINE MAMMALS AND SEABIRDS	ALTERNATIVE 2.2 SHORT-BURST HARVESTING STRATEGY- INCREASED PROTECTION TO MARINE MAMMALS AND SEABIRDS	ALTERNATIVE 3 INCREASED PROTECTION TO TARGET GROUNDFISH SPECIES	ALTERNATIVE 4.1 AGGREGATE TAC INCREASED PROTECTION TO NON-TARGET AND FORAGE SPECIES	ALTERNATIVE 4.2 RARE SPECIES TAC INCREASED PROTECTION TO NON-TARGET AND FORAGE SPECIES	ALTERNATIVE 5 INCREASED PROTECTION TO HABITAT	ALTERNATIVE 6.1 INCREASE IN LONG-TERM SOCIOECONOMIC BENEFITS	ALTERNATIVE 6.2 INCREASE IN SHORT-TERM SOCIOECONOMIC BENEFITS
DESCRIPTION OF ALTERNATIVES								
Alternative 1 represents the management regime currently in place in the year 2000. This alternative maintains the existing fishery management plan (FMP) constraints designed to meet a variety of objectives. Model simulations under Alternative 1(and for the other Alternatives) are generated by computing the year 2000 fishing mortality rate, assuming that recruitments of new fish into the fishery in 1998 and 1999 are equal to the values given in the 1999 Stock Assessment and Fishery Evaluation (SAFE) report, and assuming that 2000 catch will equal the actual 2000 total allowable catch (TAC). The fishing mortality rate in each year beyond 2000 was set equal to the minimum of the following two rates: 1) the recommended 2000 fishing mortality rate and 2) the maximum allowable harvest rate of all species (F_{ABC}) in that year.	The policy objective of the Alternative 2 model regime is to emphasize protection of marine mammals and seabirds by reducing potential adverse impacts of groundfish harvesting, including direct take, competition for prey, disturbance, and degradation of habitat. Alternative 2.1 is premised on fisheries removing only limited amounts of prey per day, over long periods, so that daily removals are low enough such that it is unlikely to result in localized depletion of fish stocks. The pace of fishing is kept slow over prolonged periods, hence the "low and slow" approach (Section 4.1.1 of the SEIS). Alternative 2.1 also incorporates a system of enlarged fishery exclusion zones to provide complete partitioning between foraging areas used by Steller sea lions and commercial fisheries.	The policy objective of the Alternative 2 model regime is to emphasize protection of marine mammals and seabirds by reducing potential adverse impacts of groundfish harvesting which may include direct take, competition for prey, disturbance, and degradation of habitat. The "short burst" management approach of Alternative 2.2 would limit the number of instances where Steller sea lions would interact with the fisheries by tailoring fisheries removals in accordance with Steller sea lion foraging behavior. Instead of creating long periods of limited fishery removals, as in Alternative 2.1, this alternative begins with lower TACs which are distributed in four short periods of fishing effort. The rationale for beginning with lower TACs is based specifically on limiting the intensity and duration of a few, temporally-spaced fishing pulses. Each season is kept very short to minimize the extent to which Steller sea lions would encounter fisheries activities during individual or consecutive foraging excursions.	The policy emphasis of Alternative 3 is to prevent overfishing, maintain healthy stocks, and rebuild depressed stocks of target species, while maximizing yield from the groundfish fishery on a sustainable basis. The specific management tools implemented for Alternative 3 are TAC setting, time-area closures, and gear restrictions.	The policy emphasis of Alternative 4.1 is to prevent overfishing, maintain healthy stocks, and rebuild depressed stocks of non-target species while providing for sustainable groundfish fisheries. A method for prioritizing management actions is introduced. This method calls for consideration of the sensitivity of the organism to exploitation, the spatial distribution of bycatch, and the ability to monitor catch. In situations where catch can be monitored and reliable biomass estimates for fish stocks are available, Alternative 4.1 designates acceptable biological catch (ABC) and total allowable catch (TAC) limits on species complexes. When catch or biomass cannot be estimated, Alternative 4.1 provides for area restrictions in regions of high bycatch.	The policy emphasis for Alternative 4.2 is to prevent overfishing, maintain healthy stocks, and rebuild depressed stocks of non-target species while providing for sustainable groundfish fisheries. Similar to Alternative 4.1, Alternative 4.2 uses a procedure for prioritizing management actions. This method requires consideration of the sensitivity of the organism to exploitation, the spatial distribution of bycatch, and the ability to monitor catch. In situations where catch can be monitored and reliable biomass estimates for fish stocks are available, Alternative 4.2 designates acceptable biological catch (ABC) and total allowable catch (TAC) limits based on the biomass of the least abundant stock within the species complexes. When catch or biomass cannot be estimated, Alternative 4.2 provides for area restrictions in regions of high bycatch.	The policy emphasis of the Alternative 5 model regime is to protect and restore essential fish habitat and accrue benefits to marine ecosystems, while providing for sustainable groundfish fisheries. Essential fish habitat (EFH) is defined in the Magnuson-Stevens Act as "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity."	The policy emphasis of Alternative 6.1 is to: • Increase the long-term net economic benefits from commercial groundfish fisheries to those who harvest and process groundfish, the associated fishing communities, and those who consume groundfish seafood products; • Prevent preemption of one sector or fishing community by another; and • Maintain or increase levels of protection for protected species, target species, non-target species, and their habitats.	The policy emphasis of Alternative 6.2 is to: • Increase the short-term net economic benefits from commercial groundfish fisheries to those who harvest and process groundfish, the associated fishing communities, and those who consume groundfish seafood products.
DESCRIPTION OF MANAGEMENT ACTION								
The primary management measures for Alternative 1 are the current FMP regimes for the Bering Sea/Aleutians Islands and the Gulf of Alaska in their entirety, as specified in regulations effective January 2000, with the addition of major actions in the process of being implemented as of May 2000. These measures are described in detail in Chapter 2.7.	The primary management measures of the Alternative 2.1 regime include: • Temporal allocation of TAC for selected target species; • Spatial allocation of TAC for selected target species; • Designate closed areas in Steller sea lion critical habitat; • Reduce the TAC to account for foregone catch in the closed areas; • Require mandatory use of seabird scaring devices and gear handling protocols; • Prevent attraction of birds to vessels which discharge processing wastes and offal; • Reduce the incidental catch limit for short-tailed albatross; • Establish bycatch limits for seabirds; and • Employ every reasonable effort to ensure that birds brought aboard alive are released alive, and that wherever possible hooks are removed without jeopardizing the life of the bird.	The primary management measures of Alternative 2.2 include: • Develop TACs consistent with achieving the short season; • Distribute TAC spatially; • Establish season start and end dates and apply TACs to these periods; • Require use of seabird scaring devices and gear handling protocols; • Prevent attraction of birds to vessel discharges of processing wastes and offal; • Reduce the bycatch limit for short-tailed albatross; • Establish bycatch limits for seabirds; and • Make every reasonable effort to ensure that birds brought aboard alive are released alive and that, wherever possible, hooks are removed without jeopardizing the life of the bird.	The primary management measures of Alternative 3 include: • Formally incorporate uncertainty in biomass estimates into the harvest recommendation by estimating the coefficient of variation (CV) for each stock using survey data; • Set the lower bound of the 90 percent confidence interval for a log-normal distribution with this CV, and estimate a median of unity for each stock; the lower bound value is the specified fraction by which maximum harvest rate for all species (typically F_{abc}) is reduced in the projection model to accommodate survey imprecision; • Twenty percent time-area closures to protect fish habitat; • Twenty percent time-area closures to protect spawning habitat, if habitat closures do not overlap with spawning habitat; • Formal designation of a minimum stock size threshold (MSST); • Gear modification to adjust the age at 50 percent selectivity to the age at 50 percent maturity, plus one year; adjustments are only made to the ascending limb of the selectivity curve; • Removal of bycatch limits for prohibited species; and • Removal of optimum yield (OY) caps.	The primary management measures of Alternative 4.1 include: • Area restrictions are imposed on the Eastern Bering Sea pollock fishery to reduce the bycatch of squid; and • An aggregate TAC is imposed on the skate complex in the BSAI and the grenadier complex in the GOA.	The primary management measures of Alternative 4.2 include: • Area restrictions are imposed on the Eastern Bering Sea pollock fishery to reduce the bycatch of squid; and • An ABC and TAC are imposed on the skate complex in the BSAI and the grenadier complex in the GOA with ABC limits based on the biomass of the least abundant stock of the species complex.	The primary management measures of Alternative 5 include: • Area restrictions on the bottom trawl fisheries were imposed to reduce impacts to benthic habitat; • The TAC is reduced for species taken with bottom trawl gear; • Specific areas are closed to all fishing for protection of gorgonian coral; and • Where possible, bottom trawl fisheries were shifted to pelagic trawl or fixed gear.	The primary management measures of the Alternative 6.1 regime include: • Imposition of rights based management programs; • Elimination of the vessel incentive program; and • Elimination of the improved retention and utilization program.	The primary management measures of the Alternative 6.2 regime include: • The TAC is set at a level equal to the over-fishing level (fishing mortality rate is less than the maximum sustainable yield); • The prohibited species catch limits are eliminated; and • The OY caps are eliminated in both the BSAI and GOA.

