

## **3.2 Assessment of the Fishery Management Plan Amendments**

The BSAI and GOA FMPs were implemented in 1979 and 1981, respectively. Since that time, the BSAI FMP has been amended 65 times, and the GOA FMP has been amended 55 times. Each FMP amendment was supported by the required level of analysis under NEPA, Executive Order (EO) 12866, and the Regulatory Flexibility Analysis. As part of the programmatic review, it is necessary to analyze the cumulative impacts of the groundfish fisheries on the human environment. This includes reviewing the incremental impacts of the FMP amendments, the impact of groundfish fishery management, and the impact of other past external events, in order to establish a baseline condition against which to compare the Programmatic SEIS alternatives for direct, indirect and cumulative effects.

Appendix B provides a description and detailed discussion of the nature of the fisheries and the lingering influences of pre-MSA fisheries in the North Pacific. Later sections of Chapter 3 discuss other ongoing external influences on the human environment that may be impacting synergistically with the groundfish fisheries. Appendix E summarizes the regulatory amendments that regulate the fisheries within the guidelines of the amended FMPs. This section deals specifically with the incremental amendments to groundfish fishery management. Section 3.2.1 describes the management actions contained within the BSAI and GOA amendments. Section 3.2.2 provides a description of the FMP amendments, objectives, implementing regulations, and results. Section 3.2.3 assesses the cumulative past effects of similar management actions in order to determine whether an impact occurred, and if so, whether it was adverse or beneficial. This evaluation is an important element in assessing the baseline condition for the groundfish fisheries.

### **3.2.1 Fishery Management Plan Amendments**

The management measures implemented through the BSAI and GOA FMPs, and their amendments, are categorized and summarized in Tables 3.2-1 and 3.2-2 for the BSAI and GOA, respectively. The management actions have been grouped into six categories: management and monitoring, groundfish yield/sustainability, bycatch and incidental catch, habitat conservation, seabird and marine mammal conservation, and socioeconomic issues. Many of the amendments initiate multiple management changes, and the amendment number may appear in more than one category. However, each specific measure only appears once in the table. The categorization is based on the primary objective of the management action. For example, although a particular management action may have achieved a secondary objective of providing incidental benefits for habitat conservation, if the primary intent of the action (as stated in the supporting analysis) was to control bycatch, the management action is listed in the 'Bycatch and Incidental Catch' category.

The six categories of management actions and their concomitant objectives are as follows:

- Management and Monitoring
  - To continue authorization of the groundfish fisheries
  - To establish a structured process for administering groundfish fisheries
  - To correct inefficiency in administration of the fishery management process
  - To make the management process more understandable to users
  - To facilitate enforcement of fishery regulations
  - To enhance data collection and record keeping
  - To improve reporting
  - To clarify the intent of past regulations

- Groundfish Yield/Sustainability
  - To protect target groundfish stocks
  - To ensure productivity of groundfish stocks
  - To control the rate of groundfish harvest
  - To maintain long-term yield from groundfish stocks
  - To improve the quality of groundfish products
  - To protect groundfish habitat
- Bycatch and Incidental Catch
  - To reduce discards to the extent practicable
  - To minimize the incidental catch of non-target groundfish species, undersized target groundfish, and prohibited species
  - To avoid waste of marine resources
  - To facilitate full utilization of catches taken in groundfish fisheries
  - To avoid gear loss and subsequent “ghost fishing” of lost gear
- Habitat, Seabird and Marine Mammal Conservation
  - To reduce fishing gear effects on the marine environment
  - To avoid fishing effects on marine mammals, birds, or habitat areas of critical concern
  - To avoid disturbance, injury, or mortality to marine mammals or seabirds
  - To protect marine mammal and seabird food sources
- Socioeconomic Issues
  - To manage effort in groundfish fisheries
  - To make prosecution of groundfish fisheries more fair to user groups
  - To avoid gear conflicts, gear entanglement, or gear damage
  - To enhance safety at sea

### **3.2.2 Description of Fishery Management Plan Amendments, Objectives, Implementing Regulations, and Results**

A detailed summary of the amendments to the BSAI and GOA FMPs may be found in Appendix C and Appendix D respectively. The amendments are listed numerically, and for each, the following information is included: the dates of decision-making and implementation, the purpose and need of each amendment, a summary of implementing regulations, a description of the supporting analysis, and a statement of the results of the amendment.

### **3.2.3 Cumulative Past Effects of Fishery Management Plan Amendments**

The following section summarizes the results of the historical review of the North Pacific fishery management incremental decision-making process. The FMP amendments are assessed below. Section 3.2.3.1 examines the FMP amendment actions by determining the degree to which they were effective at resolving the stated management objective. Section 3.2.3.2 summarizes the impact of the FMP amendments on particular resources or resource categories. It directs the reader to the more detailed analysis of the contribution that groundfish fishery management has made to the comparative baseline condition of the resources in question.

### **3.2.3.1 Fishery Management Plan Amendments Assessed by Management Objective**

As described in Section 3.2.1, the historical FMP amendments have been organized into six categories based on the objective of the management action: management and monitoring actions, groundfish yield and sustainability actions, bycatch and incidental catch actions, habitat actions, seabird and marine mammal actions, and socioeconomic actions. The BSAI and GOA FMP amendments are assessed below in terms of their efficacy in achieving the management objective and mitigating adverse effects of groundfish fishery prosecution.

