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Environmental Assessment/Regulatory Impact Review/Initial Regulatory Flexibility Analysis

For Proposed Amendment 69 to the
Fishery Management Plan for Groundfish of the Gulf of Alaska
to modify the Total Allowable Catch Calculation for the "Other Species" Complex

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Abstract: This EA/RIR/IRFA evaluates the environmental impacts, the costs and benefits, and the small entity impacts, of a proposed Amendment to the GOA Fishery Management Plan to change the way the total allowable catch (TAC) is determined for the "other species" complex. The analysis also examines alternatives for changing the calculation of "other species" complex maximum retainable amounts (MRAs) in directed fisheries. This EA/RIR/IRFA addresses the requirements of the National Environmental Policy Act, Presidential Executive Order 12866, and the Regulatory Flexibility Act.

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Table of Contents

List of Tables

Executive Summary

This Environmental Assessment/Regulatory Impact Review/Initial Regulatory Flexibility Analysis (EA/RIR/IRFA) addresses an amendment to the Gulf of Alaska (GOA) groundfish Fishery Management Plan (FMP) to modify the total allowable catch (TAC) calculation for the "other species" complex. Currently the TAC for the "other species" complex is calculated as equal to 5% of the sum of the target species TACs for the GOA.

The "other species" complex currently contains the following species: squids, sculpins, sharks, and octopi. As currently configured, the "other species" complex is open to directed fishing up to the TAC for the complex. This has caused conservation concerns given the removal of several species over time from the complex, which under the current calculation has served to increase the complex TAC by placing additional species into target categories upon which the TAC for the "other species" complex is based. Additionally, given the configuration of the complex, it is possible to target one member of the complex close to the full complex-level TAC, which inhibits in-season management's ability to control directed fishing within the complex and raises concerns given the lack of available stock information on most members of the complex.

Three alternatives and one sub-option are considered in this analysis:

Alternative 1: (Status Quo). TAC for the "other species" complex is fixed at 5% of the sum of the target groundfish TACs.

Alternative 2: (Preferred) Set the "other species" complex TAC at less than or equal to 5% of the sum of the target species TACs.

Alternative 3: Set the "other species" complex TAC at a level anticipated to meet incidental catch in other directed fisheries throughout the fishing year.

Sub-option: Revise the maximum retainable amount for the "other species" complex by fishery.

The alternatives under consideration were developed by the Council in order to potentially modify the TAC calculation for the "other species" complex. This analysis is limited in scope to an evaluation of this TAC calculation only. These alternatives are intended as a short-term solution, understanding that a more comprehensive amendment package is planned, which will consider a broader range of alternatives to modify the management of target and non-target species in the GOA.

An Environmental Assessment (EA) of this action (Chapters 3 and 4) was prepared pursuant to the requirements of the National Environmental Policy Act. This EA evaluates the environmental and economic impacts of the alternatives under consideration. This action is considered to be an interim, short term, measure towards the development for a longer term FMP amendment to revise the management strategy for non-targeted groundfish species, which is being developed by the Council's Non-target Species Committee.

The immediate and cumulative effects are rated as insignificant for the resource components of the GOA ecosystem for all of the alternatives considered. It was noted that under Alternative 1, the status quo, directed fisheries could be developed on individual stocks such as spiny dogfish or octopus. If a large proportion of the TAC was harvested by targeting on an individual stock within the "other species" complex the result could be detrimental over the long term to that targeted stock. There could, as well, be

slight impacts on the "other species" themselves, seabirds, marine mammals, the ecosystem, and the fishing economy. However, for various reasons, including the small size of current incidental catches, the ability of NMFS to take emergency action if a directed fishery emerged and threatened overfishing, the ability of the Council to move a species from the "other species" complex and give it target species status if necessary, and the Council's ongoing activity to address the needs of non-target species in general, these impacts appear insignificant, at this time.

Under Alternatives 2 and 3, the Council would be able to set TAC at lower levels than under Alternative 1. Under Alternative 2, it could be set below 5%, and the Council would have the opportunity to set it high enough to allow a directed fishery; under Alternative 3, it would be set equal to or below 5%, but only high enough to allow incidental harvests. These alternatives give the Council more tools to address the impacts of potential directed fisheries on these species, and appear to be insignificant, at this time.

In June 2005, the Council chose TAC Alternative 2 as its preferred alternative.

Several different approaches to revising the maximum retainable amount (MRA) for the "other species" complex by fishery are discussed.

A Regulatory Impact Review (RIR) was prepared for this action (Chapter 5) pursuant to the requirements of Presidential Executive Order 12866. Alternative 1 is the status quo; it provides for incidental catches at current levels and would permit the emergence of a directed fishery for some of these species, but it provides limited protection from overfishing for the stocks in the "other species" complex. If a directed fishery emerged and threatened overfishing, NMFS would have to take emergency action to protect the stock, and/or the Council would have to move the stock from the complex to a target species status. The Council has done this in the past for Atka mackerel and skates. Alternative 2 allows for incidental catches of "other species", and gives the Council the option to allow a directed fishery for one or more of the species. It also gives the Council an additional tool to address the potential overfishing of one or more of the "other species". Alternative 3 would preclude directed fishing for "other species". It provides the greatest protection against overfishing these stocks pending the implementation of more comprehensive non-target species measures. The RIR discusses the ways in which the TAC alternatives would interact with potential MRA measures.

An Initial Regulatory Flexibility Analysis (IRFA) was prepared for this action (Chapter 6) pursuant to the requirements of the Regulatory Flexibility Act. An estimated 803 small catcher vessels and 13 small catcher-processor vessels fishing for groundfish in the GOA may be directly regulated by this action. Average gross revenues for these vessels from Federally managed fisheries off Alaska in 2003, were $170,000 for the catcher vessels, and $1,530,000 for the catcher-processors. Alternatives 1 and 2 provide for TACs that would cover existing incidental catches and the potential emergence of a directed fishery. Alternative 3 could interfere with the development of a new directed fishery for one or more of the species in the "other species" complex. While this alternative would have no adverse impacts on fishing operations under current conditions, it could have if interest developed in targeting one of these species. It is impossible to predict whether or not a directed fishery will emerge. The analysis reviewed the potential interactions between the TAC alternatives and MRA sub-options. The analysis did not identify any new projected reporting, record keeping or other compliance requirements associated with the proposed FMP amendment. The analysis did not reveal any Federal rules that duplicate, overlap, or conflict with the proposed action.

1 Purpose and Need

1.1 Introduction

The proposed action would modify the total allowable catch (TAC) calculation for the "other species" complex, currently fixed in regulation as equal to 5% of the sum of the GOA target species TACs.