TABLE 1 SUMMARY OF ENVIRONMENTAL CONSEQUENCES

ALTERNATIVE 1 (NO ACTION) CONTINUE WITH EXISTING MANAGEMENT POLICY	ALTERNATIVE 2.1 LOW & SLOW HARVESTING STRATEGY- INCREASED PROTECTION TO MARINE MAMMALS AND SEABIRDS	ALTERNATIVE 2.2 SHORT-BURST HARVESTING STRATEGY- INCREASED PROTECTION TO MARINE MAMMALS AND SEABIRDS	ALTERNATIVE 3 INCREASED PROTECTION TO TARGET GROUNDFISH SPECIES	ALTERNATIVE 4.1 AGGREGATE TAC INCREASED PROTECTION TO NON-TARGET AND FORAGE SPECIES	ALTERNATIVE 4.2 RARE SPECIES TAC INCREASED PROTECTION TO NON-TARGET AND FORAGE SPECIES	ALTERNATIVE 5 INCREASED PROTECTION TO HABITAT	ALTERNATIVE 6.1 INCREASE IN LONG-TERM SOCIOECONOMIC BENEFITS	ALTERNATIVE 6.2 INCREASE IN SHORT-TERM SOCIOECONOMIC BENEFITS
EFFECTS ON THE NATURAL ENVIRONMENT - MARINE MAMMALS								
Section 4.2 of the SEIS considers the impacts of alternatives on the following marine mammals or marine mammal complexes: Steller sea lions, northern fur seals, harbor seals, other pinnipeds, baleen whales toothed whales, and sea otters. Four main issues are examined: • Direct take of mammals in fisheries; • Harvest of prey species; • Spatial/temporal concentration of fisheries on prey; and • Disturbance of pinniped rookeries and haul-outs by vessels.								
Direct and indirect effects include: • No significant impacts on marine mammals due to direct take or marine debris; • Conditionally significant adverse impacts on the three primary pinniped species (Steller sea lions, northern fur seals, harbor seals) due to harvest of prey species; • Conditionally significant adverse impacts on the primary pinniped species are identified due to spatial/temporal concentration of the fishery; and • No significant impacts on marine mammals due to disturbance are identified. Cumulative effects are identified for prey availability and spatial/temporal removal of prey for Steller sea lion, northern fur seal, and harbor seal. These effects are conditionally significant adverse based primarily on competition for prey between these marine mammals and the groundfish fisheries, and past external factors.	Direct and indirect effects of Alternative 2.1 are similar to Alternative 1 for baleen whales, toothed whales, sea otters, and the "other" pinniped species group. Direct take is similar to Alternative 1 for Steller sea lions, northern fur seals, and harbor seals. The effects of Alternative 2.1 include: • Measurable reduction in the harvest of prey species consumed by Steller sea lions (greater than 20 percent), northern fur seals (5-20 percent), and harbor seals (5-20 percent); • Much less temporal and spatial compression of prey removals for Steller sea lions, and marginally less for harbor seals; and • Much less disturbance for Steller sea lions, and marginally less disturbance for northern fur seals and harbor seals. Cumulative effects for prey availability and spatial/temporal harvest of prey for Steller sea lions, northern fur seals, and harbor seals are rated as not significant.	Direct and indirect effects of Alternative 2.2 are similar to Alternative 1 for baleen whales, toothed whales, sea otters, and the "other" pinniped species group. Direct take is similar to Alternative 1 for the three primary pinnipeds (Steller sea lions, northern fur seals, and harbor seals). The effects of Alternative 2.2 include: • Measurable reduction in the harvest of prey species consumed by Steller sea lions (greater than 20 percent), northern fur seals (5-20 percent), and harbor seals (5-20 percent); • Much less temporal and spatial compression of prey removals for Steller sea lions, and marginally less for northern fur seals and harbor seals; and • Much less disturbance for Steller sea lions, and marginally less disturbance for northern fur seals. Cumulative effects for prey availability and spatial/temporal harvest of prey for Steller sea lions, northern fur seals, and harbor seals are rated as not significant.	Direct and indirect effects under Alternative 3 are similar to Alternative 1 for baleen whales, toothed whales, sea otters, and the "other" pinniped species group. Direct take is similar to Alternative 1 for the three primary pinnipeds (Steller sea lions, northern fur seals, and harbor seals). The effects of Alternative 3 include: • Measurable reduction in the harvest of prey species consumed by Steller sea lions (greater than 20 percent), northern fur seals (5 - 20 percent), and harbor seals (5 - 20 percent); • More temporal and spatial compression of prey removals for Steller sea lions and harbor seals; and • Less disturbance for Steller sea lions and northern fur seals. Cumulative effects for prey availability and spatial/temporal removal of prey for Steller sea lions, northern fur seals, and harbor seals are rated as conditionally significant adverse, based primarily on competition for prey between these marine mammals and the groundfish fisheries, and past external factors.	Under Alternative 4.1, direct and indirect effects are similar to Alternative 1 for baleen whales, toothed whales, sea otters, and the "other" pinniped species group. Direct take is similar to Alternative 1 for the three primary pinnipeds (Steller sea lions, northern fur seals, and harbor seals). The effects of Alternative 4.1 include: • Measurable reduction in the harvest of prey species consumed by Steller sea lions (5-20 percent), northern fur seals (5-20 percent), and harbor seals (5-20 percent); • Less temporal and spatial compression of prey removals for northern fur seals; and • Less disturbance for Steller sea lions and northern fur seals. Cumulative effects for prey availability and spatial/temporal removal of prey for Steller sea lions, northern fur seals, and harbor seals are rated conditionally significant adverse, based primarily on competition for prey between these marine mammals and the groundfish fisheries, and past external factors.	Under Alternative 4.2, direct and indirect effects are similar to Alternative 1 for baleen whales, toothed whales, sea otters, and the "other" pinniped species group. Direct take is similar to Alternative 1 for the three primary pinnipeds (Steller sea lions, northern fur seals, and harbor seals). The effects of Alternative 4.2 include: • Measurable reduction in the harvest of prey species consumed by Steller sea lions (5-20 percent), northern fur seals (5-20 percent), and harbor seals (5-20 percent); • Less temporal and spatial compression of prey removals for northern fur seals; and • Less disturbance for Steller sea lions and northern fur seals. Cumulative effects for prey availability and spatial/temporal removal of prey for Steller sea lions, northern fur seals, and harbor seals are rated conditionally significant adverse, based primarily on competition for prey between these marine mammals and the groundfish fisheries, and past external factors.	Direct and indirect effects under Alternative 5 are similar to Alternative 1 for baleen whales, toothed whales, sea otters, and the "other" pinniped species group. Under Alternative 5, direct take is similar to Alternative 1 for the three primary pinnipeds (Steller sea lion, northern fur seal, and harbor seal). The effects of Alternative 5 include: • Measurable reduction in the harvest of prey species consumed by Steller sea lions (5 -20 percent); • Less temporal and spatial compression of prey removals for Steller sea lion and harbor seal; and • Less disturbance for Steller sea lions and northern fur seals. Cumulative effects for prey availability and spatial/temporal removal of prey for Steller sea lion, northern fur seal and harbor seal are rated conditionally significant adverse based primarily on competition for prey between these marine mammals and the groundfish fisheries, and past external factors.	Under Alternative 6.1, direct and indirect effects are similar to Alternative 1 for Steller sea lions, northern fur seals, harbor seals, other pinnipeds, baleen whales, toothed whales, and sea otters. Direct take is similar to Alternative 1 for the three primary pinnipeds (Steller sea lions, northern fur seals, and harbor seals). The effects of Alternative 6.1 include: • No change in the harvest of prey species consumed by Steller sea lions, northern fur seals, and harbor seals; • No change in the temporal and spatial compression of prey removals for Steller sea lions, northern fur seals and harbor seals; and • No changes in disturbance for Steller sea lions, northern fur seals, and harbor seals. Cumulative effects for prey availability and spatial/temporal removal of prey for Steller sea lions, northern fur seals, and harbor seals are rated conditionally significant adverse, based primarily on competition for prey between these marine mammals and the groundfish fisheries, and past external factors.	Under Alternative 6.2 direct and indirect effects are similar to Alternative 1for baleen whales, toothed whales, sea otters, and the "other" pinniped species group. Direct take is similar to Alternative 1 for the three primary pinnipeds (Steller sea lions, northern fur seals, and harbor seals). The effects of Alternative 6.2 include: • Measurable increases in the harvest of prey species consumed by Steller sea lions (greater than 20 percent), northern fur seals (5 -20 percent), and harbor seals (5 -20 percent); • Much greater temporal and spatial compression of prey removals for Steller sea lions, and marginally greater temporal and spatial compression of prey removals for northern fur seals and harbor seals; and • No changes in disturbance for Steller sea lions, northern fur seals, and harbor seals. Cumulative effects for prey availability and spatial/temporal removal of prey for Steller sea lions, northern fur seals, and harbor seals are rated conditionally significant adverse, based primarily on competition for prey between these marine mammals and the groundfish fisheries, and past external factors.
EFFECTS ON THE NATURAL ENVIRONMENT - SEA BIRDS								
Section 4.3 of the SEIS considers the impacts of alternatives on the following seabirds or seabird complexes: northern fulmars, short-tailed albatross, other albatross and shearwaters, piscivorous (fish-eating) seabirds, eiders, and other seabirds. Four main issues were examined: • Direct take of seabirds by fishing activity; • Harvest of prey species; • Disturbance of benthic habitat; and • Discharge of processing waste and offal.								
Under Alternative 1, there is a conditionally significant adverse effect on short-tailed albatross due to direct take. The effects on piscivorous seabirds are unknown due to uncertainties about fishery effects on non-target species of squid and forage fish. No significant impacts on seabirds are identified for disturbance of benthic habitat or the discharge of processing waste and offal. A cumulative effect identified for take of the endangered short-tailed albatross is found to be conditionally significant	The effects of Alternative 2.1 include: • Decreased direct take of short-tailed albatross and three seabird groups; • Increased prey availability for piscivorous seabirds and three seabird groups; • Reduction in impacts to eider benthic habitats; and • Substantially reduced availability of processing wastes for three species of seabirds.	The effects of Alternative 2.2 include: • Direct take decreases for short-tailed albatross and three other bird groups; • Prey availability for piscivorous seabirds and three other bird groups is increased; • Impact is reduced for benthic habitat used by eiders; and • The availability of processing wastes that attract seabirds is substantially reduced for three species.	The effects of Alternative 3 include: • Direct take of most species remain unchanged from Alternative 1; • Takes are slightly reduced for northern fulmars in the BSAI, and slightly increased for northern fulmars in the GOA; • Prey availability remains unchanged from Alternative 1 for all groups; • Impact is reduced for benthic habitat used by eiders; and • The availability of processing wastes that attract seabirds is reduced for three species.	The effects of Alternative 4.1 include: • Direct takes of most species remains unchanged from Alternative 1; • Take is slightly reduced for northern fulmars in the BSAI, and slightly increased for northern fulmars in the GOA; • Prey availability is improved and the discharge of processing waste and offal are reduced for three of the six species; and • No change in impacts to eider benthic habitat is expected, relative to Alternative 1.	The effects of Alternative 4.2 include: • Direct take of most species remains unchanged from Alternative 1; • Take is much reduced for northern fulmars in the BSAI, and slightly increased for northern fulmars in the GOA; • Prey availability is improved and the discharge of processing waste and offal are reduced for three of the six species; and • No change in impacts to eider benthic habitat is expected, relative to Alternative 1.	The effects of Alternative 5 include: • Direct takes of northern fulmar increase slightly in both the BSAI and GOA; • Take is slightly reduced for piscivorous seabirds under this alternative; • Prey availability and attraction to processing waste and offal are unchanged relative to Alternative 1 for all six seabird species; and • Substantially reduced impact to eider benthic habitat is expected.	The effects of Alternative 6.1 include: • Direct take of northern fulmar is reduced slightly in the BSAI and increased substantially in the GOA; • Take is slightly increased for piscivorous seabirds; • Prey availability is slightly increased for the "other" albatross and shearwater group; and • No change in impacts to eider benthic habitats.	The effects of Alternative 6.2 include: • Direct take of northern fulmar is increased slightly in the BSAI and increased substantially in the GOA; • Take is increased substantially for piscivorous seabirds; and • Prey availability is unchanged from Alternative 1 for all species, but attraction to processing waste and offal is increased minimally for three of the six seabird groups.

