

Chapter 2

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Chapter 2 The Programmatic Alternatives

This chapter has two purposes. The first is to give readers a broad understanding of fisheries management policies and practices in the United States (U.S.) and, specifically, in the federally managed waters off Alaska. Beginning with a review of the Magnuson-Stevens Fishery Conservation and Management Act (MSA) and the other applicable federal statutes and executive orders (EO), we discuss the development of fisheries policy, its assumptions and intentions, and how policy is conveyed and applied to the subject groundfish fisheries. This chapter explains how decisions are made and who makes them; how a Fishery Management Plan (FMP) operates; and how National Marine Fisheries Service (National Oceanic and Atmospheric Administration [NOAA] Fisheries or NMFS) uses the practical tools of fishery management to manage the groundfish fisheries on a daily basis. Knowing how the fisheries management system works will make the programmatic alternatives easier to understand.

This chapter's second purpose is to present the programmatic alternatives. Beginning with Section 2.6, we recount the history of the development of the alternatives and briefly discuss those alternatives that were considered but not carried forward in this document. We then present the programmatic alternatives and the methods used to evaluate them. The chapter concludes by identifying the North Pacific Fishery Management Council's (NPFMC) preferred alternative (PA).

2.1 Background Specific to Understanding this Federal Action

Chapter 1 discussed the general purpose and need for this federal action, the ongoing management of the federal groundfish fisheries off Alaska. Chapter 1 defined the purpose of a Programmatic Supplemental Environmental Impact Statement (SEIS) in terms of the procedural requirements of the National Environmental Policy Act (NEPA) and as defined by both the Council on Environmental Quality (CEQ) and NOAA in their respective guidelines. Chapter 1 also explained the specific purpose of this Programmatic SEIS in support of the continuing management of the subject groundfish fisheries. As a Programmatic SEIS, this document proposes to analyze the general environmental consequences of a broad scope of actions presented in the context of various policy alternatives.

The policy alternatives have been developed as alternative frameworks. A framework is a statement of particular goals and objectives that allows the NPFMC and NOAA Fisheries some latitude in proposing specific future actions necessary to manage the fishery and conserve the groundfish resource consistent with the goals and objectives that form the framework. Such frameworks, found in the existing FMPs for both the Bering Sea and Aleutian Islands (BSAI) and the Gulf of Alaska (GOA), provide the flexibility needed to manage dynamic fisheries that rely on a no less dynamic, complex, and changing ocean environment for their continued survival. A framework also allows the accommodation of changing public values regarding the nation's natural resources and how best to utilize and conserve those resources. Moreover, the frameworks allow decision-makers the latitude needed to balance sometimes competing objectives and priorities.

The current management policy for the groundfish fisheries, as identified in the current FMPs and presented herein as Alternative 1 (the no-action alternative), is also structured as a framework composed of a number of management goals and objectives. The policy frameworks of the FMPs, as shown later in this chapter, have allowed considerable latitude for action by the NPFMC and NOAA Fisheries; both FMPs have been amended more than 65 times over the last 25 years to respond to new information and new environmental issues and to improve the efficiency and effectiveness of fisheries management.

The alternatives to the status quo are also structured as policy frameworks. Other than this Programmatic SEIS process, no formal proposal is currently before the NPFMC or NOAA Fisheries that outlines a new or alternative management policy. However, NEPA requires that resource managers identify and evaluate alternatives to the status quo before promulgating new actions or, as in this case, to support continuing actions. Therefore, NOAA Fisheries developed the present policy alternatives that, in response to the values and objectives expressed through scoping and public comments on the 2001 Draft Programmatic SEIS and the 2003 Draft Programmatic SEIS, attempt to capture those values and objectives while remaining consistent with the MSA and other applicable federal law (see Section 2.3). A common theme that emerged from the public comments was the need to pursue a more precautionary approach to fisheries management when faced with the uncertainties associated with the effects of commercial fishing on the environment. With the assistance of the NPFMC and public stakeholders, NOAA Fisheries has designed alternative policy frameworks that, to varying degrees, capture the precautionary principle and elevate key ecosystem issues to the forefront of the fisheries decision-making process.

The main purpose of this chapter is to present the programmatic policy alternatives. To help readers understand and evaluate the programmatic alternatives, this chapter first provides a detailed discussion of the federal fishery management system in the Exclusive Economic Zone (EEZ) off Alaska.

2.2 Management Policies and Objectives

The survey of fishery management laws, policies, and practices begins with a review of federal policies regarding marine fishery conservation and management as those policies have evolved historically and as they are currently mandated by federal statute and EO. Throughout this general discussion, references are provided to more detailed discussions contained in the appendices.

2.2.1 Origins of United States Fisheries Policy

Fisheries management in the U.S. has historically been based on the principle of the public trust doctrine, a principle of common law that reflects certain political and cultural concepts pertaining to natural resources. Based first on Roman law and then on English common law, the principle asserts that certain resources, such as the air and the water in rivers and oceans, are incapable of private ownership and control. Fish swimming freely in rivers and oceans, by extension, are included in the principle. In medieval England, running water, the air, the sea, the shores of the sea, and the right to fish in the rivers and sea were considered common to all by “natural law.” The Crown held these resources in trust for the benefit of the nation as its sovereign right and responsibility. When the U.S. colonies successfully defended their independence from England in the late eighteenth century, they assumed the trust authority of the Crown over navigable waterways within their borders, including the fish within these waters.

The public trust is held to be inalienable, and stewardship of natural resources cannot be transferred from the government that has responsibility for protecting those resources from overuse or habitat degradation for the benefit of its people (National Research Council [NRC] 1999). In the U.S., the public trust principle was further advanced under the presidency of Theodore Roosevelt, whose Chief Forester, Gifford Pinchot, asserted the government’s right and duty to control the use of natural resources for the greater prosperity of the public (Mitchell 1997).

Regarding fisheries, a corollary to the public trust principle is that the principle applies to the resource in its natural state only; a fisherman acquires title to fish when he removes them from their natural state and takes them into his possession, i.e., when he catches them.

2.2.2 Current Federal Statutes and Mandates

The public trust doctrine stands as the basis for the Federal Government’s responsibility to conserve and manage marine fisheries resources in the EEZ for the overall benefit of the people of the U.S. The principles of the doctrine are mandated by the body of federal statutes and EOs that guide the formulation and implementation of federal fishery management policies. Currently, these include 12 statutes and 7 EOs. Some of these laws speak directly to the conservation or management of fishery resources; others are directed at ensuring that fishery management measures and federal actions, in general, are fair and equitable and that potential environmental, economic, and social effects of federal actions are considered before they are adopted. For purposes of managing federal fisheries, the executive branch’s responsibility for compliance with these mandates resides primarily with the Secretary of Commerce and has been delegated largely to NOAA Fisheries, one of the five NOAA agencies in the Department of Commerce.

In the following paragraphs, each of these federal statutes and EOs are discussed in turn as they apply to management and conservation of the groundfish fisheries.

Magnuson-Stevens Fishery Conservation and Management Act

The MSA (16 United States Code [USC] 1801, *et seq.*) is the principal federal statute providing for the management of U.S. marine fisheries. Originally enacted as the Fishery Conservation and Management Act in 1976 (Public Law 94-265), this law was arguably the most significant fisheries legislation in U.S. history. It has been amended periodically since 1976; most recently in 1996, by the Sustainable Fisheries Act (SFA) (Public Law 104-297). The basic concepts of that original Act, however, have not changed. They include the following:

1. Fisheries should be managed in a sustainable manner such that conservation and management measures achieve the optimum yield (OY) from each fishery on a continuing basis while preventing overfishing.
2. Conservation and management decision-making must be based on the best available scientific information, which should include social, economic, and ecological factors along with biological factors.
3. The needs of fishery resource users vary across the nation, and public participation in the policy-making process should be maximized.

The MSA (as amended in 1996 by the SFA) adds the following policy statement regarding the nation's fisheries (16 USC 1801(c)):

POLICY—It is further declared to be the policy of the Congress in this Act:

To maintain without change the existing territorial or other ocean jurisdiction of the U.S. for all purposes other than the conservation and management of fishery resources, as provided for in this Act;

To authorize no impediment to, or interference with, recognized legitimate uses of the high seas, except as necessary for the conservation and management of fishery resources, as provided for in this Act;

To assure that the national fishery conservation and management program utilizes, and is based upon, the best scientific information available; involves, and is responsive to the needs of, interested and affected states and citizens; considers efficiency; draws upon federal, state, and academic capabilities in carrying out research, administration, management, and enforcement; considers the effects of fishing on immature fish and encourages development of practical measures that minimize bycatch and avoid unnecessary waste of fish; and is workable and effective;

To permit foreign fishing consistent with the provisions of this Act;

To support and encourage active U.S. efforts to obtain internationally acceptable agreements which provide for effective conservation and management of fishery resources, and to secure agreements to regulate fishing by vessels or persons beyond the exclusive economic zones of any nation;

To foster and maintain the diversity of fisheries in the U.S.; and

To ensure that the fishery resources adjacent to a Pacific Insular Area, including resident or migratory stocks within the exclusive economic zone adjacent to such areas, be explored, developed, conserved, and managed for the benefit of the people of such area and of the U.S.

The MSA also established 10 National Standards that serve as the overarching objectives for fishery conservation and management and the development of FMPs (16 USC 1851):

(a) IN GENERAL—Any Fishery Management Plan prepared, and any regulation promulgated to implement any such plan, pursuant to this title shall be consistent with the following National Standards for fishery conservation and management:

- (1) Conservation and management measures shall prevent overfishing while achieving, on a continuing basis, the OY from each fishery for the U.S. fishing industry.*
- (2) Conservation and management measures shall be based upon the best scientific information available.*
- (3) To the extent practicable, an individual stock of fish shall be managed as a unit throughout its range, and interrelated stocks of fish shall be managed as a unit or in close coordination.*
- (4) Conservation and management measures shall not discriminate between residents of different states. If it becomes necessary to allocate or assign fishing privileges among various U.S. fishermen, such allocation shall be (a) fair and equitable to all such fishermen; (b) reasonably calculated to promote conservation; and (c) carried out in such manner that no particular individual, corporation, or other entity acquires an excessive share of such privileges.*
- (5) Conservation and management measures shall, where practicable, consider efficiency in the utilization of fishery resources; except that no such measure shall have economic allocation as its sole purpose.*
- (6) Conservation and management measures shall take into account and allow for variations among, and contingencies in, fisheries, fishery resources, and catches.*
- (7) Conservation and management measures shall, where practicable, minimize costs and avoid unnecessary duplication.*

(8) Conservation and management measures shall, consistent with the conservation requirements of this Act (including the prevention of overfishing and rebuilding of overfished stocks), take into account the importance of fishery resources to fishing communities in order to (a) provide for the sustained participation of such communities, and (b) to the extent practicable, minimize adverse economic impacts on such communities.

(9) Conservation and management measures shall, to the extent practicable, (a) minimize bycatch, and (b) to the extent bycatch cannot be avoided, minimize the mortality of such bycatch.

(10) Conservation and management measures shall, to the extent practicable, promote the safety of human life at sea.

The MSA also mandates the Secretary of Commerce to develop advisory guidelines to assist in FMP development. These guidelines serve primarily to interpret and aid compliance with the National Standards (codified at 50 Code of Federal Regulations [CFR] Part 600).

In recent years, amendments to the MSA have played a critical role in framing the regulatory regime within which the North Pacific groundfish fisheries operate. In particular, MSA amendments have addressed issues regarding overfishing, resource allocation among competing users, bycatch management, and conservation of essential fish habitat (EFH).

American Fisheries Act

Next to the MSA, the American Fisheries Act (AFA) (Public Law 105-277, division C, title II) is the only other fisheries-specific legislation affecting how groundfish fisheries in the BSAI and, to a lesser extent, the GOA are managed. Enacted in October 1998, the AFA represents the culmination of a decade-long struggle over the allocation of Alaska's most abundant fishery resource, pollock, in the BSAI. The AFA institutionalized a resource allocation scheme among competing onshore and offshore components of the fish processing industry.

Provisions mandated by the AFA, effective as of 1999, were implemented through the total allowable catch (TAC) specification process and emergency interim rule-making until the final regulations were published on December 30, 2002 (67 Federal Register [FR] 79692).

Major provisions of the AFA include the following:

- Requirement of a minimum of 75 percent U.S. ownership of fishing vessels (up from the majority ownership previously required) and maximum size and horsepower limits for replacement vessels.
- Specific allocation of the BSAI directed pollock fishery TAC among the inshore component (50 percent) catcher processor vessels in the offshore component (40 percent), and motherships in the offshore component (10 percent) after first deducting 10 percent of the TAC for the Community Development Quota (CDQ) Program and an incidental catch allowance.

- Buyout of nine catcher processor vessels' future fishing privileges, financed through a combination of a grant and direct loan obligations, to be paid back by a tax of \$0.006 per pound of pollock harvested by the inshore sector.
- Specific naming of 20 catcher processor vessels that may participate in the (offshore) pollock fishery, seven catcher vessels that may deliver pollock to those catcher processors, and 19 catcher vessels that may deliver pollock to motherships.
- Criteria for catcher vessels to participate in harvesting BSAI pollock in the inshore sector, and criteria for limiting the participation of onshore processing plants in the BSAI pollock fishery.
- The ability to form fishery cooperatives (with limitations on their structure and the participation of catcher vessels and the inshore sector processing plants).
- Directions for the NPFMC to develop or improve on limitations (sideboards) on the activities of AFA vessels and processors in non-pollock fisheries to prevent negative spillover effects of fishery cooperatives.

Beginning January 1, 2000, all vessels and processors wishing to participate in the non-CDQ BSAI pollock fishery are required to have valid AFA permits on board the vessel or at the processing plant. AFA permits are required even for vessels and processors specifically named in the AFA and are required in addition to any other federal or state permits. AFA permits also may limit the take of non-pollock groundfish, crab, and prohibited species as governed by AFA "sideboard" provisions.

With the exceptions of applications for inshore vessel cooperatives and for replacement vessels, the AFA permit program had a one-time application deadline of December 1, 2000, for AFA vessel and processor permits. Applications for AFA vessel or processor permits were not accepted after this date, and any vessels or processors for which an application had not been received by this date became permanently ineligible to receive AFA permits.

National Environmental Policy Act

The first chapter explained the provisions of NEPA (42 USC 4331, *et seq.*), the U.S.'s basic national charter for environmental responsibility. To briefly recount those provisions: NEPA establishes the national environmental policy, provides an interdisciplinary framework for environmental planning by federal agencies, and contains action-forcing procedures to ensure that federal decision-makers take environmental factors into account. NEPA does not require that the most environmentally desirable alternative be chosen, but does require that the environmental effects of all the alternatives be analyzed equally for the benefit of decision-makers and the public.

NEPA has two principal purposes:

1. To require federal agencies to evaluate the potential environmental effects of any major planned federal action to ensure that public officials make well-informed decisions about the potential impacts.

2. To promote public awareness of potential impacts at the earliest planning stages of major federal actions by requiring federal agencies to prepare a detailed environmental evaluation for any major federal action significantly affecting the quality of the human environment.

As with the MSA, NEPA requires an assessment of both the biological and the social and economic consequences of fisheries management alternatives and provides that members of the public have an opportunity to be involved in and to influence decision-making on federal actions. In short, NEPA ensures that environmental information is available to government officials and the public before decisions are made and actions taken.

Title II, Section 202 of NEPA (42 USC 4332) created the CEQ. The duties of CEQ include, among other things, advising and assisting the President in preparing an annual environmental quality report, which is submitted to Congress. This report gathers information concerning trends in the quality of the environment, and developing policies to promote the goals of NEPA (42 USC 4344). The CEQ is also responsible for the development and oversight of regulations and procedures implementing NEPA. The CEQ regulations provide guidance for federal agencies regarding NEPA's requirements (40 CFR Part 1500) and require agencies to identify processes for issue scoping, for the consideration of alternatives, for developing evaluation procedures, for involving the public and reviewing public input, and for coordinating with other agencies—all of which are applicable to the NPFMC's development of the groundfish FMPs.

NOAA has also prepared environmental review procedures for implementing NEPA (NOAA Administrative Order 216-6). This Administrative Order describes NOAA's policies, requirements, and procedures for complying with NEPA and the implementing regulations issued by the CEQ. A 1999 revision and update to the Administrative Order includes specific guidance regarding categorical exclusions, especially as they relate to endangered species, marine mammals, fisheries, and habitat restoration. The Administrative Order also expands on guidance for consideration of cumulative impacts and "tiering" in the environmental review of NOAA actions. This Administrative Order provides comprehensive and specific procedural guidance to NOAA Fisheries and the NPFMC for preparing and adopting groundfish FMPs.

Federal fishery management actions subject to NEPA requirements include the approval of FMPs, FMP amendments, and regulations implementing FMPs. Such approval requires preparation of an environmental assessment (EA). The purpose of an EA is to determine if the proposed action is a major federal action significantly affecting the environment and thereby requiring an environmental impact statement (EIS) or whether the action does not significantly affect the environment, in which case a finding of no significant impact may be issued.

NEPA and the MSA requirements for schedule, format, and public participation are compatible and allow one process to fulfill both obligations. If an EIS or SEIS is prepared, however, the notice of availability (NOA) of a final EIS (or SEIS) must be published at least 30 days before the Secretary of Commerce approves, disapproves, or partially approves an FMP or FMP amendment.

Endangered Species Act

The Endangered Species Act (ESA) (16 USC 1531 *et seq.*), passed in 1973 and reauthorized in 1988, provides broad protection for fish and wildlife species that are listed as threatened or endangered. The ESA establishes procedures for the formal listing of a species, for the development of recovery plans, and for designation of critical habitats. It also outlines procedures for federal agencies to follow when taking actions that may jeopardize the continued existence of a species or that may adversely modify its critical habitat. Responsibilities for implementing the ESA are shared by the U.S. Fish and Wildlife Service (USFWS) and NOAA Fisheries. With some exceptions, the USFWS oversees freshwater fish, birds, terrestrial mammals, and plants, and NOAA Fisheries oversees anadromous and marine fish, marine mammals, and sea grasses. NOAA Fisheries is therefore tasked both with managing the groundfish harvest through FMPs and with ensuring that identified threatened and endangered species (e.g., the Steller sea lion) receive appropriate consideration and protection during the planning and implementation of groundfish management measures. It should be noted that compliance with ESA provisions is not subject to modification based on economic hardship. Recovery plans required under the ESA give priority to those listed species that may be affected by different economic activities.

Sections 2(c)(1) and 7(a)(1) of the ESA require federal agencies to conserve endangered and threatened species; however, conservation is broadly defined. Section 7(a)(2) of the ESA requires federal agencies to ensure that any action authorized, funded, or carried out by such agencies is not likely to jeopardize or result in the destruction or adverse modification of the critical habitat of endangered or threatened species.

Under an FMP, all fishing activities must be considered; not just the specific fisheries for which management measures are under consideration. NOAA Fisheries must conduct a formal Section 7 consultation that results in a biological opinion if a proposed action “may affect” or “is likely to adversely affect” endangered or threatened species or their critical habitat. If the biological opinion concludes that the proposed action “is likely to jeopardize the continued existence of” threatened or endangered species, then reasonable and prudent alternatives must be developed to minimize or mitigate the effect of the action. The fishery management action in question must then be revised to implement the reasonable and prudent measures.

The Marine Mammal Protection Act

The Marine Mammal Protection Act (MMPA) of 1972 (16 USC 1361, *et seq.*), as amended, establishes a federal responsibility to conserve marine mammals. Congress declared that marine mammals are resources of great international significance and that they should be protected and their development promoted to the greatest extent feasible, commensurate with sound resource management policies. Finding that certain species and populations of marine mammals are or may be in danger of extinction or depletion due to human activities, Congress vested NOAA Fisheries with management responsibility for cetaceans (whales) and pinnipeds other than walrus (seals). (All other marine mammals found in Alaska, such as the sea otter, walrus, and polar bear, fall under the auspices of the USFWS.)