Groundfish fisheries in the Gulf of Alaska (GOA) are managed by NMFS under the Fishery Management Plan (FMP) for the groundfish of the Gulf of Alaska (NPFMC 2005). The FMP covers fisheries for all stocks of finfish except salmon, steelhead, Pacific halibut, Pacific herring, and tuna. The FMP was developed by the North Pacific Fishery Management Council (Council) and implemented on December 1, 1978. Since that time it has been amended over sixty times in response to on-going management issues.

Actions taken to amend FMPs must meet the requirements of Federal laws and regulations. These include the Magnuson-Stevens Act, National Environmental Policy Act (NEPA), the Endangered Species Act (ESA), the Marine Mammal Protection Act (MMPA), Executive Order (E.O.) 12866, and the Regulatory Flexibility Act (RFA), among others.

This Environmental Assessment/Regulatory Impact Review/Initial Regulatory Flexibility Analysis (EA/RIR/IRFA) addresses an amendment to the GOA groundfish FMP. NEPA, E.O. 12866, and the RFA require a description of the purpose and need for the proposed action, as well as a description of alternative actions that may address the problem. The purpose and need is addressed in Chapter 1 of this document. Chapter 2 described the alternatives considered for analysis as well as alternatives considered but not carried forward. Chapter 3 describes the affected environment. Chapter 4 discusses the biological and environmental impacts of the alternatives as required by NEPA, as well as impacts on endangered species and marine mammals. Chapter 5 contains a Regulatory Impact Review (RIR), which addresses the economic impacts of the alternatives. Chapter 6 contains the Initial Regulatory Flexibility Analysis (IRFA) as required under the RFA.

1.2 Background and history of the "other species" complex

The "other species" complex has evolved via a series of amendments to the GOA FMP. The following section provides an overview of how the complex has been managed historically under the FMP, and the amendments that have modified the complex and its management.

The original FMP, implemented in 1978, identified three separate species categories: 1) prohibited species; 2) specific species or species complexes; and 3) "other species". Under the original FMP, "other species" had a Maximum Sustained Yield/Optimum Yield (MSY/OY) of 16,200 mt, as a whole, based upon historic foreign catch.

Amendment 5 to the FMP removed grenadiers from the "other species" complex and established them as their own category with a separate MSY/OY of 13,200 mt based upon the recorded average grenadier catch from 1967-1979. Grenadiers were removed from the "other species" complex given concerns that catches of grenadiers (specifically unforeseen bycatch in the hook-and-line sablefish fishery) would exceed the MSY/OY for the "other species" complex and close directed fishing for target species. Because the population of grenadiers was not included in the development of the OY for "other species", the MSY/OY for the "other species" complex remained unchanged following the removal of grenadiers (NMFS 2003, NMFS 1979).

Amendment 8 to the FMP was implemented in November, 1980 (45 FR 73486). Under this amendment, the grenadiers category was re-named non-specified species and all non-target catches from directed fishing (other than the species named in the "other species" complex) were reported to that category. This was intended to alleviate operational problems with fishermen reporting non-target species in the "other species" complex. "Other species" were defined as species that have "*only slight economic value and are not generally targeted upon, but which are either significant components of the ecosystem or have economic potential.*" (45 FR 73486). The OY for the "other species" complex was established as 5% of the OYs for all target species. The "other species" complex included sculpins, sharks, skates, eulachon, smelts, capelin, and octopus. At this time, squid were managed as a separate target fishery with a separate MSY and OY. Under amendment 8, OY for the "other species" complex (as well as squid, other rockfish, and thornyhead rockfish) was modified to be managed Gulf-wide, rather than allocated by management area.

The non-specified category was defined as a "*residual category of species and species groups of no current or foreseeable economic value or ecological importance, which are taken in the groundfish fishery as an accidental bycatch and are in no apparent danger of depletion.*"(45 FR 73486). Grenadiers were included under the non-specified category.

Amendment 14 to the FMP was implemented November 18, 1985 (50 FR 43193). As a by-product of changing the OYs for pollock (western and central), POP, Atka mackerel, and "other rockfish," the OY for the "other species" complex decreased, given the specification in the FMP that OY for the "other species" complex be established as equal to 5% of the total OY for all of the target groundfish species.

In 1987, the FMP was amended (Amendment 15) such that the TAC calculation for the "other species" complex was fixed in regulation as equal to 5% of the total TACs for all GOA target groundfish species. This percentage was consistent with previous approaches for OY for the "other species" complex, and was determined as "ample to provide for the anticipated incidental catch of those species" (NPFMC 2005).

In 1988, Atka mackerel were combined into the "other species" complex due to low abundance, and the absence of a directed fishery for several years (Lowe and Lauth 2003). However, high landings in 1992, and a directed fishery in 1993, led to the development of Amendment 31 to the GOA FMP, which removed Atka mackerel from the "other species" complex and placed them back into a target species category (NPFMC 1993). In 1988, under Amendment 16, squid were moved into the "other species" complex. Previously they had been listed as a separate target fishery.

Amendment 39, implemented in 1998, defined a forage fish category in the FMP. Important prey species were included in this category. Regulations were implemented which prohibited directed fishing on this category, placed limitations on allowable bycatch retention, and on the sale, barter, trade, or other commercial exchange, and prohibited the processing of forage fish in a commercial processing facility. The forage fish category contains species that were formerly included in the "other species" complex, including species of eulachon, capelin, and smelts. The full list of species included in this category is in the GOA groundfish FMP (NPFMC 2005).

Conservation concerns were raised in 2003, regarding a developing skate fishery, and the inability of inseason management to allow for some directed fishing, and still adequately protect skate stocks, while these species were within the larger "other species" complex. In 2004, amendment 63 to the GOA FMP removed skates from the "other species" complex and placed them in a target category. Currently OFL, ABC, and TACs are specified for big skates, longnose skates, and the remaining skates in the *bathyraja* (or other skate) complex. This has allowed for some small but controlled directed fishing to occur on

skates until such a time as additional data allow for adequate stock assessment and monitoring of these species to ensure their continued health and viability.

The "other species" complex currently contains the following species: squids, sculpins, sharks, and octopi. There has been some indication of increased incidental catch of spiny dogfish in 2005. It is unclear to what extent this is a market-driven directed fishery, or simply an increased incidental catch of this species. As currently configured, the "other species" complex is open to directed fishing up to the TAC for the complex. This has caused conservation concerns given the removal of several species over time from the complex, which under the current calculation has served to increase the complex TAC by placing additional species into target categories upon which the TAC for the "other species" complex is based. Additionally, given the configuration of the complex, it is possible to target one member of the complex up to the full complex-level TAC, inhibiting in-season management's ability to control directed fishing within the complex, and raising concerns given the lack of available stock information on most members of the complex.