#### **Management and Monitoring Actions**

Various GOA and BSAI FMP amendments implemented administrative changes. FMP amendments are denoted in the following manner: GOA FMP Amendment 1 is listed as GOA 1. GOA 1, 7, and 8 extended the GOA FMP and eliminating the expiration date. GOA 16 and 34 corrected previous FMP language. GOA 14, 15, and 18 and BSAI 1, 11, 12, 13, and 21 added framework measures to remove the setting of target quotas, incidental catch and prohibited species catch (PSC) limits, and fishing season dates from the FMP amendment process, and to conform the GOA FMP with the BSAI FMP. GOA 21 and BSAI 16 established procedures for setting interim total allowable catch (TACs), so that the fisheries could open on January 1. Since these actions provided for more effective fishery management, they are considered to have had a non-conditional beneficial effect on the groundfish fisheries.

Clarifications and definitions of terms and standards are management actions that form part of the FMP amendments. Target and prohibited species are defined in GOA 16 and 21 to be consistent with the BSAI FMP. GOA 14, 16, 21 and 24 and BSAI 9, 16, and 19 also specify and define legal gear and clarify directed fishing definitions. GOA 21, 44 and 56, and BSAI 16, 44 and 56 define overfishing levels for the groundfish fishery resources, allowing for improved conservation of target groundfish stocks. Additionally, GOA 15 revised the goals and objectives for the GOA FMP. Unambiguous standards, definitions and policies assist the efficient prosecution of the groundfish fisheries and are considered to have had a beneficial effect.

The GOA and BSAI FMPs, GOA 4, 11, 14, 15, 16, 17, and 18 and BSAI 9, 10, 11a, 12, and 13 established and revised recordkeeping and reporting requirements for vessels participating in the groundfish fisheries. The GOA and BSAI FMPs included provisions for observers on foreign fishing boats, while GOA 18 and 30 and BSAI 10, 13, 27, and 37 initiated and redefined the domestic fisheries observer program. Data from catch and observer reports are important components of the fisheries management processes. Therefore, we consider the establishment of these programs and their continuing implementation to have had a non-conditional beneficial effect on the groundfish fisheries.

Various GOA and BSAI FMP amendments were intended for conservation purposes or to increase the ability of managers to respond quickly to situations to resolve gear conflict issues. The GOA FMP, GOA 8 and 15 and BSAI 1, 10, 16a, 19, 21 and 24 all authorize the NOAA Fisheries Regional Administrator to use inseason management measures to react responsively to fishery issues. The intent of these actions, the issuance of rapid field orders in response to newly developing issues, has not necessarily been fulfilled; however, to the extent that it has allowed flexibility in management, these actions are considered beneficial.

The original GOA FMP, GOA 22, and BSAI 17 allowed the issuing of experimental fishing permits for the purpose of testing gear efficiency, fishing techniques, bycatch mortality reduction techniques, and other methodologies. It is inferred that information gained from activities conducted under experimental fishing

permits leads to gains in the effectiveness of the groundfish fisheries. Therefore, these actions are considered to have had a conditionally beneficial effect on the groundfish fisheries.

### **Groundfish Yield and Sustainability Actions**

The BSAI and GOA FMPs establish annual harvest levels for groundfish species. For foreign fishermen, exceeding a nation's allocation in a management area or district triggered closure of that area to fishermen from that nation. These actions are considered beneficial as they prevented overfishing of the stocks by foreign fishermen.

The GOA FMP establishes optimum yield (OY) levels for each groundfish species, with revisions to squid, Atka mackerel, Pacific cod, pollock, sablefish, 'other rockfish', and 'other species' determinations made in GOA 4, 7, 10, 11, 13, 14. Available data on stock biomass indicated that the given target groundfish stocks were appropriate. Therefore, these actions are considered to have had a neutral to beneficial effect on the given target groundfish stocks. As discussed in the Management and Monitoring Actions above, GOA 15 revised the process for setting target species quotas, resulting in the establishment of an OY range, and an annual TAC-setting process implemented by regulatory amendment. Harvest levels were established in the BSAI FMP also; however BSAI 1 established a multi-year, multi-species OY (a range from 1.4-2.0 million metric tons [mt]) for the BSAI groundfish complex as a whole. Prior to the implementation of this amendment, BSAI 4 adjusted the Pacific cod harvest levels from the harvest levels set in the BSAI FMP. The TAC framework has had a beneficial impact due to the increased management flexibility, and the incorporation of an annual status of stock review that sets catch quotas based on the best available science.

The GOA and BSAI FMPs managed specific species targeted by the groundfish fisheries, and identified requirements for some incidentally caught species (see prohibited species discussions in the following section). Various FMP amendments made alterations to the management categories identified in the FMPs. GOA 5, 7, and 8 established new management categories for grenadiers, and for idiot rockfish, and non-specified species. GOA 14 gave the Secretary of Commerce the authority to split or combine species within the target species category. GOA 31 established Atka mackerel as a separate target species category. BSAI 12 established a separate rock sole target species category separate from the 'other flatfish' category. Since these actions provided for more species-specific management and thus reduced the risk of overfishing the stocks, they are considered to have had a beneficial effect.

The GOA FMP apportioned quota over five subareas, which were reduced to three by GOA 4, GOA 8, 11, and 22. They divided and modified the eastern GOA districts for sablefish management. GOA 13 combined the western and central management areas for pollock allocations. GOA 14 created a new regulatory district for 'other rockfish', and recognized the State of Alaska management areas for demersal shelf rockfish. GOA 18 and BSAI 17 established the Shelikof District in the GOA (which was rescinded in favor of other measures in GOA 25 as part of Steller sea lion protection measures) and the Bogoslof district in the Bering Sea, respectively, in order to manage the fisheries' catch of spawning pollock. GOA 4, 8, and 22 modified the GOA regulatory districts. BSAI 28 divided the Aleutian Islands subarea into three management districts for the immediate purpose of spatially allocating Atka mackerel in order to address localized depletion. The creation of subareas and species-specific districts has allowed managers to control for uneven exploitation and is considered beneficial.