Table 1 Summary of Environmental Consequences

Alternative 1 (No Action) Continue with Existing Management Policy	Alternative 2.1 Low & Slow Harvesting Strategy- Increased Protection to Marine Mammals and Seabirds	Alternative 2.2 Short-Burst Harvesting Strategy- Increased Protection to Marine Mammals and Seabirds	Alternative 3 Increased Protection to Target Groundfish Species	Alternative 4.1 Aggregate TAC Increased Protection to Non-Target and Forage Species	Alternative 4.2 Rare Species TAC Increased Protection to Non-Target and Forage Species	Alternative 5 Increased Protection to Habitat	Alternative 6.1 Increase in Long-Term Socioeconomic Benefits	Alternative 6.2 Increase in Short-Term Socioeconomic Benefits
Effects on the Natural Environment - Sea Birds (continued)								
adverse primarily from past external factors of commercial harvest on their breeding grounds. The contribution to this effect from groundfish fisheries is very small.	A conditionally significant adverse cumulative effect is identified for take of the endangered short-tailed albatross, primarily from past external factors of commercial harvest on their breeding grounds. The contribution of groundfish fisheries to this effect is very small.	A conditionally significant adverse cumulative effect is identified for take of the endangered short-tailed albatross, primarily due to past external factors of commercial harvest on their breeding grounds. The contribution of groundfish fisheries to this effect is very small.	A conditionally significant adverse cumulative effect is identified for take of the endangered short-tailed albatross, primarily due to past external factors of commercial harvest on their breeding grounds. The contribution of groundfish fisheries to this effect is very small.	A conditionally significant adverse cumulative effect is identified for take of the endangered short-tailed albatross, primarily due to past external factors of commercial harvest on their breeding grounds. The contribution of groundfish fisheries to this effect is very small.	A conditionally significant adverse cumulative effect is identified for take of the endangered short-tailed albatross, primarily due to past external factors of commercial harvest on their breeding grounds. The contribution of groundfish fisheries to this effect is very small.	A cumulative effect is identified for take of the endangered short-tailed albatross and found to be conditionally significant adverse primarily from past external factors of commercial harvest on their breeding grounds. Contribution to this effect from groundfish fisheries is very small.	A conditionally significant adverse cumulative effect is identified for take of the endangered short-tailed albatross, primarily due to past external factors of commercial harvest on their breeding grounds. The contribution of groundfish fisheries to this effect is very small.	A conditionally significant adverse cumulative effect is identified for take of the endangered short-tailed albatross, primarily due to past external factors of commercial harvest on their breeding grounds. The contribution of groundfish fisheries to this effect is very small.
Effects on the Natural Environment - Target Species								
Thirty-two target species groups (i.e., stocks or stock complexes) are analyzed in Section 4.4 of the SEIS.								
No significant impacts on target species due to fishing mortality are expected for thirty-one target species groups, and the significance of Alternative 1 on GOA Atka mackerel is unknown. For seventeen target species groups, Alternative 1 is not expected to have significant adverse or beneficial effects resulting from spatial/temporal concentration, changes in prey availability, or habitat suitability. Of the remaining fifteen groups, the significance of Alternative 1 on spatial/temporal concentration, prey availability, and habitat suitability is unknown (Section 4.4.7 of the SEIS). Cumulative effects identified for habitat suitability and prey availability for Pacific ocean perch are rated as conditionally significant adverse for the GOA stock because it is presently at the minimum stock size threshold (MSST). Any negative effects from external factors could jeopardize the ability of the stock to sustain itself.	With few exceptions, Alternative 2.1 does not substantially change the mean fishing mortality rate of target species groups. Eighteen stocks of target species (56 percent) are expected to be within +/- 10 percent of Alternative 1, with respect to direct take expressed as mean fishing mortality. The twelve remaining target species stocks are expected to benefit from reduced fishing mortality under Alternative 2.1 (Table 2). The impacts are unknown for two stocks of target species. The spatial/temporal concentration of the catch under Alternative 2.1 is expected to be similar to Alternative 1 for 50 percent of the target species groups (Table 2). Six target species groups are expected to benefit from reduced levels of spatial/temporal concentration of the catch, while detrimental effects are expected for one stock. The impact of Alternative 2.1 on the spatial/temporal concentration of the catch is unknown for seven stocks. Alternative 2.1 is expected to result in a similar level of prey availability for 53 percent of the target species groups (Table 2). Beneficial effects are expected for two groups, while detrimental effects are expected for three groups. The impact of Alternative 2.1 on prey availability is unknown for ten stocks of target species. Alternative 2.1 is expected to result in the same level of habitat suitability as Alternative 1 for 50 percent of the target species groups (Table 2). A beneficial effect to habitat suitability is expected for the remaining fifteen target species groups. The direction of change under Alternative 2.1 is unknown for one target species group. No significant cumulative effects due to direct take are expected for target species under Alternative 2.1. No significant cumulative effects due to changes in the spatial/temporal distribution of catch are expected for 80 percent of the groundfish stocks.	Fishing mortality under Alternative 2.2 is expected to be more than 10 percent lower for nineteen target species groups (59 percent). Fishing mortality levels are expected to be similar to Alternative 1 for eleven target species groups (34 percent). The expected direction of change in fishing mortality is unknown for GOA Atka mackerel and GOA Pacific ocean perch. The level of spatial/temporal concentration of the fishery is expected to be similar to Alternative 1 for the majority of target species groups (59 percent). A notable decrease is expected for two groups, and a marginal increase in spatial/temporal concentration is expected for four groups. The direction of change in spatial/temporal concentration of the fishery is unknown for seven groups. Alternative 2.2 is not expected to impact target species prey availability for 47 percent of the target species groups. Exceptions include piscivorous seabird species where a build-up of adult biomass may lead to reduced abundance of juvenile fish. A reduction in prey availability is expected for three groups (9 percent), and an increase in prey availability is expected for two groups. The effect of Alternative 2.2 on prey availability is unknown for twelve target species groups (38 percent). For 67 percent of target species groups, habitat suitability under Alternative 2.2 is similar to Alternative 1. In the remaining groups, the level of habitat suitability is expected to increase. Conditionally significant adverse cumulative effects are identified for habitat suitability and prey availability for Pacific ocean perch for the GOA stock because it is presently at the minimum stock size threshold. Any negative effects from external factors could jeopardize the ability of the stock to sustain itself.	Under Alternative 3 fishing mortality is reduced more than 10 percent for sixteen of the target groundfish stocks (50 percent). Reduced fishing mortality results from a combination of management tools including the uncertainty correction and, in some cases, the shift in selectivity. A greater than 10 percent increase in fishing mortality is expected for nine of the target species groups (28 percent). For eight flatfish species groups, the increase in fishing mortality resulted from the removal of prohibited species bycatch caps. The expected direction of change in fishing mortality is unknown for one stock. Relative to all other alternatives, habitat suitability is expected to increase for 66 percent of the target species groups. Compared with other alternatives, Alternative 3 has the highest percentage of stocks showing increased habitat suitability. Improved habitat suitability is expected because Alternative 3 imposes spawning and habitat closures for all target species. Under Alternative 3, the level of spatial/temporal concentration of the fishery and the level of prey availability is expected to be similar to Alternative 1 for a majority of stocks. Fifty-three percent of the target species groups are expected to exhibit similar levels of spatial/temporal concentration of the fishery. Prey availability levels are expected to be similar to Alternative 1 for 66 percent of the target species groups. The direction of change in prey availability is unknown for twelve target species groups. A cumulative effect is identified for sablefish and is considered conditionally significant beneficial for habitat, based on a 20 percent increase in protection for sablefish habitat under Alternative 3.	Under Alternative 4.1 fishing mortality is reduced by more than 10 percent for two of the target groundfish stocks (6 percent). For a majority of target species stocks (28 stocks, 88 percent of target species), the change in fishing mortality under Alternative 4.1 is within +/- 10 percent of the Alternative 1 level. For the majority of target species groups (94 percent), this alternative is not expected to change levels of habitat disturbance. Prey availability (72 percent) and spatial/temporal concentration of the fishery (94 percent) are similar to Alternative 1 for a majority of the target species stocks. Cumulative effects are identified for habitat suitability and prey availability for Pacific ocean perch. These effects are rated as conditionally significant adverse for the GOA stock because it is presently at the minimum stock size threshold. Any negative effects from external factors could jeopardize the ability of the stock to sustain itself.	Under Alternative 4.2, fishing mortality is reduced by more than 10 percent for three of the target groundfish stocks (9 percent). For the majority of target species stocks (27 stocks, 84 percent of target species) the change in fishing mortality under Alternative 4.2 is within +/- 10 percent of the Alternative 1 level. For 94 percent of the target species groups, this alternative is not expected to change the levels of habitat disturbance. The expected level of prey availability and spatial/temporal concentration of the fishery is similar to Alternative 1 for a majority of the target species stocks. Cumulative effects are identified for habitat suitability and prey availability for Pacific ocean perch. These effects are rated as conditionally significant adverse for the GOA stock because it is presently at the minimum stock size threshold . Any negative effects from external factors could jeopardize the ability of the stock to sustain itself.	Reductions in fishing mortality in excess of 10 percent are expected for 14 (44 percent) of the target groundfish stocks. Fishing mortality is expected to be within +/- 10 percent of the Alternative 1 level for 14 additional stocks. For the majority (63 percent) of target species groups this alternative is expected to reduce the level of habitat disturbance. The expected level of prey availability and spatial/temporal concentration of the fishery is expected to be similar to Alternative 1 for a majority of stocks. Cumulative effects are identified for habitat suitability and prey availability for Pacific ocean perch are rated as conditionally significant adverse for the GOA stock because it is presently at the sustainability threshold (MSST). Any negative effects from external factors could jeopardize the ability of the stock to sustain itself.	For eighteen target species stocks (56 percent) the change in fishing mortality under Alternative 6.1 is expected to be within +/- 10 percent of the Alternative 1 level. For the majority of target species groups, Alternative 6.1 is not expected to change levels of habitat disturbance and prey availability. A rights-based fisheries management regime is expected to have similar levels of spatial/temporal concentration of the fishery for a majority (56 percent) of the target species groups. However, this alternative is expected to reduce spatial/ temporal concentration of the fishery for seven of the target species groups (25 percent). Cumulative effects are identified for habitat suitability and prey availability for Pacific ocean perch. These effects are rated as conditionally significant adverse for the GOA stock because it is presently at the minimum stock size threshold. Any negative effects from external factors could jeopardize the ability of the stock to sustain itself.	Under Alternative 6.2, the fishing mortality rate is expected to increase by more than 10 percent for twenty-two (69 percent) of the target species stocks. For the majority of target species groups, Alternative 6.2 is not expected to change levels of spatial/temporal concentration of the fishery and prey availability. A rights-based fisheries management regime is expected to have levels of habitat disruption similar to Alternative 1 for 75 percent of the target species groups. However, this alternative is expected to increase habitat disruption in six of the target species groups (19 percent). Cumulative effects are identified for habitat suitability and prey availability for Pacific ocean perch. These effects are rated as conditionally significant adverse for the GOA stock because it is presently minimum stock size threshold. Any negative effects from external factors could jeopardize the ability of the stock to sustain itself. A cumulative effect identified for Pacific cod is considered conditionally significant adverse for fish mortality since the stock would be approaching the overfishing level (OFL).

TABLE 1 SUMMARY OF ENVIRONMENTAL CONSEQUENCES

ALTERNATIVE 1 (NO ACTION) CONTINUE WITH EXISTING MANAGEMENT POLICY	ALTERNATIVE 2.1 LOW & SLOW HARVESTING STRATEGY- INCREASED PROTECTION TO MARINE MAMMALS AND SEABIRDS	ALTERNATIVE 2.2 SHORT-BURST HARVESTING STRATEGY- INCREASED PROTECTION TO MARINE MAMMALS AND SEABIRDS	ALTERNATIVE 3 INCREASED PROTECTION TO TARGET GROUNDFISH SPECIES	ALTERNATIVE 4.1 AGGREGATE TAC INCREASED PROTECTION TO NON-TARGET AND FORAGE SPECIES	ALTERNATIVE 4.2 RARE SPECIES TAC INCREASED PROTECTION TO NON-TARGET AND FORAGE SPECIES	ALTERNATIVE 5 INCREASED PROTECTION TO HABITAT	ALTERNATIVE 6.1 INCREASE IN LONG-TERM SOCIOECONOMIC BENEFITS	ALTERNATIVE 6.2 INCREASE IN SHORT-TERM SOCIOECONOMIC BENEFITS
EFFECTS ON THE NATURAL ENVIRONMENT - TARGET SPECIES (CONTINUED)								
	Cumulative impacts on spatial/temporal concentrations of target species are unknown for the remaining 20 percent of the stocks. No significant cumulative effects are expected for 56 percent of the stocks, and the cumulative effects are unknown for 44 percent of the target species stocks. A significant cumulative effect due to habitat suitability is expected for GOA Pacific ocean perch. No significant cumulative effects due to habitat suitability are expected for 60 percent of the stocks, and cumulative effects are unknown for 36 percent of the target species stocks. Conditionally significant adverse cumulative effects are identified for habitat suitability and prey availability for Pacific ocean perch for the GOA stock because it is presently at the minimum stock size threshold. Any negative effects from external factors could jeopardize the ability of the stock to sustain itself.							
EFFECTS ON THE NATURAL ENVIRONMENT - NON-TARGET SPECIES								
Section 4.5 of the SEIS analyzed twenty-seven species or species complexes. The primary issue examined was the direct effect of fishing mortality on non-target species.								
Conditionally significant adverse impact on the skate complex in the BSAI, and the grenadier complex in the GOA is expected due to direct take. Impact on the GOA skate complex, the BSAI grenadier complex, and the BSAI and GOA squid complex are unknown. Cumulative effects of bycatch on the skate complex in the Eastern Bering Sea/Aleutian Islands and the grenadier complex in the Gulf of Alaska are identified as conditionally significant adverse since they are managed collectively and have no bycatch limits or catch reporting requirements. External factors, when added to the effects of current non-management, could mask declines in individual species and therefore lead to overfishing.	The catch of non-target species under Alternative 2.1 is expected to decrease by more than 10 percent for eighteen non-target species groups (Table 2). Catch levels for the nine remaining non-target species groups are expected to fall between +/- 10 percent under Alternative 2.1, an effect similar to Alternative 1. The cumulative effects of bycatch on the skate complex in the Eastern Bering Sea/Aleutian Islands and the grenadier complex in the Gulf of Alaska are identified as conditionally significant adverse since they are managed collectively and have no bycatch limits or catch reporting requirements. External factors, when added to the effects of current non-management, could mask declines in individual non-target species and potentially lead to overfishing.	Under Alternative 2.2, the bycatch of non-target species is expected to decline for 85 percent of the non-target species groups. These declines result from TAC reductions in high volume groundfish fisheries. Cumulative effects of bycatch on the skate complex in the Eastern Bering Sea/Aleutian Islands and the grenadier complex in the Gulf of Alaska are conditionally significant adverse since they are managed collectively and have no bycatch limits or catch reporting requirements. External factors, when added to the effects of current non-management, could mask declines in individual non-target species and potentially lead to overfishing.	Alternative 3 is expected to have a minor impact (+/- 10 percent of Alternative 1) on the catch of non-target species for 63 percent of the non-target groups. Cumulative effects of bycatch on the skate complex in the Eastern Bering Sea/Aleutian Islands and the grenadier complex in the Gulf of Alaska are conditionally significant adverse since they are managed collectively, and have no bycatch limits or catch reporting requirements. External factors, when added to the effects of current non-management, could mask declines in individual species and potentially lead to overfishing.	The catch of the majority of non-target species groups (85 percent) is expected to be within +/- 10 percent of Alternative 1. Cumulative effects of bycatch on the skate complex in the Eastern Bering Sea/Aleutian Islands and the grenadier complex in the Gulf of Alaska are identified as conditionally significant adverse, since they are managed collectively and have no bycatch limits or catch reporting requirements. External factors, when added to the effects of current non-management, could mask declines in individual species and potentially lead to overfishing.	The catch of the majority of non-target species groups (74 percent) is expected to be within +/- 10 percent of Alternative 1. Cumulative effects of bycatch on the skate complex in the Eastern Bering Sea/Aleutian Islands and the grenadier complex in the Gulf of Alaska are identified as conditionally significant adverse, since they are managed collectively and have no bycatch limits or catch reporting requirements. External factors, when added to the effects of current non-management, could mask declines in individual species and potentially lead to overfishing.	Under Alternative 5, the catch of 52 percent of non-target species groups is expected to be within +/- 10 percent of Alternative 1. Cumulative effects of bycatch on the skate complex in the eastern Bering Sea/Aleutian Islands and the grenadier complex in the Gulf of Alaska are identified as conditionally significant adverse, since they are managed collectively and have no bycatch limits or catch reporting requirements. External factors, when added to the effects of current non-management, could mask declines in individual species and potentially lead to overfishing.	Under Alternative 6.1 bycatch of non-target species is reduced by greater than +/- 10 percent of Alternative 1 for 67 percent of the non-target species groups. Cumulative effects of bycatch on the skate complex in the eastern Bering Sea/Aleutian Islands and the grenadier complex in the Gulf of Alaska are identified as conditionally significant adverse, since they are managed collectively and have no bycatch limits or catch reporting requirements. External factors, when added to the effects of current non-management, could mask declines in individual species and potentially lead to overfishing.	Under Alternative 6.2 bycatch is expected to increase by more than 10 percent for 96 percent of the non-target species groups. Cumulative effects of bycatch on the skate complex in the eastern Bering Sea/Aleutian Islands and the grenadier complex in the Gulf of Alaska are identified as conditionally significant adverse since they are managed collectively and have no bycatch limits or catch reporting requirements. External factors, when added to the effects of current non-management, could mask declines in individual species and potentially lead to overfishing.