In State waters, there is no closed season for the "other species" complex. Instead, they are managed as a parallel fishery where openings and closing are made concurrently with federal actions. Directed fishing for sharks, squid, and octopus requires a Commissioner's permit. The permit is for a specific time period (generally 30 days), specifies the type of gear which may be used, and requires that a logbook be filled out by the vessel operator describing the fishing location, effort, and harvest. Sculpins are managed as groundfish in a parallel fishery where openings and closing are made concurrently with federal actions.

1.3 Background on Maximum Retainable Amounts in the GOA

MRAs are established for groundfish species or species groups that are closed to directed fishing. Regulations at 50 CFR 679.20 (e) establish rules for calculating and implementing MRAs. The MRA is calculated as a percentage of the retained amount of species closed to directed fishing relative to the retained amount of basis species or species groups open to fishing (69 FR 32901).

When the FMP for the GOA was implemented in 1978, most of the MRAs were set at 20 percent. This is a level higher than the average incidental catch observed in the fishery, but takes into account instances when the average rate is exceeded, and thus would reduce discards required by regulation. Over time, as fishing practices and regulations have changed, the MRAs have often been revised. When a valuable fishery is closed to directed fishing, vessels have "topped off" on that species by targeting it up to the MRA. A good example of this practice is the "topping off" of sablefish in the trawl fisheries targeting rockfish in the GOA.

At present, MRAs in the GOA range from 0 percent to 35 percent (CFR part 679 Table 10). The highest rate (35 percent) is for arrowtooth flounder when directed fishing for arrowtooth is prohibited in all other directed fisheries. The MRA was raised for arrowtooth because of its increasing relative abundance (to other groundfish species) in the GOA. The lowest rates (0 percent) are for deep water flatfish, rex sole, flathead sole, shallow water flatfish, sablefish, all rockfish, Atka mackerel, skates, and the "other species" complex, when directed fishing for these species is prohibited in the arrowtooth fishery. This was done before the directed arrowtooth fishery developed, when arrowtooth was being targeted to serve as ballast so that additional, more valuable, species on bycatch status could be retained.

In State waters, when "other species" are closed to directed fishing, the State's MRAs are set equal to the federal MRAs. Only the Eastern GOA, in State waters, has a more liberal MRA for sharks. In the Eastern GOA hook-and-line, hand troll, and power troll gear may retain up to 35 percent sharks. In the

East Yakutat Section and the Icy Bay sub district, a salmon gillnet permit holder may retain all spiny dogfish during salmon gillnet operations (Nick Sagalkin, ADF&G, personal communication).

1.4 Related Council efforts on non-target species management

In 2003, the Council convened a Non-target Species Management Committee to address on-going concerns and competing initiatives regarding the management of target versus non-target (i.e., incidentally caught) species. Previously an ad hoc working group of scientists had convened multiple times to begin to develop criteria for sorting complex, group, and species management into the two categories of target and non-target. The Council-appointed committee will continue these efforts as they work towards a series of (or a single wide-ranging) plan amendments to the GOA and BSAI groundfish FMPs.

This committee effort, while on-going, is focused on developing a long-range solution to the myriad of problems that arise in delineating target and non-target species management. However, it may take the Council considerable time to come up with an action plan and an analysis in order to address these problems from a broad perspective. An amendment package was initiated for analysis by the Council in April 2005. This package will address alternative measures for comprehensive management of "other species" in both the BSAI and GOA. However, a short-term solution is needed prior to the broader scope (and longer term) planned initiative, in order to be responsive to concerns about the potential for developing fisheries within the complex, and to continue conservative management practices upon stocks for which there is limited information.

1.5 Problem statement adopted by the Council

The following problem statement was crafted by the Council Non-target Species Management Committee and reviewed by the Council at their February 2005 meeting:

> *In May of 2004, a final rule was published that removed skates from the "other species" complex in the Gulf of Alaska. This rule established ABCs and TACs, based on survey biomass, for Big, Longnose, and other skates, and thus provided a measure of protection against possible overfishing of skates in the Gulf of Alaska. Those species remaining in the "other species" complex include sharks, sculpins, squids, and octopi. The complex is open for directed fishing. While no ABC or OFL is set for this complex, TAC is defined as 5% of the combined TACs of all other groundfish species in the GOA.*
>
> *While recognizing that no members of the complex are targeted, the non-target species committee also noted that the removal of skates from the complex resulted in the potential for increased harvest of the remaining "other species". This is because the harvest of skates no longer accrues to the "other species" category. In addition, when a member is removed, the sum of all the single species TACs increases, resulting in an increase of the "other species" TAC when the 5% default TAC is applied. Ideally, the TAC for the "other species" complex would be lowered when a member such as skates is removed. Unfortunately, biomass estimates for most of the species in this group cannot be determined reliably by trawl surveys, and the remaining species still exist in a group with TAC determined by the TACs of other groundfish species in the Gulf of Alaska. Lacking any means of determining a survey-based TAC for this group leads to the conclusion that when members are removed, the Council should consider reducing the percentage basis for the "other species" TAC to something less than 5% of the combined members.*

1.6 Next Steps in the Process

This is the public review draft for the EA/RIR/IRFA. The Council reviewed an initial draft of the analysis at its April 2005 meeting and recommended its release for public review prior to the June Council meeting. In June 2005, the Council selected Alternative 2, along with the Sub-option B to raise the MRA for "other species" in the arrowtooth fishery from 0 to 20 percent, as its preferred alternative.

2 Description of the Alternatives

This EA/RIR/IRFA evaluates three FMP-level alternatives to revise the manner in which the TAC for the "other species" complex is specified in the GOA, as well as a sub-option to revise the maximum retainable amounts (MRA) for the "other species" complex, by fishery, when directed fishing for "other species" is prohibited. In drafting the alternative at its February 2005 meeting, the Council did not specify the manner in which to revise the MRAs for "other species". For the purposes of discussion the authors present three possible approaches to revising the MRAs for "other species".