GOA 21 and 46 deferred demersal shelf, blue, and black rockfish management to the State of Alaska. The management shift is considered to have had a conditionally beneficial effect, since state management has

allowed more consistent management of these species throughout federal and state waters, minimizing the risk of localized depletion and the possibility of exceeding TAC.

GOA 19 and BSAI 14 allocated the pollock TAC seasonally, over four seasons in the GOA and two in the BSAI, in order to reduce the potential for fishing on spawning aggregations to adversely impact the sustainability of the stock. Limiting the amount of quota available during spawning seasons is effective at reducing fishing on spawning populations, although it also decreases the value of the fishery.

GOA 10, 32, and 38 were conservation measures taken to rebuild depressed Pacific ocean perch stocks. These measures were implemented specifically to conserve stocks, and have succeeded at rebuilding the Pacific ocean perch stocks. They are considered to be beneficial.

### **Bycatch and Incidental Catch Actions**

Species that must be discarded at sea are specified in the GOA and BSAI FMPs, and limits on the catch of these prohibited species are established in the FMP amendments as a way to minimize the bycatch and encourage the use of more selective gear. Once a limit is achieved, a closure is triggered either of a fishery, fisheries, or a specified fishing area. GOA 14, 15, 18, and 21 specify halibut PSC limits for the GOA groundfish fisheries, and apportion them by season and gear. BSAI 1a, 3, 8, 12, 12a, 16, 19, 25, 37, 40, 41, 57 and 58 all establish or modify PSC limits in the BSAI for halibut, crab, salmon and herring, by sector and fishery. PSC limits have been consistently used as a bycatch management tool, have been extended from applying to halibut to most prohibited species in the BSAI, and have consistently decreased over the years. It is inferred from this that PSC limits are successful in decreasing the bycatch of these species in the groundfish fisheries. As a result, these actions are considered beneficial in minimizing the impact of the groundfish fisheries.

Many measures identify gear specific closure areas to reduce bycatch. The GOA and BSAI FMPs, GOA 9 and 10 and BSAI 4, 7, and 10 specified foreign bottom trawl and trawl closures to reduce crab and halibut bycatch. Although GOA 4 and BSAI 1 exempted the domestic fleet from some of the domestic bottom trawl restrictions in the GOA and BSAI FMPs, GOA 15, 18, 26, and 60 reinstated specific non-pelagic trawl prohibitions around Kodiak and in Cook Inlet to lower bycatch of crab species. BSAI 10, 12a, 21a, 35, 37, 40, and 57 established restricted seasonal, year-round or PSC limit-triggered areas to decrease crab bycatch. BSAI 10, 12a, 16a, and 57 established protections to lower the bycatch of halibut. BSAI 1a, 3, and 8 were early measures to reduce salmon PSC limits over time, as referred to above, whereas BSAI 21b, 35, and 58 attempted to address salmon bycatch using trigger amounts and area closures. BSAI 16 established herring savings areas. It is inferred that these measures improved the efficiency of groundfish harvest, and decreased the incidental take of species in bottom trawls. Therefore, these measures are considered to have had a conditionally beneficial effect.

Various other measures were adopted to control bycatch and incidental catch. GOA 24 and BSAI 19 delayed the start of the groundfish trawl fisheries in order to avoid excessive bycatch. Also, GOA 45 adjusted the seasonal pollock allowance schedule in order to avoid high salmon bycatch in the summer months. Bycatch reduction was also encouraged through gear modifications. GOA 21 and 16 required halibut excluder devices on pots, and FMP amendment actions were specifically implemented to reduce ghost fishing by lost gear. GOA 8 and 21 and BSAI 16 required biodegradable panels on sablefish pots. Any reduction in ghost fishing or increase in gear selectivity is considered to have a conditionally beneficial effect.

Additionally, incentive programs were introduced in GOA 21 and 24 and BSAI 16 and 19 to penalize vessels with excessive bycatch. Vessel sanctions under the incentive programs have proved very difficult to enforce, and these actions have not achieved bycatch reductions in the groundfish fisheries.

Another goal of bycatch-related measures is the minimization of waste. BSAI 11 minimized waste by splitting the annual JV pollock quota into two seasons, and GOA 19 and BSAI 14 prohibited roe stripping of pollock in the groundfish fisheries. Both amendments encouraged greater utilization of fish fit for human consumption and mitigated the potential for overharvest of spawning stocks to affect the sustainability of the pollock resource. BSAI 26 and 50 and GOA 29 and 50 were implemented to reduce post-harvest waste of incidentally-caught Pacific halibut and salmon in specified groundfish fisheries by donating the bycatch to social service food banks. Since Pacific halibut and salmon bycatch would typically be discarded in federal waters, these actions help provide for the needy and have a non-conditional beneficial effect. The retention of Pacific halibut and salmon bycatch also provides an additional opportunity to collect biological samples and scientific data to support long-term solutions to bycatch of these species. Therefore, these actions are also considered to have had a beneficial effect on groundfish fisheries.