TABLE 1 SUMMARY OF ENVIRONMENTAL CONSEQUENCES

ALTERNATIVE 1 (NO ACTION) CONTINUE WITH EXISTING MANAGEMENT POLICY	ALTERNATIVE 2.1 LOW & SLOW HARVESTING STRATEGY- INCREASED PROTECTION TO MARINE MAMMALS AND SEABIRDS	ALTERNATIVE 2.2 SHORT-BURST HARVESTING STRATEGY- INCREASED PROTECTION TO MARINE MAMMALS AND SEABIRDS	ALTERNATIVE 3 INCREASED PROTECTION TO TARGET GROUNDFISH SPECIES	ALTERNATIVE 4.1 AGGREGATE TAC INCREASED PROTECTION TO NON-TARGET AND FORAGE SPECIES	ALTERNATIVE 4.2 RARE SPECIES TAC INCREASED PROTECTION TO NON-TARGET AND FORAGE SPECIES	ALTERNATIVE 5 INCREASED PROTECTION TO HABITAT	ALTERNATIVE 6.1 INCREASE IN LONG-TERM SOCIOECONOMIC BENEFITS	ALTERNATIVE 6.2 INCREASE IN SHORT-TERM SOCIOECONOMIC BENEFITS
EFFECTS ON THE NATURAL ENVIRONMENT - PROHIBITED SPECIES								
Section 4.6 of the SEIS analyzed fourteen prohibited species groups including: eight crab or species complexes; four salmon species or species complexes; Pacific herring; and Pacific halibut.								
No significant impact is expected on Pacific herring or Pacific halibut. Conditionally significant adverse impacts are expected on BSAI chinook salmon and other BSAI salmon due to bycatch in groundfish target fisheries. The impact on GOA chinook salmon is unknown. No significant impact, or unknown impact, is identified for BSAI and GOA crabs. Conditionally significant adverse cumulative effects are identified for bycatch of chinook salmon and other salmon in the BSAI; effects on other species are unknown.	Under Alternative 2.1, the catch of prohibited species is reduced by more than 10 percent for nine groups (67 percent), and will fall within +/- 10 percent of Alternative 1 levels for five prohibited species groups (Table 2). With respect to the spatial/temporal concentration of bycatch, Alternative 2.1 is expected to result in the same level of concentration as observed under Alternative 1 for 64 percent of the prohibited species (nine groups); beneficial effects are anticipated for the remaining stocks (Table 2). Under Alternative 2.1, fifty percent of prohibited species (7 groups) will experience levels of habitat disruption that are similar to the levels experienced under Alternative 1. The impact of Alternative 2.1 on habitat disruption is unknown for six of the crab species groups (43 percent). Expected impacts of Alternative 2.1 on prey competition include a substantial reduction for two groups, a marginal reduction for three groups, and the same level of prey competition as Alternative 1 for nine groups. No cumulative effects were identified for prohibited species, with the exception of salmon. The potential for significance of cumulative effects of spatial and temporal concentration of bycatch, spawning habitat disruption, and prey competition on BSAI and GOA other salmon stocks are also unknown.	Reductions in catch are expected for 93 percent of the prohibited species groups. These reductions result from the sharp decreases in TAC for three high volume groundfish fisheries. Alternative 2.2 is expected to result in levels of habitat disruption, prey availability, and spatial/temporal concentration of the fishery similar to Alternative 1 for most species groups. However, the direction of change in spawning habitat disturbance is unknown for six of the crab species groups (43 percent). No cumulative effects were identified for prohibited species, with the exception of salmon. For all alternatives the potential for any cumulative effects due to chinook or other salmon bycatch in the BSAI or GOA is unknown due to lack of information. The significance of potential cumulative effects of spatial and temporal concentration of bycatch, spawning habitat disruption, and prey competition on BSAI and GOA other salmon stocks are also unknown.	Reductions in catch are expected for six (43 percent) of the prohibited species groups. These reductions result from reductions in catch of target groundfish fisheries. In the case of BSAI tanner crab, BSAI red king crab, GOA red king crab, and other BSAI tanner crab, a greater than 10 percent increase in prohibited species bycatch is expected under Alternative 3. The level of habitat disruption, prey availability, and spatial/temporal concentration of the catch is expected to be similar to Alternative 1 for a majority of the prohibited species groups. However, the direction of change in spawning habitat disturbance is unknown for six of the crab species groups (43 percent). No cumulative effects were identified for prohibited species, with the exception of salmon. For all alternatives the potential for any cumulative effects due to chinook or other salmon bycatch in the BSAI or GOA is unknown due to lack of information. The significance of potential cumulative effects of spatial and temporal concentration of bycatch, spawning habitat disruption, and prey competition on BSAI and GOA other salmon stocks are also unknown.	Prohibited species bycatch under Alternative 4.1 is similar to Alternative 1 for a majority of the groups. However, reductions in catch greater than 10 percent are expected for Pacific herring, BSAI chinook salmon, and BSAI other salmon. These changes in bycatch result from reductions in the eastern Bering Sea walleye pollock fishery. The level of habitat disruption, prey availability, and spatial/temporal concentration of the catch is similar to Alternative 1 for a majority of the prohibited species groups. However, the direction of change in spawning habitat disturbance is unknown for six of the crab species groups (43 percent). No cumulative effects were identified for prohibited species, with the exception of salmon. For all alternatives the potential for any cumulative effects due to chinook or other salmon bycatch in the BSAI or GOA is unknown due to lack of information. The significance of potential cumulative effects of spatial and temporal concentration of bycatch, spawning habitat disruption, and prey competition on BSAI and GOA other salmon stocks are also unknown.	Prohibited species bycatch under Alternative 4.2 is expected to be similar to Alternative 1 for a majority of the prohibited species groups (79 percent). However, reductions in catch greater than 10 percent are expected for Pacific herring, BSAI chinook salmon, and BSAI other salmon. These changes in bycatch result from reductions in the eastern Bering Sea walleye pollock fishery. The level of habitat disturbance, prey availability, and spatial/temporal concentration of the fishery is similar to Alternative 1 for a majority of prohibited species groups. However, the direction of change in spawning habitat disturbance is unknown for six of the crab species groups (43 percent). No cumulative effects were identified for prohibited species, with the exception of salmon. For all alternatives the potential for any cumulative effects due to chinook or other salmon bycatch in the BSAI or GOA is unknown due to lack of information. The significance of potential cumulative effects of spatial and temporal concentration of bycatch, spawning habitat disruption, and prey competition on BSAI and GOA other salmon stocks are also unknown.	Prohibited species bycatch under Alternative 5 is similar to Alternative 1 for 57 percent of the prohibited species groups. However, more than 10 percent increases in bycatch are projected for BSAI and GOA red king crab, other BSAI king crab, and GOA Tanner crab. These increases in bycatch result from concentration of fishing by pot gear where crab bycatch is high. Levels of spatial/temporal concentration of the fishery, prey availability, and habitat disturbance are similar to Alternative 1 for a majority of prohibited species groups. However, the direction of change in spawning habitat disturbance is unknown for six of the crab species groups (43 percent). No cumulative effects were identified for prohibited species, with the exception of salmon. For all alternatives the potential for any cumulative effects due to chinook or other salmon bycatch in the BSAI or GOA is unknown due to lack of information. The significance of potential cumulative effects of spatial and temporal concentration of bycatch, spawning habitat disruption, and prey competition on BSAI and GOA other salmon stocks are also unknown.	The catch of prohibited species groups under Alternative 6.1 is reduced by more than 10 percent for half of the prohibited species groups. Of the remaining stocks, bycatch is expected to be similar to Alternative 1 for 43 percent of the stocks. Levels of habitat disturbance, prey availability, and spatial/temporal concentration of the fishery are similar to Alternative 1 for a majority of prohibited species groups. None of the prohibited species groups are expected to experience higher levels of habitat disturbance, lower prey availability, or increased concentration of the fishery. However, the direction of change in spawning habitat disturbance is unknown for six of the crab species groups (43 percent). No cumulative effects were identified for prohibited species, with the exception of salmon. For all alternatives the potential for any cumulative effects due to chinook or other salmon bycatch in the BSAI or GOA is unknown due to lack of information. The significance of potential cumulative effects of spatial and temporal concentration of bycatch, spawning habitat disruption, and prey competition on BSAI and GOA other salmon stocks are also unknown.	The bycatch of prohibited species is expected to increase by more than 10 percent under Alternative 6.2 for all of the prohibited species groups. Levels of habitat disturbance, prey availability, and spatial/temporal concentration of the fishery are expected to be similar to Alternative 1 for a majority of prohibited species groups. None of the prohibited species groups are expected to experience lower levels of habitat disturbance, higher prey availability, or reduced concentration of the fishery. However, the direction of change in spawning habitat disturbance is unknown for six crab species groups (43 percent). No cumulative effects were identified for prohibited species, with the exception of salmon. For all alternatives the potential for any cumulative effects due to chinook or other salmon bycatch in the BSAI or GOA is unknown due to lack of information. The significance of potential cumulative effects of spatial and temporal concentration of bycatch, spawning habitat disruption, and prey competition on BSAI and GOA other salmon stocks are also unknown.
EFFECTS ON THE NATURAL ENVIRONMENT - HABITAT								
Section 4.7 of the SEIS analyzed four categories of biota in habitat areas of particular concern (HAPC): corals; anemones; sponges; and sea pens/whips. Three main issues were examined: • Destruction of HAPC by mobile gear and fixed-gear; • Potential for modification of non-living substrate by mobile and fixed gear; and • Benthic biodiversity improvements (measured by the amount of area closed to bottom trawling).								
Under Alternative 1, conditionally significant adverse impact to habitat complexity is expected due to bycatch of HAPC biota by bottom trawl gear and fixed gear. No significant impact is expected on non-living substrates. Conditionally significant adverse impact to benthic biodiversity is expected under Alternative 1. Cumulative effects are identified for damage to HAPC biota from trawl gear and from fixed gear. These effects are rated as conditionally significant adverse based on the direct effects of fishing and external factors that contribute	Reductions in the catch of biota in habitat areas of particular concern (HAPC) are expected under Alternative 2.1, along with reduction in the disturbance to non-living substrate attributable to the use of both mobile and fixed gear types. Benthic biodiversity impacts under Alternative 2.1 are unchanged from Alternative 1. Cumulative effects are identified for damage to HAPC biota from trawl gear and from fixed gear. These effects are rated as conditionally significant adverse based on the direct effects of fishing and external factors that contribute	Alternative 2.2 exhibits relatively large reductions in catches of some HAPC biota, particularly sea pens/whips. The modification of non-living substrate by fishing gear is predicted to decrease. Under Alternative 2.2, benthic biodiversity is unchanged from Alternative 1. Conditionally significant adverse cumulative effects are identified for damage to HAPC biota from trawl gear based on the direct effects of fishing and external factors that contribute incrementally adverse impacts to the HAPC. The cumulative effects of	Alternative 3 exhibits a mixed direction of change in the catches of some HAPC biota, depending on region and gear type. Adverse impacts on benthic biodiversity are minimized under this alternative due to the large areas which are protected from bottom trawling. Cumulative effects are identified for damage to HAPC biota from trawl gear and from fixed gear. These effects are rated as conditionally significant adverse based on the direct effects of fishing and external factors that contribute incrementally adverse impacts to the HAPC.	Alternative 4.1 produced no changes relative to Alternative 1 with respect to HAPC biota bycatch, non-living substrate modification, or benthic biodiversity. Cumulative effects are identified for damage to HAPC biota from trawl gear and from fixed gear. These effects are rated as conditionally significant adverse based on the direct effect of fishing, and external factors that contribute incrementally adverse impacts to the HAPC. The cumulative effects of Alternative 4.1 on benthic biodiversity are conditionally significant adverse	Alternative 4.2 produced some reduction in HAPC biota bycatch by fixed gear, and substantially reduced modification of non-living substrate by fixed gear relative to Alternative 1. Cumulative effects are identified for damage to HAPC biota from trawl gear and from fixed gear. These effects are rated as conditionally significant adverse based on the direct effect of fishing and external factors that contribute incrementally adverse impacts to the HAPC. The cumulative effects of Alternative 4.2 on benthic biodiversity are conditionally significant adverse	Under Alternative 5, the bycatch of HAPC biota by bottom trawl gear is predicted to substantially decrease, and the bycatch of HAPC biota by fixed gear is predicted to substantially increase. Similarly, substantial reduction in modification of non-living substrates by bottom trawl gear is predicted, along with substantial increases in modification of non-living substrates by fixed gear. Large improvements to benthic biodiversity are anticipated due to extensive area closures to bottom trawling under Alternative 5.	Alternative 6.1 predicts mixed changes in HAPC biota bycatch by bottom trawl gear, depending on the area and HAPC biota group. This alternative results in marginally higher removal/bycatch of HAPC biota by fixed gear, and marginally higher modification of non-living substrate by bottom trawl gear. Cumulative effects are identified for damage to HAPC biota from trawl gear and from fixed gear. These effects are rated as conditionally significant adverse based on the direct effect of fishing and external factors that contribute incrementally adverse impacts to the	Alternative 6.2 predicts a much higher bycatch of HAPC biota by bottom trawl gear, and marginally higher bycatch by fixed gear. Under Alternative 6.2 there is much greater modification of non-living substrate by bottom trawl and fixed gear, and no change in benthic biodiversity as measured by area closures. Cumulative effects are identified for damage to HAPC biota from trawl gear and from fixed gear. These effects are rated as conditionally significant adverse, based on the direct effect of fishing and external factors that