2.1 Alternative 1: Status Quo

Alternative 1, the status quo, is the requisite no action alternative. At present, the FMP specifies that the TAC for the "other species" complex be set at 5 percent of the sum of all target species TACs in the GOA. From 1995 through 2004, the "other species" TAC has ranged from 11,260 mt to 15,570 mt, and the catch has ranged from 1,638 mt to 6,339 mt (Table 3.1.1). The 2005 TAC for the "other species" complex is 13,871 mt (70 FR 8958, February 24, 2005). Species in the "other species" complex are taken primarily as incidental catch in other directed fisheries. Because the TAC for the "other species" complex is in excess of the amount needed for incidental catch, directed fishing for "other species" is permitted year round with the exception of seasonal closures to the use of hook-and-line and trawl gear when seasonal apportionments of the halibut PSC limits are reached. This has allowed directed fisheries for individual species within the "other species" complex to develop. In the past, when the harvests of individual species have developed to the extent that they caught a disproportionate amount of the "other species" complex TAC, the Council has recommended that that species be removed from the "other species" complex by FMP amendments and managed separately. This was the case with Atka mackerel in 1993, and skates in 2004. NMFS monitors the catch of "other species" through its catch accounting system, which can be updated on a daily basis.

2.2 Alternative 2: Less Than or Equal to 5%

Alternative 2 would allow the Council the greatest flexibility of the alternatives considered in setting the TAC for the "other species". The Council would, after considering the most recent and best scientific information available, as well as recommendations from its Scientific and Statistical Committee, Advisory Panel, public testimony, and socio-economic information, recommend a TAC for the "other species" as part of the annual harvest specification process. Under Alternative 2, the Council could consider setting a TAC at a level anticipated to meet the incidental catch in other directed fisheries during the year in the GOA, or at a higher level, which would allow for directed fishing but be low enough to prevent excessive harvests of the "other species" complex as a whole.

In June 2005, the Council chose TAC Alternative 2 as its preferred alternative.

2.3 Alternative 3: Less Than or Equal to 5%; No Directed Fisheries

Alternative 3 would require the Council to recommend a TAC for the "other species" complex at a level anticipated to meet incidental catch needs in other directed fisheries through the year. This would result in a directed fishing allowance of zero, and as part of the management measures contained in the annual harvest specifications for the GOA published in the Federal Register, NMFS would close directed fishing for the "other species" complex. Maximum retainable amounts (CFR part 679 Table 10) could still be kept for processing until the TAC level was reached, at which point all retention of "other species" would be prohibited. For the species that presently comprise the "other species" complex (sharks, sculpins, octopus, and squid), incidental catch between 1997 and 2002 has been estimated to range between 1,633 mt and 3,102 mt, annually in the groundfish fisheries in the GOA. The average catch during this six-year period was 2,124 mt (Table 3.2.1). The catch of "other species" in the GOA in 2004, was estimated to be 1,638 mt. Setting a TAC at or near the upper end of the range would result in a closure of directed fishing while presumably allowing MRAs to be retained throughout the fishing year. A TAC set at an average level would, presumably in some years, be reached, and the retention of "other species" would be prohibited for the remainder of the fishing year. Since there is no OFL established for the "other species" complex, other directed fisheries would not be affected by prohibiting retention of the "other species" complex.

2.4 Sub-Option: Revise the MRA for "Other Species" by Fishery

As discussed above, a likely range of alternatives could fall in the range of the current minimum (0 percent) and maximum (35 percent). Any one of these approaches could be applied to any of the alternatives.

a) Status Quo. The "other species" MRAs would remain at the current level of 20 percent in all open fisheries with the exception of arrowtooth, which would remain at 0 percent.

b) Set the "other species" MRAs for all fisheries at 20 percent. This would only change the MRA for "other species" in the arrowtooth fishery, increasing the MRA from 0 percent to 20 percent, recognizing that an expanding directed fishery for arrowtooth with trawl gear is likely to have some intrinsic bycatch needs.

   In June 2005, the Council chose the above MRA suboption b) as part of its preferred alternative.

c) Set the "other species" MRA in each fishery equal to the average incidental catch of "other species" in each fishery. Incidental catch needs in each fishery could be estimated using observer data. This option would likely reduce the MRA in most fisheries, except for arrowtooth where it would be increased. As discussed above, if "other species" were on bycatch status, this approach could lead to additional regulatory discards.

2.5 Alternatives considered but not carried forward for analysis

At the December 2004 Council meeting, the SSC recommended that, in addition to considering a change in the TAC calculation for the "other species" complex, consideration be given to establishing an aggregate OFL and ABC for the complex. Establishing an ABC and OFL for the "other species" complex

would necessitate the production of a stock assessment chapter for the annual SAFE Report for the GOA groundfish. In the BSAI, an annual assessment is done for the individual species in the complex, and based upon recommendations for individual ABCs and OFLs within the complex, an aggregate OFL and ABC for the complex as a whole are established. At this time there are insufficient information and staff time to prepare a stock assessment for the "other species" complex in the GOA. Additional information for the "other species" complex will be available following the 2005 summer trawl survey in the GOA, and staff time will be allocated to summarize these data, as well as data from previous surveys (2003 and 2001). NMFS staff also intends in its stock assessment for "other species" to include estimates of incidental catch of "other species" in the commercial halibut fishery, which are not currently available.

A separate amendment package is anticipated, which will break individual species in the BSAI and GOA out from the "other species" complex, such that OFL and ABC by species can be established. This represents an improved mechanism for managing these species on the basis of the best information available. Analysis of this broader scope amendment was initiated for analysis by the Council in April 2005, with an expected final action on the amendment by June of 2006, in time for regulatory changes to be promulgated for the 2007-2008 specifications process. That amendment analysis will include information from the 2005 GOA trawl survey, as well as synthesized information from previous (2003 and 2001) trawl surveys and all available updated species information on individual species in the GOA "other species" complex, following the assessment cycle in 2005. This information would not be available for inclusion in this analysis until January 2006, thus analysis of this additional alternative is not possible at this time. Considering a complex-wide OFL and ABC for "other species" in the GOA within this analysis would also represent a redundant effort, given that the anticipated comprehensive amendment package will consider this alternative, as well as the full break-out by species. For these reasons this alternative was not carried forward for analysis at this time. It will, however, be included in the broader scale analysis to be initiated as a separate amendment package (for both the BSAI and GOA FMPs).

3 Affected Environment

3.1 Overview

The Gulf of Alaska management area encompasses the U.S. Exclusive Economic Zone (EEZ) of the North Pacific Ocean, exclusive of the Bering Sea, between the Aleutian Islands at 170° W. longitude and Dixon Entrance at 132° 40' W. longitude. For management purposes the area is divided into three regulatory areas: Western, Central and Eastern. Additional information on the management area can be found in the FMP for Groundfish of the GOA (NPFMC 2005).

The GOA is a large body of water bordered by the Alaska coast from Dixon Entrance to Unimak Pass. This coast is unusually rugged and mountainous and deeply indented by numerous fjords and inlets. Tidewater glaciers flow down into the heads of many bays. Thousands of streams and rivers flow into these waters, including many that are glacier-fed and silt-laden.