GOA 49 and BSAI 49 were implemented to reduce discards in the groundfish fisheries, and encourage full utilization. The amendments required 100 percent retention of pollock and Pacific cod and, as of January 1, 2003, for rock sole and yellowfin sole as well, regardless of how or where the fish were caught unless the fish were unfit for human consumption. These measures, beginning in 1998, have dramatically reduced the discard rates of pollock and Pacific cod. Therefore, they are considered to have had a conditionally beneficial effect on groundfish fisheries. BSAI 75 repealed the implementation of Improved Retention/Improved Utilization (IR/IU) for flatfish due to the excessive cost it would have imposed on flatfish fishermen. Because IR/IU was never implemented for flatfish, this action has had no effect.

### **Habitat Actions**

GOA 14 and 55 and BSAI 9 and 55 defined and established habitat protection policies for the future conservation of groundfish stocks. GOA 55 and BSAI 55 identified and described essential fish habitat (EFH) for species managed under the FMPs. Habitat areas of particular concern were identified as living substrates in shallow and deep waters, and freshwater habitats used by anadromous fish. To the extent that such policies increase awareness of sensitive habitat and influence other management decisions, they have provided a conditionally beneficial effect to marine habitat. However, no concrete measures were proposed in conjunction with these FMP amendments to mitigate adverse habitat impacts from fishing activities.

GOA 59 established the Sitka Pinnacles Marine Reserve encompassing a 2.5 square nautical miles (nm<sup>2</sup>) area off the Cape Edgecumbe pinnacles as a protected area for rockfish and lingcod habitat. This action is anticipated to be beneficial to these long-lived, vulnerable species.

### **Seabirds and Marine Mammal Actions**

Forage fish (e.g., capelin, eulachon, and sand lance) are an important food source for seabirds and marine mammals. GOA 39 and BSAI 36 prohibited the establishment of a commercial fishery targeting forage fish, thereby preserving the food resource. These FMP amendments are considered to have had a conditionally beneficial effect on seabirds and marine mammals.

Several FMP amendments have been implemented specifically for the direct protection and conservation of marine mammals. No-fishing buffer zones were established around rookeries and haulouts deemed critical to walrus (BSAI 13 and 17) and Steller sea lions (BSAI 20 and GOA 25). GOA 25 also modified pollock management districts in the western/central GOA, to reduce the effects of prey competition from the groundfish fisheries. While the impact of the fisheries on walrus has not reasserted itself as a problem, the population levels of the western stock of Steller sea lions continued to decline even after the protection measures adopted in GOA 25. Further protection measures have been implemented by emergency rules and regulatory amendments since 1999; however, the degree to which the Steller sea lion population levels are impacted by the groundfish fisheries is still a matter of scientific controversy. As such, the effect of the FMP amendments relating to Steller sea lion protection measures cannot be determined.

### **Socioeconomic Actions**

The establishment of groundfish quotas and spatial and seasonal allocation was discussed previously in the groundfish yield and sustainability actions section.

The GOA and BSAI FMPs established specific allocations for foreign and domestic fisheries, with reserves providing for growth of the domestic fisheries. The program was modified in GOA 7, 8, and 11; and GOA 2 and 6, BSAI 2 and 4 increased domestic groundfish quota and correspondingly decreased foreign allocations. To the extent that the MSA called for domestication of the fisheries, the amendments were beneficial in promoting domestic groundfish harvests. The establishment of foreign closure areas, particularly in areas likely to be utilized by domestic fishermen (such as the Aleutian Islands and southeast Alaska) under the FMPs, was also effective in preventing gear conflict between domestic and foreign fishermen and promoting domestic fisheries (although certain foreign and domestic restrictions were relaxed in GOA 4 after they were found to be unnecessary).

The GOA and BSAI FMPs specified allocations between gear types for foreign fishermen. Management measures favoring foreign longliners were adopted in GOA 3, which modified restrictions on foreign Pacific cod quota in the Chirikof District in order to allow the foreign longline fleet to take a higher percentage of the allocated foreign quota, and GOA 4, which separated longliners from trawlers for quota closures. The greater selectivity of longline gear over trawl gear resulted in beneficial impacts on bycatch rates and habitat.

Allocation by gear type was first adopted for the domestic fisheries in GOA 14. In order to address excess capacity in the sablefish fishery, fixed allocations were assigned over a four-year adjustment period, to longline, trawl, and pot fisheries, with pot fisheries being phased out of the GOA sablefish fishery by the end of that time. Additionally, the amendment delayed the sablefish fishery start date to allow smaller vessels more opportunity to participate in the fishery. The FMP amendment slowed the growth in capacity and diminished the possibility of gear conflicts and grounds preemption, but did not solve the problem of overcapacity in the fishery.

The sablefish fishery was further modified by GOA 20 and BSAI 15, which implemented the sablefish Individual Fishing Quota (IFQ) program and eliminated the derby-style fishing associated with these fisheries. While the framework of the IFQ program was set out in GOA 20 and BSAI 15, modifications were made to ownership, transfer, and processing restrictions in GOA 35, 36, 37, 42, 43, 54, and 64 and BSAI 31, 32, 33, 42, 43, 54, and 72. The sablefish IFQ program has been successful in diminishing the number of participants in the sablefish fishery, and has succeeded at reducing bycatch (particularly of Pacific halibut),

improving safety, reducing gear conflicts and fishing mortality due to lost gear, and increasing the economic value of the fishery.