The MMPA's primary management objective is to maintain the health and stability of the marine ecosystem, with a goal of obtaining an optimum sustainable population of marine mammals within the carrying capacity of the habitat. The MMPA is intended to work in concert with the provisions of the ESA. The Secretary of Commerce is required to give full consideration to all factors regarding regulations applicable to the "take" of marine mammals. (The MMPA defines "take" broadly to mean "to harass, hunt, capture, or kill, or attempt to harass, hunt, capture, or kill any marine mammal.") Such factors include the conservation, development, and utilization of fishery resources, and the economic and technological feasibility of implementing the regulations. If a fishery affects a marine mammal population, then the potential impacts of the fishery must be analyzed in the appropriate EA or EIS, and the pertinent regional council or NOAA Fisheries may be requested to consider regulations to mitigate adverse impacts.

The Fish and Wildlife Coordination Act

The Fish and Wildlife Coordination Act (FWCA) authorizes collection of fisheries data and coordination with other agencies for environmental decisions affecting living marine resources. Both formal and informal consultations, cooperative research, and data-gathering programs are routinely pursued.

The Federal Power Act

The Federal Power Act (FPA) provides for concurrent responsibilities with the USFWS in protecting aquatic habitat. The original statute was enacted in 1920; however, only the 1935 and 1986 amendments added new requirements to incorporate fish and wildlife concerns in licensing, relicensing, and exemption procedures for power projects.

Coastal Zone Management Act

The Coastal Zone Management Act (CZMA) (16 USC 1451, *et seq.*) is designed to encourage and assist states in developing coastal management programs, to coordinate federal and state activities, and to safeguard regional and national interests in the coastal zone. Section 307(c) (16 USC 1456(c)) of the CZMA requires that any federal activity affecting the land or water uses or natural resources of a state's coastal zone be consistent with the state's approved coastal management program to the maximum extent practicable.

A proposed fishery management action that requires an FMP amendment or implementing regulations must be assessed to determine whether it directly affects the coastal zone of a state with an approved coastal zone management program. If so, NOAA Fisheries must provide the state agency having CZMA responsibility with a consistency determination for review at least 90 days before final NOAA Fisheries action.

Administrative Procedure Act

The Administrative Procedure Act (APA) (5 USC 551, *et seq.*) requires federal agencies to give the public prior notice of rule-making and an opportunity to comment on proposed rules. General notice of proposed rule-making must be published in the FR, unless persons subject to the rule have actual notice of the rule. Proposed rules published in the FR must include reference to the legal authority under which the rule is proposed and explain the nature of the proposed action, its intended effect, and any relevant regulatory history that provides the public with a well-informed basis for understanding and commenting on the

proposed action. The APA also specifies conditions that allow an agency to implement regulations on an emergency or interim basis without requiring public comment periods. These emergency conditions can be of an ecological, economic, social, or public health nature.

Except for the emergency or interim rule provisions, a proposed rule is designed to give interested or affected persons opportunity to submit written data, views, or arguments for or against the proposed action. After the end of a public comment period, the APA requires comments received to be summarized and responded to in the final rule notice. Further, the APA requires the effective date of a final rule to be no less than 30 days after publication of the final notice in the FR. This delayed effectiveness or “cooling off” period is intended to allow the affected public to become aware of and be prepared to comply with the requirements of the rule. For fishery management regulations, the primary effect of the APA, in combination with the MSA, NEPA, and other statutes, is to provide for public participation and input into the development of FMPs, FMP amendments, and regulations implementing FMPs.

Regulatory Flexibility Act

The Regulatory Flexibility Act (RFA) (5 USC 601, *et seq.*) requires federal agencies to assess the impacts of their proposed regulations on small entities and to seek ways to minimize economic effects on small entities that would be disproportionately or unnecessarily adverse. The RFA defines small entities as (1) small businesses which, for commercial fishing or fish processing, are firms with receipts of up to \$3 million annually or up to 500 employees, respectively, (2) small non-profit organizations, and (3) small governmental jurisdictions with a population of up to 50,000 persons. For Alaska fisheries, these criteria include most fishing firms except for the large catcher processor vessels and most coastal communities except for Anchorage. NOAA Fisheries has published revised guidelines dated August 16, 2000, for RFA analysis; they include criteria for determining if the action would have a significant impact on a substantial number of small entities. Those guidelines may be viewed online at www.nmfs.noaa.gov/sfa/prorules.

Although the RFA allows agencies to certify that a proposed rule will not have significant impacts on a substantial number of small entities, an initial regulatory flexibility analysis (IRFA) is routinely prepared for most proposed Alaska groundfish fishery management measures. The IRFA is usually combined with the EA or EIS document required by NEPA. If, following public comments on the proposed rule, the action is still considered to meet the criteria for requiring RFA analysis, then a final regulatory flexibility analysis (FRFA) must be prepared. The FRFA contains most of the same information presented in the IRFA, but also must include (1) a summary of significant issues raised in public comment on the IRFA and the agency’s response to those comments, and (2) a description of the steps the agency has taken to minimize the significant economic impacts on small entities, including a statement of factual, policy, and legal reasons for selecting the alternative adopted in the final rule and why all other alternatives considered were rejected. Finally, the FRFA or a summary of it must be published in the FR with the final rule.

Paperwork Reduction Act

The Paperwork Reduction Act (PRA) of 1995 (44 USC 3501 *et seq.*, and 5 CFR part 1320) is designed “to minimize the paperwork burden for individuals, small businesses, educational and nonprofit institutions, federal contractors, state, local and tribal governments, and other persons resulting from the collection of information by or for the Federal Government.” In brief, this law is intended to ensure that the government

is not overly burdening the public with requests for information. Procedurally, the PRA requirements constrain what, how, and how frequently information will be collected from the public affected by a rule that requires reporting (e.g., the amount of fish caught during a fishing trip).

Data Quality Act

Section 515 of the Treasury and General Government Appropriations Act for Fiscal Year 2001 (Public Law 106-554) directed the Office of Management and Budget (OMB) to issue government-wide guidelines that provide policy and procedural guidance for ensuring and maximizing the quality, objectivity, utility, and integrity of information (including statistical information) disseminated by federal agencies. This bill is known as the Data Quality Act. The OMB's guidelines require all federal agencies to develop their own guidelines for ensuring and maximizing the quality, objectivity, utility, and integrity of information disseminated by the agency. NOAA published its guidelines in February 2002 (available online at <http://www.commerce.gov>).

Executive Order 12630: Takings

This EO on Government Actions and Interference with Constitutionally Protected Property Rights was signed by the President on March 15, 1988, and published on March 18, 1988 (53 FR 8859). This EO requires that each federal agency prepare a "takings implications assessment" for any of its administrative, regulatory, and legislative policies and actions that affect, or may affect, the use of any real or personal property. Fishery management measures that limit fishing seasons, areas, catch quotas, the size of harvested fish, and bag limits have received a categorical exclusion from a takings analysis. However, takings issues are raised frequently in the context of limited access systems, which confer a harvesting privilege on a fisherman in the form of a permit to catch a specific amount of fish or a license to enter and participate in a fishery. Although such permits and licenses may be transferrable, and therefore increase (or decrease) in market value, they do not convey any property rights in the fishery resource (i.e., the fish).

Executive Order 12898: Environmental Justice

EO 12898, signed by the President on February 11, 1994, and published February 16, 1994 (59 FR 7629), requires that federal agencies make achieving "environmental justice" part of their mission by identifying and addressing disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority populations and low income populations in the U.S. A growing number of Alaska Natives participate in the groundfish fisheries as a result of the federal CDQ Program. As a result, coastal Native communities participating in the CDQ Program derive substantial economic benefits from the federal groundfish fisheries. The effects of the federal action on minority populations are described in Chapter 4.

Executive Order 13175: Consultation and Coordination with Indian Tribal Governments

This EO, signed by the President on November 6, 2000, and published November 9, 2000 (65 FR 67249), is intended to establish regular and meaningful consultation and collaboration between federal agencies and Native tribal governments in the development of federal regulatory practices that significantly or uniquely affect their communities. This EO prohibits regulations that impose substantial direct compliance costs on

Native tribal communities. In preparing this Programmatic SEIS, NOAA Fisheries has initiated a government-to-government consultation process with affected Native communities.

Executive Order 13158: Marine Protected Areas

This EO, signed by the President on May 26, 2000, and published on May 31, 2000 (65 FR 34909), directs the Departments of Commerce and the Interior to jointly develop a national system of marine protected areas (MPAs). The purpose of the system is to strengthen the management, protection, and conservation of existing protected areas and establish new or expanded MPAs. The MPA system is to be scientifically based, representing diverse U.S. marine ecosystems and the nation's natural and cultural resources. Establishing such a system is intended to reduce the likelihood that MPAs are harmed by federally approved or funded activities. Alternatives 1(b), 3, and 4 of this Programmatic SEIS specifically address this EO in their respective policy frameworks.

Executive Order 12114: Environmental Effects Abroad

This EO, signed by the President on January 4, 1979, and published on January 9, 1979 (44 FR 1957), directs agencies to consider the effects of major federal actions upon the environment of foreign nations or of "global commons" such as the oceans. These actions include those major federal actions that result in significant environmental effects that extend outside of the geographic borders of the U.S. In some cases, an EIS may be required. This EO encourages international agreements and an exchange of information between the affected nations and the U.S. This EO may pertain to the groundfish fisheries in the EEZ off Alaska to the extent that those fisheries impact the ocean environment beyond the EEZ.

Executive Order 12866: Regulatory Planning and Review

EO 12866, signed by the President on September 30, 1993, and published October 4, 1993 (58 FR 51735), replaced EOs 12291 and 12498. Its purpose, among other things, is to enhance planning and coordination with respect to new and existing regulations, and to make the regulatory process more accessible and open to the public. In addition, EO 12866 requires agencies to take a deliberative, analytical approach to rule-making, including assessment of costs and benefits of the intended regulations. For fisheries management purposes, it requires NOAA Fisheries (1) to prepare a regulatory impact review (RIR) for all regulatory actions, (2) to prepare a unified regulatory agenda twice a year to inform the public of the agency's expected regulatory actions, and (3) to conduct a periodic review of existing regulations.

The purpose of an RIR is to assess the potential economic impacts of a proposed regulatory action. As such, it can be used to satisfy NEPA requirements and to serve as a basis for determining whether a proposed rule will have a significant impact on a substantial number of small entities which would trigger the completion of an IRFA under the RFA. For this reason, the RIR is frequently combined with an EA and an IRFA in a single EA/RIR/IRFA document that satisfies the analytical requirements of NEPA, RFA, and EO 12866. Criteria for determining "significance" for EO 12866 purposes, however, are different than those for determining significance for RFA purposes. A significant rule under EO 12866 is one that is likely to (1) have an annual effect on the economy (of the nation) of \$100 million or more; (2) create serious inconsistency or otherwise interfere with an action taken or planned by another agency; (3) materially alter

the budgetary impact of entitlements, grants, user fees, or loan programs or the rights and obligations of recipients thereof; or (4) raise novel legal or policy issues.

Although fisheries management actions rarely have an annual effect on the national economy of \$100 million or more or trigger any of the other criteria, OMB makes the ultimate determination of significance under this EO, based in large measure on the analysis in the RIR. A recent example of a fishery management action determined to be “significant” under this EO is the regulatory action to implement provisions of the AFA. The significance determination is in part because, at least initially, the AFA rule-making raises novel legal or policy issues arising out of legal mandates. An action determined to be significant is subject to OMB review and clearance before its publication and implementation.

Executive Order 13132: Federalism

The “Federalism” EO, signed by the President on August 4, 1999, and published on August 10, 1999 (64 FR 43255), supercedes earlier federalism EOs (12612 and 13083), and supplements EOs 12372 (“Intergovernmental Review of Federal Programs”), 12866, and 12988 (“Civil Justice Reform”). This EO is intended to guide federal agencies in the formulation and implementation of “policies that have federalism implications,” such as regulations, legislative comments or proposed legislation, and other policy statements or actions that have substantial direct effects on the states, on the relationship between the national government and the states, or on the distribution of power and responsibilities among the various levels of government. This EO requires federal agencies to have a process to ensure meaningful and timely input from state and local officials in the development of regulatory policies that have federalism implications. A federalism summary impact statement is also required for rules that have federalism implications.

To preclude conflict between state and federal law on fishery management issues, the MSA (16 USC 1856) explicitly establishes conditions for federal preemption of state regulations (and of any extension of state fishery management authority into the EEZ). Furthermore, close consultation between the state and federal governments on Alaska groundfish fishery measures is provided by the NPFMC process (see Section 2.4).

Summary

These federal statutes and EOs constitute the legal foundation for all fishery management actions in the EEZ. As we have shown, some, such as the MSA and AFA, provide direct statutory direction for fisheries management, while others, such as the Administrative Procedure and PRAs, pertain to more general issues that impact all federal actions, including fisheries management. Together they require the NPFMC and NOAA Fisheries to create management policies and practices that are environmentally, socially, and economically responsible to the people of the U.S.

In the following section, we continue our discussion of how federal fisheries are managed by examining the components and functions of those FMPs and how they are developed by the NPFMC under the regional council process.

2.3 Components of a Fishery Management Plan

The MSA mandates the creation of FMPs as the primary fisheries management tools to be developed by the regional councils. Sections 303(a) and (b) of the MSA (16 USC 1853(a) and (b)) mandate that each FMP will contain 14 mandatory provisions and may contain 12 additional, discretionary provisions. The provisions are statements of policy and, in some cases, reflect competing objectives which must be balanced in the course of decision-making. These provisions are summarized below.

Required Provisions

FMPs must:

1. Contain conservation and management measures to prevent overfishing, rebuild overfished stocks, and promote the long-term health and stability of the fishery.
2. Contain a description of the fishery, including, but not limited to, the number of vessels involved, the type and quantity of fishing gear used, the species of fish involved and their location, the cost likely to be incurred in management, actual and potential revenues from the fishery, any recreational interest in the fishery, and the nature and extent of foreign fishing and Indian treaty fishing rights, if any.
3. Assess and specify the maximum sustainable yield and OY from the fishery and include a summary of calculations used to specify the maximum sustainable yield.
4. Assess and specify the proportion of OY that can be harvested and processed by U.S. interests.
5. Specify the fishing industry data that will be submitted to the Secretary of Commerce.
6. Consider and provide for temporary adjustments of fishing efforts that were curtailed for safety reasons.
7. Describe and identify EFH and protect such habitats from adverse fishing impacts.
8. Assess and specify the nature and extent of the scientific data needed for effective implementation of the plan.
9. Include a fishery impact statement that describes the likely effects of conservation and management measures, if any, on participants in the fisheries and fishing communities.
10. Specify objective and measurable criteria for identifying when the fishery is overfished with an analysis of how the criteria were determined.
11. Establish a standardized reporting methodology to assess the amount and type of bycatch occurring in the fishery, and include measures to minimize bycatch and minimize the mortality of bycatch that cannot be avoided.

12. Assess the efficacy of catch-and-release fishery management programs.
13. Describe the participation of the recreational and charter fishing sectors.
14. Allocate any harvest restrictions or recovery benefits fairly and equitably among the commercial, recreational, and charter fishing sectors in the fishery.

Discretionary Provisions

FMPs may:

1. Require permits and fees from any fishing vessel or fish processor who receives fish that are subject to the plan.
2. Establish time, area, and gear restrictions to limit fishing effort as necessary.
3. Establish catch, sale, or transportation limits based on area, species, size, number, weight, sex, bycatch, total biomass, or other factors consistent with any applicable federal and state safety and quality requirements.
4. Prohibit, limit, condition, or require the use of specified types and quantities of fishing gear, fishing vessels, or equipment for such vessels, including devices which may be required to facilitate enforcement provisions.
5. Incorporate (consistent with other applicable laws) the relevant fishery conservation and management measures of the coastal states nearest to the fishery.
6. Establish a limited access system for the fishery in order to achieve OY.
7. Require fish processors to submit data necessary for the conservation and management of the fishery.
8. Require observers to be carried aboard a vessel for the purpose of collecting data necessary for the conservation and management of the fishery.
9. Assess and specify the impact of the plan on the naturally spawning anadromous fish stocks of the region.
10. Include incentives to minimize bycatch and decrease bycatch mortality.
11. Reserve portions of the allowable catch for use in scientific research.
12. Prescribe other measures, requirements, conditions, and restrictions necessary for the conservation and management of the fishery.

The First BSAI and GOA FMPs

An FMP thus comprises a set of coherent, specific policy statements that define a particular fishery. The role of the NPFMC and its regulatory partners is to apply a long list of general fishery policy objectives—the FMP requirements and standards listed above—to the particulars of the Alaska groundfish fishery. Competing interests within the fishing industry and competing policy objectives make this deliberative process a continual balancing act.

Both the BSAI and GOA groundfish FMPs state the NPFMC’s goals and objectives for managing the fisheries (see Section 2.6.1). These goals and objectives and their accompanying policy statements are intended to clarify the basis for the NPFMC’s decisions and recommendations to the Secretary of Commerce. They are also intended to provide the public and the stakeholders of the resource a clear sense of the management direction for the fisheries. It is important to recognize that at the time the original FMPs were prepared, the Alaska groundfish fisheries were going through a remarkable transition, changing from a foreign-dominated fishery to a purely domestic fishery. The goals and objectives developed during this period reflect the issues and needs of the time, and do not necessarily represent today’s perspective and our current understanding of the fisheries and the marine ecosystem. (In Appendices C and D, readers may review a summary of the original FMPs and the numerous amendments that have been adopted since that time to see how changes in policy emphasis have reflected changing conditions in the fishery and environment.)

The GOA groundfish FMP, published in 1979, was the first FMP adopted by the NPFMC. Following implementation of the MSA in 1976, preliminary management plans were prepared for the GOA and BSAI to establish a management regime to control the foreign fisheries. The management of domestic harvests of groundfish requires an FMP. The NPFMC chose to prepare an FMP for the GOA first because at the time it was the only area with an existing domestic groundfish fishery. As a result, the GOA FMP was a simple document and limited in scope, compared to the regime in place today. In 1985, a general omnibus amendment (Appendix D; Amendment 14) overhauled the GOA FMP by addressing a number of administrative weaknesses. It also updated the plan’s policy statement to better reflect the thinking at that time.

The BSAI groundfish FMP, implemented in 1981, set new standards for fisheries management. The FMP introduced a “framework” approach to decision-making. This plan authorized certain management tools, the subsequent application of which would not require a lengthy plan amendment process. Rather, such tools—already authorized by the FMP—could be implemented by regulatory amendment, a more efficient and expeditious means of implementing actual management measures than by FMP amendment. The BSAI FMP was also based on ecosystem principles, reflected in a statement of policy goals and objectives that has not been changed since 1981.

Subtle differences exist between the BSAI and GOA FMPs in terms of policy. Prepared by different authors, the FMPs exhibit differences in wording that can be attributed to the respective authors’ different writing styles. Partially conflicting policy goals and objectives listed in both FMPs require that the NPFMC balance conflicting goals (e.g., stimulating the development of domestic fisheries versus rebuilding depressed stocks). Both policy statements reference the National Standards of the MSA as the overarching principles for managing the groundfish fisheries. The GOA FMP policy places primary emphasis on maximizing positive

economic benefits to the U.S., consistent with resource stewardship responsibilities for the continuing welfare of the GOA's living marine resources. The BSAI FMPs policy is more neutral. The BSAI policy recognizes the dynamics of the Bering Sea ecosystem and the need for a flexible management regime to accommodate new information as more is learned about the ecosystem. Among other secondary objectives, the BSAI FMP also highlights the importance both of designing fishing strategies that have minimal impact on the environment and of taking a precautionary approach when data on the stock or the ecosystem is lacking. The differences in wording of the BSAI policy goals and objectives reflect a broader ecosystem view of the fisheries. Even though the policy statements in the two FMPs are worded differently, both areas are managed using the same principles. The NPFMC has always managed the BSAI and GOA groundfish fisheries as a whole, recognizing the close inter-relationships that exist between the fisheries and the two geographical areas.

The specificity of FMPs has changed over time. Early FMPs contained very specific management measures and harvest levels that could only be changed through a lengthy plan amendment process, which could require 18 to 24 months from problem identification to a change in management. Because of this process delay, changes in harvest limits often lagged behind changes in stock abundance. In addition, federal regulations often lagged behind changes in regulations for adjacent state waters, causing conflicts and confusion where stocks had to be managed as a unit throughout their range. This process has been streamlined by incorporating "framework" management tools into the FMP that allow for management changes within prescribed boundaries. For instance, harvest levels are now adjusted through a relatively brief specifications process, implemented by notice in the FR, rather than by the FMP amendment process (see Section 2.4).