The continental shelf parallels the southeastern Alaska coast and extends around the GOA. Total area of the continental shelf in the GOA is about 160,000 square km. Between Canada and Cape Spencer in the GOA, the continental shelf is narrow and rough. North and west of Cape Spencer it is broader and more suitable for trawling. As it curves westerly from Cape Spencer towards Kodiak Island it extends some 50 miles seaward, making it the most extensive shelf area south of the Bering Sea. West of Kodiak Island and proceeding along the Alaska Peninsula toward the Aleutian Islands, the shelf gradually becomes narrow and rough again. Although its width is less than 10 miles at some points, it is generally 30 to 60 miles wide. Off the Kenai Peninsula and Kodiak Island it is more than 100 miles broad (NPFMC 2005).

Coastal waters overlying the continental shelf are subject to considerable seasonal influences. Winter cooling accompanied by turbulence and mixing due to major storms results in a uniform cold temperature in the upper 100 m. Seaward of the continental shelf, there is a surface flow of water called the Alaska Current which moves in a northwesterly direction in the eastern GOA and swings to the west and southwest off Kodiak Island and westward toward Unimak Pass (Musgrave *et al.* 1992).

A full description of the physical environment of the GOA can be found in the PSEIS for the groundfish fisheries of the BSAI and GOA (NMFS 2004b).

Target species and species categories in the GOA groundfish FMP include the following: Pollock, Pacific cod, sablefish, deep water flatfish complex, rex sole, shallow water flatfish complex, flathead sole, Arrowtooth flounder, other slope rockfish complex, northern rockfish, Pacific ocean perch, shortraker rockfish, rougheye rockfish, pelagic shelf rockfish complex, demersal shelf rockfish complex, thornyhead rockfish, Atka mackerel, big skates, longnose skates, and combined bathyraja skates complex. For all of these species or complexes, an OFL, ABC and TAC are established, and a stock assessment is annually produced (in the GOA biennial assessments are now done for some species).

As explained previously, for the "other species" complex, no annual stock assessment is produced, and an OFL and ABC are not specified. A preliminary stock assessment for the "other species" complex was done in 1999 as an appendix to the GOA SAFE Report for target species. While preliminary OFLs and ABCs were calculated for members of the "other species" complex (based upon Tier 5 criteria) by Gaichas et al (1999) and were based upon the best available information, these were done to highlight existing information and to develop approaches for establishing ABCs and OFLs for these species. At the time of this preliminary assessment, the authors and the GOA Plan Team were aware that a plan amendment would be necessary in order to establish ABCs and OFLs for this complex (either for the complex as a whole or for individual species within it). The SSC encouraged the development of such a plan amendment. The preliminary SAFE report for GOA "other species" represented a suggested approach for establishing ABCs and OFLs, understanding that without a plan amendment these could not be applied. The existing TAC calculation remains as the only mechanism for controlling harvests of "other species". A TAC is specified based upon 5% of the sum of the target species TACs. This TAC is currently open for directed fishing and may be taken preferentially on any member of the complex up until the full TAC is taken. "Other species" are taken incidentally (with some exceptions due to targeting e.g., octopus and previously for skates) in many groundfish fisheries, the TAC for "other species" was exceeded in 1993 due to effort directly targeting Atka mackerel. As a result in 1994 Atka mackerel was removed from the "other species" complex and is now managed as separate target under a tier 6 formula, where the TAC is set low enough to meet incidental catch needs during the fishing year and directed fishing for Atka mackerel is prohibited in the GOA. Exceeding the TAC for "other species" places the complex on prohibited species status but does not shut down any target groundfish fisheries since there is no ABC or OFL level established for "other species".

The GOA FMP defines "other species" as "…groundfish species and/or species groups which currently are of only slight economic importance or contain economically valuable species but insufficient data exist to allow separate management." (NPFMC 2005, Section 2.2, page 4). The FMP currently places four species groups in the "other species" complex. These are sculpin, shark, octopus, and squid (NPFMC 2005, Section 3.1, page 11).

Until mid-2004, the "other species" complex also included the species of skates that are harvested in the GOA. In 2003, fishermen began to target skates in the central GOA. In response to the management concerns raised by increasing skate harvests as the result of a directed fishery, the Council adopted an FMP Amendment (Amendment 63 to the GOA FMP) taking skates out of the "other species" complex,

and treating them as a target species (69 FR 26313; May 12, 2004. http://www.fakr.noaa.gov/frules/fr26313.pdf). The EA/RIR/IRFA for Amendment 63, with its environmental and economic analysis of the action, may be found at: http://www.fakr.noaa.gov/sustainablefisheries/specs04/skateeairfa.pdf .

The GOA Plan Team does not make OFL or ABC recommendations for the "other species" complex. In accordance with the provisions of the GOA FMP (GOA FMP, Section 4.2.1, page 14), "other species" complex TACs are set equal to 5% of the sum of the TACs for groundfish species.

Table 3.1.1 shows the "other species" complex TACs from 1995 to 2004, and compares them to estimated catches (retained and discarded) of the "other species" complex. Skates are included in the estimates from 1995 through 2003.

Fishermen only harvested roughly half of the TAC in one year (2003 when they harvested 56%). Otherwise, the percentage of the TAC caught ranged between 24% and 40% from 1995 to 2002. The percentage dropped dramatically in 2004. This was caused by the creation of a new target species category for skates. A large proportion of "other species" complex catches had been made up of skates; when skates were no longer counted against the "other species" complex TAC, the percentage dropped. As a target species, skate TACs will now tend to contribute to higher "other species" complex TACs, since the "other species" complex catches will now increase by 5% of the skate TAC. The increase in the percentage of the TAC harvested in 2003 (the only year that exceeded 50%) is due to the emergence of the targeted skate fishery in that year.

Table 3.1.1 "Other species" complex TACs and Estimated Catches (Retained plus discards) in the GOA from 1995 to 2004

Year	TAC (mt)	Catch (mt)	Percent of TAC caught
2004*	12,942	1,638	13
2003	11,260	6,339	56
2002	11,330	4,040	36
2001	13,619	4,801	35
2000	14,215	5,649	40
1999	14,600	3,859	26
1998	15,570	3,781	24
1997	13,470	5,409	40
1996	12,390	4,478	36
1995	13,308	3,433	26

Notes: Data summarized from NMFS AKR "Gulf of Alaska Catch Reports" accessed at http://www.fakr.noaa.gov/sustainablefisheries/catchstats.htm on February 28, 2005
* Until 2004, skates were included in the "other species" complex category. In 2004, skates ceased to be treated as an "other species". This meant that the "other species" complex catch total was much smaller. This accounts for the large drop in the percent of the "other species" complex caught in 2004.