Quota allocation between gear types continued to be used to address socioeconomic issues in the groundfish fisheries. BSAI 34 allocated two percent Atka mackerel TAC in the eastern Aleutian Islands to jig gear, in order to promote a local, small vessel fishery without direct competition from the large, high-capacity trawl fleet. Although the amendment was successful in creating a quota allocation for the jig gear fishery, the fishery has not taken advantage of the quota to harvest Atka mackerel. Therefore the amendment has had no appreciable effect. BSAI 53 allocated shortraker/rougheye rockfish between trawl and non-trawl gear in the Aleutian Islands, as the potential overfishing of shortraker/rougheye by the trawl fleet was also threatening to close non-trawl fisheries, resulting in loss of economic opportunity. The gear allocation was successful in limiting the scope of the problem.

In the pollock fishery, allocation of quota was further divided between processing sectors, namely trawl catcher processors and trawl catcher vessels delivering to catcher processors (the offshore sector), and trawl catcher vessels delivering to inshore processors. BSAI 18 established a 35/65 percent allocation of pollock between the inshore and offshore sectors, which was extended through 1998 in BSAI 38. BSAI 18, 38, and 51 established, adjusted, and extended the catcher vessel operational area, to a designated area off of Dutch Harbor to which the offshore sector was allowed only minimal access. GOA 23 allocated 100 percent of GOA pollock to inshore processors, which allocation was extended in GOA 40, 51, and 61. The amendments were successful in preventing the grounds preemption that occurred in 1991 and prompted development of the inshore/offshore allocations.

BSAI 61 implemented the provisions of the American Fisheries Act (AFA), establishing sector and cooperative allocations of pollock. The amendment defined specific vessel and processor cooperative linkages, and defined 'sideboards' that limited the participation of AFA pollock vessels in other fisheries in the BSAI and the GOA (implemented in the GOA in GOA 61). BSAI 69 further modified the BSAI pollock cooperative program. The establishment of cooperatives, and the buyout of nine vessels participating in the pollock fishery, was considered beneficial as it served to reduce excess capacity in the BSAI pollock fishery, resulting in increased economic efficiencies.

In conjunction with the BSAI and GOA pollock inshore/offshore allocations, Pacific cod was identified in GOA 23 with 90 percent allocated to inshore processors and 10 percent to offshore processors. This allocation was extended through 2004 in GOA 40, 51, and 61. In the BSAI, Pacific cod was initially allocated by gear type in BSAI 24 between trawl, hook-and-line, pot, and jig gear. BSAI 46 modified the percentage allocation between trawl and fixed gear, and extended the two percent jig allocation. The specific allocation to jig gear was beneficial in that it gave coastal communities a way to compete in the valuable fishery. However, the allocation is not fully utilized by the jig fleet. BSAI 64 further divided the fixed gear allocation between hook-and-line catcher processors, and hook-and-line catcher vessels, pot vessels, and vessels less than 60 feet (ft) length overall (LOA). In order to avoid a substantial number of new entrants into the Pacific cod fishery, BSAI 67 specified eligibility requirements and required a limited entry permit Pacific cod species and gear endorsement for participation in the Pacific cod fishery. To the extent that the amendment avoided excess capacity in the fishery, it is considered beneficial.

GOA 28 and BSAI 23 established a vessel moratorium on new vessels entering into the groundfish fisheries, and was supplemented in GOA 41 and BSAI 39 with a License Limitation Program (LLP) for participating groundfish vessels. This program was modified and extended in GOA 57 and 58 and BSAI 59 and 60. The



moratorium and LLP have reduced excess capacity in the groundfish fisheries, and prevented further growth, resulting in a beneficial impact.

The Community Development Quota (CDQ) program was established in conjunction with the sablefish and Pacific halibut IFQ programs in BSAI 15; however, due to delays in the implementation of that program, the CDQ program was first actualized in the pollock fishery as a result of BSAI 18. The CDQ quota for sablefish was increased in BSAI 30. BSAI 38 and 45 extended the pollock CDQ allocation, and BSAI 39 established a multi-species CDQ program for all groundfish species managed under the BSAI FMP. This was subsequently modified in BSAI 66 which removed squid from the CDQ program in order to allow more efficient use of the small squid quota allocation. The CDQ program was created in order to provide fishermen who reside in western Alaska communities a fair and reasonable opportunity to participate in the groundfish fisheries, to expand their participation in nearshore fisheries, and to help alleviate the growing social economic crisis in these communities. The FMP amendments are considered beneficial in their impact on western Alaska communities, as they have created revenues and employment in many of the communities.

GOA 27 and BSAI 22 established gear test areas in the Bering Sea that could be used to ensure that gear was in working order prior to season opening dates. It is inferred that this action likely resulted in reduced gear loss and entanglement on the fishing grounds, which would increase economic efficiency and reduce adverse habitat and mortality impacts due to ghost fishing.

Vessel safety was addressed in the GOA FMP in GOA 16, which formally incorporated safety considerations in accordance with the MSA. The amendment had little effect, other than to reinforce fishery managers' awareness of vessel safety considerations in decision-making.

### **3.2.3.2 Fishery Management Plan Amendments – Assessed by Impact to Resource Category**

Although adopted to achieve a particular management objective, the FMP amendments have had secondary and indirect impacts as a result of their implementation. The impacts of the FMP amendments on the resources or resource categories that are components of the human environment affected by the groundfish fisheries, are discussed in detail in the remainder of Chapter 3. Specifically, the contribution of internal groundfish fishery management and the amended FMPs is assessed as part of the analysis of the cumulative past effects influencing the baseline condition of each resource. This section provides a brief summary of the FMP amendment impacts, and includes a reference to the relevant section later in Chapter 3 for more detailed discussion.