TABLE 1 SUMMARY OF ENVIRONMENTAL CONSEQUENCES

ALTERNATIVE 1 (NO ACTION) CONTINUE WITH EXISTING MANAGEMENT POLICY	ALTERNATIVE 2.1 LOW & SLOW HARVESTING STRATEGY- INCREASED PROTECTION TO MARINE MAMMALS AND SEABIRDS	ALTERNATIVE 2.2 SHORT-BURST HARVESTING STRATEGY- INCREASED PROTECTION TO MARINE MAMMALS AND SEABIRDS	ALTERNATIVE 3 INCREASED PROTECTION TO TARGET GROUNDFISH SPECIES	ALTERNATIVE 4.1 AGGREGATE TAC INCREASED PROTECTION TO NON-TARGET AND FORAGE SPECIES	ALTERNATIVE 4.2 RARE SPECIES TAC INCREASED PROTECTION TO NON-TARGET AND FORAGE SPECIES	ALTERNATIVE 5 INCREASED PROTECTION TO HABITAT	ALTERNATIVE 6.1 INCREASE IN LONG-TERM SOCIOECONOMIC BENEFITS	ALTERNATIVE 6.2 INCREASE IN SHORT-TERM SOCIOECONOMIC BENEFITS
EFFECTS ON THE NATURAL ENVIRONMENT - HABITAT (CONTINUED)								
incrementally adverse impacts to the HAPC. The cumulative effects of Alternative 1 on benthic biodiversity are conditionally significant adverse based on a lack of spatial distribution of fishing closures sufficient to protect a wide diversity of benthic habitat types.	incrementally adverse impacts to the HAPC. The cumulative effects of Alternative 2.1 on benthic biodiversity are conditionally significant adverse based on a lack of spatial distribution of fishing closures sufficient to protect a wide diversity of benthic habitat types.	Alternative 2.2 on benthic biodiversity are conditionally significant adverse based on a lack of spatial distribution of fishing closures sufficient to protect a wide diversity of benthic habitat types.		based on a lack of spatial distribution of fishing closures sufficient to protect a wide diversity of benthic habitat types.	based on a lack of spatial distribution of fishing closures sufficient to protect a wide diversity of benthic habitat types.	Cumulative effects are identified for damage to HAPC biota from fixed gear These effects are rated as conditionally significant adverse based on the direct effect of fishing, and external factors that contribute incrementally adverse impacts to the HAPC.	HAPC. The cumulative effects of Alternative 6.1 on benthic biodiversity are conditionally significant adverse, based on a lack of spatial distribution of fishing closures sufficient to protect a wide diversity of benthic habitat types.	contribute incrementally adverse impacts to the HAPC. The cumulative effects of Alternative 6.2 on benthic biodiversity are conditionally significant adverse based on a lack of spatial distribution of fishing closures sufficient to protect a wide diversity of benthic habitat types.
EFFECTS ON THE NATURAL ENVIRONMENT - ECOSYSTEM IMPACTS								
Section 4.9 of the SEIS analyzes the effects of the alternatives on the ecosystem using three general categories of issues: • Predator/prey relationships; • Energy flow and balance; and • Diversity.								
Under Alternative 1, significant beneficial impact on forage fish due to increased production is expected. Conditionally significant adverse impacts are expected due to the spatial/temporal concentration of fishery impact on forage species, the introduction of non-native species, and reductions in species diversity. No significant impact is identified for removal of top predators, energy flow and balance (total catch and discard), or functional diversity and genetic diversity. For ecosystem effects, pelagic forage fish availability is rated as a conditionally significant cumulative effect on pelagic forage, but could be beneficial or adverse (+/-) depending on largely unpredictable climatic trends. The spatial/temporal concentration of fisheries on forage species is rated as conditionally significant adverse due to an adverse external influence exerted by the herring fishery. This fishery reduces the availability of an important ecosystem forage component. Introduction of non-indigenous species is rated as conditionally significant adverse due to the potential effects on the food web. Cumulative effects on species diversity are conditionally significant adverse due to factors associated with the groundfish fishery, and external environmental factors that continue to exert both beneficial and adverse influences on the system.	Alternative 2.1 is expected to result in a marginal improvement in pelagic forage availability, species diversity, and genetic diversity. Substantial improvements are expected for the spatial/temporal concentration of fisheries on prey, introduction of non-native species, and energy flow and balance (total catch and discards). Alternative 2.1 is expected to result in effects that are similar to Alternative 1 for the removal of top predators and functional diversity. For ecosystem effects, pelagic forage fish availability is rated as a conditionally significant cumulative effect; it could be beneficial or adverse (+/-) depending on largely unpredictable climatic trends. The spatial/temporal concentration of fisheries on forage species is rated as conditionally significant adverse due to an adverse external influence exerted by the herring fishery. This fishery reduces the availability of an important ecosystem forage component. Introduction of non-indigenous species is rated as conditionally significant adverse due to the potential effects on the food web. Cumulative effects on species diversity are conditionally significant adverse due to factors associated with the groundfish fishery, and external environmental factors that continue to exert both beneficial and adverse influences on the system.	Alternative 2.2 is expected to result in a substantial improvement in pelagic forage availability, species diversity, and genetic diversity. Substantial improvements are expected for spatial/temporal concentration of fisheries on prey, introduction of non-native species, and energy flow and balance (total catch and discards). Alternative 2.2 is expected to result in effects similar to Alternative 1 for removal of top predators and functional diversity. For ecosystem effects, pelagic forage fish availability is rated as a conditionally significant cumulative effect; it could be beneficial or adverse (+/-), depending on largely unpredictable climatic trends. Spatial/temporal concentration of fisheries on forage species is rated as conditionally significant adverse due to an adverse external influence exerted by the herring fishery. This fishery reduces the availability of an important ecosystem forage component. Introduction of non-indigenous species is rated as conditionally significant adverse due to the potential effects on the food web. Cumulative effects on species diversity are conditionally significant adverse due to factors associated with the groundfish fishery and external environmental factors that continue to exert both beneficial and adverse influences on the system.	Alternative 3 provides some improvement in pelagic forage availability and genetic diversity. Substantial improvements are expected for introduction of non-native species, energy removals (total catch), and species diversity. Alternative 3 exhibits effects that are similar to Alternative 1 for removal of top predators, energy re-direction (discards), and functional diversity. For ecosystem effects, pelagic forage fish availability is rated as a conditionally significant cumulative effect; it could be beneficial or adverse (+/-), depending on largely unpredictable climatic trends. Spatial/temporal concentration of fisheries on forage species is rated as conditionally significant adverse due to an adverse external influence exerted by the herring fishery. This fishery reduces the availability of an important ecosystem forage component. Introduction of non-indigenous species is rated as conditionally significant adverse due to the potential effects on the food web. Cumulative effects on species diversity are found to be conditionally significant adverse due to factors associated with the groundfish fishery and external environmental factors that continue to exert both beneficial and adverse influences on the system.	Alternative 4.1 is expected to result in improvement in pelagic forage availability, reduction in spatial/temporal concentration of the fishery on forage, less removal of top predators, and a reduced possibility for introduction of non-native species. Energy removals are substantially reduced relative to Alternative 1. Substantial improvements in species diversity are predicted, and some improvements in functional and genetic diversity are anticipated. Pelagic forage fish availability is rated as a conditionally significant cumulative effect which could be beneficial or adverse (+/-), depending on largely unpredictable climatic trends. Spatial/temporal concentration of fisheries on forage species is rated as conditionally significant adverse due to an adverse external influence exerted by the herring fishery. This fishery reduces the availability of an important ecosystem forage component. Introduction of non-indigenous species is rated as conditionally significant adverse due to the potential effects on the food web. Cumulative effects on species diversity are conditionally significant adverse due to factors associated with the groundfish fishery, and external environmental factors that continue to exert both beneficial and adverse influences on the system.	Alternative 4.2 is expected to result in improvement in pelagic forage availability, reduction in spatial/temporal concentration of fishery on forage, less removal of top predators, and a largely reduced possibility of introduction of non-native species. Energy removals (total catch) are substantially reduced, and energy re-direction (discards) are somewhat reduced relative to Alternative 1. Substantial improvements in species diversity are predicted, and some improvements in functional and genetic diversity are anticipated. Pelagic forage fish availability is rated as a conditionally significant cumulative effect which could be beneficial or adverse (+/-), depending on largely unpredictable climatic trends. Spatial/temporal concentration of fisheries on forage species is rated as conditionally significant adverse due to an adverse external influence exerted by the herring fishery. This fishery reduces the availability of an important ecosystem forage component. Introduction of non-indigenous species is rated as conditionally significant adverse due to the potential effects on the food web. Cumulative effects on species diversity are conditionally significant adverse due to factors associated with the groundfish fishery, and external environmental factors that continue to exert both beneficial and adverse influences on the system.	Alternative 5 is expected to result in improvement in pelagic forage availability, reduction in spatial/temporal concentration of the fishery on forage, and reduced possibility of introduction of non-native species. Energy re-direction (discards) are reduced relative to Alternative 1. Substantial improvements in species diversity are predicted, and some improvement in functional diversity is also anticipated. Pelagic forage fish availability is rated as a conditionally significant cumulative effect which could be beneficial or adverse (+/-), depending on largely unpredictable climatic trends. Spatial/temporal concentration of fisheries on forage species is rated as conditionally significant adverse due to an adverse external influence exerted by the herring fishery. This fishery reduces the availability of an important ecosystem forage component. Introduction of non-indigenous species is rated as conditionally significant adverse due to the potential effects on the food web. Cumulative effects on species diversity are conditionally significant adverse due to factors associated with the groundfish fishery, and external environmental factors that continue to exert both beneficial and adverse influences on the system.	Alternative 6.1 substantially reduces the spatial/temporal concentration of the fishery on forage, but substantially increases energy re-direction (discards). Pelagic forage fish availability is rated as a conditionally significant cumulative effect which could be beneficial or adverse (+/-), depending on largely unpredictable climatic trends. Spatial/temporal concentration of fisheries on forage species is rated as conditionally significant adverse due to an adverse external influence exerted by the herring fishery. This fishery reduces the availability of an important ecosystem forage component. Introduction of non-indigenous species is rated as conditionally significant adverse due to the potential effects on the food web. Cumulative effects on species diversity are found to be conditionally significant adverse due to factors associated with the groundfish fishery, and external environmental factors that continue to exert both beneficial and adverse influences on the system.	Alternative 6.2 is expected to result in reductions in pelagic forage abundance, substantial increases in spatial/temporal concentration of the fishery on forage, and a considerably increased possibility of the introduction of non-native species. Both energy re-direction (discards) and energy removals (total catch) show large increases relative to Alternative 1. Large negative impacts on species diversity are anticipated, along with some reductions in genetic diversity. Pelagic forage fish availability is rated as a conditionally significant cumulative effect which could be beneficial or adverse (+/-), depending on largely unpredictable climatic trends. Spatial/temporal concentration of fisheries on forage species is rated as conditionally significant adverse due to an adverse external influence exerted by the herring fishery. This fishery reduces the availability of an important ecosystem forage component. Introduction of non-indigenous species is rated as conditionally significant adverse due to the potential effects on the food web. Cumulative effects on species diversity are found to be conditionally significant adverse due to factors associated with the groundfish fishery, and external environmental factors that continue to exert both beneficial and adverse influences on the system.