The "other species" complex retainable catch percentage is 20% for all fisheries other than the fishery for arrowtooth flounder; the percentage for arrowtooth flounder is zero. (Table 10 to CFR 679; found at http://www.fakr.noaa.gov/rr/tables.htm).

3.2 Species in the "other species" complex

Relatively little information on the life history, catch history, and species composition of the catch is available for "other species" in the GOA. The most recent information on "other species" in the GOA can be found in the PSEIS (NMFS, 2004b, Section 3.5.4), "Other Species" Considerations for the Gulf of

Alaska" (Gaiches et al. 1999), the 2002 SAFE report Chapter 15 "Squid and "Other Species" in the BSAI" (Gaichas 2002), the 2004 SAFE report Ecosystem Chapter (NPFMC 2004), and in "Sharks in the Gulf of Alaska, Eastern Bering Sea, and Aleutian Islands" (Courtney et al. 2004).

The following extracts are from the above referenced documents which provide an overview of the biology of the species in the "other species" complex (Many of the references to underlying scientific documents have been deleted from these extracts. The references may be found in the original documents from which the following quotations were taken).

Sharks

Shark species occurring in the GOA and BSAI include the brown cat shark (*Apristurus brunneus*), the basking shark (*Cetorhinus maximus*), the sixgill shark (*Hexanus griseus*), the salmon shark (*Lamna ditropis*), the blue shark (*Prionace glauca*), the Pacific sleeper shark (*Somniosus pacificus*), and the spiny dogfish (*Squalus acanthias*) (NMFS, 2004c, page 1029).

Information on distribution, stock structure, and life history characteristics for sharks in the GOA and BSAI is extremely limited. Sharks are long-lived species with slow growth to maturity and large maximum size; therefore the productivity of shark stocks is very low relative to most commercially exploited bony fishes. Shark reproductive strategies in general are characterized by long (6 months - 2 years) gestation periods, with small numbers of large, well-developed offspring. Many large-scale directed fisheries for sharks have collapsed, even where management was attempted. The three shark species most likely to be encountered in GOA and BSAI fisheries are the Pacific sleeper shark, *Somniosus pacificus*, the piked or spiny dogfish, *Squalus acanthias*, and the salmon shark, *Lamna ditropis.*

Little biological information is available for Pacific sleeper sharks, although they are considered common in boreal and temperate regions of shelf and slope waters of the North Pacific. Sleeper sharks are found in relatively shallow waters at higher latitudes and in deeper habitats in temperate waters. Pregnant females have not been found, so reproductive mode is unknown, although ovoviviparity is suspected. Sleeper sharks grow to large sizes; individuals have been measured to 4.3 m, and lengths to 7 m have been observed under water. Sleeper sharks prey primarily on arrowtooth flounder but have also been known to prey on rex and dover sole, salmon, halibut, hair seal (3 in one stomach), octopus, squid, crab, triton, rockfish, and carrion.

Spiny dogfish are demersal, occupying shelf and upper slope waters from the Bering Sea to the Baja Peninsula in the North Pacific, and worldwide in non-tropical waters. They are considered more common off the U.S. west coast and British Columbia (BC) than in the Gulf of Alaska. This species may once have been the most abundant living shark. However, it is commercially fished worldwide, and has been heavily depleted in many locations. The population structure of spiny dogfish in the North Pacific is unknown. Complex population structure characterizes spiny dogfish stocks in other areas. Tagging studies show separate migratory stocks that mix seasonally on feeding grounds in the UK. BC and Washington state have both local and migratory stocks that don't mix. In some areas, dogfish form large feeding aggregations, with schools often segregated by size, sex, and maturity stage. Male dogfish are generally found in shallower water than females, except for pregnant females that enter shallow bays to pup. While all parameters may vary by population, British Columbia female spiny dogfish are reported to mature at 35 years, and males at 19. Historic estimates of the age at 50% maturity for the eastern North Pacific range from 20 to 34 years.

However, ages from the spines of oxytetracycline-injected animals provided validation of an age length relationship and indicate that 50% sexual maturity occurs at 35.3 years of age. The same study suggested that longevity in the eastern North Pacific is between 80 and 100 years, and stated that several earlier

published ages at maturity, and therefore longevity, were low due to the rejection of difficult to read spines and the grouping of annuli that were very close together. Based on this life history information, there is a generation time of 42 years. Eastern North Pacific spiny dogfish stocks grow to a relatively large maximum size of 1.6 m. Directed fisheries for spiny dogfish are often selective on larger individuals (mature females), resulting in significant impacts on recruitment.

This species is ovoviviparous with gestation periods of 18-24 months. The majority of biological knowledge of spiny dogfish is based on controlled laboratory experiments, stock assessments, and field biology conducted in the North Atlantic and European waters. Little research has been conducted in the North Pacific waters. Ketchen reported timing of parturition in BC to be October through December, and in the Sea of Japan it was reported to occur between February and April. Washington State spiny dogfish have a long pupping season, which peaks in October and November. Pupping is believed to occur in estuaries and bays or mid-water over depths of about 90-200fm. Immature juveniles tend to inhabit the water column near the surface and are not available to the targeted fishery until they mature and descend to the benthos. The average litter size for spiny dogfish in Puget Sound, WA is 6.9 pups and 6.2 pups for BC. The number of pups per female also increases with the size of the female with estimates ranging from 0.20 – 0.25 more pups for every centimeter in female length from the onset of maturity.

Dogfish have been shown to be opportunistic feeders, not wholly dependent on one food source. Only the smallest dogfish are limited to consuming smaller fish and invertebrates, while the larger animals will eat a wide variety of foods. Diet changes are consistent with the changes of the species assemblages in the area by season, and they eat twice as much in the summer than winter. Spiny dogfish have also been shown to prey heavily on outmigrating salmon smolts. In general, feeding studies on spiny dogfish show that they are generalists, eating anything from snails and clams to salmon, and even scavenging the remains of discarded dogfish.

Salmon sharks range in the North Pacific from Japan through the Bering Sea and Gulf of Alaska to southern California and Baja. They are considered common in coastal littoral and epipelagic waters, both inshore and offshore. Like other lamnid sharks, salmon sharks are active and highly mobile, maintaining body temperatures as high as 21.2 degrees C above ambient water temperatures, and appear to maintain a constant body core temperature regardless of ambient temperatures. Salmon sharks have been both considered a nuisance for eating salmon and damaging fishing gear and investigated as potential target species in the Gulf of Alaska, although little is known about their life history locally.