#### **Target Species**

Since the implementation of TAC frameworking removed the adjustments and modification of OY from the need for an FMP amendment, the amendments relating directly to target species have primarily been allocative (allocating TAC among seasons, areas or gear types, or implementing rationalization programs for target species). These amendments result primarily in socioeconomic impacts, rather than affecting the sustainability of the stocks. Some amendments have directly impacted the stocks. For example, BSAI 14 and GOA 19 dispersed directed fishing on pollock spawning aggregations, and GOA 59 established a protection area for rockfish and lingcod habitat. Other amendments have had ancillary impacts on target stocks. These impacts are discussed in further detail in the species subsections in Section 3.5.1, under internal effects from foreign, JV and domestic groundfish fisheries from 1976 to the present.

## **Prohibited Species and Non-Target Species**

Many amendments have been implemented since the original FMPs to minimize bycatch of target and non-target species. PSC limits, with triggered closures upon exceeding the limits, have been the most popular and effective method for addressing prohibited species concerns.

Other measures that were implemented for other reasons have had incidental benefits for non-target species. BSAI 13, 15, and 46 and GOA 3 and 20 increased apportionment of target groundfish quotas to the longline fleet, which equated to a decrease in bottom trawl quotas. It is inferred that these measures improved the efficiency of groundfish harvest and as a consequence decreased the incidental take of species in bottom trawls. Therefore, these measures are considered to have had a conditionally beneficial effect.

BSAI 13, 15, and 46 and GOA 3 and 20 increased apportionment of target groundfish quotas to the longline fleet, which equated to a decrease in bottom trawl quotas. GOA 12 prohibited the use of longline pot gear for the harvest of sablefish in favor of hook-and-line gear. It is inferred that these measures may have had offsetting results such as decreased grenadier bycatch from bottom trawls, and increased grenadier and skate bycatch in the longline fishery. Therefore, these measures are considered to have had a conditionally insignificant effect on grenadier and skate stocks.

The impact of the FMP amendments on prohibited species is discussed in detail in Section 3.5.2, under the individual species headings. The impact on non-target species is discussed in the species subsections in Sections 3.5.3, 3.5.4, and 3.5.5, under internal effects from foreign, JV and domestic groundfish fisheries from 1976 to the present (also referred to as post-MSA fisheries).

## **Habitat**

Many FMP amendments whose purpose was primarily to reduce bycatch or incidental take or to address allocation issues have also mitigated fishing impacts on habitat. GOA 3 and 20 and BSAI 15 increased apportionment of target fish quotas to the longline fleet, equating to a decrease in bottom trawl quotas. BSAI 10 and 21a and GOA 9, 15, 18, and 26 closed specific geographic areas to bottom trawling, primarily for the protection of prohibited species. The reduction of bottom trawling due to these measures could provide conditionally beneficial effects to benthic habitat in localized areas.

In contrast, BSAI 4 allowed fishing within 3 to 12 nautical miles (nm) of the Aleutian Islands on the narrow margin of the continental shelf. The potential offsetting effects would be increased benthic damage around the Aleutian Islands and less damage in other areas. With BSAI 4, it is inferred that since more productive fishing grounds were being accessed, fewer trawls would be required to reach harvest quotas resulting in less overall trawl damage to the marine habitat. However, trawl damage tends to be most severe in areas of highly localized fishing where the benthos is repeatedly disrupted. Decreased, but more localized fishing effort might actually be more damaging. The net habitat effect resulting from BSAI 4 could not be determined.

Further discussion of the impact of past amendment and management actions on habitat is contained in Section 3.6.5.

## **Seabirds and Marine Mammals**

Interactions of the groundfish fisheries with seabirds and marine mammals may involve direct injury or mortality of these animals, or may result from prey competition where the groundfish fisheries catch species that form the prey base for marine mammals or seabirds. Efforts have been made to minimize the interaction in both of these areas. BSAI 36 and GOA 39 banned a directed fishery on forage fish, which are preyed upon by seabirds, marine mammals, and commercially important groundfish species. Forage fish are the principal diet of more than two thirds of Alaskan seabirds.

Other efforts to avert prey competition with the Steller sea lion are amendments dispersing Steller sea lion prey species, pollock, Pacific cod and Atka mackerel, in space and time. These actions were precipitated by the rapid decline in the western stock of Steller sea lions. Although scientific evidence of the relationship between the groundfish fisheries and Steller sea lion decline is a matter of controversy, measures were put in place in various FMP amendments to disperse the fishery and to prevent disturbance of the animals at rookeries and haulouts.

For further discussion of the effect of FMP amendments on seabirds and marine mammals, refer to Section 3.7.1 for seabirds, and to individual marine mammals species subsections in Section 3.8, under the headings relating internal effects from the MSA groundfish fisheries).

## **Socioeconomic Factors**

Section 3.9.1 contains a historical overview of the fisheries that includes changes since the implementation of the FMPs. Impacts of the FMP amendments on harvesting and processing sectors are discussed in detail in Section 3.9.2.2.

Impacts of other amendments on communities are discussed in Section 3.9.3. Impacts of the CDQ program are discussed in detail in Section 3.9.4.3.

## **Ecosystem**

Section 3.10.1.4 discusses the FMP management changes since the implementation of the FMPs, and the impact of the amendments on the ecosystem.