Table 1 Summary of Environmental Consequences

Alternative 1 (No Action) Continue with Existing Management Policy	Alternative 2.1 Low & Slow Harvesting Strategy- Increased Protection to Marine Mammals and Seabirds	Alternative 2.2 Short-Burst Harvesting Strategy- Increased Protection to Marine Mammals and Seabirds	Alternative 3 Increased Protection to Target Groundfish Species	Alternative 4.1 Aggregate TAC Increased Protection to Non-Target and Forage Species	Alternative 4.2 Rare Species TAC Increased Protection to Non-Target and Forage Species	Alternative 5 Increased Protection to Habitat	Alternative 6.1 Increase in Long-term Socioeconomic Benefits	Alternative 6.2 Increase in Short-term Socioeconomic Benefits
Effects on the Human Environment - Overall Socioeconomic Effects								
Under Alternative 1, overall groundfish harvests are projected to approach 1.9 million mt annually, including more than 1.3 million mt of pollock. Collectively, the 1,184 fish harvesting and processing operations involved in the fishery are projected to generate more than $1.2 billion in wholesale product value and more than $570 million in labor income for an estimated 10,000 persons. Overall these values reflect a significant beneficial effect to the human environment.	Under Alternative 2.1, total annual groundfish harvests would decline by 485,000 mt, 25.7 percent of the Alternative 1 total. Projected harvest declines are 26.5 percent for pollock, 32.4 percent for Pacific cod, 37.4 percent for the Atka mackerel, sablefish, rockfish, and other groundfish group (mostly Atka mackerel), and 4.3 percent for flatfish. Ex-vessel payments would decline by 11.6 percent and wholesale value would fall by 25.3 percent. Payments to labor would decrease by 25 percent.	Under Alternative 2.2, the total annual groundfish harvest would decline by more than 1.45 million mt, 77 percent of the Alternative 1 total. Harvest declines would be 85 percent for pollock; 83 percent for Pacific cod; 49 percent for the Atka mackerel, sablefish, rockfish, and other groundfish species group (mostly Atka mackerel); and 39 percent for flatfish. Ex-vessel payments would decline by 32.7 percent, and wholesale value of production would fall by 74.2 percent. Payments to labor would decrease by 71 percent.	Under Alternative 3, total annual groundfish harvests would decline by more than 224,000 mt, 12 percent of the Alternative 1 total. Harvest declines would be 15 percent for pollock, 8 percent for Pacific cod, and 38 percent for the Atka mackerel, sablefish, rockfish, and other groundfish species group (mostly Atka mackerel). Flatfish harvests would increase by 35 percent. Ex-vessel payments would decline by 7 percent. The wholesale value of production would fall by 12.5 percent, and annual payments to labor would decrease by 12.7 percent.	Under Alternative 4.1, total annual groundfish harvests would decline by more than 225,000 mt, nearly 12 percent of the Alternative 1 total; however, only pollock would be affected. The projected harvest decline for pollock is 15 percent. Ex-vessel payments would decline by nearly 5 percent, relative to Alternative 1, for all species including non-groundfish. The wholesale value of production would fall by 11.3 percent, and payments to labor would decrease by 10.7 percent.	Under Alternative 4.2, total annual groundfish harvests would decline by more than 282,000 mt, nearly 15 percent of the Alternative 1 total. Most of the decline would be in pollock harvests, but constraints on skate catches would cause declines of 21.8 percent for Pacific cod harvests and 4 percent for the Atka mackerel, sablefish, rockfish, and other groundfish species group. Ex-vessel payments would decline by nearly 5 percent of the Alternative 1 projection for all species, including non-groundfish species. The wholesale value of production would fall by 14.5 percent, and payments to labor would decrease by 13.4 percent.	There would be little change in total annual groundfish harvest between Alternative 5 and Alternative 1 (two percent overall reduction), with 11,000 fewer tons from the Atka mackerel, sablefish, rockfish, and other groundfish species group and 9,000 fewer tons of flatfish. The primary impacts would be felt in industry classes as harvests are reapportioned among gear types to protect benthic habitat. Reductions and reapportionments in harvests would result in a 2.2 percent decline in total annual ex-vessel payments for all species, including non-groundfish species. The wholesale value of production would fall by 0.9 percent, and payments to labor would decrease by 1.6 percent.	There would be no change in pollock or Pacific cod harvests under Alternative 6.1 compared to Alternative 1.. Increased harvests of flatfish and slightly reduced harvests in the Atka mackerel, sablefish, rockfish, and other groundfish species group (primarily "other groundfish") would increase total harvests by 21,300 mt, 1.1 percent above the Alternative 1 total. Changes in ex-vessel payments would be negligible, and the wholesale value of production would increase by 2 percent. Payments to labor would increase by 1.7 percent. While it appears that Alternative 6.1 would have little impact, it expected to reduce operational costs, and create gains in efficiency, factors for which necessary information is currently unavailable.	Under Alternative 6.2, there would be large increases in harvest of all species. Harvest increases would be 250,000 mt for pollock, almost 60,000 mt for flatfish, and 40,000 mt for Pacific cod and species in the Atka mackerel, sablefish, rockfish, and other groundfish group. A 9 percent increase in total ex-vessel payments (groundfish and non-groundfish species) is projected. Product values and payments to labor would increase by 20 percent.
Effects on the Human Environment - Distribution of Effects Among Industry Sectors								
Under Alternative 1, catcher vessels would generate nearly $280 million in ex-vessel revenue from groundfish. Approximate percentages are 70 percent for trawl vessels, 3.5 percent for pot vessels, and 10 percent for longline vessels which focus primarily on sablefish. The other two fixed gear catcher vessel classes, which tend to participate in the groundfish fishery to augment other fisheries income, would generate more than $46 million, primarily from high-value species, with more than 95 percent of this amount attributable to vessels 33 to 59 feet in length. Under Alternative 1, shore plants and motherships would generate more than $612 million in wholesale product revenue, with nearly 60 percent from Bering Sea pollock inshore plants. Shore plants in the Alaska Peninsula and Aleutian Islands would generate $64 million, Kodiak shore plants $60 million, and Southcentral and Southeast Alaska shore plants (together) $58 million. Motherships would generate about 9 percent of total wholesale value. Catcher processors would generate $594 million in total wholesale value. Of this total, surimi vessels would generate more than 47 percent, fillet vessels 11 percent, head and gut trawlers 26 percent, longline catcher processors 11 percent, and pot catcher processors less than 1 percent. Alternative 1 maintains conditionally significant beneficial cumulative effects on ex-vessel and groundfish product value, harvesting and processing costs, and net benefits to consumers. With continuation of the race for fish and	Changes in output value would be negative for all fishing and processing sectors. The trawl sector would be affected most negatively, while longline catcher vessels and Southeast Alaska shore plants would suffer least. The disproportional effects occur because this alternative reduces the total allowable catch of GOA pollock and Pacific cod more than it affects other species and areas. Conditionally significant adverse cumulative effects occur for most of the fish harvesting and processing sectors, particularly for those based in the Alaska Peninsula and Aleutian Islands region and Kodiak regions, because they fish in nearshore waters that would be restricted under this alternative. Many of the harvesters and processors also rely on crab and salmon fisheries which are currently depressed or restricted, and would likely experience some preemption from participation in the fisheries due to economic impacts of restrictions. Vessel safety and excess harvesting and processing capacity would experience conditionally significant adverse cumulative effects.	Projected effects are significantly negative for almost all fishing and processing sectors. Exceptions are longline catcher vessels and fixed gear catcher vessels 33 to 59 feet in length, and Southcentral and Southeast Alaska region shore plants where negative effects on output value would not exceed 18 percent. Conditionally significant adverse cumulative effects would occur for most of the fish harvesting and processing sectors, particularly for those based in the Alaska Peninsula and Aleutian Islands region and Kodiak region, because they fish in nearshore waters that would be restricted under this alternative. Many of the harvesters and processors also rely on crab and salmon fisheries which are currently depressed or restricted, and would likely experience some preemption from participation in the fisheries due to economic impacts of restrictions. Vessel safety and excess harvesting and processing capacity would experience conditionally significant cumulative adverse effects.	Under Alternative 3, effects on harvesting and processing sectors would generally be distributed evenly, with output value decreases ranging from 7 to 20 percent. A notable exception is the head and gut trawl catcher processor sector, with an 8 percent increase in output value. This increase is directly linked to the higher flatfish harvests that would be a major result of this alternative. Cumulative effects on harvesting and processing sectors would generally not be significant. There would be conditionally significant adverse effects on processing costs, preemption of trawl vessel classes, and excess capacity in the Alaska Peninsula and Aleutian Islands region and Kodiak region, which rely on crab and salmon fisheries that are currently depressed or restricted.	Impacts would be generally limited to harvesters and processors that rely on Bering Sea pollock fisheries. These classes would experience output value declines from 15 to 19 percent, while all other classes would experience minimal impacts. Similar to Alternative 3, cumulative effects under Alternative 4.1 would be not significant on harvesting and processing sectors, with the exception of conditionally significant adverse effects on processing costs for the Alaska Peninsula and Aleutian Islands region, where many of the processors also rely on crab and salmon fisheries which are currently depressed or restricted.	Impacts would be generally limited to harvesters and processors that rely on Bering Sea pollock fisheries, with one major exception; longline catcher processors would experience a 46 percent decline in output value because of restrictions on skate harvests. Cumulative effects on harvesting and processing sectors would generally not be significant. There would be conditionally significant adverse effects on processing costs, preemption of vessel and processing classes, and excess capacity in the Alaska Peninsula and Aleutian Islands region, which relies on crab and salmon fisheries that are currently depressed or restricted.	Distribution of effects would show extreme variation, with significant negative impacts for several classes and significant positive impacts for others. Trawl catcher vessels in the GOA, and shore plants in the Alaska Peninsula and Aleutian Islands region, would experience severe negative impacts. Other vessels and processors that rely on trawl-caught Pacific cod would have slight negative impacts. Fixed gear catcher vessels, catcher processors that target Pacific cod, and Southcentral Alaska region shore plants would realize significant positive impacts under Alternative 5. Cumulative effects on harvesting and processing sectors would generally not be significant, with one exception. There would be conditionally significant adverse effects on ex-vessel value for trawl catcher vessels participating in the Pacific cod fishery, increases in harvesting and processing costs, preemption of trawl vessel and processor classes, and excess capacity in the Alaska Peninsula and Aleutian Islands region, which relies on crab and salmon fisheries that are currently depressed or restricted.	Under Alternative 6.1 projected effects are insignificant for all industry sectors except head and gut trawl catcher processors; output values are significantly higher for these vessels than for other classes. Potential reductions in operational costs and gains in efficiency are difficult to quantify with available data. Significant beneficial cumulative effects associated with fisheries harvest levels would be maintained or increased by reducing harvesting and processing costs, reducing excess capacity, and increasing vessel safety. Continuation of current fishing levels maintains conditionally significantly adverse effects on non-consumptive and non-use values due to perceived effects on Steller sea lions and the Bering Sea ecosystem.	Under Alternative 6.2, every class and sector except trawl catcher vessels less than 60 feet in length are expected to realize significant output value increases, ranging from 13 to 35 percent. Trawl catchers less than 60 feet would experience a 1,200-ton decline in Pacific cod harvests. The decline is a result of much higher overall catches of flatfish in the GOA, in which relatively high levels of Pacific cod bycatch decrease the amount of Pacific cod available for the trawl target fishery. Other trawl vessels in the Gulf of Alaska are more likely to target flatfish and compensate for lower targeted harvests with bycatch. Conditionally significant beneficial cumulative effects on ex-vessel value, groundfish product value, benefits to consumers, reductions in harvesting and processing costs, and reductions in excess capacity would increase under Alternative 6.2. Conditionally significant adverse cumulative effects on non-consumptive and non-use values due to perceived effects on Steller sea lions and the Bering Sea ecosystem would increase.