Salmon sharks occur in both the near-shore and oceanic environments. Adult salmon sharks typically range in size from 180-210 cm PCL (where TL = 1.1529•PCL + 15.186) for eastern North Pacific (no conversions are given in the literature for salmon sharks in the western North Pacific), and can weigh upwards of 220 kg. Reported lengths of 260 cm PCL (>300 cm TL) and greater with weights exceeding 450 kg are unsubstantiated. Length-at-maturity in the western North Pacific (WNP) has been estimated to occur at approximately 140 cm PCL (age five) for males and 170-180 cm PCL (ages eight to ten) for females. Length-at-maturity in the eastern North Pacific (ENP) has been estimated to occur between 125-145 cm PCL (age three to five) for males and between 160-180 cm PCL (age six to nine) for females.

In addition to length and age-at-maturity, growth rates and weight-at-length of *L. ditropis* also differ between males and females from ENP and the WNP. Tanaka (1980, also see Nagasawa 1998) states that maximum age from vertebral analysis for WNP *L. ditropis* is at least 25 years for males and 17 for females, and that the growth coefficient (k) for males and females are 0.17 and 0.14 respectively. Goldman and Musick gave maximum ages for ENP *L. ditropis* (also from vertebral analysis) of 17 years for males and 20 years for females, with growth coefficients of 0.23 and 0.17 for males and females, respectively. Longevity estimates are similar (20-30 years) for the ENP and WNP. Salmon sharks in the

ENP and WNP attain the same maximum length (approximately 215cm PCL for females and about 190 cm PCL for males). However, males past approximately 140 cm PCL and females past approximately 110 cm PCL in the ENP are of a greater weight-at-length than their same-sex counterparts in the WNP.

The reproductive mode of salmon sharks is ovoviviparous and includes an oophagous stage. Litter size in the western Pacific is four to five pups and litters have been reported to be male dominated 2.2:1, but this is from a very limited sample size. The number of pups and sex ratio of eastern North Pacific litters is currently unknown. Gestation times throughout the North Pacific appear to be nine months with mating occurring during the late summer and early fall, and parturition occurring in the spring. Size at parturition is between 60-65 cm PCL in both the ENP and WNP.

In the WNP, a salmon shark pupping and nursery ground may exist just north of the transitional domain in oceanic waters. According to Nakano and Nagasawa, larger juveniles than term (70-110cm PCL) were caught in waters with SST's of 14-16 degrees C with adults occurring in colder waters further north. Another pupping and nursery area appears to range from southeast Alaska to northern Baja California, Mexico, in the ENP.

Salmon sharks are opportunistic feeders, sharing the highest trophic level of the food web in subarctic Pacific waters with marine mammals and seabirds. They feed on a wide variety of prey including salmon (Oncorhynchus), rockfishes (Sebastes), sablefish (Anoplopoma fimbria), lancetfish (Alepisaurus), daggerteeth (Anotopterus), lumpfishes (Cyclopteridae), sculpins (Cottidae), Atka mackerel (Pleurogrammus), mackerel (Scomber), pollock and tomcod (Gadidae), herring (Clupeidae), spiny dogfish (Squalus acanthias), tanner crab (Chionocetes), squid and shrimp. Bycatch in the central Pacific has been significantly reduced since the elimination of the drift gillnet fishery and the population appear to have rebounded to its former levels. Additionally, the most recent demographic analysis support the contention that salmon shark populations in the eastern and western North Pacific are stable at this time (NMFS, 2004c, pages 1011-1014).

There is a small scale recreational fishery for salmon sharks in Alaska. The State of Alaska manages the sport fishery with a daily and annual bag limit for salmon sharks. In the charter boat fishery salmon sharks are normally photographed, tagged, and released.

From 1997 – 2001 shark catches composed from 19% to 32% of the estimated "other species" total catch in the GOA. In the GOA, spiny dogfish composed 42% of total shark catch, Pacific sleeper sharks 25%, unidentified sharks 26%, salmon sharks 6%, blue sharks, sixgill sharks, and brown cat sharks were rarely identified in catches. Preliminary comparisons of incidental catch estimates with available biomass estimates suggest that current levels of incidental catches are low relative to available biomass for spiny dogfish and Pacific sleeper sharks in the GOA. There is also an increasing trend in bottom trawl survey biomass estimates for Pacific sleeper sharks and perhaps spiny dogfish in the GOA (Courtney et al, 2004).

Sculpins

Sculpins (Cottidae) are relatively small, benthic dwelling predators, with many species in the North Pacific. Despite their abundance and diversity, sculpin life histories are not well known in the Gulf of Alaska. Sculpin spawning generally occurs in the winter months; adhesive eggs are laid in nests, which are guarded by the male sculpin. The great sculpin, *Myoxocephalus polyacanthocephhalus*, is a relatively large sculpin species which is commonly identified in fishery catches. In the western North Pacific, individuals grow to 70 cm and 8 kg. Female great sculpins from Kamchatka matured at 8 years (54-58 cm), males at 6 years (38-40 cm). Maximum ages reported for females and males were 13 and 9 years, respectively. Differences in fecundity and egg size were found between geographic areas, suggesting

local stock structure. Mean fecundities for great sculpin were 60,000 to 88,000 eggs per gram body weight. Between 1984 and 1999 total sculpin biomass appeared relatively stable while biomass estimates for individual sculpin species have greater uncertainty and vary more over the years (NMFS, 1999, pages 5-11).

Octopus

In general, short lifespans of 1 to 5 years with a single reproductive period are reported for octopod species. The North Pacific giant octopus, *Octopus dofleini*, is the largest of all octopods. It ranges from northern California to Japan in nearshore waters from low tide line to 200 m deep. In Japan, where octopus support directed fisheries, its life history has been extensively studied. Seasonal inshore-offshore migrations are reported, with mating occurring during autumn inshore in less than 100 m depth. Male octopus migrate back offshore and die, while females remain inshore, spawning 18,000 to 74,000 eggs in shallow water nests (< 50 m) on rocky or sandy bottom between May and July. Eggs are brooded for 6-7 months; female octopus do not feed during this period, and die soon after the eggs hatch. Hatchlings are about 10 mm long, and are planktonic until growing to 20-50 mm, settling out to benthos in about March of the year following hatching. Life history in the eastern North Pacific is not as well known, but spawning may be more common in winter months. It is thought that giant octopus require 3 years to grow to an adult (mature female) weighing 6 to 10 kg, and that they live 3-5 years. We found no specific information about the life history of the flapjack devilfish, *Opisthotheuthis californiana*, or the smoothskin octopus, *Octopus leioderma*. Considering the burrowing habits and rocky inshore habitat of octopus, biomass estimates from trawl surveys are considered to be substantially underestimated and biomass trends of abundance cannot be determined (NMFS, 1999, page 6-10).