### **3.2.4 Significant Changes to Bering Sea and Aleutian Islands and Gulf of Alaska Groundfish Fishery Management**

Since the implementation of the BSAI and GOA FMPs in 1978 and 1981 respectively, the manner in which the groundfish fisheries have been managed has adapted and changed. These changes have been incrementally analyzed in terms of the specific actions implemented by the individual FMP amendments, and their impacts, as summarized above. When these changes are viewed cumulatively, however, it is apparent that the current fishery management philosophy is built upon the incremental responses of the last twenty years.

This section attempts to identify the significant changes to the way the groundfish fisheries are managed, since the implementation of the FMPs. The changes identified in this section have been deemed significant by NOAA Fisheries analysts; however, due to the qualitative nature of this discussion, the list may not be exhaustive. Additionally, the discussion of the amendments is primarily based on the NEPA documents that

analyzed the action (Environmental Assessments [EAs] or EIS). While these documents do address the purpose and need for proposing a change to existing management conditions, and often include a rationale for selecting a preferred alternative, the full debate regarding the implementation of a particular amendment is not always apparent in the NEPA analysis, particularly if changes are made as a result of Secretarial disapproval. To the degree that the analysis below is based in large part on the analysis of the NEPA documentation, the discussion of significant changes may also be lacking.

The significant management changes since 1978 (GOA) and 1981 (BSAI) that have been identified by NOAA Fisheries analysts are changes to: 1) the OY framework and to the apportionment of quota; 2) methods to minimize bycatch particularly of prohibited species; 3) tools to deal with excess capacity; 4) means for protecting communities dependent on fishing; 5) monitoring and reporting programs; and 6) frameworking and flexible management.

The establishment of a multi-species groundfish OY range in the BSAI and GOA FMPs represented a significant shift in groundfish fishery management. Although the implementation of the BSAI OY range was Amendment 1 to the BSAI FMP, it was analyzed as part of the FMP EIS. The OY range in the GOA was established in GOA 15. This change allowed considerably more flexibility of management, as the annual quota for an individual species was no longer defined in the FMP and would be set annually, based on best available science and in accordance with the TAC frameworking procedures in the FMP, using the more streamlined regulatory amendment process. GOA 15 was implemented in 1987. In the eight years prior to its implementation, OY adjustments had been made in eight of the thirteen amendments.

The implementation of the OY range in the BSAI has had other impacts because the maximum limit of the FMP-defined OY range constrains the sum of groundfish acceptable biological catch (ABC). The sum of groundfish ABC for 2003 was approximately 3.5 million mt, while the maximum limit of the OY range is set at 2 million mt. As a result, the North Pacific Fishery Management Council (NPFMC) has leeway in making recommendations for TAC settings in the BSAI, and in determining which species should be fished to the level of their ABC and which should not. The cap on OY is believed by NPFMC to be an effective conservation measure that mitigates uncertainty, particularly in the BSAI. The use of the existing OY ranges has been reaffirmed by NPFMC in the Preferred Alternative (PA).

Another significant change since the implementation of the FMPs is to the apportionment of annual quota. In the original FMPs, the domestic fishery received a species-specific catch quota for the managed groundfish species that, in the GOA was spatially divided among five statistical areas. The foreign catch quota in the GOA was spatially distributed and had seasonal restrictions. Although not specified in the FMPs, the foreign catch quota was allocated among nations. Since the implementation of the original FMPs, the spatial, seasonal, directed fishery, and gear-specific subdivision of species quota allocation has increasingly become a management tool that is used to address a variety of problems. In the GOA FMP, quota was divided among the statistical areas to “reduce the likelihood of uneven exploitation on localized stocks or concentrations” (NMFS 1978). This issue was echoed in BSAI 28, where the ability to apportion the Atka mackerel TAC over subdivided BSAI districts allowed for a higher Atka mackerel ABC than would otherwise be recommended if the directed fishery were allowed to take the quota all from one spatially concentrated portion of the subarea (NMFS 1993b). Seasonal quota allocations (BSAI 14 and GOA 19) and the creation of species-specific management districts (BSAI 17 and GOA 18) were also used as tools to protect the pollock stock against intensive fishing on spawning aggregations.

The subdivision of allocation by gear type has also been used to resolve socioeconomic issues such as gear conflicts and grounds preemption disputes. Further discussion may be found under Socioeconomic Actions in Section 3.2.3.1. Due to the difference in selectivity and bycatch rates among different gear types, excessive groundfish bycatch by a particular gear-type may result in a target fishery being closed before the quota is reached, when that quota could safely be harvested by vessels of a different gear type without triggering a bycatch concern. To the extent that species allocation by gear type allows the fishery to achieve the optimum harvest levels and avoids gear conflict, it is a useful tool that will continue to be recommended by the NPFMC. The downside of subdividing allocations is that it requires increased attention from NOAA Fisheries managers in terms of the potential need to close fisheries, to reallocate incidental catch amounts, or to investigate overages. In 2003 in BSAI, there were 152 non-CDQ TAC allocations, and 29 TAC allocations for each of the six CDQ groups. This represents a 23-fold increase from 1995.

The use of PSC limits has also been a significant change in fisheries management since the implementation of the original FMPs. Although prohibited species, which must be discarded at sea, were specified in the original FMPs, limits on their catch were not formally included in the FMPs. Subsequent amendments first specified catch limits on foreign catch of halibut in the GOA, and chinook salmon, halibut and crab in the BSAI. Once its PSC limit was reached, the nation was prohibited from fishing in the management area or subarea. The application of PSC limits as a tool for reducing prohibited species bycatch was subsequently applied to the domestic fleet trawl sectors, and then to the fixed gear sectors, and apportioned by area or season. The NPFMC continues to find PSC limits to be an effective method for reducing bycatch, and the establishment of PSC limits for salmon, crab and herring in the GOA are included in the PA. Analysis to address salmon bycatch, and suggested PSC limits for the GOA, have already been initiated.