TABLE 1 SUMMARY OF ENVIRONMENTAL CONSEQUENCES

ALTERNATIVE 1 (NO ACTION) CONTINUE WITH EXISTING MANAGEMENT POLICY	ALTERNATIVE 2.1 LOW & SLOW HARVESTING STRATEGY- INCREASED PROTECTION TO MARINE MAMMALS AND SEABIRDS	ALTERNATIVE 2.2 SHORT-BURST HARVESTING STRATEGY- INCREASED PROTECTION TO MARINE MAMMALS AND SEABIRDS	ALTERNATIVE 3 INCREASED PROTECTION TO TARGET GROUNDFISH SPECIES	ALTERNATIVE 4.1 AGGREGATE TAC INCREASED PROTECTION TO NON-TARGET AND FORAGE SPECIES	ALTERNATIVE 4.2 RARE SPECIES TAC INCREASED PROTECTION TO NON-TARGET AND FORAGE SPECIES	ALTERNATIVE 5 INCREASED PROTECTION TO HABITAT	ALTERNATIVE 6.1 INCREASE IN LONG-TERM SOCIOECONOMIC BENEFITS	ALTERNATIVE 6.2 INCREASE IN SHORT-TERM SOCIOECONOMIC BENEFITS
EFFECTS ON THE HUMAN ENVIRONMENT - DISTRIBUTION OF EFFECTS AMONG INDUSTRY SECTORS (CONTINUED)								
current restrictions on crab and salmon harvests in the Alaska Peninsula and Aleutian Islands, significant adverse effects occur for excess capacity and vessel safety. Continuation of current fishing levels maintains conditionally significantly adverse effects on non-consumptive and non-use values due to real and perceived effects on Steller sea lions and the Bering Sea ecosystem.								
EFFECTS ON THE HUMAN ENVIRONMENT - DISTRIBUTION OF EFFECTS AMONG REGIONS								
Under Alternative 1, the Alaska Peninsula and Aleutian Islands region accounts for more than four times the combined volume of groundfish processed inshore in the other Alaska regions. Kodiak is dominant for GOA groundfish, accounting for 30 to 45 percent of local seafood processing value. Groundfish fishing and processing is much more limited in the Southcentral and Southeast Alaska regions. In terms of vessel and processor ownership, Washington Inland Waters region has the most involvement of any region. The Oregon Coast region has a long history of significant involvement through catcher vessels that participate in various fisheries across Alaska. Alternative 1 maintains conditionally significant beneficial cumulative effects on labor payments and total employment by harvesting and processing sectors, regional ex-vessel and product value by both region and ownership, and related regional and community effects on economic activity and tax revenue. There is a conditionally significant adverse or unknown effect on subsistence harvests of Steller sea lions and salmon.	Impacts would be felt strongly in the Alaska Peninsula and Aleutian Islands region and the Kodiak region due to relatively high dependency on groundfish. Impacts to the Southcentral Alaska and Southeast Alaska regions would be minimal. In the Washington Inland Waters region, likely significant impacts to individual firms and the commercial fishing sector would be muted by the size of the region. Impacts to the Oregon Coast region would be limited to catcher vessel operations. Conditionally significant adverse cumulative effects would occur with regard to labor payments and employment, and related effects on economic activity and tax revenue for some of the Alaskan regions and communities participating in the groundfish fisheries. This is particularly true for communities in the Alaska Peninsula and Aleutian Islands region and Kodiak regions where many of the harvesters and processors also rely on crab and salmon fisheries which are currently depressed or restricted, and other economic opportunities are limited. There would be related significant adverse effects on municipal tax revenue. There would be conditionally beneficial or unknown effects on subsistence harvests of Steller sea lions and salmon.	Under Alternative 2.2, impacts would be extremely severe in the Alaska Peninsula and Aleutian Islands region, and profound in the Kodiak region. The groundfish fishery in its present form would be virtually eliminated in these regions. Southcentral and Southeast Alaska impacts would be relatively slight because of greater dependence on other fisheries or industries. Impacts to the Washington Inland Waters region economy would be muted by the size of the region, but involved enterprises would suffer extremely negative impacts. In the Oregon Coast region, impacts to catcher vessel operations would be severe. Conditionally significant adverse cumulative effects would occur with regard to labor payments and employment, and related effects on economic activity and tax revenue for some of the Alaskan regions and communities participating in the groundfish fisheries. This is particularly true for communities in the Alaska Peninsula and Aleutian Islands region and Kodiak region, where many of the harvesters and processors also rely on crab and salmon fisheries which are currently depressed or restricted, and other economic opportunities are limited. There would be related significant adverse effects on municipal tax revenue. There would be conditionally beneficial or unknown effects on subsistence harvests of Steller sea lions and salmon.	Impacts in the Alaska Peninsula and Aleutian Islands region and the Kodiak region would be significant under Alternative 3, with decreases in relevant indicators in the range of 10 to 20 percent. Significant impacts from reduced fish taxes, processor and harvester changes, and population shifts may affect participants but not the fundamental structure of the regional economies. For the Southcentral Alaska and Southeast Alaska regions, community impacts would be significant and in the range of variation commonly experienced in Alaska fisheries. In the Washington Inland Waters region, decreases in relevant variables would be in the range of 5 to 15 percent. Impacts to the economy would be muted by the size of the region, but some economic adjustments would be expected. Oregon Coast regional impacts would be concentrated among catcher vessel operations. Cumulative effects would generally not be significant on communities and regions, with the exception of conditionally significant adverse effects on total ex-vessel value by region in the Alaska Peninsula and Aleutian Islands region and Kodiak region, where many of the harvesters and processors also rely on crab and salmon fisheries, which are currently depressed or restricted. Cumulative effects on subsistence would be unknown.	Impacts to the Alaska Peninsula and Aleutian Islands region would be significant, with decreases in relevant indicators in the range of 10 to 20 percent. Significant impacts from reduced fish taxes and processor and harvester changes may affect participants, but not the fundamental structure of the regional economy. Kodiak regional impacts would be slight and concentrated among catcher vessel operations. Southcentral and Southeast Alaska regional impacts would be insignificant. For the Washington Inland Waters region, relevant indicators show declines in the range of 10 to 15 percent. While impacts to the economy would be muted by the size of the region, some economic adjustments are expected. In the Oregon Coast region, declines experienced by catcher vessel operations would be relatively small and within the variability common in Alaska fisheries. Similar to Alternative 3, cumulative effects under Alternative 4.1 would be not significant on communities and regions, with the exception of conditionally significant adverse effects on total ex-vessel value and processing costs by region for the Alaska Peninsula and Aleutian Islands region, where many of the harvesters and processors also rely on crab and salmon fisheries that are currently depressed or restricted. Cumulative effects on subsistence would be unknown.	Impacts in the Alaska Peninsula and Aleutian Islands region would be significant under Alternative 4.2, with decreases in relevant indicators in the range of 10 to 20 percent. Significant impacts from reduced fish taxes and processor and harvester changes may affect participants, but not the fundamental structure of the regional economy. Kodiak impacts would be concentrated among catcher processors and catcher vessels. While individual operations may be affected adversely, overall regional impacts would be minimal. For the Southcentral Alaska region, some impacts would be felt among catcher processors and catcher vessels, but potential regional impacts would likely be insignificant. Southeast Alaska regional impacts would be confined to the longline catcher processor sector. In the Washington Inland Waters region, a reduction of 10 to 20 percent for relevant indicators is projected for several sectors. Impacts to the economy would be muted by the size of the region, but some economic adjustments are expected. In the Oregon Coast region, declines experienced by catcher vessel operations would be relatively small and within the variability common in Alaska fisheries. Similar to Alternative 4.1, cumulative effects under Alternative 4.2 would be not significant on communities and regions, with the exception of conditional significant adverse effects on total ex-vessel by region for the Alaska Peninsula and Aleutian Islands and Kodiak regions, where many of the harvesters and processors also rely on crab and salmon fisheries that are currently depressed or restricted. Cumulative effects on subsistence would be unknown.	Under Alternative 5, impacts in the Alaska Peninsula and Aleutian Islands region would be significant with decreases in most relevant indicators in the range of 5 to 15 percent. Regional catcher vessel operations would be affected the most. Significant impacts from reduced fish taxes and processor and harvester changes may affect participants, but not the fundamental structure of the regional economy. Kodiak regional impacts would be mixed across sectors, with some negative and some positive impacts. Southcentral Alaska region impacts would be positive, reflecting the non-trawl nature of the groundfish fishery in the region. Southeast Alaska region impacts would be positive and slight. Impacts on the Washington Inland Waters region would not be profound and would be mixed by sector. Oregon Coast region impacts would be significant and concentrated among catcher vessel operations. Cumulative effects would generally not be significant on communities and regions, with the exception of conditionally significant adverse effects on total ex-vessel value by region in the Alaska Peninsula and Aleutian Islands region, where many of the harvesters and processors also rely on crab and salmon fisheries which are currently depressed or restricted. There would be related significant adverse effects on municipal tax revenue. Cumulative effects on subsistence would be unknown.	Impacts in the Alaska Peninsula and Aleutian Islands region under Alternative 6.1 would be minimal and related to reorganization of the fishery. For the Kodiak, Southcentral Alaska, and Southeast Alaska regions, impacts would be neutral overall, and the impacts would arise primarily from decisions on how to implement this alternative. For the Washington Inland Waters region and the Oregon Coast region, changes would be slight and related to decisions on how to implement Alternative 6.1. Conditionally significant beneficial cumulative effects on labor payments and total employment by harvesting and processing sectors, regional ex-vessel and product value by both region and ownership, and related regional and community effects on economic activity and tax revenue would be maintained. This alternative would even out some of the seasonal peaks in economic activities associated with short openings of the fisheries. There would be conditionally significant adverse or unknown effects on subsistence harvests of Steller sea lions and salmon.	Under Alternative 6.2, the Alaska Peninsula and Aleutian Islands region would experience positive impacts that would be significant for the processing sectors. Because present regional capacity (which was built up during race-for-fish conditions) could handle these increases, little or no negative effects such as increased population or demand for infrastructure are expected. In the Kodiak region, similar positive impacts would be experienced, and present regional capacity could absorb all anticipated increases. Southcentral and Southeast Alaska regional impacts would be positive, but not as marked as region-wide impacts on the Alaska Peninsula and Aleutian Islands and Kodiak regions. For the Washington Inland Waters region, relevant indicators show an increase of approximately 15 to 20 percent, benefitting a wide range of sectors; however, this increase would be muted by the size of the region. The Oregon Coast region would experience positive impacts concentrated in the catcher vessel sector. Conditionally significant beneficial cumulative effects on labor payments and total employment by harvesting and processing sectors, regional ex-vessel and product value by both region and ownership, and related regional and community effects on economic activity and tax revenue would increase under Alternative 6.2. This alternative would even out some of the seasonal peaks in economic activities associated with short openings. There would be conditionally significant adverse or unknown effects on subsistence harvests of Steller sea lions and salmon.

Table 2 Comparison of effects by alternative for analysis categories used in the SEIS. Percentages represent the percent of species in the analysis category that exhibited negative (orange), neutral (yellow) or positive (green) scores.