2.4 Decision-Making Process for Fishery Management Plans

In addition to establishing the requirements for FMPs, the MSA also created a system of regional councils to manage the nation's marine fisheries. Unlike management of the nation's timber, mineral, grazing, and water resources, for which policy is determined by a federal agency, management responsibility for the nation's marine fisheries is assigned by the MSA to eight regional councils, which are charged with overseeing fisheries in their respective regions. For the federal waters off Alaska, the MSA thus created the NPFMC to be charged with responsibility for making fisheries management policy in the Alaska region of the EEZ.

The North Pacific Fishery Management Council

The NPFMC is composed of 15 members: 11 voting and four non-voting. Seven of the voting members are appointed by the Secretary of Commerce upon the recommendation of the governors of Alaska and Washington. The Governor of Alaska nominates candidates for five seats, the Governor of Washington two seats. Each member is appointed to a three-year term and may be reappointed, but may not exceed three consecutive terms. Four mandatory voting members are the leading fisheries officials from the states of Alaska, Washington, and Oregon, as well as the Alaska Regional Administrator for NOAA Fisheries. The four non-voting members are the Executive Director of the Pacific States Marine Fisheries Commission, the Area Director for the USFWS, the Commander of the 17th Coast Guard District, and a representative from the U.S. State Department. From the voting membership, the NPFMC elects a Chairman and Vice-Chairman to serve one-year terms. The NPFMC's current members are identified on the NPFMC website (<http://www.fakr.noaa.gov/npfmc/>).

The NPFMC has five regularly scheduled meetings each year, four in communities in Alaska, and one in Washington or Oregon. The NPFMC may also schedule additional meetings if the need arises. At each of these meetings, the NPFMC receives advice from its 22-member Advisory Panel, representing fishing industry groups, environmentalists, and consumer groups, and from its 12-member Scientific and Statistical Committee, made up of highly respected scientists who review all information brought to the NPFMC. In addition, the NPFMC works collaboratively with NOAA Fisheries, the federal regulatory agency charged with implementing and enforcing the management decisions of the NPFMC and running the day-to-day operations of fishery management. NOAA Fisheries scientists also conduct research and provide analysis for the NPFMC.

North Pacific Fisheries Management Council Action

The NPFMC uses a formal public process to solicit proposals on how the fisheries should be managed. Through this deliberative public process, and in consultation with several federal and state agencies, the NPFMC develops and amends the FMPs (with the approval of the Secretary of Commerce). FMP amendments may be inspired by a variety of events, including new laws, statutory requirements, and operational problems. Most FMP amendments, however, are generated by public recommendation through an open process (Figure 2.4-1).

The NPFMC annually solicits proposals for FMP amendments or regulatory changes from the public. These proposals are reviewed and qualitatively ranked in terms of analytical difficulty by the NPFMC's Plan Development Team for each FMP. Unfortunately, the number of proposals that merit serious policy consideration far exceed the number of policy analyses that the NPFMC can reasonably accomplish in any one year, so amendments that are needed to address critical issues, such as overfishing, take precedence. All of the amendment proposals are reviewed by the NPFMC's Advisory Panel, which makes recommendations on which proposals should be considered. After hearing the recommendations and public testimony on them (usually at the NPFMC's October meeting), the NPFMC selects the proposals—those it considers most urgent—that it will consider during the coming year.

Selected proposals are then analyzed in compliance with the laws and statutory requirements outlined in Section 2.2.2. Amendment analyses are usually drafted by NPFMC staff biologists and economists, with whatever assistance and collaboration may be needed from scientists and managers of NOAA Fisheries and the Alaska Department of Fish and Game (ADF&G). Sometimes the NPFMC contracts with private consultants to prepare all or part of an analysis. Any proposals made by NOAA Fisheries or ADF&G to improve the implementation of existing management policies frequently are analyzed by staff of the proposing agency.

No specific time limit is imposed by law for completing the draft analysis. Generally, for any particular amendment proposal, the NPFMC staff attempts to complete its analysis before the NPFMC's April meeting following the year in which the NPFMC decided to address the proposal. This is not always possible, however. Controversial proposals, or those that have a large number of alternatives and options for analysis, may require more time than the four months typically allocated for the analytical task. In addition, a proposal that, if implemented, could have a significant impact on the human environment is required by NEPA to have an EIS or SEIS instead of an EA. In this event, NEPA requires "scoping": "an early and open process for determining the scope of issues to be addressed and for identifying the significant issues related to a proposed action" (40 CFR 1501.7). Formal scoping officially begins with publication in the FR of a notice of intent to prepare an EIS or SEIS. Depending on the nature of the proposed action, it may be a lengthy period, involving numerous public hearings, or it may be fairly brief and involve no hearings and only a brief public comment period. At a minimum, however, the public comment period on the scope of issues to be addressed in the analysis should be at least 30 days (NAO 216-6). This additional public process, which occurs at the beginning of the analysis period, plus the greater depth of analysis in a draft EIS or SEIS, adds substantially to the overall time to plan and draft the analysis.

The next step is for the NPFMC to review a draft analysis and decide whether to release it officially for public review and comment. In making this decision, the NPFMC relies heavily on the advice it receives from its Advisory Panel and Scientific and Statistical Committee. The NPFMC also receives public testimony before making this decision, as the public too is given access to the initial draft analysis in advance of the formal public comment period. This "public release" decision also considers whether the analysis adequately addresses a reasonable range of alternatives and options, and adequately responds to the requirements of the MSA and other applicable laws. The NPFMC may decide at this point to release the initial draft analysis "as is" for formal public review; to instruct staff to make certain minor revisions before release; to request major revisions and another NPFMC review before release; or to suspend further action on the analysis, which would, at least temporarily, stop further development of the proposal. If the NPFMC decides to release the

initial draft analysis for public review, the comment period is normally scheduled to begin at least four weeks before the NPFMC's next meeting. Complicated proposals are often granted longer public comment periods.

The NPFMC's next action on a management proposal is to decide on its PA. The NPFMC's PA at this point may be entirely different from the preference of the person or constituency group that originally proposed the action, or the NPFMC may decide to abandon the proposal. Normally, however, the NPFMC selects a PA from those in the analysis or one that is reasonably within the range of alternatives analyzed. The NPFMC takes this action after hearing again from its Advisory Panel, Scientific and Statistical Committee, and the public. If the NPFMC chooses a policy alternative that is not explicitly assessed in the analysis as its PA, the analysis is revised to include the PA.

The NPFMC's choice of a PA is frequently referred to as the "final action of the NPFMC to adopt an FMP/amendment for recommendation to the Secretary of Commerce," or simply as the NPFMC's "final action." Although the analysis frequently needs to be revised to specify the PA and rule-making documents that need to be drafted, the NPFMC rarely reviews the decision-making documents and analyses following a final vote. Instead, the NPFMC relies on the work of its staff and the NOAA Fisheries staff in the Alaska Regional Office and NOAA General Counsel, Alaska region, to prepare the necessary documents in final form. This cooperation among professional staffs is necessary to ensure that the proposed regulatory language accurately reflects the intent of the PA, results in an administratively efficient and enforceable program, and meets all the applicable laws. When all the necessary documents are complete, the NPFMC then transmits the necessary legal documents to the Secretary of Commerce for official review.

Secretarial Review

Section 304(a)(1) of the MSA (16 USC 1854(a)(1)) requires the Secretary of Commerce, "upon transmittal by the NPFMC to the Secretary of a Fishery Management Plan or plan amendment," to "immediately commence a review" of the FMP/amendment and to "immediately publish" a NOA in the FR soliciting public comment on the proposed plan/amendment for a 60-day period beginning on the date of publication. NOAA Fisheries, by delegation of the Secretary's authority, is required to review the documents and determine if they comply with the MSA and other applicable laws and if the policy proposal is structurally complete.

The decision to approve or disapprove a proposal is prescribed by the MSA (16 USC 1854(a) and (b)). For an FMP/amendment, NOAA Fisheries must approve, disapprove, or partially approve the FMP/amendment within 30 days of the end of the comment period published in the NOA. If Secretarial action is not taken within this 30-day period, then the FMP/amendment takes effect as if it were fully approved. The MSA clearly gives NOAA Fisheries only the power to approve, disapprove, or partially approve a NPFMC-recommended FMP/amendment and does not allow NOAA Fisheries to substitute its judgment for that of the NPFMC's or to attach conditions for approval. If an FMP/amendment is disapproved or partially approved, NOAA Fisheries must give written notice to the NPFMC specifying the applicable law with which the FMP/amendment is inconsistent, the nature of the inconsistency, and recommendations on how the NPFMC could correct the inconsistency. A similar process is required for proposed regulatory amendments. If NOAA Fisheries determines that the proposed regulatory amendment is consistent with the FMP/amendment and applicable laws, then it is published in the FR for a 15- to 60-day public comment period. If the determination is negative, NOAA Fisheries must notify the NPFMC in writing, specifying the inconsistencies and providing recommendations for revision that would make the proposed regulation

consistent. A schematic representation of the procedural steps involved from NPFMC transmittal to an approval/disapproval decision is presented in Figure 2.4-2.

An approved FMP/amendment is implemented by publication of the final rule in the FR. The preamble to a final rule must summarize and respond to comments received on the proposed FMP/amendment or proposed rule. The MSA requires that a final rule be published within 30 days of the end of the comment period on the proposed rule. The rule normally is not effective for an additional 30 days after it is published as required under the APA. Regulations governing federal marine fisheries off the coast of Alaska are codified in the CFR at 50 CFR Part 679.

2.5 Fishery Management Practices

To govern a fishery, policy statements must be translated into the regulatory language of management rules. In the Alaska region, this is the responsibility of NOAA Fisheries. These fishery regulations must not only accurately reflect the intent of the NPFMC's policy; they must be consistent with national policy as expressed by the laws and EOs described in Section 2.2.

Although an FMP is technically a set of policy statements and does not implement any specific regulatory language, the proposed plan amendment must be analyzed in a manner that satisfies both MSA and NEPA requirements. In order to accomplish this analysis at a meaningful level of detail and specificity, managers and researchers must analyze sets of particular management tools as alternatives to the existing management tools used in the FMP (e.g., the status quo FMP). These alternatives must address the proposed action. Since the NPFMC could elect to use a different set of tools, or more likely, different configurations of the same tools, it is important for the reader to have a basic understanding of the nature of these management tools and how they might be used to achieve particular results. It is also useful to have an understanding of what types of information, or data, are available to guide and monitor the effectiveness of different management measures. The following sections will provide a brief summary of the management practices and tools currently used in the Alaska groundfish fisheries. Technical descriptions and stock assessment models are included in Appendix F-1.

2.5.1 Management Tools

Management measures and management tools are the means by which managers control the fishery. The two terms, "management measures" and "management tools" (often used interchangeably by fishery managers), refer to all the rules, regulations, conditions, and methods that are required to rebuild, restore, or maintain any fishery resource and the marine environment. For each management issue or problem, managers review the available tools to determine the best way to address the issue or solve the problem. Some management tools are designed to be manipulated within the broadly authorized regulatory framework of the FMPs. Others require a lengthy process of amending the FMP to be implemented.

Most fisheries management regulations limit the power of individuals and corporations to catch fish. These regulations govern who can fish, what species they can catch, when they can fish, where they can fish, and what gear they can use. Some fishery regulations are more administrative in nature and require those fishing to keep records of and report certain data to fishery managers. This data is used by fishery managers and biologists to monitor the biological and economic health of the fishery, develop conservative harvest strategies and assess their potential impacts, and to enforce regulations. In addition, the regulations sometimes define measures that ensure fairness for all participants in a fishery. For example, some regulations require fishermen to apply for a license, file a particular report, or pay certain fees. Such fairness rules may also apply to the regulatory agency itself by requiring the agency to issue certain reports, specify catch limits, or make certain determinations by a certain date.

The following paragraphs discuss each of the management measures or tools that fishery managers use to manage and conserve the resource: who can participate in a fishery; what species may be harvested; when and where harvesting may occur; and what restrictions may be placed on fishing gear.

Who May Participate

Until the MSA was implemented in 1976, the only restrictions on who could participate in offshore fisheries were imposed by bilateral or multilateral agreements with foreign countries (see Appendix B). Fishery resources beyond the territorial jurisdiction (which at that time extended to only 3 nautical miles [nm] from shore) of any nation were considered common property and open to access by fishermen from all nations. Freedom to fish on the high seas was considered a basic principle of international law of the sea. (Koers 1973). The MSA established, for the first time at the national level, an access priority for U.S. domestic fishermen over foreign fishermen in the U.S. EEZ (3 nm to 200 nm from shore off the coast of Alaska). Although this change was made primarily to support a growing U.S. industry, it was also justified on the grounds of addressing environmental conservation concerns. While the MSA began to limit participation in the fisheries in the EEZ to domestic fishermen, it nonetheless continued to allow an “open access” fishery with few limitations on fishing activities.

The problem with such an open access fishery has been summarized as follows:

If no control exists over access in fisheries and if demand for a stock (or stocks) of fish increases, then:

- Overcapitalization is inevitable and will become worse as prices for the product increase.
- Measures to prevent depletion will either impose or lead to increased costs of fishing to the fishermen, and these costs will become greater as prices for the product increase.
- The costs of management, research, and enforcement will be borne entirely by the taxpayer (Christy 1978).

Theoretically, the problem of an open-access resource may easily be solved by limiting access or establishing a system of property rights in the resource. Once a policy decision is made to limit access to a fishery, the first question is raised: to whom should exclusive harvesting privileges be granted? Typically, fishermen who have traditionally and regularly participated in a fishery in the past are included (i.e., licensed or permitted) in a limited-access fishery, and those who have never participated or have had insignificant involvement are not included. Early limited-access programs had problems in defining these categories of participants (Ginter and Rettig 1978). Fair and defensible implementation of a limited-access system requires precise and politically acceptable definitions of traditional, regular, and insignificant participation. Not surprisingly, most of the political controversies and legal challenges attending limited-access systems have focused on the questions, “Who is in?” “Who is out?” and “Why?”

Although limiting the number of vessels that can fish in a given area is a powerful tool for protecting limited stocks, modern fishing technologies (such as computerized fish detectors and global positioning systems, as well as gear improvements) often allow fishermen to harvest a large amount of fish in a short period of time. If the TAC for a given area can be caught in a matter of days, fishermen wishing to participate in that particular fishery are forced into a “race-for-fish,” where the fishermen who catch the most fish in the shortest amount of time “win” the race. This is one indication that, even with limited entry, a given fishery may have an over-harvesting capacity. While the race-for-fish system is “fair” in the sense that everyone has the same opportunity to enter the race, such a system leads to needlessly dangerous fishing conditions by

compelling fishermen to work with very little sleep and heedless of weather or sea conditions. Another argument against the race-for-fish is that it tends to swamp the capacity of fish processors when all the fish come in at the same time and leads to wasteful and inefficient use of the resource and increased bycatch and discards.

One way that fishery managers have responded to this situation is by developing so-called “rationalized” or “rights-based” fisheries. These controversial programs give specific individuals or communities the right to harvest a given percentage of the TAC, thus eliminating the race-for-fish because each individual’s (or community’s) share is protected from harvest by another individual or community. These programs can be designed to allow individuals to catch their quota of fish over a relatively long time period. The intent is that quota holders would fish when it is safe or convenient to do so, given all other fishing restrictions. If designed properly, this individual flexibility could reduce the race-for-fish, increase the temporal and spatial distribution of fishing effort, allow fishermen the time to minimize bycatch, and distribute the fishery’s demands on the processing/marketing sectors more evenly. The controversy arises over the contention that these programs grant private access to public resources, with all the economic benefits that accrue, to the exclusion of other citizens. Some people feel that rationalization plans have little to do with conservation or safety concerns and are really designed to preserve profitability for the select few who receive the fishing rights.

Under the MSA, limited-access systems are discretionary, but the law provides some guidance and standards in developing them. The NPFMC has exercised this discretionary limited-access authority on several occasions.

In December 1991, in response to overcapacity conditions, the NPFMC adopted a limited-access system in the form of an Individual Fishing Quota (IFQs) Program for the halibut and sablefish fixed-gear fisheries. An IFQ is essentially a federal permit that gives the person holding the IFQ an exclusive harvesting privilege to catch a specified percentage of the TAC of a fishery (i.e., a certain amount of fish). A novel feature of the IFQ Program is that it includes a separate allocation of halibut and sablefish for a CDQ Program. A CDQ is an allocation of a specific amount of fish that may be harvested by a particular type of coastal community or group of communities.

(It should be noted here that while sablefish are a target species defined under the BSAI and GOA groundfish FMPs and governed under the MSA, Pacific halibut are governed under the Northern Pacific Halibut Act of 1982, which authorizes the NPFMC to recommend allocation measures for the halibut fishery to the Secretary of Commerce.)

In the early 1990s, the NPFMC became increasingly aware of excess harvesting capacity also in the groundfish and crab fisheries under its jurisdiction. In June 1992, the NPFMC again exercised its discretion to recommend a limited-access policy by adopting a moratorium on the entry of new vessels into the groundfish and Bering Sea crab fisheries. The Vessel Monitoring Program (VMP) was designed to be an interim measure until a comprehensive “rationalization” plan could be developed and implemented. The VMP limited the ability of new participants to enter these fisheries until it was replaced by the License Limitation Program (LLP) in October 1998. The LLP was adopted together with a multi-species CDQ Program that included all other groundfish and crab species for which there were no CDQ allocations at that time. Under the LLP, qualified fishing vessels receive a license that authorizes fishing operations. The LLP,

in and of itself, does not eliminate the race-for-fish situation; although the use of qualifying criteria has reduced the number of vessels, the race-for-fish can still occur even though the fleet size is smaller than it once was. This realization has led managers to consider other types of programs for rationalizing fisheries.

Currently, participation in all fisheries for which the NPFMC has an FMP is managed under a limited-access program. The federal regulations that implement such programs for the IFQ, CDQ, LLP, and AFA programs for the groundfish fisheries are published primarily at 50 CFR 679.4, 679.30–32, 679.40–45, and 679.60–64, which list the qualification criteria for receiving and transferring harvesting privileges (permits or licenses) under these limited-access systems and other management considerations. The Restricted Access Management division of NOAA Fisheries, Alaska Region administers these programs (<http://www.fakr.noaa.gov/ram/>).

What May Be Harvested

To manage the species of groundfish likely to be taken in the groundfish fisheries, the FMPs divide those species into four categories.

1. **Target Species**—Those species that are commercially important and for which a sufficient database exists that allows each to be managed on its own biological merits. Accordingly, a specific determination of the total amount of fish that can be taken (the TAC) is established annually for each target species. Catch of each species must be recorded and reported.
- 2.. **Other Species**—Species that are currently of slight economic value and not generally targeted. This category contains species with economic potential or those that are important ecosystem components, but for which there is insufficient stock assessment data to manage each separately. Accordingly, a single TAC applies to this category as a whole. Catch of this category as a whole must be recorded and reported.
3. **Nonspecified Species**—Those species and species groups of no current economic value but that are taken by the groundfish fishery only as incidental catch in the target fisheries. Virtually no data exist that would allow population assessments. No record of catch is required. The TAC for this category is the amount that is taken incidentally while fishing for target species, whether retained or discarded.
4. **Prohibited Species**—Those species and species groups that must be returned to the sea with a minimum of injury, except when their retention is authorized by other applicable law. Groundfish species and species groups for which the annual TAC has already been taken are treated in the same manner as prohibited species.

Restrictions on what species of fish and, more specifically, how much of a particular species of fish may be harvested represent the most basic form of fisheries management in the EEZ off Alaska. Such restrictions focus on either numbers of animals, volume, or weight of the regulated species and are commonly referred to as *quotas*, *catch limits*, or *bag limits*. A catch limit is designed to balance the natural reproductive growth of the stock and the desire to harvest fish. Theoretically, at the “right” catch limit, the stock can continue to reproduce itself and sustain being harvested over time. A corollary control that is frequently integrated in

a catch limit rule is a size limit. Minimum size limits are designed to allow fish to grow to sexual maturity and spawn at least once before becoming vulnerable to fishing gear or “recruited to the fishery.” Maximum size limits may also be used to protect the largest animals from harvest because, in some species, the largest animals are the best reproducers.