PSC limits have been implemented in response to increased concern as to the rate of prohibited species bycatch in the groundfish fisheries. Prior to the full domestication of the groundfish fisheries, domestic catch of prohibited species was not a matter of concern. Once the issue was raised at the NPFMC level, however, PSC limits have been demonstrably effective in reducing PSC in the groundfish fisheries. For details on the specific reductions in prohibited species bycatch, see Appendix C BSAI Amendment description for BSAI 21b, 25, 35, 37, 40, and 41.

Since the domestication of the groundfish fisheries, excess capacity has increasingly become an issue for the NPFMC. Programs such as the vessel monitoring program (VMP), the LLP, the IFQ program for sablefish, and the AFA cooperatives for BSAI pollock have all changed the nature of groundfish fisheries from their state as described in the original FMPs. The impact of these programs is described in detail in Section 3.9 of this document. The NPFMC has identified comprehensive rationalization as a policy goal since 1992. In the PA of this document, the NPFMC has reaffirmed its intention to further decrease excess capacity and overcapitalization through eliminating latent licenses and extending programs such as community or rights-based management to some or all groundfish fisheries.

The NPFMC has also specifically recommended prioritizing the implementation of management measures that provide stable economic opportunities for fishery-dependent coastal communities. This includes management measures that provide allocations to small vessels or particular gear types, such as allocations to jig gear (BSAI 24 and 34). Additionally, consideration for coastal communities is important during the development of area restrictions such as closure areas so that they still allow access for local vessels. The inshore-offshore issue in the pollock fleet included coastal community consideration, as communities hosting a processor were more likely to benefit from inshore allocations (BSAI 18, 38, and 61 and GOA 23, 40, and 51). The establishment of the CDQ program for western Alaska coastal communities illustrates a well-

developed program for community protection, where a percentage of the TAC for each BSAI groundfish and crab species is allocated among six CDQ groups. The economic impacts of the CDQ program are discussed in detail in Section 3.9.4.3. The NPFMC is currently developing a program in the GOA for eligible communities to purchase sablefish quota share (GOA 66). The shift in emphasis to provide for sustainable fisheries-dependent communities influences all groundfish fishery management actions, and in particular is a major criterion in the development of future rationalization programs.

The original FMPs established specific monitoring and reporting requirements for the foreign fisheries, and minimal reporting requirements for the domestic fisheries. As the domestic fleet began to increase their proportion of the North Pacific TAC, however, the need for more timely and comprehensive domestic fishery data became apparent. Management and Monitoring Actions of Section 3.2.3.1 provides a summary of the various FMP amendments that increased observer coverage for domestic fishery operations and expanded recordkeeping and reporting requirements. These programs, in combination with NOAA Fisheries independent resource surveys, are part of one of the most comprehensive fishery data collection systems in the world (Appendix F-11). Acknowledged deficiencies of the system are the non-random observer coverage in the 60 ft to 125 ft sector of the groundfish fleet, and the lack of observer coverage on vessels smaller than 60 ft. Additionally, the economic data collected is mostly limited to price and revenue data. In order for fishery managers to assess the full economic impact of their decisions, it is necessary to expand the range of economic data collected to include, for example, expenditure, employment and earnings data. These deficiencies are addressed in policy objectives in the PA.

Since the implementation of the FMPs, a major management emphasis has been on frameworking of management measures. The process for implementing FMP amendments is time-consuming, and does not allow for quick responsiveness to new conservation or management issues. In contrast, the nature of fisheries management is variable, with stock sizes fluctuating naturally from year to year. As a result, when rapid reaction to a conservation issue is required, the immediate management response must often be implemented by NOAA Fisheries' emergency rule, and after the fact be supported by an FMP amendment and requisite analyses. As a result of the bureaucracy of this latter procedure, the NPFMC has attempted to framework those management measures that are reviewed and adjusted on a regular basis, so that their change does not trigger the procedure of an FMP amendment. Instead, the procedure for regular review and modification is outlined in the FMP, along with the NPFMC intent and authorization, and as a result, the actions can subsequently be implemented through regulatory amendments rather than FMP amendments. Various management measures have been frameworked in this manner, including the TAC-setting process as discussed above. Additionally, setting annual PSC limits for some prohibited species, setting season start dates, inseason management measures, and granting experimental fishing permits are all actions that are authorized in the FMPs, often with specific criteria and procedural requirements, but are implemented through regulatory amendments.

Another example of a framework procedure is the hot spot authority granted to NOAA Fisheries. The NPFMC has frequently recommended that the FMPs be amended to allow the NOAA Fisheries Regional Administrator the field authority to implement temporary time or area closures to specific areas for conservation reasons (known as hot spot authority), such as if a particular fishing ground seems to be producing high bycatch rates (BSAI 1, 4, 10, 16a, 19; GOA 15, 24). Although numerous efforts were made between 1983 and 1992 to refine the authorization language and enable temporary fishery closures by regulatory amendment, the original rapid reaction intent has not been met. The standards of evidence and public comment periods required for inseason management to close an area to fishing do not permit for flexible, temporary closures of the type envisioned by the NPFMC. The principle of hot spot closures has

been used voluntarily in the BSAI pollock cooperatives to reportedly good effect. A review of the effectiveness of bycatch reduction in the BSAI pollock fishery is currently initiated in the PA.

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