Alternative 1 Status Quo	Cumulative Effects	Species Group	Effects	2.1			2.2			3			4.1			4.2			5			6.1			6.2		
				Percent of Scores			Percent of Scores			Percent of Scores			Percent of Scores			Percent of Scores			Percent of Scores			Percent of Scores			Percent of Scores		
				<0	0	>0	<0	0	>0	<0	0	>0	<0	0	>0	<0	0	>0	<0	0	>0	<0	0	>0	<0	0	>0
NS	NS	Abundant Pinnipeds	Direct Take	0%	100%	0%	0%	100%	0%	0%	100%	0%	0%	100%	0%	0%	100%	0%	0%	100%	0%	0%	100%	0%	0%	100%	0%
CS-	CS-		Prey	0%	0%	100%	0%	0%	100%	0%	0%	100%	0%	0%	100%	0%	0%	100%	0%	67%	33%	0%	100%	0%	100%	0%	0%
CS-	CS-		Spatial-Temporal	0%	33%	67%	0%	0%	100%	67%	33%	0%	0%	67%	33%	0%	67%	33%	0%	33%	67%	0%	100%	0%	100%	0%	0%
NS	NS		Disturbance	0%	0%	100%	0%	33%	67%	0%	33%	67%	0%	33%	67%	0%	33%	67%	0%	33%	67%	0%	100%	0%	0%	100%	0%
NS	NS	Other Marine Mammals	Direct Take	0%	100%	0%	0%	100%	0%	0%	100%	0%	0%	100%	0%	0%	100%	0%	0%	100%	0%	0%	100%	0%	0%	100%	0%
NS	NS		Prey	0%	100%	0%	0%	100%	0%	0%	100%	0%	0%	100%	0%	0%	100%	0%	0%	100%	0%	0%	100%	0%	0%	100%	0%
NS	NS		Spatio-Temporal	0%	100%	0%	0%	100%	0%	0%	100%	0%	0%	100%	0%	0%	100%	0%	0%	100%	0%	0%	100%	0%	0%	100%	0%
NS	NS		Disturbance	0%	100%	0%	0%	100%	0%	0%	100%	0%	0%	100%	0%	0%	100%	0%	0%	100%	0%	0%	100%	0%	0%	100%	0%
CS-	CS-	Seabirds	Direct Take	3%	59%	6%	0%	50%	50%	0%	50%	50%	0%	50%	50%	0%	50%	50%	0%	50%	50%	0%	100%	0%	0%	100%	0%
CS-	NS		Prey	0%	33%	67%	0%	33%	67%	17%	83%	0%	17%	83%	0%	17%	83%	0%	17%	67%	17%	33%	67%	0%	33%	67%	0%
NS	NS		Benthic habitat	0%	33%	67%	0%	33%	67%	0%	100%	0%	0%	33%	67%	0%	33%	67%	0%	100%	0%	0%	83%	17%	0%	100%	0%
NS	NS		Processing Waste &Offal	0%	83%	17%	0%	83%	17%	0%	83%	17%	0%	100%	0%	0%	100%	0%	0%	83%	17%	0%	100%	0%	0%	100%	0%
NS	NS	Target	Direct Take	0%	56%	38%	0%	34%	59%	28%	19%	50%	0%	88%	6%	0%	84%	9%	3%	44%	44%	13%	56%	25%	69%	9%	19%
NS	NS		Habitat	0%	50%	47%	0%	67%	33%	0%	34%	66%	0%	94%	6%	0%	94%	6%	0%	38%	63%	3%	84%	0%	19%	75%	0%
NS	CS-		Prey	9%	53%	6%	9%	47%	6%	3%	66%	0%	3%	72%	3%	3%	75%	3%	0%	69%	0%	0%	72%	0%	0%	69%	3%
NS	NS		Spatial-Temporal	3%	56%	19%	13%	59%	6%	19%	53%	3%	3%	94%	0%	6%	91%	0%	6%	66%	6%	0%	50%	22%	3%	59%	6%
CS-/U	CS-/U	Non-target	Direct Take	0%	33%	67%	4%	11%	85%	11%	63%	26%	0%	85%	15%	0%	74%	26%	33%	52%	15%	0%	33%	67%	96%	4%	0%
CS-/U	CS-/U	Prohibited	Direct Take	0%	36%	64%	0%	7%	93%	29%	29%	43%	0%	79%	21%	0%	79%	21%	29%	57%	14%	7%	43%	50%	100%	0%	0%
NS	NS		Habitat	7%	50%	0%	0%	57%	0%	0%	57%	0%	0%	57%	0%	0%	57%	0%	0%	50%	7%	0%	57%	0%	0%	57%	0%
NS	NS		Prey	0%	64%	36%	0%	64%	36%	0%	86%	14%	0%	79%	21%	0%	79%	21%	0%	100%	0%	0%	79%	21%	36%	64%	0%
NS	NS		Spatial-Temporal	0%	64%	36%	0%	64%	36%	36%	64%	0%	0%	93%	7%	0%	93%	7%	0%	100%	0%	0%	71%	29%	29%	71%	0%
				Score			Score			Score			Score			Score			Score			Score			Score		
CS-	CS-	Habitat	HAPC damage (bottom trawl)		1.00			2.00			1 or -1			0.00			0.00			2.00			1 or -1			-2.00	
CS-	CS-		HAPC damage (fixed gear)		1.00			1 or -1			1.00			0.00			1.00			-2.00			-1.00			-1.00	
NS	NS		Non-living substrate mod. (bottom trawl)		1.00			2.00			0.00			0.00			0.00			2.00			-1.00			-2.00	
NS	NS		Non-living substrate mod. (fixed gear)		2.00			2.00			1.00			0.00			2.00			-2.00			0.00			-2.00	
CS-	CS-		Benthic biodiversity		0.00			0.00			2.00			0.00			0.00			2.00			0.00			0.00	
CS+	CS+/-	Ecosystem	Pelagic forage		1.00			2.00			1.00			1.00			1.00			1.00			0.00			-1.00	
CS-	CS-		Spatial-Temporal		2.00			2.00			-1.00			1.00			1.00			1.00			2.00			-2.00	
NS	NS		Removal of top predators		0.00			0.00			0.00			1.00			1.00			0.00			0.00			0.00	
CS-	CS-		Introd. non-native species		2.00			2.00			2.00			1.00			2.00			1.00			0.00			-2.00	
NS	NS		Energy re-direction		2.00			2.00			0.00			0.00			1.00			1.00			-2.00			-2.00	
NS	NS		Energy removal		2.00			2.00			2.00			2.00			2.00			0.00			0.00			-2.00	
CS-	CS-		Species diversity		1.00			1.00			2.00			2.00			2.00			2.00			0.00			-2.00	
NS	NS		Functional diversity		0.00			0.00			0.00			1.00			1.00			1.00			0.00			0.00	
NS	NS		Genetic diversity		1.00			1.00			1.00			1.00			1.00			0.00			0.00			-1.00	
S+	CS+	Harvesting and Processor Sector Effects	Groundfish ex-vessel value for catcher vessels	75%	25%	0%	100%	0%	0%	100%	0%	0%	25%	75%	0%	25%	75%	0%	50%	13%	38%	0%	100%	0%	0%	13%	88%
S+	CS+		Groundfish product value for catcher processors	100%	0%	0%	100%	0%	0%	80%	20%	0%	40%	60%	0%	60%	40%	0%	40%	20%	40%	0%	80%	20%	0%	0%	100%
S+	CS+		Groundfish product value for other groundfish processors	100%	0%	0%	100%	0%	0%	100%	0%	0%	33%	67%	0%	33%	67%	0%	33%	50%	17%	0%	100%	0%	0%	0%	100%
S+	CS+		Labor payments by catcher vessels	75%	25%	0%	100%	0%	0%	100%	0%	0%	25%	75%	0%	25%	75%	0%	50%	13%	38%	0%	100%	0%	0%	13%	88%
S+	NCE		Labor payments by catcher processors	100%	0%	0%	100%	0%	0%	80%	20%	0%	40%	60%	0%	60%	40%	0%	40%	20%	40%	0%	80%	20%	0%	0%	100%
S+	CS+		Labor payments by other groundfish processors	100%	0%	0%	100%	0%	0%	100%	0%	0%	33%	67%	0%	33%	67%	0%	33%	50%	17%	0%	100%	0%	0%	0%	100%
S+	CS+		Total employment for catcher vessels	75%	25%	0%	100%	0%	0%	100%	0%	0%	25%	75%	0%	25%	75%	0%	50%	13%	38%	0%	100%	0%	0%	13%	88%
S+	CS+		Total employment for catcher processors	100%	0%	0%	100%	0%	0%	80%	20%	0%	40%	60%	0%	60%	40%	0%	20%	40%	40%	0%	80%	20%	0%	0%	100%
S+	CS+		Total employment for other groundfish processors	100%	0%	0%	100%	0%	0%	100%	0%	0%	33%	67%	0%	33%	67%	0%	50%	33%	17%	0%	100%	0%	0%	0%	100%
S+	CS+		Total ex -vessel value for catcher vessels (includes non-groundfish ex-vessel revenue)	50%	50%	0%	75%	25%	0%	50%	50%	0%	25%	75%	0%	25%	75%	0%	50%	13%	38%	0%	100%	0%	0%	38%	63%
S+	CS+		Total ex -vessel value for other groundfish processors (includes non-groundfish ex-vessel revenue)	67%	33%	0%	67%	33%	0%	50%	50%	0%	33%	67%	0%	33%	67%	0%	17%	83%	0%	0%	100%	0%	0%	33%	67%
S+	CS+	Regional Effects	Groundfish ex-vessel value by landing region	33%	67%	0%	67%	33%	0%	67%	33%	0%	17%	83%	0%	17%	83%	0%	17%	67%	17%	0%	100%	0%	0%	33%	67%
S+	CS+		Total ex -vessel value by landing region (includes non-groundfish)	33%	67%	0%	33%	67%	0%	33%	67%	0%	17%	83%	0%	17%	83%	0%	0%	100%	0%	0%	100%	0%	0%	50%	50%
S+	CS+		Inshore groundfish processing labor payments by operation region	83%	17%	0%	83%	17%	0%	83%	17%	0%	33%	67%	0%	67%	33%	0%	17%	50%	33%	0%	83%	17%	0%	17%	83%
S+	CS+		Catcher vessel labor payments by owner region	83%	17%	0%	83%	17%	0%	100%	0%	0%	17%	83%	0%	17%	83%	0%	33%	33%	33%	0%	100%	0%	0%	0%	100%
S+	CS+		Groundfish ex-vessel value by owner region (inshore processors and catcher vessels)	83%	17%	0%	83%	17%	0%	100%	0%	0%	17%	67%	17%	33%	67%	0%	33%	33%	33%	0%	83%	17%	0%	17%	83%
S+	CS+		Total ex-vessel value by region of owner (inshore processors and catcher vessels) (includes non-groundfish)	67%	33%	0%	83%	17%	0%	67%	33%	0%	17%	83%	0%	17%	83%	0%	33%	50%	17%	0%	100%	0%	0%	33%	67%
N/A	CS+		Avg. harvest cost		-1.00			-2.00			-1.00			-1.00			-1.00			-1.00			2.00			1.00	
S+	CS+		Avg. processing cost		-1.00			-2.00			-1.00			-1.00			-1.00			-1.00			2.00			1.00	
NS	NS		Preemption processing sectors		-2.00			-2.00			-1.00			-1.00			-2.00			-2.00			0.00			0.00	
NS	NS		Preemption vessel classes		-2.00			-2.00			-1.00			-1.00			-1.00			-2.00			0.00			0.00	
CS-	CS+		Net benefits to domestic seafood consumers		-2.00			-2.00			-1.00			-1.00			-1.00			0.00			1.00			1.00	
NS	CS-		Non-consump./non-use value		1.00			1.00			0.00			0.00			0.00			1.00			0.00			-1.00	
S+	NCE		Groundfish discards		2.00			2.00			-1.00			0.00			1.00			1.00			2.00			-2.00	
N/A	NCE		Prohibited species catch		2.00			2.00			0.00			0.00			1.00			1.00			1.00			-2.00	
S+	CS-		Safety		-2.00			-1.00			0.00			0.00			0.00			0.00			2.00			0.00	
S-	CS-		Excess capacity		-1.00			-2.00			-1.00			-1.00			-1.00			-1.00			2.00			1.00	

table2.xls
12/21/2000