A TAC is specified for each target groundfish species. The FMP implementing regulations require NOAA Fisheries, through formal consultation with the NPFMC, to establish TACs annually for each groundfish species, based on the biological condition of the stocks and on socioeconomic considerations (50 CFR 679.20(a)). The analytical basis for the NPFMC’s TAC recommendations is the annual Stock Assessment and Fishery Evaluation (SAFE) report, produced by NOAA Fisheries biologists and economists and reviewed by the NPFMC’s Plan Teams, Scientific and Statistical Committee, and Advisory Panel.

The sum of the TACs for all groundfish species is restricted to an established range of OY for the groundfish complex as a whole. OY represents a calculation of the amount of harvest that provides the greatest overall benefit to the nation with particular reference to food production and the protection of marine ecosystems. The OY range represents the lower and upper limits within which the yield is “optimum” for both the fishery and the resource. In the BSAI, the lower limit of that range is 1.4 million metric tons (mt), and the upper limit is 2 million mt (50 CFR 679.20(a)(1)(I)). In the GOA, the OY range is between 116,000 mt and 800,000 mt (50 CFR 679.20(a)(1)(ii)).

The annual TAC-setting process is similar to the public rule-making process for FMP amendments. The process begins in September with the NPFMC Plan Teams’ review of preliminary stock assessment data. The NPFMC deliberates on TAC limits and some prohibited species catch (PSC) limits, and decides how the TACs should be apportioned and allocated among various fishing industry components. In October, the NPFMC selects proposed TACs and allocations that are published by NOAA Fisheries in the FR for public comment. With public input and further committee reviews of updated stock assessments, the NPFMC selects final TACs for the following year at its December meeting. Ultimately, when approved by NOAA Fisheries, the final TAC amounts and their apportionments and allocations among areas, gear types, or sectors are published in the FR. Fishery closures are made by the agency during that fishing year to avoid exceeding the amounts of fish authorized for harvest, as specified by the TACs. See Section 2.3 and Appendix F-1 for more details on how TACs are calculated.

Another major fishery management issue is the regulation of incidentally caught species, or “bycatch.” Bycatch is inevitable in almost all fisheries that use nets, hooks, or traps of any kind. Bycatch may not always be a species different from that being targeted. For example, individual fish of the target species that are too small, too large, or of the wrong gender may be worthless in the fisherman’s market; any fish that is discarded because it has little or no value to the fisherman is often referred to as “economic bycatch.” Another form of bycatch occurs when fishermen catch fish that are commercially valuable but, if retained, would violate various fishing regulations designed to conserve or allocate the resource. Fishing vessels are usually required to discard these fish at sea, and this is called “regulatory bycatch.”

Fishery managers can implement regulatory incentives and gear restrictions to minimize economic bycatch. Bycatch limits may be imposed that, when reached, cause closure of the targeted fishery or closure of certain high bycatch areas. Alternatively, fishery managers may require fishermen to retain bycatch onboard rather than discard it at sea. This imposes an economic cost in the time it takes fishermen to handle the bycatch and in the hold space it takes up. These management measures in Alaska are called Improved Retention/Improved Utilization programs (IR/IU). Gear restrictions include minimum mesh sizes for trawls, biodegradable panels and halibut excluder devices on pot gear, and careful release mechanisms for longline gear. Certain gear types, like seine and gillnets, have been prohibited in the groundfish fishery because of their indiscriminate bycatch. Efforts to measure and improve the effectiveness of bycatch measures receive a great deal of attention from the fishing industry, conservation organizations, and fishery managers alike.

The groundfish fisheries are prohibited from harvesting some species because other fisheries depend on them. Prohibited species (crab, Pacific halibut, Pacific salmon, and Pacific herring) are identified in the FMPs and must be discarded if caught (with certain exceptions). Management efforts to minimize this regulatory bycatch include PSC limits that, when reached, cause closure of the targeted fishery or closure of certain high bycatch areas. As mentioned above, gear restrictions also help minimize catch of prohibited species.

When, Where, and How Harvesting May Occur

In the U.S., fishing has historically been allowed unless regulations specifically close or limit the harvesting of fish. In other words, if there are no regulations prohibiting or constraining a fishery, gear type, or catch level, then a fishing activity can legally proceed without any constraints. Typically, such constraints are specified in terms of the area and time period during which they apply. Hence, regulations governing when and where fish may be harvested are nearly always linked. For example, a rule usually specifies an area in which certain restrictions apply for a specified time period or season. An area may be closed all the time, only for certain periods, or it may be open at the beginning of a fishing year and remain open unless certain criteria are triggered during the year that cause it to close. The reasons for restricting fishing in a certain area are as varied as the types of restrictions that apply. An area may be closed to fishing to protect spawning stocks, to protect sensitive habitat, to control the bycatch of a non-target species, or to prevent competition between the fishery and marine mammals protected under the ESA. Fishing in certain areas may also be restricted for allocation purposes or to eliminate conflicts between different gear types. Fishing effort may be dispersed over a larger area by selectively closing smaller areas.

For the groundfish fisheries in the EEZ off Alaska, rules restricting where and when fishing can occur generally appear at 50 CFR 679.22–23. In addition, regulations at 50 CFR 679.20–21 provide for certain area closures when specified TAC and PSC limits are reached.

Management Areas and Area Closures

Sectioning areas of ocean along the Alaska coastline into discrete management areas has been a fundamental fishery management tool beginning with the declaration of the EEZ by the MSA in 1976. With further division of the EEZ into the GOA and BSAI in 1978 and 1981, respectively, the NPFMC and NOAA Fisheries have used area designations to more effectively gather data, prevent overharvest of the TACs, reduce bycatch, allocate harvesting and processing privileges, promote rebuilding of depressed crab stocks,

and protect areas containing sensitive marine habitat. For more than 25 years, a complex grid of management areas and area closures has been used to provide strict control over the GOA and BSAI groundfish fisheries and to achieve the policy objectives of the FMPs. Groundfish management areas and area closures are implemented by regulations at 50 CFR 679.21-24. See Figure 4.2-1 for a map of these areas as defined in the 2002 regulations. See also Appendix F-3 for a qualitative discussion paper on the current closed areas and an environmental impact assessment of potential amendments to this regulatory scheme.

Fishing Gear Restrictions

Many species of fish can be caught with a variety of fishing techniques. Although some types of fishing gear are more selective than others for the species targeted, there are many logistical and traditional reasons that certain gear types are preferred in different areas. For fishery managers, restrictions on the types of fishing gear that may be used represent another basic management tool. Such restrictions usually prescribe what types of fishing gear may or may not be used to harvest certain species and are often linked to specific areas and time frames.

Gear restrictions may be imposed for various reasons, including biological conservation of target or non-target species, habitat protection, or socioeconomic management. Also, gear restrictions may be necessary to resolve gear conflicts or to protect the interests of fishermen who have traditionally used a particular gear type. For example, GOA FMP Amendment 14, adopted by the NPFMC in 1985, prohibited the use of pot gear in the eastern GOA in the sablefish fishery because pots conflicted with the retrieval of hook-and-line gear, which was traditionally used in that fishery. In addition, gear restrictions are commonly used in an open-access fishery to impose constraints on the harvesting efficiency of the fleet. Efficiency restrictions effectively allow for more participation in the fishery rather than less, which may be desirable to slow the pace of harvesting or to distribute the social and economic benefits of the harvest among more participants.

Until recently, any fishing gear could be used to harvest fish in the EEZ unless it was specifically prohibited or regulated. The 1996 amendments to Section 305(a) of the MSA (Section 305(a)) changed this approach by requiring the Secretary of Commerce to publish a list of authorized fisheries and fishing gear. Under this change, a fish, regardless of whether it was targeted for capture, may be retained only if it is taken within a listed fishery, is taken with gear authorized for that fishery, and is taken in conformance with all other applicable regulations. A final rule that lists authorized fisheries and gear types was published December 2, 1999 (64 FR 67511). Authorized gear types for the BSAI and GOA groundfish fisheries include bottom and pelagic trawls, pots, and hook-and-line. Groundfish gear limitations are implemented by regulations at 50 CFR 679.24. See Appendix F-7 for the distribution of gear types used to catch different groundfish species. (The reader can learn more about the current Federal Observer Program and potential changes being considered by NOAA Fisheries in Appendix F-10). See Appendix F-7 for a qualitative discussion paper on the rationale behind the current gear restrictions and gear allocations in the Alaska groundfish fisheries and on the environmental tradeoffs of potential amendments to these regulations.

Summary

These management tools—restrictions on who may fish what, when, where, and how—allow NOAA Fisheries and the NPFMC to maintain the control necessary to maximize the benefit of the fisheries while conserving the resource to ensure its sustained availability. The success of these tools requires that managers have access to up-to-date information, sometimes on a daily basis, about the fisheries and their harvests and about the state of the resource and its environment. To gather that information, NOAA Fisheries has developed an elaborate system for monitoring the fisheries, the resource, and the environment. The sources and methods for gathering data on the fisheries are the subject of the following section.

2.5.2 Sources of Fisheries Management Data

Fisheries managers use several different sources of information to design, implement, and monitor the specific goals and effects of FMPs. These include catcher vessel and processor logbook records, data collected by trained observers, detailed location data collected with automated Vessel Monitoring System (VMS) units, and independent research carried out by government agencies and academia. This section summarizes the collection and importance of those data for fisheries management.

Record-Keeping and Reporting Requirements

Reporting requirements include maintaining logbooks at sea and on shore, as well as submitting certain forms to NOAA Fisheries. Catcher vessels and buying stations (tender vessels and land-based buying stations) are required to record fishery information in logbooks daily. Processors (motherships, catcher processors, shoreside processors, and stationary floating processors) are required to record fishery information in logbooks daily and summarize the information on production reports that are submitted weekly to NOAA Fisheries.

To assist NOAA Fisheries in determining fishing effort by species, processors also report the start and end of their participation in fishing operations (called check-in/check-out reports). To allow NOAA Fisheries to develop a catch history for catcher vessels delivering to motherships, each mothership must issue ADF&G fish tickets for each groundfish delivery. Information common to all the logbooks includes participant identification; amount and species of harvest, discard, and product; gear type used to harvest the groundfish; area where fish were harvested; and observer information. The reader can learn more about the current data and reporting requirements and the cost and benefits of potential changes in Appendix F-11.

Participation in the BSAI and GOA groundfish fisheries in any manner (i.e., as catcher, processor, or transporter of fish) requires one or more federal permits. All permit holders are required to comply with record-keeping and reporting requirements to report groundfish harvest, discard, receipt, and production (50 CFR 679.5).

Since 1992, NOAA Fisheries has based all estimates of catch in the groundfish fisheries on a combination of observer data and Weekly Production Report (WPR) data. The WPR summarizes the Daily Cumulative Production Logbook (DCPL) on a weekly basis. The operator of a catcher processor or mothership or the manager of a shoreside processor must submit a WPR for any week the mothership, catcher processor, or shoreside processor is checked in. A Shoreside Processor Electronic Logbook Report (SPELR) is required

instead of a DCPL and WPR for shoreside processors or stationary floating processors receiving groundfish from AFA catcher vessels or receiving pollock harvested in a directed pollock fishery.

The blend data processing system developed by NOAA Fisheries combines data from industry and observer reports to estimate groundfish harvest in North Pacific groundfish fisheries. The system blends the best available data from different sectors of the fishery to generate what, NOAA Fisheries believes, is the most accurate estimate of total groundfish harvest possible with the existing data.

WPRs for shoreside processors report landed weight of catch. These WPRs are the best source of data for retained groundfish landings. All fish delivered to shoreside processors are weighed on scales, and these weights are used to account for retained catch. Observers on catcher vessels report groundfish species composition, total catch, and estimates of retention and discard on a weekly basis. Observer information on groundfish discards is used in conjunction with total retained groundfish catch from shoreside weekly production reports to estimate total at-sea discards from all catcher vessels, including observed and unobserved vessels. All observer data for a month, gear, and target fishery are combined to compute discard rates for each groundfish species observed to be discarded. The discard rates are expressed as a ratio of the weight of the discarded species to the total retained groundfish weight. The discard rates are multiplied by the retained landings for each shoreside processor to estimate total at-sea discards of groundfish associated with the groundfish landed to the processor.

Total catch for shoreside processors is obtained by adding the landed catch weights reported on shoreside processor WPRs to the estimates of at-sea discards. WPRs for catcher processors and motherships report weights of processed product and round weights of discards. Product weights are converted to equivalent round weights using product recovery rates (PRRs). Total catch may be estimated using cod-end or bin volumetrics, scales, or conversion from production data. Species composition of the catch is obtained by sampling the catch, and the total catch is apportioned by species based on that sampling.

Total groundfish catch for all species combined is computed each week for each processor vessel from the WPR and the observer report. If either report is missing, the available report is selected. If both reports are available, the blend compares the two numbers: if the WPR and observer total catch numbers are within 5 percent, the WPR is selected as the data source; if the WPR is more than 30 percent higher than the observer total catch (for pollock target fisheries) or more than 20 percent higher (for all other target fisheries), the WPR is selected as the data source. In all other cases, the observer report is selected as the data source. The blend program then returns to the source data (WPR or observer) and copies the detailed records, showing gear type, area and species, to the blend. Records from WPRs are identified in the blend by a source field value of "W," observer records are identified by a source field value of "O."

As noted above, the blend process combines data from industry production reports and observer reports to make the best possible, comprehensive accounting of groundfish catch. These data are used to manage quotas for groundfish in the GOA and BSAI. The blend data are also used as the basis for computing estimates of prohibited species bycatch and for numerous regional and national reports, fishery stock assessments, and analysis of FMPs.

In 2003, NOAA Fisheries, Alaska Region implemented a new groundfish accounting system. This new groundfish catch accounting system utilizes the same data sources as the blend—observer data, shoreside processor landings data, and processor weekly production report data, but where the blend aggregated all data to the level of processor and week, the new system accounts for data at the haul (observer) and delivery (shoreside landings) level and can track all the current quotas. The new system is also more adaptable for anticipated future changes. More information on the new accounting system is online at <http://www.fakr.noaa.gov/sustainablefisheries/catchaccounting.htm>.

The reader can learn more about the current data and reporting requirements and the cost and benefits of potential changes in Appendix F-11.

Observer Program

The North Pacific Groundfish Observer Program offers an important check on the validity of data reported by catcher vessels and processors and provides some data that would not otherwise be available. Observers are trained by NOAA Fisheries (through contract with the University of Alaska's North Pacific Observer Training Center in Anchorage) and hired by private contractors who provide observer services to catcher vessels and processors. NOAA Fisheries requires that observers have a minimum of a bachelor's degree in biology, zoology, wildlife management, fisheries, or a related area of study; and one course each in math and statistics. Some contractors also require employees to have additional coursework or experience, especially with computers.

As a condition of their fishing permits (see 50 CFR 679.50), fishing vessels and processors are required to provide various levels of observer coverage for their operations. Vessels 125 feet (ft) or greater in length overall (LOA) are required to carry observers for 100 percent of their fishing days. Vessels that are 60 ft LOA or greater but less than 125 ft LOA are required to carry observers for 30 percent of their fishing days. (Vessels under 60 ft LOA are not required to carry observers.) Observers are also required at shoreside and floating processing plants according to processing rate, with 100 percent observer coverage of plants processing 1,000 mt or more per month, and 30 percent observer coverage of plants processing 500 to 1,000 mt per month.

Groundfish observers collect catch and other biological data throughout the groundfish fishing season. Information is recorded on catch composition of targeted, bycatch, and prohibited species; total groundfish catch, location of fishing, and fishing effort; length and weight frequency measurements, collection of age structures (scales/otoliths), and retrieval of tags from tagged fish. Observers also record the species, number, and condition of marine mammals and seabirds observed in the area or interacting with the fishing gear.

The catch-estimation methods used by observers vary among the vessel types, due to differences in available equipment and fishery operations. For individual hauls at sea, observers aboard catcher vessels using trawl gear make volumetric estimates of catch weight (by making either measurements of the trawl net as it is hauled aboard or measurements of fish in the holding bins multiplied by a density factor). When the vessel delivers to a shoreside processor, the catch is weighed on scales. The observer then uses the at-sea volumetric estimates and discard information to calculate the proportional weight of individual hauls. If an observer is unable to make volumetric estimates at sea (for a variety of logistical reasons), the vessel operators estimate individual haul weights using a variety of methods. The accuracy or precision of vessel estimates is unknown.

The trawl catcher processors that fish under the AFA or the CDQ regulations are required to weigh their catches using NOAA Fisheries-inspected, in-line motion-compensated scale systems that provide very accurate individual haul weights. All fish coming aboard these vessels are weighed, and these weights are reported to NOAA Fisheries by the observer. The observer also has a role in monitoring the daily testing of the scale to ensure its accuracy.

Aboard hook-and-line vessels, observers count or estimate the total number of hooks in each set, tally the number and species caught in sampled sections of the set, estimate the average weight of individuals of each species sampled, and multiply these average species weights and numbers by the number of hooks in the entire set. Observers are instructed not to use vessel estimates of total catch aboard hook-and-line vessels because they usually do not include bycatch and fish that drop off hooks before being hauled aboard. Consequently, observer catch estimates for unsampled sets are extrapolated from similar sampled sets. Observers aboard boats using pot gear count and weigh the catch in sampled pots and estimate the total catch in a set by multiplying the sampled species' numbers and average weights by the number of pots in the set. Weekly summary reports of observer data are sent to the NOAA Fisheries, Alaska Region for use in groundfish and prohibited species accounting. Daily reports are sent as needed to monitor specific fisheries. The reader can learn more about the current federal observer program and potential changes being considered by NOAA Fisheries in Appendix F-10.

Vessel Monitoring System

Beginning in 2002, all fishing vessels participating in the directed fisheries for pollock, Pacific cod, or Atka mackerel using pot, hook-and-line, or trawl gear are required to have aboard an operable VMS, which provides regular vessel location data to NOAA Fisheries via satellite (40 CFR 679.7(a)(18)). This requirement is necessary to monitor fishing restrictions in Steller sea lion protection and forage areas. A VMS consists of a Global Positioning System unit that is integrated with a satellite communication device in a tamper-proof system. The VMS determines vessel location in latitude and longitude and transmits this data, along with a vessel identifier number and the time of transmission, to NOAA Fisheries. VMS data are used to monitor compliance with closed areas and to verify the location of catch when separate quotas are established inside small or irregularly shaped areas that do not correspond with the standard reporting or statistical areas.

Independent Resource Surveys

Measuring fish stock abundance or biomass in the ocean is not easy. Unlike trees, and even unlike fish that have been harvested, fish below the water surface cannot simply be individually counted. Assessing stock abundance and biomass is further complicated because fish move around and may migrate extensively over relatively short time periods. This means that the abundance of oceanic fish stocks can only be estimated, and the only feasible way to estimate fish abundance independent of commercial harvests is by survey sampling methods. The Alaska Fisheries Science Center (AFSC), the research arm of NOAA Fisheries in Alaska, and specifically, the AFSC's Resource Conservation Assessment Engineering (RACE) Division have primary responsibility for conducting sampling surveys and have made some of the most significant contributions to the science of fishery resource surveys as it has developed over the past 40 years (Gunderson 1993).

Several different surveys have been developed for the BSAI and GOA areas, including bottom trawl surveys, acoustic echo-integration/trawl surveys, and longline surveys. Each survey has unique strengths and weaknesses for estimating abundance depending on the species' social behavior, preferred habitat, location in the water column or proximity to the sea floor, swimming ability, and attraction to bait, among other variables. For example, the bottom trawl survey can do a good job of estimating the biomass of rock sole, which inhabit the seafloor, but will be less effective at estimating the biomass of midwater or pelagic fishes, such as herring and squid. Conversely, fish without air bladders or that live on the sea floor are very difficult to detect by acoustic survey systems. For estimating abundance and distribution of Alaska's groundfish resources, the AFSC's primary methods include area-swept bottom trawl surveys for shellfish and bottomfish stocks; echo-integration/trawl surveys (acoustic surveys) for the dominant semipelagic stocks, such as pollock; and longline surveys for measuring relative abundance of valuable bottom species that inhabit the deeper waters of the upper portion of the continental slope.

The AFSC's comprehensive survey strategy consists of a suite of annual and triennial bottom trawl and acoustic surveys alternating among the eastern Bering Sea (EBS), Aleutian Islands, GOA, and the West Coast regions. Annual surveys have been conducted for the crab and groundfish stocks in the Bering Sea, spawning pollock in Shelikof Strait of the GOA, and Bogoslof Island area of the Bering Sea, and sablefish in the GOA. In recent years, NOAA Fisheries bottom trawl surveys have annually sampled an area of approximately 600,000 square kilometers (km²), an area that includes as many as 1,400 sampling stations. The winter and summer acoustic surveys cover about 15,000 km of tracklines annually. The annual Alaska sablefish longline survey covers about 95,000 km² and fishes 16 km (7,200 hooks) of longline per station over a depth range of about 660 to 3,960 ft at about 90 sampling stations.

Survey gear is generally designed to catch fish over a wide range of sizes. Hence, surveys provide a consistent sample of fish from year to year, and provide information on prerecruit-size fish (fish smaller than those "recruited" to the fishery, i.e., available for legal harvest) that would otherwise not be available for stock assessment. Survey stations are either laid out in a systematic pattern over the fishing grounds or in a stratified random pattern. Table 2.5-1 summarizes the survey strategy for the BSAI and GOA fisheries for the 1999-2000 period. See Appendix B for maps and tables summarizing the historic survey efforts. For further information on the AFSC, RACE, and the surveys, visit the AFSC website at www.afsc.noaa.gov.

In summary, the groundfish surveys conducted off Alaska represent probably the most extensive survey effort implemented by a single government agency anywhere in the world. The survey strategy is currently being expanded to an annual/biennial cycle, which will greatly increase the pollock stock monitoring in the groundfish stocks. The increased age composition data from expanded surveys will also improve stock assessments and forecasts, particularly for the younger incoming year-classes (all fish born in a particular year). Data collection management from the observer program and resource surveys has been enhanced by modern computer technology, which expedites the availability of fishery catch data to allow in-season management of harvest quotas. Both survey and catch data now become available in time to be incorporated into annual stock assessment updates used to set TACs for the upcoming fishing season. These surveys also provide the best database for identifying EFH, interspecific interactions (interactions between different species), and biodiversity of marine ecosystems.

Summary

This section has outlined the systems and methods that the NPFMC and NOAA Fisheries use to gather information about the fisheries, the resource, and the environment. Yet, however elaborate and sophisticated these systems and methods may be, the fact remains that fishery scientists and managers cannot simply count the individual fish below the surface, and for this reason, the fisheries must necessarily be managed in the face of some degree of uncertainty. The following sections discuss the strategies fisheries biologists and managers have developed for accounting for uncertainty and integrating it into fisheries management.

2.5.3 Establishing Limits in the Face of Uncertainty

Fishery managers face the daunting task of controlling the large-scale manipulation of a complex system, the marine environment, without causing unacceptable changes in that system. The traditional scientific approach to this task is to reduce the complex problem into simpler components, analyze these components separately, and then try to synthesize the different pieces and extrapolate the effects on the whole. Fishery managers have followed this tradition by reducing the complex ecosystem problem to a series of single-species management problems, analyzing the impacts of fishing on one species at a time, and then trying to synthesize the impacts at a broader management level.

While single-species management analyses try to incorporate a wide variety of environmental information into their stock assessment models and the NPFMC has established principles of ecosystem-based management, the reality is that the larger system is far too dynamic and complex for even the best minds with the fastest computers to fully understand. Of course, managers of other natural resource systems struggle with the same issue, namely, how do you do your job in the face of continual uncertainty about how the system really works and how it responds to various human activities?

The short answer is that fishery managers do the best they can with the available information, however imperfect and uncertain. At the same time, they try to eliminate as much uncertainty as possible by expanding and improving the types of information available to them and improving the integration of that information into the decision-making process. That is one of the major goals of this Alaska Groundfish Fisheries Programmatic SEIS.

This section will provide brief descriptions of the complicated processes required to establish the goals and limits of the groundfish fisheries and, at the same time, to account for uncertainty at every level in order to manage the system in a “precautionary” manner, as required by the NPFMC policy. Discussion of these processes is simplified for readers. Details of the calculations and methodology discussed here can be found in Appendix B.

Stock Assessments for Alaska Groundfish Stocks

Passage of the MSA in 1976 marked the beginning of the collection by NOAA Fisheries of fisheries data in an effort to generate stock assessments of major groundfish resources. The AFSC, responsible for BSAI and GOA groundfish assessments, updates the stock assessments annually in the SAFE reports. These SAFE reports are prepared and reviewed by the NPFMC’s BSAI and GOA groundfish plan teams, which are comprised of scientists from NOAA Fisheries, ADF&G, USFWS, several universities, and NPFMC staff.

Spearheading each of these plan teams are NOAA Fisheries scientists from the AFSC Resource Evaluation and Fishery Ecology Division. These scientists incorporate the biomass estimates generated by the RACE division's stock assessment surveys into statistical models to provide insight into the effects of different harvesting strategies, to test analytical assumptions, and to learn more about how the marine ecosystem works and the effects of fishing on that ecosystem. For further information on the AFSC, Resource Evaluation and Fishery Ecology Division, and the methods and analyses used in making stock assessment projections, visit the AFSC website at www.afsc.noaa.gov.

Stock assessment analysis is a way to estimate how many fish are in a specific geographic ocean area or fishing grounds and to predict how these fish stocks or populations will respond to a particular harvest rate. Scientists use resource survey and fishery information in mathematical calculations to estimate how many fish are in a specific management area of the ocean (abundance or biomass). Life history information (growth, maturity, fecundity) is combined with estimates of natural mortality, including removals by predators, and used to estimate how many fish can be caught in a fishing season without impacting future stocks. While the NPFMC weighs economic and social considerations along with biological and ecological concerns to establish OY, stock assessments are primarily concerned with biological limits and stock production variability.

Three analytical assessment methods are typically used for Alaska groundfish: index methods, stock synthesis, and an Automatic Differentiation (AD) model builder. (For a review of current stock assessment methodology used in the TAC-setting process, see Section 4.3.1 and Appendix F-1.) A brief discussion of these three assessment methods, beginning with the simplest follows below.

Index Methods

The simplest way to assess a fish stock is to create an index of population size or biomass based primarily on resource surveys (see Section 2.3). A survey method is selected that targets one or more stocks in a specific area. By multiplying the average catch rate (the rate at which the survey caught fish) by the size of the area fished, scientists can estimate the abundance of fish or the biomass for that survey area. The results can be expressed either as an index of abundance or as an estimate of stock biomass in metric tons. There are several sources of sampling and statistical uncertainty inherent in these surveys that cannot be eliminated merely by increasing the frequency or intensity of the surveys. Ideally, the amount of uncertainty at each step in the process is incorporated into a "confidence interval" for each estimate. For example, the stock assessment could say there is a 95 percent chance that the actual biomass of the stock in the given area is between a range of high and low values. Given a particular data set, the narrower the range of points between those high and low values, the less confidence one may have that a point between that range is an accurate estimate of biomass.

Stock Synthesis and Automatic Differentiation Model Builder

Stock synthesis and AD model builder are computer programs that create statistical models of complex fish population dynamics. Without going into the details of statistical analysis and model-building here, we can say that, as the name suggests, model builder software allows us to create models: statistical replicas of a fish population that, while not as accurate as, say, a photograph, nevertheless provide scientists with a statistically reasonable facsimile of what a population looks like and what it will look like at a given time in the near

future. Basically, this software allows us to input what we do know about the fish stocks to find out some of what we do not know (again, because we can not count the fish) and to predict short-term trends in biomass with some certainty.

The survival and growth of eggs, larvae, and juvenile fish are highly variable over time due to natural fluctuations in the marine environment. The appearance of small, younger fish in resource survey and observer data provides a means to forecast the strength of various year-classes. However, variability in recruitment (the number of fish that survive and grow large enough to be targeted by the fishery) from one year to the next impairs our ability to project stock trends with much certainty. The ability to determine changes over time in the age-structure of a fish population (how many fish of each year-class make up the total population) is critical to assessing a stock accurately—particularly if the population has undergone extreme changes in abundance. With a time series of age composition data, scientists can use stock synthesis and AD model builder software to generate complex population models.

For most Alaska groundfish, spawning is highly seasonal, so that all fish in a particular year-class will have been born within a month or two of each other. Stock synthesis and AD model builder keep track of each year-class as it ages, enters the fishery, and eventually dies out. Recruitment occurs when a year-class begins to be captured by fishing gear. For example, the relatively strong 1994 year-class of pollock in the GOA “recruited” to the fishery in 1996 at age two; in 1999, at age five, it constituted 36 percent of the total pollock catch. Being able to keep track of year-classes in this way improves abundance estimates and allows scientists to better predict short-term trends.

One of NOAA Fisheries’s primary long-term objectives is to reduce uncertainty in stock assessments. Moving from an assessment based on a biomass index, or an aggregate biomass model, to an age-structured assessment is a positive step towards achieving this objective. In 1990, four Alaska groundfish assessments were based on age-structured models. By 2004, 19 assessments were based on age-structured models, and 19 were based on a survey index (Table 2.5-2).

Further refinements, such as the development of AD model builder applications specific for Alaska groundfish, may further reduce uncertainty, but only moderate gains can be expected. The real strength of these modern assessment methods lies in their ability to realistically integrate into the model the uncertainty inherent in the assessment processes. Using AD model builder, it is possible to obtain confidence limits for current stock size that reflect the uncertainty in the input parameters and in how well the model fits the data. These confidence limits may be rather large for many groundfish stocks.

Setting Fishery Targets and Limits

Fishery managers have developed a series of targets and limits for each fishery. They are all abbreviated in common usage among scientists and managers, and can be quite confusing at first. Readers new to the science should refer to the Acronyms and Abbreviations located in the beginning of this document. This section will introduce the terms, their relationships to each other, and how they are used in fishery management. Details on the mathematical derivations of each term are listed in Appendix B. The Appendix also includes a qualitative discussion paper on the TAC-setting process currently being used and provides an EA of potential amendments to that process (see Appendix F-1).

The National Standards established in the MSA (see Section 2.2.2) establish guidelines for the management of fishery resources based on the concept of Maximum Sustainable Yield (MSY). According to these FMP guidelines, a stock is defined to be overfished if the harvest exceeds MSY for a year or more. Overfishing is, by definition, a rate of fishing that is not sustainable over time. Thus, MSY and the overfishing level (OFL) are examples of a fishery *limit*, an amount of fishing that management is trying to avoid. The FMP guidelines distinguish such a limit from a fishery *target*, an amount of fishing that management is trying to achieve. Historically, NPFMC policy has been to use a precautionary approach in setting target levels so that they are well below the appropriate limits. Furthermore, NPFMC policy holds that the criteria used to set target catch levels should be explicitly risk-averse, so that the caution used in setting target levels is commensurate with the uncertainty about the status or productivity of a stock.

The National Standards require that each FMP specify, to the maximum extent possible, objective and measurable criteria for determining the status of each stock or stock complex covered by the FMP. The FMP must also provide an analysis of how those criteria were chosen, and describe how they relate to the reproductive potential of a stock. One such criterion is the maximum fishing mortality threshold: in other words, the maximum allowable number of fish killed through fishing. In the BSAI and GOA groundfish FMPs, the maximum fishing mortality threshold is equivalent to the OFL. The OFL is the most basic fishery limit and is defined as any amount of fishing in excess of a prescribed maximum allowable rate. Exceeding the maximum fishing mortality threshold for a period of one year or more constitutes *overfishing*. The maximum allowable rate of fishing varies depending on the amount of information available from the stock assessment. The BSAI and GOA groundfish stocks are managed within a system of six tiers corresponding to a descending order of the availability of reliable information. Stocks managed under Tier 1 have the most reliable stock assessment data, and those managed under Tier 6 have the least reliable data. The NPFMC's Scientific and Statistical Committee has the final authority for determining whether a given item of information is "reliable" for the purpose of assigning a stock to a certain tier, and may use either objective or subjective criteria in making such determinations.

The second status determination criterion of the National Standards is the minimum stock size threshold (MSST). Although MSSTs are not specified by the BSAI and GOA groundfish FMPs, the fact that their use is required by the National Standards resulted in their becoming a standard component of the SAFE Reports beginning in 1999. It is currently considered impossible to evaluate the status of stocks in Tiers 4-6 with respect to their MSSTs because stocks qualify for management under these tiers only if reference stock levels (such as MSST) cannot be reliably estimated. Derivation and values of MSST for Tier 1-3 species are included in Appendix B.

The stock-specific TAC has been the basic target or goal for a fishery and is set by the NPFMC for different categories of groundfish species and species groups every year after taking into account other uses and needs of the ecosystem. The decision to manage a species individually or as part of a species group depends on the commercial importance and the amount of biological information that is available for each species. *Target species* are commercially valuable and are managed individually with separate TACs. *Other species* have some economic potential but are not generally targeted and are managed as a group with a single TAC that applies to the whole category. *Nonspecified species* have no commercial value, and the single TAC for the group is whatever amount is caught incidentally. *Prohibited species* have, by definition, no allowable catch limit and must be released with a minimum of injury. The NPFMC has the discretion to create or change

subgroups of species within a management category, but an FMP amendment is required to move a species into the target category.

The TAC specifications define upper harvest limits, or fishery removals, for the next fishing year. The sum of the TAC specifications is important because the FMPs specify the upper and lower ceilings for total TAC in each management area. As noted earlier, those upper and lower ceilings define the OY for each management area. In the BSAI, the lower limit is 1.4 million mt and the upper limit is 2 million mt (50 CFR 679.20(a)(1)(I)). In the GOA, the lower limit is 116,000 mt and the upper limit is 800,000 mt (50 CFR 679.20(a)(1)(ii)).

Sub-allocations of TAC are made for biological and socioeconomic reasons according to percentage formulas established through FMP amendments. For particular target fisheries, TAC specifications are further allocated within management areas (Eastern, Central, Western Aleutian Islands; Bering Sea; Western, Central, and Eastern GOA), among management programs (open access or CDQ Program), processing components (inshore or offshore), specific gear types (trawl, nontrawl, hook-and-line, pot, jig), and seasons according to regulations at 50 CFR 679.20, 50 CFR 679.23, and 50 CFR 679.31.

There are certain notice and comment rule-making requirements that NOAA Fisheries must meet, particularly those of the APA, concerning prior public review and comment regarding regulatory actions. To satisfy these requirements, NOAA Fisheries uses a three-part process for publishing the TAC specifications and allocations in the FR. Proposed, interim, and final TAC specifications and allocations are published in sequence by NOAA Fisheries.

NOAA Fisheries first publishes *proposed specifications* based on the NPFMC's recommendations from its October meeting. These recommendations are typically based on the previous year's fishing data, as contained in the SAFE reports. All Plan Team and NPFMC meetings leading up to the proposed specifications are open to the public with opportunities for public comment. It then takes NOAA Fisheries about two months to draft, review, get internal clearance, and publish the proposed regulations after receiving the NPFMC's recommendations in October. The proposed regulations are typically published in December. In 2002, for example, the NPFMC met and recommended proposed year 2003 specifications on October 6, 2002, and the proposed specifications were published December 13, 2002. After the publication date, NOAA Fisheries must then provide a 30-day public comment period before publishing *final specifications*.

However, because the fishing year in both the GOA and BSAI begins on January 1, and because the final specifications and allocations cannot be published by this date, NOAA Fisheries publishes *interim specifications* which are effective from January 1 until implementation of the final specifications. The interim TAC specifications are prescribed as 25 percent of the proposed TACs. Final TAC specifications are recommended by the NPFMC at its December meeting. These recommendations are based on the final SAFE reports that incorporate much of the data from the most recent fishing season and so represent an updated picture of the fishery. Again, it takes NOAA Fisheries about two months to prepare and approve the final regulations based on these new recommendations from the NPFMC. For the 2003 fishing year, the NPFMC met December 4–9, 2002, and recommended final TAC specifications that were published in the FR on February 18, 2003.

Since 1991, an EA has been prepared on each year's TAC specifications to comply with both MSA and NEPA requirements. These EAs are used in the decision-making process and accompany the specification rules through regulatory review and filing with the FR.

The TAC-setting process is known to have flaws. The proposed specifications are outdated by the time they are published and the public has a formal opportunity to comment on them. Compounding the problem is that the initial specifications are not based on the best scientific information. The scientific information obtained from the surveys, observer program, and other sources is usually not available until November. Stock assessment biologists need some time to review the data, correct errors, and run their population dynamics models. The NPFMC recommended a revision of the TAC-setting process in 1996 (BSAI/GOA FMP Amendments 48/48), but technical difficulties pertaining to the timing and completion of analyses have delayed a regulatory amendment. A new draft analysis to revise the process was presented to the NPFMC in September 2002. If approved, a revised TAC-setting process would be in effect in time for setting the TACs for the 2004 fishing year. See www.fakr.noaa.gov for updates on this analysis and schedule for decision-making.

Target Species Limits

Target species are those groundfish species or species groups that are actively pursued by the fishing industry. As described above, an annual process has been established for setting TAC for each of these target species. The annual TAC for each species of groundfish is allocated or apportioned to industry components based on gear type, vessel size category, processing sector, and quota recipient class (such as CDQ group or AFA cooperative or IFQ holders).

The CDQ Program receives an allocation of a percentage of each groundfish species or species group that are managed under the BSAI FMP and that have an annual TAC. The overall CDQ allocation for each species is further allocated to the six CDQ groups. NOAA Fisheries requires each CDQ group to submit catch reports for all vessels fishing for it. Observer data are used to monitor groundfish CDQ harvests by all catcher processors and motherships. Trawl catcher vessels are required to retain and deliver groundfish CDQ harvest to a shoreside processor, where they must be sorted by species, weighed (or, as in the case of salmon, counted), and reported by the processor on a CDQ delivery report. Observer data are used to verify the species reported on the CDQ delivery report and to check the species weights. For hook-and-line and pot catcher vessels, they may either deliver their fish to shoreside processors and use their delivery reports or use on-board observer data.

TACs are further subdivided for the GOA and BSAI sablefish fixed gear fisheries, which are managed under the IFQ Program (see 50 CFR 679.40 to 679.45). Once all of the CDQ and or trawl allocations have been subtracted, the remaining sablefish TAC is allocated to the fixed gear sablefish fishery. Permits are issued to qualified IFQ Program participants, allocating them a specific amount of sablefish quota by area and vessel size category. Individual accounts are established for each permit in the NOAA Fisheries database. Fishermen must report landed weights of sablefish using a real-time transaction processing system. A computer system subtracts the amount from the IFQ account and prints a receipt for the fisherman showing the transaction amount and remaining account balance. For more details on the sablefish IFQ program, see the NOAA Fisheries webpage at www.fakr.noaa.gov.

The pollock fishery in the BSAI is managed under the AFA. The annual pollock TAC, after subtracting the CDQ percentage and an incidental catch allowance, is allocated among the catcher processor, mothership, and inshore sectors that have formed cooperatives. Currently, one catcher processor cooperative, one mothership cooperative, and eight inshore cooperatives have formed, each of which receives an allocation of pollock based on the historic harvest percentages of each catcher vessel in the cooperative. The history of catcher vessels not in cooperatives forms the basis of an open-access quota, available to vessels not in cooperatives. Pollock caught in the directed pollock fishery count against the cooperative allocations. NOAA Fisheries considers all pollock caught by vessels using pelagic trawl gear to be directed fishing. Pollock caught with non-pelagic (bottom) trawl gear is counted against the incidental catch allowance. Regulations at 50 CFR 679.24(b)(4) prohibit directed fishing for pollock with nonpelagic trawl gear. The pollock cooperatives actively monitor their pollock harvest and cease fishing activity when their catch equals their allocation. NOAA Fisheries also monitors the pollock harvest and can close a cooperative fishery if needed.

For the general groundfish fishery—all groundfish fishing not managed under either the CDQ, IFQ, or AFA Cooperative Programs—NOAA Fisheries monitors the catch and issues regulatory notices to open and close specific fisheries. In some cases, catch is monitored from daily or weekly reports, and a closure date is projected by extrapolating catch rates. If fishing effort is high relative to the available quota, NOAA Fisheries will estimate the length of the fishery using historic effort and catch rates, and open the fishery for a specific length of time, ranging from as little as six hours to several days.

If NOAA Fisheries determines that a groundfish allocation or apportionment (quota) will be reached, the agency establishes a directed fishing allowance (DFA) under regulations at 50 CFR 679.20(d)(1)(I). The DFA is an amount less than the quota, leaving a portion to support incidental catch of the species in other fisheries. When the DFA is reached, NOAA Fisheries prohibits directed fishing for that species under 50 CFR 679(d)(1)(iii). When directed fishing is closed, fishermen may retain incidental catch of the species up to specified percentage limits (50 CFR 679.20(e)), which allows limited retention of the species but greatly reduces the catch rate compared to the directed fishery.

When a groundfish TAC is reached, NOAA Fisheries prohibits further retention of the species under 50 CFR 679.20(d)(2). If catch amounts reach the level defined as overfishing for the species, the agency can take actions to restrict other fisheries to prevent overfishing the species, under 50 CFR 679.20(d)(3).

Most groundfish quotas are for areas that correspond with federal statistical areas or FMP management areas. For these quotas, the location of catch is determined by the reported catch location or the observed haul location. However, when catch quotas are established for small areas (for example, the Atka mackerel TAC in the Aleutian Island Steller sea lion critical habitat area), the agency cannot accurately monitor the quotas based on the reporting areas or observer data alone. Fishing vessels typically haul their nets for at least several hours; so, in a small enough area, a vessel's initial setting of the net could occur inside the area, while the haul-back of the net occurs outside the area. NOAA Fisheries has adopted two strategies to address this type of problem.

One strategy is to treat the critical habitat quota as a limit within the overall area quota. NOAA Fisheries monitors the overall area catch, and when an amount equal to the critical habitat quota is reached, the agency closes critical habitat. This method is very effective in controlling the catch inside critical habitat. Because all catch from the larger area is initially counted against the critical habitat quota, it tends to encourage vessels to fish inside critical habitat first, which may cause concerns about temporal concentration of the catch in critical habitat, even though the catch amount is well-controlled.

The other strategy, which has become popular, is to utilize VMS data in conjunction with observer data to monitor vessel location during the time between gear set and retrieval. This method allows assignment of catch from a specific haul or set as inside or outside critical habitat. If any portion of the haul or set occurs inside critical habitat, the catch for that haul or set is counted as coming from inside critical habitat.

Prohibited Species Catch Limits

Bycatch—defined as fishery discards (e.g., fish not kept for sale or personal use) and unobserved mortalities resulting from direct encounter with fishing gear—has become a central concern of commercial and recreational fisheries, resource managers, scientists, and the public, both nationally and globally. Bycatch concerns arise from the apparent waste that discarded fish represent when so many of the world’s marine resources are either fully utilized or overexploited. These issues apply to fishery resources as well as to marine mammals, seabirds, sea turtles, and other components of the marine ecosystem even though they may not technically be included in the bycatch definition. There are allocative issues related to bycatch as well.

The U.S. Congress, NOAA Fisheries, and the NPFMC have responded to these concerns by modifying the groundfish management program in ways that result in lower bycatch and waste. Bycatch limits, specified in regulations, provide a popular management tool that serves as an economic disincentive to those fisheries that experience high bycatch levels. When specified for a particular species, bycatch limits close all further groundfish fishing in an area once the limit is reached. The disincentive, then, is for fishermen to find ways through improved gear technology, improved communication among the fleet, and changed fishing behavior, to reduce their bycatch and not reach the bycatch limit. In doing so, the fishermen can continue to harvest groundfish up to the TAC. The lower their bycatch rate, the more fish they catch, and the more profitable the fleet.

In order to eliminate any incentive for the groundfish fleet to target commercially exploited species that already support their own commercial fishery off Alaska, the BSAI and GOA FMPs prohibit the groundfish fisheries from retaining all species of salmon, king and Tanner crabs, Pacific halibut, and Pacific herring taken as bycatch. Annual PSC are specified each year based on a review of the fishery and the policy goals for bycatch reduction. These prohibited species must be returned to the sea as soon as possible after they are caught. One exception to the mandatory discard rule is the Prohibited Species Donation Program. Under this program, groundfish fishermen who incidentally harvest salmon or halibut can donate them to a foodbank for the poor. Retaining them for donation is a legal alternative that does not “waste” the resource, yet maintains the disincentive to target salmon or halibut.

The North Pacific Groundfish Observer Program collects data on the numbers and weights of each prohibited species caught and sorts them by vessel, gear type, season, and fishing area. NOAA Fisheries combines this information with the catch rate of targeted species and calculates the rates at which prohibited species are caught per unit of groundfish caught for each fishing sector. Bycatch rates of prohibited species for unobserved vessels are extrapolated from similar observed vessel data. Observer data also provides estimates for the proportion of each prohibited species that is effectively killed before it is released under different fishing regimes.

PSC limits for each species are expressed in terms of mortality. Annual PSC limits for some species are specified under 50 CFR 679.21, or through the annual specification process. The PSC limits may be further allocated to fishery categories, gear groups, or seasons to create PSC quotas. The rules for whether particular prohibited species count against a PSC quota are specific to different fisheries, areas, gear types, and seasons (see Appendix B, Table B.4-3). When NOAA Fisheries projects that a PSC quota will be reached in a given fishery, the agency publishes a notice in the FR closing the area or season for the fishery, even if groundfish quota remains unharvested.

Other management tools have been used to directly control and meet bycatch reduction objectives. These include gear restrictions, season delays, and mandatory retention and utilization regulations. For information pertaining to these FMP management tools, see Chapter 4. The reader is also directed to the Appendix which also includes a qualitative discussion paper on bycatch and incidental catch restrictions currently being used and provides an environmental impact assessment of potential amendments (see Appendix F-5).

In-Season Monitoring and Control of Catch Limits

The annual TAC for each species of groundfish is allocated or apportioned to industry components based on gear type, vessel size category, processing sector, and quota recipient class such as CDQ group or AFA Cooperative. These allocations and apportionments result in a set of quotas that NOAA Fisheries must monitor. The procedures for monitoring and management of each quota depend on the regulatory program that established the quota. All of these systems rely heavily on catch reports from observers on catcher vessels and in processing facilities. Reports of catch from unobserved vessels and processors are combined with observer reports from similar operations. NOAA Fisheries accounting systems are quite complicated and require consistent and standardized input from the fishing industry. Changes in management rules, especially those triggered by certain catch limits, can happen very quickly. Communication channels between NOAA Fisheries and the industry, including where catch data and stock assessments are published, are spelled out in the regulations governing each program. The reader can read more about in-season management by reviewing Appendix F-11, which provides a qualitative discussion paper on the data and reporting program and the federal fishery observer program.

Summary of Sections 2.1 through 2.5

The preceding sections of this chapter have outlined the laws and policies governing fisheries management in the EEZ off Alaska; described the tools and practices that the NPFMC and NOAA Fisheries use to manage the groundfish fisheries in conformance with those laws and policies; and presented some of the complexities of groundfish management—all in an effort to provide readers with a basic context for understanding and evaluating the programmatic alternatives.

2.6 The Programmatic Alternatives

National Environmental Policy Act Guidance for Alternatives

In keeping with CEQ requirements for implementing NEPA, the Programmatic SEIS offers a range of alternatives, in addition to the no-action, or status quo, alternative, and a discussion of the environmental impacts of activities that flow from each. The alternatives, four in number, represent alternative policies for the continuing management of the federal groundfish fisheries off Alaska and range from an aggressive harvest strategy to a more environmentally precautionary harvest strategy. These alternatives are intended to serve as options for an overarching framework for managing the groundfish fisheries off the coast of Alaska. Each is based on a different philosophy and management approach and, to varying degrees, contains the principles of ecosystem-based management. Each alternative contains a policy statement, a set of goals and objectives for that policy, and, with the exception of the status quo alternative, a pair of example FMPs that would achieve the goals and objectives of the policy statement. The selection of one of these policy alternatives will set the stage for subsequent FMP amendments that will alter the FMP and its implementing regulations to achieve a particular policy goal or objective. In providing such policy options, these alternatives are action-forcing and binding.

The impacts of the four alternatives presented in this section are evaluated from information and analysis summarized in Chapter 3 (Affected Environment) and Chapter 4 (Environmental and Economic Consequences). Chapter 4 presents the issues (and their potential impacts) as defined by the public scoping and comment process. Our findings in these chapters provide the basis for the public's assessment of the relative merits of the alternatives and, ultimately, for the NPFMC's and NOAA Fisheries' choice of a PA.

Recent History of the Development of the Alternatives

The alternatives presented here are the product of two-and-a-half years of public process. As noted in the review of the history of the development of this Programmatic SEIS in Chapter 1, NOAA Fisheries announced its decision to revise the January 2001 draft Programmatic SEIS (2001 Draft Programmatic SEIS) after reviewing public comments and determining that, as those comments suggested, the alternatives could be improved by 1) being restructured from single-focus to multi-component alternatives; 2) expanding the cumulative effects analysis; and 3) making the document more concise and easier to read. In January 2002, the agency placed these new alternatives on its website and solicited public comment. In February of the same year, following review of the public comment, the NPFMC developed a range of eight policy alternatives and case studies ranging from the original FMPs to a "No Fishing" FMP. The NPFMC requested that NOAA Fisheries continue to work with these alternatives to make them more specific and differentiable, to address problems of combining specific management tools with the policy objectives in each alternative's set of goals and policies, and to consolidate the alternatives if possible.

Between the February and April, 2002 NPFMC meetings, NOAA Fisheries, including the AFSC, consulted with public stakeholders and legal counsel to determine the best way to restructure the alternatives to provide the specificity needed to differentiate between the policy alternatives, as well as to provide the detail necessary to conduct a meaningful scientific analysis. At the April 15, 2002 NPFMC meeting, NOAA Fisheries recommended that the eight more specific objective alternatives be consolidated into four broad-band policy alternatives (Figure 2.6-1). Each alternative to the status quo would include two FMP-like

examples that would serve as bookends to an FMP framework, within which future project-level management decisions could be made. Under this scenario, the bookends do not reflect the actual specific measures that will be chosen in the future. Rather, they represent the outer bounds of the range of management decisions and measures specific to any policy alternative and serve, also, to provide the basis for a solid scientific analysis of the effects of each specific policy alternative.

This approach to developing the programmatic alternatives sets a distinct course for decision-making. At the same time, it maintains flexibility in decision-making by providing a range of policy goals and objectives that form a framework within which the NPFMC and NOAA Fisheries can work as they seek to satisfy their statutory obligations under the MSA, the MMPA, and other federal statutes. These alternatives also provide the NPFMC with flexibility in selecting those policy goals, objectives, and foreseeable actions that it intends to pursue as FMP amendments in the near future. This approach allows the alternatives to capture the full range of policy options and actions approved by the NPFMC at the February 2002 meeting. This approach also will provide the specificity needed to satisfy the legal and analytical requirements of this Programmatic SEIS.

This approach does, however, constitute a departure from the 2001 Draft Programmatic SEIS. In adopting the current approach, the NPFMC recognized that to satisfy the legal requirements of this Programmatic SEIS by examining alternative FMPs that are comparable in scope to the current FMPs, the NPFMC and NOAA Fisheries needed to commit to a review of different policy objectives as well as the “means” of achieving a change in policy direction. Developing an example FMP range for each alternative to status quo will allow the NPFMC to consider potential FMP management measures and a preliminary assessment of their environmental impacts. These measures will subsequently be further developed and implemented by the NPFMC as follow-on amendments through its normal FMP decision-making process. The time schedule for developing any follow-on amendments will be determined after the NPFMC has constructed its PA, reviewed data requirements and public comment, and prioritized its policy objectives.

During its June 4-12, 2002 meeting, the NPFMC received a report from NOAA Fisheries staff on the refinements made to the April 2002 suite of programmatic alternatives and the results of several meetings held with public stakeholder groups. The NPFMC also reviewed written comments from the public and received oral testimony from a number of representatives of fishing industry and environmental organizations. Following a review of all this information, the NPFMC modified, through a series of motions, the wording of alternative policy language as well as details of the alternatives’ associated FMP examples. The NPFMC completed its June action by adopting the present suite of alternatives for analysis. [At its June 2003 meeting the Council adopted a PA based on a preliminary review of the findings contained in the 2003 Draft Programmatic SEIS. This PA is based on a variation of Alternative 3 where the Council incorporated a number of policy elements from the other alternatives. For more information on the PA, see Section 2.6.9.]

This Final Programmatic SEIS identifies the PA. The NPFMC revisited the preliminary PA (PPA) after reviewing all the public comments on the 2003 Draft Programmatic SEIS and has recommended a final PA (PA) that contains FMP policy goals and objectives that are different from the policy goals and objectives contained in the current FMPs. The NPFMC will formally move to amend the BSAI and GOA groundfish FMPs to incorporate any change in policy. NOAA Fisheries will announce the PA in the Record of Decision document, which will also contain a time schedule for implementing FMP amendments and regulatory

changes necessary for implementing the selected policy. Following publication of the Record of Decision, the NPFMC will submit the proposed FMP policy amendment for approval by the Secretary of Commerce and, upon Secretarial approval, NOAA Fisheries will publish the new policy in the FR.

Overview of the Programmatic Alternatives

The four policy alternatives range from a harvest policy that is more aggressive than the status quo to two different harvest policies that are more environmentally precautionary. Each policy alternative is comprised of a set of FMP policy goal and objective statements. Additionally, except for Alternative 1 (the no-action or status quo alternative), each new policy alternative includes two illustrative FMPs that serve as bookends to a management framework consistent with that policy. Each FMP bookend will be analyzed separately and will serve as a proxy for a range of future management actions. As explained above, the bookend approach will illustrate the range of environmental effects of that policy. The bookends are not intended to be self-sufficient alternatives. Rather, the bookends establish the likely range of management actions the NPFMC will examine when implementing the selected policy alternative and predict the range of potential environmental effects from the use of those management tools. Once the NPFMC and NOAA Fisheries choose a policy-level alternative (and accompanying bookends), it will be committing, to the extent practicable, to devise and implement FMPs and management actions consistent with the goals and objectives of that chosen alternative.

This alternative structure recognizes that the resource being managed and the marine ecosystem are quite dynamic in nature and only partially understood. By providing a range of management tools and their potential effects for each policy alternative, attempts were made to take into account the dynamic nature of the fisheries as a whole and to provide enough flexibility in each alternative management regime to allow decision-makers to base decisions on the best available science.

Each of the alternatives is informed by ecosystem-based policies. The NOAA Fisheries Ecosystem Principles Advisory Panel (NMFS Ecosystem Principles Advisory Panel 1999) describes ecosystem-based management for marine fisheries as follows:

Ecosystem-based management can be an important complement to existing fisheries management approaches. When fishery managers understand the complex ecological and socioeconomic environments in which fish and fisheries exist, they may be able to anticipate the effects that fishery management will have on the ecosystem and the effects that ecosystem change will have on fisheries. However ecosystem-based management cannot resolve all of the underlying problems of the existing fisheries management regimes. Absent the political will to stop overfishing, protect habitat, and support expanded research and monitoring programs, an ecosystem-based approach cannot be effective.

A comprehensive ecosystem-based fisheries management approach would require managers to consider all interactions that a target fish stock has with predators, competitors, and prey species; the effects of weather and climate on fisheries biology and ecology; the complex interactions between fishes and their habitat; and the effects of fishing on fish stocks and their habitat. However, the approach need not be endlessly complicated. An initial step may require only that managers consider how the harvesting of one species might impact other

species in the ecosystem. Fishery management decisions made at this level of understanding can prevent significant and potentially irreversible changes in marine ecosystems caused by fishing.

While the alternatives are all ecosystem-based and conform to federal law, they differ in the number and specificity of the policy objectives contained within each policy statement. The alternatives provide vision. They set the stage for future decision-making. They capture a range of philosophical differences and varying degrees of precautionary management when faced with uncertainty about the effects of fishing on the environment and the lack of understanding of the ecological processes exhibited by a dynamic ever-changing marine ecosystem. They capture a range of values and needs from a diverse and educated group of public stakeholders. The goals and objectives are grouped around the key principles and issues identified by the public as being very important in the management of the Alaska groundfish fisheries. These principles and issues led to the list of key FMP components that would need to be addressed in an Alaska groundfish FMP.

The policy issues associated with management of the fisheries and reflected in this analysis arise from a number of questions faced by the NPFMC and NOAA Fisheries. In what direction should the NPFMC and NOAA Fisheries go with regard to managing the fishery resources off Alaska? How successful has past management policy been in meeting the goals and objectives of national fisheries policy, while conserving marine fish resources and providing protection to marine mammals and endangered species? Do we need to change our current policy, and if so, in what ways? How can we achieve the broadly supported goals of sustainable fisheries while still generating the social and economic benefits of a diverse population of citizens? The information and analyses needed to answer these questions are contained in this Programmatic SEIS. Whether past management policy has been in the best interest of the U.S., or whether a change in policy is needed, is ultimately a decision that will be made by the NPFMC and NOAA Fisheries. With public comment, the NPFMC and NOAA Fisheries will make what they believe to be the wisest policy decision for managing the Alaska groundfish fisheries in the future. Once a policy alternative is adopted and made a part of the BSAI and GOA groundfish FMPs, the preferred policy will establish a path for managers and stakeholders to follow. Future management actions taken by the NPFMC and implemented by NOAA Fisheries, through FMP amendments and regulatory changes, will each aim to achieve the goals and objectives of the policy in a balanced fashion.

2.6.1 Alternative 1(a) – Continue Under the Current Risk-Averse Management Policy (the no-action, status quo alternative)

The GOA and BSAI groundfish FMPs, first implemented in 1978 and 1981, respectively, contained management policy statements that incorporated the MSA's National Standards (there were seven then; now there are 10) and reflect the management issues and priorities of that period. Because the two FMPs were prepared by different writers, their respective policy statements differ in wording. They differ also because, in 1985, the GOA FMP policy was updated. Since 1985, there have been no formal amendments to either the GOA or the BSAI FMP policy statement. Adoption of this alternative would leave these sections of the FMPs unchanged.

Current Policy Statement for Managing the BSAI Groundfish Fisheries (FMP 3.2)

Goals for Management Plan

The NPFMC has determined that all its FMPs should, in order to meet the requirements of its constituency, the resources, and the MSA, achieve the following goals:

1. Promote conservation while providing for the OY from the region's groundfish resource in terms of providing the greatest overall benefit to the nation with particular reference to food production and recreational opportunities; avoiding irreversible or long-term adverse effects on the fishery resources and the marine environment; and ensuring availability of a multiplicity of options with respect to the future uses of these resources.
2. Promote, where possible, efficient use of the fishery resources but not solely for economic purposes.
3. Promote fair and equitable allocation of identified available resources in a manner such that no particular group acquires an excessive share of the privileges.
4. Base the plan on the best scientific information available.

In accomplishing these broad objectives a number of secondary objectives have been considered:

1. Conservation and management measures have taken into account the unpredictable characteristics of future resource availability and socioeconomic factors influencing the viability of the industry.
2. Where possible, individual stocks of fish are managed as a unit throughout their range, but such management is in due consideration of other impacted resources.
3. In such instances when stocks have declined to a level below that capable of producing MSY, management measures promote rebuilding the stocks. In considering the rate of rebuilding, factors other than biological considerations have been taken into account.
4. Management measures, while promoting efficiency where practicable, are designed to avoid disruption of existing social and economic structures where fisheries appear to be operating in reasonable conformance with the MSA and have evolved over a period of years as reflected in community characteristics, processing capability, fleet size and distribution. These systems and the resources upon which they are based are not static, but change in the existing regulatory regime should be the result of considered action based on data and public input.
5. Management measures should contain a margin of safety in recommending allowable biological catches when the quality of information concerning the resource and ecosystem is questionable. Management plans should provide for accessing biological and socioeconomic data in such instances where the information base is inadequate to effectively establish the biological parameters of the resource or to reasonably establish OY. This plan has identified information and research required for further plan development.

6. Fishing strategy has been designed in such a manner as to have minimal impact on other fisheries and the environment.

Current Policy Statement for Managing the GOA Groundfish Fisheries (FMP 2.1)

Goals and Objectives for Management of GOA Groundfish Fisheries

The NPFMC is committed to developing long-range plans for managing the GOA groundfish fisheries that will promote a stable planning environment for the seafood industry and will maintain the health of the resource and the environment. In developing allocations and harvesting systems, the NPFMC will give overriding considerations to maximizing economic benefits to the U.S. Such management will:

- Conform to the National Standards and to the NPFMCs' Comprehensive Fishery Management Goals.
- Be designed to assure that to the extent possible:
 - Commercial, recreational, and subsistence benefits may be obtained on a continuing basis
 - Chances of irreversible or long-term adverse effects on fishery resources and the marine environment are minimized
 - A multiplicity of options will be available with respect to future use of the resources
 - Regulations will be long-term and stable with changes kept to a minimum

Principal Management Goal. Groundfish resources of the GOA will be managed to maximize positive economic benefits to the U.S., consistent with resource stewardship responsibilities for the continuing welfare of the GOA living marine resources. Economic benefits include, but are not limited to, profits, benefits to consumers, income and employment.

To accomplish this goal, a number of objectives will be considered:

Objective 1: The NPFMC will establish annual harvest guidelines, within biological constraints, for each groundfish fishery and mix of species taken in that fishery.

Objective 2: In its management process, including the setting of annual harvest guidelines, the NPFMC will account for all fishery-related removals by all gear types for each groundfish species, sport fishery, and subsistence catches, as well as by directed fisheries.

Objective 3: The NPFMC will manage fisheries to minimize waste by:

- Developing approaches to treating bycatches other than as a prohibited species. Any system adopted must address the problems of covert targeting and enforcement.
- Developing management measures that encourage the use of gear and fishing techniques that minimize discards.

Objective 4: The NPFMC will manage groundfish resources of the GOA to stimulate development of fully domestic fishery operations.

Objective 5: The NPFMC will develop measures to control effort in a fishery, including systems to convert the common property resource to private property, but only when requested to do so by industry.

Objective 6: Rebuilding stocks to commercial or historic levels will be undertaken only if the benefits to the U.S. can be predicted after evaluating the associated costs and benefits and the impacts on related fisheries.

Objective 7: Population thresholds will be established for economically viable species complexes under NPFMC management on the basis of the best scientific information, and acceptable biological catches (ABCs) will be established as defined in this document. If population estimates drop below these thresholds, ABCs will be set to reflect necessary rebuilding as determined in Objective 6.

2.6.2 Alternative 1(b) – Update and Reformat the Current Policy Statement for both the Bering Sea and Aleutian Islands and Gulf of Alaska Groundfish Fishery Management Plans

This variation of Alternative 1 would update the old policy by modifying its format and incorporating the new National Standards and ecosystem-based management principles. Adoption of this variation of Alternative 1 would lead to a plan amendment that would replace the current BSAI and GOA policy statements with the new statement below.

Management Approach

Continue to work toward the goals of maintaining sustainable fisheries, protecting threatened and endangered species, and protecting, conserving, and restoring living marine resource habitat through existing institutions and processes. Continue to manage the groundfish fisheries through the current risk-averse conservation and management program that is based on a conservative harvest strategy. Under this management strategy, fishery impacts to the environment are mitigated as scientific evidence indicates that the fishery is adversely impacting the ecosystem. Management decisions will utilize the best scientific information available; the management process will be able to adapt to new information and respond to new environmental issues. Management will incorporate and apply ecosystem-based management principles; consider the impact of fishing on predator-prey, habitat, and other important ecological relationships; maintain the statute-mandated programs to reduce excess capacity and the race-for-fish; draw upon federal, state, and academic capabilities in carrying out research, administration, management, and enforcement; and consider the effects of fishing and encourage the development of practical measures that minimize bycatch and adverse effects to EFH. This strategy is based on the assumption that fishing produces some adverse impact on the environment and that as these impacts become known, mitigation measures will be developed and FMP amendments implemented. Issues will be addressed as they ripen and are identified through NPFMC staff tasking and research priorities. The NPFMC will continue to use the National Standards and other applicable law as its guide in practicing adaptive management and responsible decision-making and will amend the FMPs consistently and accordingly. To meet the goal of this overall program, the NPFMC and NOAA Fisheries will seek to achieve the following management objectives:

Prevent Overfishing

1. Adopt conservative harvest levels for single-species fisheries and specify OY.
2. Continue to use existing OY cap for BSAI and GOA groundfish fisheries.
3. Provide for adaptive management by continuing to specify OY as a range.

Preserve Food Web

4. Incorporate ecosystem considerations into fishery management decisions.
5. Continue to protect the integrity of the food web through limits on harvest of forage species.
6. Develop a conceptual model of the food web.

Reduce and Avoid Bycatch

7. Continue current incidental catch and bycatch management program.
8. Continue to manage incidental catch and bycatch through seasonal distribution of TAC and geographical gear restrictions.
9. Continue to account for bycatch mortality in monitoring annual TACs.
10. Control the bycatch of prohibited species through PSC limits.
11. Continue program to require full utilization of target species.
12. Continue to respond to evidence of population declines by closing areas and implementing gear and seasonal restrictions in affected areas.

Avoid Impacts to Seabirds and Marine Mammals

13. Continue to cooperate with USFWS to protect ESA-listed and other seabird species.
14. Maintain current protection measures in order to avoid jeopardy to ESA-listed Steller sea lions and adverse modification of their critical habitat.

Reduce and Avoid Impacts to Habitat

15. Respond to new scientific information regarding areas of critical habitat by closing those regions to all fishing (i.e., no-take marine reserves such as Sitka Pinnacles).

16. Evaluate the impacts of trawl gear on habitat through the stepwise implementation of a comprehensive research plan, to determine appropriate habitat protection measures.

17. Continue to evaluate candidate areas for MPAs.

Allocation Issues

18. Continue to reduce excess fishing capacity, overcapitalization and the adverse effects of the race for fish.

19. Provide economic and community stability by maintaining current allocation percentages to harvesting and processing sectors.

Increase Alaska Native Consultation

20. Continue to incorporate Traditional Knowledge in fishery management.

21. Continue current levels of Alaska Native participation and consultation in fishery management.

Data Quality, Monitoring, and Enforcement

22. Continue the existing reporting requirements and Observer Program to provide catch estimates and biological information.

23. Continue on-going effort to improve community and regional economic impact assessments.

24. Increase the quality of monitoring data through improved technological means.

2.6.3 Alternative 2 – Adopt a More Aggressive Management Policy

This policy alternative, while still meeting the minimum requirements of the MSA, MMPA, ESA, and other federal law, would result in a more aggressive management approach when faced with uncertainty as compared to Alternative 1. Adoption of Alternative 2 would lead to a plan amendment that would replace the current BSAI and GOA policy statements with the new statement below.

Management Approach

Amend the current FMPs to establish a more aggressive harvest strategy while still preventing overfishing of target groundfish stocks. The goal would be to maximize biological and economic yield from the resource. Such a management approach will be based on the best scientific information available, take into account individual stock and ecosystem variability; involve and be responsive to the needs and interests of affected states and citizens; continue to work with state and federal agencies to protect threatened and endangered species; maintain the statutorily mandated programs to reduce excess capacity and the race-for-fish; draw upon federal, state, and academic capabilities in carrying out research, administration, management, and enforcement; and consider the effects of fishing and encourage the development of practical measures that

minimize bycatch and adverse effects of fishing on EFH. This strategy is based on the assumption that fishing does not have an adverse impact on the environment except in specific cases as noted. To meet the goal of this overall program, the NPFMC and NOAA Fisheries will seek to achieve the following management objectives:

Prevent Overfishing

1. Prevent overfishing by setting an OY cap at the sum of OFL or the sum of the ABCs for each species.
2. Provide for adaptive management by continuing to specify OY as a range.

Preserve Food Web

- (none)

Reduce and Avoid Bycatch

3. Monitor the bycatch of prohibited species and adjust or eliminate PSC limits.
4. Manage incidental catch and bycatch through closure areas for selected gear types.

Avoid Impacts to Seabirds and Marine Mammals

5. Maintain current protection measures to protect ESA-listed seabird species.
6. Maintain current protection measures to avoid jeopardy to ESA-listed Steller sea lions and adverse modification of their critical habitat.

Reduce and Avoid Impacts to Habitat

7. Evaluate the impacts of trawl gear on habitat through the implementation of the existing research plan, identify EFH, and determine appropriate habitat protection measures.
8. Continue to evaluate candidate areas for MPAs.

Allocation Issues

9. Maintain AFA and CDQ program as authorized by MSA.

Increase Alaska Native Consultation

10. Continue to incorporate Traditional Knowledge in fishery management.
11. Continue current levels of Alaska Native participation and consultation in fishery management.

Data Quality, Monitoring, and Enforcement

12. Continue the existing reporting requirements to provide catch estimates and biological information.
13. Continue on-going effort to improve community and regional economic impact assessments.
14. Consider repealing the Observer Program.

2.6.4 Alternative 3 – Adopt a More Precautionary Management Policy

This policy alternative, while still meeting the requirements of the MSA, MMPA, ESA, and other federal law, would result in a more precautionary management approach when faced with uncertainty as compared to Alternative 1. Adoption of Alternative 3 would lead to a plan amendment that would replace the current BSAI and GOA policy statements with the new statement below.

Management Approach

Accelerate precautionary management measures through community or rights-based management, ecosystem-based management principles, and where appropriate and practicable, increased habitat protection and additional bycatch constraints. This policy objective seeks to provide sound conservation of the living marine resources; provide socially and economically viable fisheries and fishing communities, minimize human-caused threats to protected species; maintain a healthy marine resource habitat; and incorporate ecosystem-based considerations into management decisions. This policy recognizes the need to balance many competing uses of marine resources and different social and economic goals for fishery management. This policy will utilize and improve upon existing processes to involve a broad range of the public in decision-making. Further, these objectives seek to maintain the balanced goals of the National Standards and other provisions of the MSA as well as the requirements of other applicable law, all as based on the best scientific information available. This policy takes into account the National Academy of Sciences Policies Recommendations for Sustainable Fisheries (NAS SF). Under this approach, additional conservation and management measures will be taken as necessary to respond to social, economic or conservation needs, or if scientific evidence indicates that the fishery is negatively impacting the environment. To meet the goal of this overall program the NPFMC and NOAA Fisheries will seek to achieve the following management objectives.

Prevent Overfishing

1. Adopt conservative harvest levels for multi-species and single-species fisheries.
2. Provide for adaptive management by continuing to specify OY as a range or a formula.
3. Initiate a scientific review of the adequacy of F_{40} and implement improvements accordingly.
4. Continue to collect scientific information and improve upon MSSTs including obtaining biological information necessary to move Tier 4 species into Tiers 1-3 in order to obtain MSSTs.

Preserve Food Web

5. Incorporate ecosystem-based considerations into fishery management decisions.
6. Develop indices of ecosystem health as targets for management.
7. Improve the procedure to adjust ABCs as necessary to account for uncertainty and ecosystem factors such as predator-prey relationships and regime shifts.
8. Initiate a research program to identify the habitat needs of different species that represent the significant food web.

Reduce and Avoid Bycatch

9. Continue and improve current incidental catch and bycatch management programs.
10. Developing incentive programs for incidental catch and bycatch reduction including the development of mechanisms to facilitate the formulation of bycatch pools, vessel bycatch accountings, or other bycatch rationalization programs.
11. Encourage research programs to evaluate current population estimates for non-target species with a view to setting appropriate bycatch limits as information becomes available.
12. Continue program to reduce discards by developing management measures that encourage the use of gear and fishing techniques that reduce discards.

Avoid Impacts to Seabirds and Marine Mammals

13. Continue to cooperate with USFWS to protect ESA-listed and other seabird species.
14. Initiate joint research program with USFWS to evaluate current population estimates for all seabird species that interact with the groundfish fisheries.
15. Maintain or adjust current protection measures as appropriate in order to avoid jeopardy to ESA-listed Steller sea lions and adverse modification of their critical habitat.
16. Encourage programs to review status of other marine mammal stocks and fishing interactions (e.g., right whales, sea otters) and develop fishery management measures as appropriate.

Reduce and Avoid Impacts to Habitat

17. Develop goals, objectives, and criteria to evaluate the efficacy of MPAs and no-take marine reserves as tools to maintain abundance, diversity, and productivity of marine organisms. Consider implementation of MPAs if and where appropriate, giving due consideration to areas already closed to various types of fishing operations.

18. Develop a research program to identify regional baseline habitat information and mapping.
19. Evaluate the impacts of all gear on habitat through the implementation of a comprehensive research plan, to determine habitat protection measures as necessary and appropriate.
20. Identify and designate EFH and habitat areas of particular concern.

Allocation Issues

21. Provide economic and community stability to harvesting and processing sectors through fair allocation of fishery resources.
22. Maintain LLP program and further decrease excess fishing capacity and other adverse effects of the race-for-fish by eliminating latent licences and extending programs such as community- or rights-based management to some or all groundfish fisheries.
23. Provide for adaptive management by periodically evaluating the effectiveness of rationalization programs and the allocation of property rights based on performance.
24. To support fishery management, extend the cost recovery program to all groundfish fisheries.

Increase Alaska Native Consultation

25. Continue to incorporate Traditional Knowledge in fishery management.
26. Consider ways to enhance collection of Traditional Knowledge from communities, and incorporate such knowledge in fishery management where appropriate.
27. Increase Alaska Native participation and consultation in fishery management.

Data Quality, Monitoring, and Enforcement

28. Increase the utility of groundfish fishery observer data for the conservation and management of living marine resources.
29. Improve the Groundfish Observer Program, and consider ways to address the disproportionate costs associated with the current funding mechanism.
30. Improve community and regional economic impact assessments through increased data reporting requirements.
31. Increase the quality of monitoring data through improved technological means.
32. Establish a coordinated, long-term ecosystem monitoring program to collect baseline information and compile existing information from a variety of ongoing research initiatives.

33. Adopt the recommended research plan included in this document.
34. Cooperate with research institutions such as the North Pacific Research Board in identifying research priorities to address pressing fishery issues.

2.6.5 Alternative 4 – Adopt a Highly Precautionary Management Policy

This policy alternative, while still meeting the requirements of the MSA, MMPA, ESA, and other federal law, would result in a highly precautionary management approach when faced with uncertainty as compared to Alternative 1. Adoption of Alternative 4 would lead to a plan amendment that would replace the current BSAI and GOA policy statements with the new statement that follows.

Management Approach

Adopt a highly precautionary approach to managing fisheries under scientific uncertainty in which the burden of proof is shifted to the user of the resource to demonstrate that the intended use will not have a detrimental effect on the environment. Modify restrictive conservation and management measures as additional, reliable scientific information becomes available. Establish a fishery conservation and management program to maintain ecological relationships among exploited, dependent, and related species, as well as the ecosystem processes that sustain them. Management decisions assume that science cannot eliminate uncertainty and that action must be taken in the face of large uncertainties, guided by policy priorities and the strict interpretation of the precautionary principle. Management decisions will involve and be responsive to the public but decrease emphasis on industry and community concerns; incorporate and apply strict ecosystem principles; address the impact of fishing on predator-prey, habitat, and other important ecological relationships in the marine environment; implement measures that avoid or minimize bycatch; include the use of explicit allocative or cooperative programs to reduce excess capacity and allocate fish to particular gear types and fisheries; identify and incorporate non-consumptive use values; and draw upon federal, state, academic, and other capabilities in carrying out research, administration, management, and enforcement. This strategy is based on the assumption that fishing produces adverse impacts on the environment but due to lack of information and uncertainty, little is known about these impacts. This strategy would result in a number of significant changes to the FMPs that would significantly curtail the groundfish fisheries until more information is known about the frequency and intensity of fishery impacts upon the environment. Expanded research and monitoring programs will fill critical data gaps. Once more is known about fishery effects on the ecosystem, precautionary measures initially adopted will be modified or relaxed when scientific information warrants such a change. To meet the goals of this overall program, the NPFMC and NOAA Fisheries will seek to achieve the following management objectives:

Prevent Overfishing

1. Prevent overfishing by transitioning from single-species to ecosystem-oriented management of fishing activities.
2. Close an additional 20 to 50 percent of known spawning areas of target species across the range of the stock to protect the productivity and genetic diversity.

Preserve Food Web

3. Develop and implement a Fishery Ecosystem Plan through the modification or amendment of current FMPs.
4. Conserve native species and biological diversity at all relevant scales of genetic, species, and community interactions.
5. Reduce the ABC to account for uncertainty and ecological considerations for all exploited stocks, including genetic, life history, food web, and habitat considerations.
6. Set fishing levels in a highly precautionary manner to preserve ecological relationships between exploited, dependent, and related species.

Reduce and Avoid Bycatch

7. Include bycatch mortality in TAC accounting and improve the accuracy of mortality assessments for target, non-target, and PSC bycatch, including unobserved mortality.
8. Reduce incidental catch, bycatch, and PSC limits (e.g., by 10 percent/year for 5 years).
9. Phase out fisheries with >25 percent incidental catch and bycatch rates.
10. Establish PSC limits for salmon, crab, and herring in the GOA.
11. Set stringent bycatch limits for vulnerable non-target species based on best available information.

Avoid Impacts to Seabirds and Marine Mammals

12. Set protection measures immediately for all seabird species and cooperate with USFWS to develop fishing methods that reduce incidental takes to levels approaching zero for all threatened or endangered species and for USFWS's list of species of management concern.
13. Initiate joint research program with USFWS to evaluate current population estimates for all seabird species that interact with the groundfish fisheries and modify protection measures based on research findings.
14. Increase existing protection measures for ESA-listed Steller sea lions by further restricting gear in critical habitat and setting more conservative harvest levels for prey base species.

Reduce and Avoid Impacts to Habitat

15. Zone and delimit fishing gear use in the action area and establish no-take marine reserves (both pelagic and nearshore) encompassing 20 to 50 percent of management areas to conserve EFH, provide refuges from fishing, serve as experimental controls to test the effects of fisheries, protect genetic and biological diversity, and foster regeneration of depleted stocks in fished areas.
16. To protect habitat and reduce bycatch, prohibit trawling in fisheries that can be prosecuted with more selective gear types and establish trawl closure areas.
17. Manage fisheries in an explicitly adaptive manner to facilitate learning (including large no-take marine reserves that provide experimental controls).
18. Protect marine habitats, including EFH, habitat areas of particular concern, ESA-designated critical habitats and other identified habitat types.
19. Commit to funding a comprehensive research plan in order to provide a baseline habitat atlas.

Allocation Issues

20. Reduce excess fishing capacity and employ equitable allocative or cooperative programs to end the race-for-fish, reduce waste, increase safety, and promote long-term stability and benefits to fishing communities.
21. Consider non-consumptive use values.

Increase Alaska Native Consultation

22. Utilize Traditional Knowledge in fishery management, including monitoring and data-gathering capabilities, through co-management and cooperative research programs.
23. Increase participation of and consultation with Alaska Native subsistence users and explicitly address the direct, indirect and cumulative fishery impacts on traditional subsistence uses and cultural values of living marine resources.

Data Quality, Monitoring, and Enforcement

24. Increase the precision of observer data through increased observer coverage and enhanced sampling protocols, and address the shortcomings of the current funding mechanism by implementing either a federally funded or equitable fee-based system for a revamped Observer Program Research Plan.
25. Improve enforcement and in-season management through improved technological means.
26. Establish a coordinated, long-term monitoring program to collect baseline information and better utilize existing research information to improve implementation of the Fishery Ecosystem Plan.

27. Adopt the recommended research plan included in this Programmatic SEIS.

2.6.6 Management Tools for Achieving Policy Goals and Objectives

A description of the principle management tools used to make up an FMP is provided in Section 2.5.1. This section briefly describes the combination of management tools used to achieve each goal and objective set forth in the alternatives.

Prevent Overfishing

Fishery managers can achieve this policy goal in a number of ways. Most commonly, managers establish quotas, or TACs to limit commercial, recreational, and subsistence catch. Setting conservative TAC levels are intended to reduce the probability of overfishing a particular fish species, fish population, or fish stock. Resource managers in some parts of the U.S. and the world have chosen not to use quotas but instead attempt to control fishing effort through use of seasons, vessel days, gear restrictions, and restrictions on the number of fishing vessels. In Alaska, the NPFMC and NOAA Fisheries have chosen to use TACs in combination with other measures such as defined fishing seasons, IFQs, and PSC limits. The components of the BSAI and GOA groundfish FMPs must therefore contain such basic elements as a TAC-setting process, bycatch reduction measures, PSC limits, marine mammal and seabird protection measures, habitat protection measures, and data collection and information reporting programs.

Preserve Food Web

Efforts to explicitly preserve the ecological food web of marine ecosystems and maintain biodiversity in fishery management programs have only recently begun as public consciousness has become more aware of the importance of marine ecosystems in the overall environmental health of a region. Such increased awareness has led to new and expanded research programs that are designed to teach us how marine ecosystem processes function and how fishing affects those processes. There is much to learn about marine ecosystems. Currently, fishery managers in Alaska rely heavily on government and academic research programs and attempt to incorporate ecosystem considerations into their decision-making through synthesis of ongoing research into the annual TAC-setting process, as well as when taking actions intended to protect endangered Steller sea lions and short-tailed albatrosses. Information on marine ecosystems is increasingly being used by the NPFMC when considering management actions such as bycatch reduction measures, closures to protect EFH, and the effects of fishing on non-target groundfish species.

Reduce and Avoid Bycatch

The reduction of bycatch and the minimization of waste have become important management goals for the NPFMC and NOAA Fisheries. Management tools used to achieve these goals include direct measures, such as PSC limits to control the mortality of prohibited species, gear restrictions to minimize bycatch, and regulations requiring that certain target species be kept and utilized, regardless of their size or condition. Management tools that indirectly reduce bycatch include area closures, allocations of TAC spread out over time, and programs designed to address overcapacity by slowing the rate of harvest and reducing the number

of fishing vessels. Overcapacity programs like the sablefish IFQ program or the pollock cooperative program are proving to be significantly beneficial indirect management approaches to reduce bycatch.

Avoid Impacts to Seabirds and Marine Mammals

Management tools used to achieve the goal of minimizing adverse impacts to seabirds and marine mammals include required gear modifications and fishing techniques in the hook and longline fisheries, reduced TAC of bird and mammal prey species, use of closure areas to minimize any disturbance to rookeries and haul-out sites from commercial fishing operations, and specific take limits.

Reduce and Avoid Impacts to Essential Fish Habitat

Marine habitat determined to be important to the life history of groundfish species and the ecology of the marine ecosystem can be afforded some protection by the use of closed areas, gear restrictions, and some combination of the two management tools. Such tools can also be used to restore damaged habitats that have been identified as important and warrant recovery.

Allocation Issues

The allocation of fish resources among users usually takes the form of a specific quota. The groundfish TAC can be allocated to different harvesting and processing sectors of the fishing industry, to specific communities, and to individual users or groups of users. Other allocation-based management tools include area registration requirements (where fishermen can register for no more than one area at a time, thereby spreading out the effort over a broad area), and allocations of fishing effort (e.g., vessel days or trip limits).

Increase Native Consultation and Participation

Management tools used to address Alaska Native issues and satisfy federal requirements for public outreach, NEPA, and government-to-government consultation, typically take the form of informal and formal discussions. These discussions are enhanced by special meetings, newsletters, webpage bulletins, and e-mail. Public hearings and NPFMC meetings provide a frequent venue for public stakeholders to provide comments and any information that may improve the management of fisheries off Alaska as well as opportunities to learn more about the effects of management on subsistence fishing and minority populations. Opportunities for cooperative research may also serve as a management tool to increase Native involvement in the management of fisheries, as well as to foster transfer of Traditional Ecological Knowledge.

Data Quality, Monitoring, and Enforcement

The success of any fishery management policy is dependent on the ability of the manager to collect biological, economic, and social information on the fishery. The management tools typically used to accomplish this collection of data include requirements to submit fishing logbooks, written harvest and processing summary reports, and observer information. Monitoring objectives are accomplished through electronic location devices placed on vessels, radio check-in and check-out reports, onboard fishery observers, and enforcement overflights. These management tools are designed to provide the information

needed to measure the success of the various components of the FMPs. Fishery management plans are routinely amended to address subject areas where fishing effects are unacceptable.

2.6.7 The Alternatives Considered but Not Carried Forward

A No-Fishing Policy

People have fished from waters off North America for thousands of years. The traditional uses of fish for food and commerce were recognized as a common practice during formation of the republic. Citizens of the U.S. have since continued to harvest fishery resources from waters off the coasts and as a matter of policy and custom place high value on fish and fishing.

A permanent “no-fishing” policy would end all commercial groundfish fishing in the EEZ off Alaska. Adoption of such a policy would be inconsistent with one stated purpose of the MSA: “to promote domestic commercial and recreational fishing under sound conservation and management principles.” Through its 10 National Standards and other mandates (see Section 2.2.2), the MSA directs the NPFMC and NOAA Fisheries to authorize fisheries—no matter how large or small—as long as those fisheries are managed in way that is consistent with the 10 National Standards.

When the NPFMC first prepared its GOA and BSAI groundfish FMPs, it considered a no-fishing policy. In its analysis of this alternative, the NPFMC found that adopting this policy would result in the economic ruin of the fishing industry and place great hardship on fishing communities economically and socially dependent upon the BSAI and GOA groundfish resources. This policy was believed by the NPFMC to violate the MSA by preventing the U.S. from exploiting the social and economic benefits of groundfish of the BSAI and GOA in the nation’s interest (NPFMC 1981).

NOAA Fisheries subsequently reviewed and prepared a detailed analysis of the effects of a no-fishing policy in its 1998 final SEIS (NMFS 1998i). Such a policy would reduce EEZ fishing mortality to zero for all target groundfish and non-target species, resulting in no commercial catch except for harvests within the State of Alaska’s jurisdiction and beyond 200 miles. The primary impact of this action would be to eliminate the impact of fishing on stock trends and conditions. For example, a pollock TAC of zero would eliminate the directed fishery for pollock and eliminate the risk of overfishing and localized stock depletion (provided that harvests within Alaska waters remain low). A zero TAC for pollock and other directed fisheries would eliminate any bycatch of pollock caught in this fishery. A zero TAC of pollock and other groundfish would impact the amounts of groundfish available to the ecosystem. More commercial-sized fish would be available as prey and predators in the ecosystem. Additionally, zero TACs on the predators of pollock would increase the predation on pollock and other forage fish.

A no-fishing policy could have positive benefits for the western stock of Steller sea lions if it eliminates fisheries harvest from a list of factors causing or contributing to Steller sea lion population decline. Direct takes from federally managed groundfish fisheries would be zero. Benthic habitat communities would eventually move toward a pre-fished condition.

However, closing the fisheries would likely result in alterations to existing predator–prey relationships, which over time could influence the population dynamics of a particular resource. Fish stocks could decline below current levels. A no-fishing policy would also eliminate thousands of jobs in the groundfish harvesting, processing, and support sectors. It would idle over \$1 billion of harvesting and processing capital, decrease the income of groundfish fishermen and processing plant employees by several \$100 million, and decrease the value of U.S. seafood exports by more than \$500 million. Few opportunities appear to offset these losses to the fishing industry, to the communities in which they are based, and to the nation. In short, implementation of such a policy would have widespread effects to the human environment.

NOAA Fisheries concluded that such a policy was not a reasonable choice among the alternatives considered in its 1998 SEIS. NOAA Fisheries again considered “no fishing” as a policy alternative during the development of the 2001 Draft Programmatic SEIS and again in this Programmatic SEIS but rejected full consideration of such a policy alternative. NOAA Fisheries rejected the no-fishing policy alternative because such an alternative would be based on the premise that no fishing could occur in the Alaska groundfish fisheries regardless of the level of scientific data demonstrating the sustainability of such a fishery. Such a policy runs counter to the MSA requirement that conservation and management measures prevent overfishing while achieving on a continuing basis OY from each fishery for the U.S. fishing industry (16 USC 1851(a)(1)). In contrast, Alternative 4 establishes an extremely precautionary policy to fisheries management that permits fishing when it can be demonstrated that the fishery will not have a detrimental effect on the environment and that relieves restrictions on fishing when new scientific data support such a change.

Alternatives that Result in Specific Fishery Regulations

A number of public comments received during the scoping process or on the 2001 and 2003 Draft Programmatic SEISs requested that alternatives be developed that go beyond policy and actually include regulatory changes to the fisheries. NOAA Fisheries rejected these requests as being beyond the scope and purpose of a Programmatic EIS. As explained previously in this document, NOAA Fisheries is preparing this programmatic document of the Alaska groundfish fisheries and their management in compliance with a court order and with CEQ and NOAA regulations.

A Programmatic SEIS on the Alaska groundfish fisheries that included specific regulatory changes would require an intricate level of detailed alternatives and a commensurately detailed analysis. However, neither NEPA nor the court require NOAA Fisheries to prepare such a document. NOAA’s own NEPA guidelines (NAO 216-6 Section 5.09a) state that “a programmatic environmental review should analyze the broad scope of actions within a policy or programmatic context by defining the various programs and analyzing the policy alternatives under consideration and the general environmental consequences of each” (emphasis added). Furthermore, the court stated that “. . . a programmatic analysis would not require consideration of detailed alternatives with respect to each aspect of the plan—otherwise a programmatic analysis would be impossible to prepare and would merely be a vast series of site-specific analyses. See Robertson, 35 F3d at 1306 (‘specific analysis is better done when a specific development action is to be taken, at the programmatic level.’)” *Greenpeace v. National Marine Fisheries Service*, 55 F. Supp. 2d 1248, 1276 (W.D. Wash. 1999).

NOAA Fisheries has determined that a Programmatic SEIS for the Alaska groundfish fisheries should essentially be a broad environmental review of the GOA and BSAI groundfish FMPs and alternatives to them. The Programmatic SEIS includes a cumulative impact analysis of management actions as a whole, and examines policies and potential future actions from a variety of environmental perspectives. The Programmatic SEIS therefore provides a broad look at the alternatives and the issues and is somewhat qualitative in nature.

Findings contained within this analysis could result in FMP amendments that, in turn, could lead to formal rule-making and implementation of changes to the current management regime governing the groundfish fisheries off Alaska. Such specific proposed regulatory changes can be expected in the future, and will be attended by case-specific, detailed analyses in subsequent second-level tiered EAs or EISs. In this Programmatic SEIS, however, NOAA Fisheries intends to provide the public with insight into the environmental effects that result from the current management regime as well as from alternative management regimes.

2.6.8 The Environmentally Preferred Alternative

The environmentally PA [40 CFR 1505.2(b)] will promote the national environmental policy as expressed in Section 101 of NEPA. Ordinarily, this means that the alternative causes the least damage to the physical and biological environment and is the alternative that best protects, preserves, and enhances historic, cultural, and natural resources. In this case, the environmentally PA is Alternative 4, the alternative that represents a highly precautionary management policy. As stated in this Programmatic SEIS, Alternative 4 is the only policy alternative that explicitly shifts the burden of proof from the resource to the managers and users of the Alaska groundfish resource. This alternative, as illustrated by its FMPs, would substantially reduce the harvest levels in the fisheries, establish a system of marine reserves where a large portion of the continental shelf would be closed to all commercial fishing, phase out bottom trawl gear, and establish lower bycatch limits. As a result, this alternative would produce the lowest amount of fish harvest, the least amount of bycatch, the least adverse impact to marine mammals, seabirds, and species listed under the ESA, and the least adverse impact to benthic habitat.

2.6.9 The Preferred Alternative

2.6.9.1 Development of the Preferred Alternative

The PA for the management policy to govern the BSAI and GOA groundfish fisheries was recommended by the NPFMC after careful consideration of public comments and the analyses of the alternatives in the PSEIS. The analyses in the PSEIS were based on the best scientific information available. The PA is based on the policy goals and objectives described under Alternative 3, with refinements incorporated from both Alternatives 1 and 4 as well as suggestions taken from public comments. NOAA Fisheries has reviewed the NPFMC recommendation, and has endorsed it as the Agency's PA.

The management approach and the objectives in the PA reflect a conservative, precautionary approach to ecosystem-based fisheries management, and communicate a policy direction for the future. The PA is a realistic and responsible approach that addresses and complies with the various goals, objectives and requirements of the MSA and other applicable law. The policy elements contained in the PA are consistent with, and also achieve a reasonable balance between the competing interests reflected in, the National Standards. The PA continues the commitment by the NPFMC and NOAA Fisheries to prevent overfishing, reduce bycatch and habitat impacts, and to the extent practicable, protect seabirds and marine mammals. The PA incorporates ecosystem-based management principles into a management approach that recognizes the need to both promote sustainable fisheries and protect fishery-dependent communities. It also retains the strong role of science in fishery management, and fosters a transparent and effective regulatory process where all stakeholders have a meaningful role. The PA is an adaptive management policy which will guide and inform fisheries management decisions made by the NPFMC and NOAA Fisheries. The adaptive nature of the PA also gives the NPFMC and NOAA Fisheries the flexibility to modify policy elements in response to new information or changing circumstances in order to continue to adequately manage the fisheries.

The example FMP bookends PA.1 and PA.2 serve to illustrate management concepts and future actions that logically flow from the PA policy and provide sufficient detail to allow for focused analysis of their environmental consequences. The NPFMC and NOAA Fisheries believe that this final Programmatic SEIS provides the public and decision-makers with the information they need to understand the challenges in managing a complex fishery, the uncertainties being faced and how managers are addressing those uncertainties, and the value of the Alaska groundfish fisheries to the residents of Alaska, the Pacific Northwest, and the nation.

2.6.9.2 The Preferred Alternative

The following has been identified as the NPFMC's and NOAA Fisheries' PA. The management approach and the objectives in the PA reflect a conservative, precautionary approach to fisheries management.

Management Approach

The productivity of the North Pacific ecosystem is acknowledged to be among the highest in the world. For the past 25 years, the NPFMC's adopted management approach has incorporated forward looking conservation measures that address differing levels of uncertainty. This management approach has, in recent years, been labeled the precautionary approach. The NPFMC's precautionary approach is about applying judicious and responsible fisheries management practices, based on sound scientific research and analysis, proactively rather than reactively, to ensure the sustainability of fishery resources and associated ecosystems for the benefit of future and current generations. Recognizing that potential changes in productivity may be caused by fluctuations in natural oceanographic conditions, fisheries, and other, non-fishing activities, the NPFMC intends to continue to recommend appropriate measures to ensure the continued sustainability of the managed species. It will carry out this objective by considering reasonable, adaptive management measures as described in the MSA and in conformance with the National Standards, the ESA, the NEPA and other applicable law. This management approach takes into account the NAS' recommendations on SF Policy.

As part of its policy, the NPFMC intends to consider and recommend, as appropriate, measures that accelerate the NPFMC's precautionary, adaptive management approach through community- or rights-based management, ecosystem-based management principles that protect managed species from overfishing, and where appropriate and practicable, increase habitat protection and bycatch constraints. All management measures will be based on the best scientific information available. Given this intent, the fishery management goal is to provide sound conservation of the living marine resources; provide socially and economically viable fisheries and fishing communities; minimize human-caused threats to protected species; maintain a healthy marine resource habitat; and incorporate ecosystem-based considerations into management decisions.

This management approach recognizes the need to balance many competing uses of marine resources and different social and economic goals for sustainable fishery management including protection of the long-term health of the resource and the optimization of yield. This policy will utilize and improve upon the NPFMC's existing open and transparent process to involve the public in decision-making.

Adaptive management requires regular and periodic review. Objectives identified in this policy statement will be reviewed annually by the NPFMC. The NPFMC will also review, modify, eliminate, or consider new issues as appropriate to best carry out the goals and objectives of this management policy.

To meet the goals of this overall management approach, the NPFMC and NOAA Fisheries will use the Programmatic SEIS as a planning document. To help focus its consideration of potential management measures, it will use the following objectives as guideposts to be re-evaluated as amendments to the FMP are considered over the life of the Programmatic SEIS.

Prevent Overfishing

1. Adopt conservative harvest levels for multi-species and single-species fisheries and specify OY.
2. Continue to use existing OY cap for BSAI (as stated in current law) and GOA groundfish fisheries.
3. Provide for adaptive management by continuing to specify OY as a range.
4. Initiate a scientific review of the adequacy of F_{40} and adopt improvements as appropriate (refer to Appendix B).
5. Continue to improve the management of species through species categories.

Promote Sustainable Fisheries and Communities

6. Promote conservation while providing for OY in terms of providing the greatest overall benefit to the nation with particular reference to food production, and sustainable opportunities for recreational, subsistence and commercial fishing participants and fishing communities.
7. Promote management measures that, while meeting conservation objectives, are also designed to avoid significant disruption of existing social and economic structures.

8. Promote fair and equitable allocation of identified available resources in a manner such that no particular sector, group, or entity acquires an excessive share of the privileges.
9. Promote increased safety at sea.

Preserve Food Web

10. Develop indices of ecosystem health as targets for management.
11. Improve the procedure to adjust ABCs as necessary to account for uncertainty and ecosystem factors.
12. Continue to protect the integrity of the food web through limits on harvest of forage species.
13. Incorporate ecosystem-based considerations into fishery management decisions as appropriate.

Manage Incidental Catch, and Reduce Bycatch and Waste

14. Continue and improve current incidental catch and bycatch management programs.
15. Develop incentive programs for bycatch reduction including the development of mechanisms to facilitate the formation of bycatch pools, vessel bycatch allowances, or other bycatch incentive systems.
16. Encourage research programs to evaluate current population estimates for non-target species with a view to setting appropriate bycatch limits as information becomes available.
17. Continue program to reduce discards by developing management measures that encourage the use of gear and fishing techniques that reduce bycatch, which includes economic discards.
18. Continue to manage incidental catch and bycatch through seasonal distribution of TAC and geographical gear restrictions.
19. Continue to account for bycatch mortality in TAC accounting and improve the accuracy of mortality assessments for target, PSC bycatch, and non-commercial species.
20. Control the bycatch of prohibited species through PSC limits or other appropriate measures.
21. Reduce waste to biologically and socially acceptable levels.

Avoid Impacts to Seabirds and Marine Mammals

22. Continue to cooperate with USFWS to protect ESA-listed species, and if appropriate practicable, other seabird species.

23. Maintain or adjust current protection measures as appropriate to avoid jeopardy to ESA-listed Steller sea lions.
24. Encourage programs to review status of endangered or threatened marine mammal stocks and fishing interactions and develop fishery management measures as appropriate.
25. Continue to cooperate with NMFS and USFWS to protect ESA-listed marine mammal species, and if appropriate and practicable, other marine mammal species.

Reduce and Avoid Impacts to Habitat

26. Review and evaluate efficacy of existing habitat protection measures for managed species.
27. Identify and designate EFH and habitat area of particular concern (HAPC) pursuant to MSA rules, and mitigate fishery impacts as necessary and practicable to continue the sustainability of managed species.
28. Develop an MPA policy in coordination with national and state policies..
29. Encourage development of a research program to identify regional baseline habitat information and mapping, subject to funding and staff availability.
30. Develop goals, objectives, and criteria to evaluate the efficacy and suitable design of MPAs and no-take marine reserves as tools to maintain abundance, diversity, and productivity, and implement MPAs if and where appropriate.

Promote Equitable and Efficient Use of Fishery Resources

31. Provide economic and community stability to harvesting and processing sectors through fair allocation of fishery resources.
32. Maintain LLP program and modify as necessary and further decrease excess fishing capacity and overcapitalization by eliminating latent licences and extending programs such as community or rights-based management to some or all groundfish fisheries.
33. Provide for adaptive management by periodically evaluating the effectiveness of rationalization programs and the allocation of access rights based on performance.
34. Develop management measures that, when practicable, consider the efficient use of fishery resources and account for the interest of harvesters, processors, and communities.

Increase Alaska Native Consultation

35. Continue to incorporate local and Traditional Knowledge in fishery management.

36. Consider ways to enhance collection of local and Traditional Knowledge from communities, and incorporate such knowledge in fishery management where appropriate.
37. Increase Alaska Native participation and consultation in fishery management.

Improve Data Quality, Monitoring, and Enforcement

38. Increase the utility of Groundfish Fishery Observer data for the conservation and management of living marine resources.
39. Improve the Groundfish Observer Program, and consider ways to address the disproportionate costs associated with the current funding mechanism.
40. Improve community and regional economic impact costs and benefits through increased data reporting requirements.
41. Increase the quality of monitoring and enforcement data through improved technological means.
42. Encourage a coordinated, long-term ecosystem monitoring program to collect baseline information and compile existing information from a variety of ongoing research initiatives, subject to funding and staff availability.
43. Cooperate with research institutions such as the North Pacific Research Board (NPRB) in identifying research needs to address pressing fishery issues.
44. Promote enhanced enforceability.
45. Continue to cooperate and coordinate management and enforcement programs with the Alaska Board of Fish, Department of Fish and Game, and Alaska Fish and Wildlife Protection, the USCG, NMFS Enforcement, IPHC, federal agencies, and other organizations to meet conservation requirements, promote economically healthy and sustainable fisheries and fishing communities, and to maximize efficiencies in management and enforcement programs through continued consultation, coordination, and cooperation.

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