Squid

Like octopods, squid species have a single reproductive period; however, most squid lifespans are thought to be 1-2 years. Unlike octopods, squid are generally migratory pelagic schooling species. Squid have been described as "the marine equivalent of weeds," displaying rapid growth, patchy distribution and highly variable recruitment. Many squid populations are composed of spatially segregated schools of similarly sized (and possibly related) individuals, which may migrate, forage, and spawn at different times of year. Most information on squids refers to *Illex* and *Loligo* species which support commercial fisheries in temperate and tropical waters. Of North Pacific squids, life history is best described for western Pacific stocks. The most commercially important squid in the north Pacific is the magistrate armhook squid, *Berryteuthis magister*. *B. magister* from the western Bering Sea are described as slow growing (for squid) and relatively long lived (up to 2 years). Males grew more slowly to earlier maturation than females. *B. magister* were dispersed during summer months in the western Bering sea, but formed large, dense schools over the continental shelf between September and October. Stock structure in this species is complex, with three seasonal cohorts identified in the region. Growth, maturation, and mortality rates varied between seasonal cohorts. NMFS bottom trawl surveys do not adequately assess the biomass of squid and estimates of biomass for squid (like octopus) are considered to be substantially underestimated and biomass trends of abundance cannot be determined (NMFS, 1999, pages 6-10).

"Other species" and the ecosystem

Understanding "other species" population dynamics is fundamental to describing ecosystem structure and function in the Gulf of Alaska, because each group in "other species" plays an important ecological role. The species groups in this category occupy all marine habitats from pelagic to benthic, nearshore to open oceans, and shallow to slope waters. Sharks are top predators, so fluctuations in their populations may have significant effects on community structure. Squid and octopus are highly productive, voracious

predators which are in turn important prey for commercially important groundfish, sharks, and marine mammals. Sculpins are important benthic predators, and sculpins serve as prey for many groundfish species (NMFS, 1999, page 14). Understanding shark species population dynamics is fundamental to describing ecosystem structure and function in the Gulf of Alaska. Shark species are top predators and likely play an important ecological role so fluctuations in their populations may have significant effects on community structure (NMFS, 2004c, page 1021).

Estimates of "other species" catch

Table 3.2.1 Estimates of GOA Annual Catch of "Other Species" 1997 – 2002 and 1999 Biomass Estimates (in metric tons), Estimated Natural Mortality (M) and Tier 5 Overfishing and Allowable Biological Catch Levels

Year	Sharks	Sculpins	Octopus	Squid	Total
1997	1,040	907	232	97	2,276
1998	2,390	541	112	59	3,102
1999	1,037	544	166	41	2,148
2000	1,118	943	176	19	1,788
2001	853	601	88	91	1,633
2002	427	926	298	43	1,694
6 year Average	1,143	774	179	58	2,124
1999 Biomass (B) Estimate	34,214	30,259	550	2,134	
Estimated M	0.09	0.15	0.30	0.40	
1999 ABC	2,309	3,404	124	649	6,486
1999 OFL	3,079	4,539	165	854	8,637

Table 3.2.1 presents estimates of the total annual catch of "other species" in the GOA from 1997 through 2002. Estimates of catch for the major taxonomic groups were made by taking the NMFS Blend estimates of total "other species" catch, and subdividing them into the major taxonomic groups based on observer data (Gaichas 2002). The first stock assessment for "other species" was conducted in 1999 (Gaichas et al. 1999). The biomass estimates are considered reliable for sculpins, less reliable for sharks, and substantially underestimated for octopus and squid. For these reasons, the authors concluded that biomass estimates should be considered as an index of relative abundance from year to year. The trawl surveys on which these biomass estimates are based are not designed to assess pelagic populations of sharks and squid, and do not adequately survey octopus habitat. For these reasons, the authors considered that biomass is underestimated, and that the resulting OFL and ABC calculations are conservative. The OFL and ABC estimates were based on a tier 5 formula, which assumes a reliable estimate of biomass (B) and natural mortality (M). The tier 5 formula sets OFL = B x M and ABC = 0.75(B x M). It should be noted that these OFLs and ABCs were suggested by the stock assessment authors based upon the best available information at that time, however without a plan amendment these could not be applied, and the complex has continued to be managed under a TAC calculation only.

The TACs for 1997 through 2002 ranged from 11,330 mt to 15,570 mt (Table 3.1.1, page 9). Skates were included in the "other species" complex during this period.

In the GOA, average catch of spiny dogfish from 1997-2001 (545 tons) represented 2% of the available spiny dogfish biomass from GOA bottom trawl surveys in 1996 and 1999 (average of 30,110 tons). The 2001 survey did not include all areas of the Eastern GOA and consequently, the 2001 survey may not be comparable with the other surveys for species such as spiny dogfish which appear to be relatively abundant in the Eastern GOA. Average catch of Pacific sleeper sharks from 1997-2001 (325 tons)

represented 1% of the available Pacific sleeper shark biomass from GOA bottom trawl surveys in 1996, 1999, and 2001 (average of 26,053 tons). Average catch of salmon sharks from 1997-2001 (79 tons) was relatively small and GOA bottom trawl biomass estimates for salmon sharks were unreliable because salmon sharks were only caught in one haul from 1996-2001 (NMFS, 2004c, page 1021).

There is no evidence to suggest that overfishing is occurring for any shark species in the GOA. There are currently no directed commercial fisheries for shark species in federally or state managed waters of the GOA and most incidentally captured sharks are not retained. Spiny dogfish are allowed as retained bycatch in some ADF&G managed salmon fisheries, and salmon sharks are targeted in some ADF&G managed sport fisheries. Incidental catches of shark species in the GOA fisheries have been very small compared to catch rates of target species. Preliminary comparisons of incidental catch estimates with available biomass estimates suggest that current levels of incidental catches are low relative to available biomass for spiny dogfish and Pacific sleeper sharks in the GOA. There is also an increasing trend in bottom trawl survey biomass estimates (used here as an index of relative abundance) for Pacific sleeper sharks and perhaps for spiny dogfish in the GOA. An independent analysis of NMFS AFSC bottom trawl surveys in the Gulf of Alaska found that Pacific sleeper shark abundance had significantly increased in the central Gulf of Alaska during 1984 - 1996 (Mueter and Norcross 2002). Salmon sharks are rarely captured in the GOA in either the fishery or the bottom trawl surveys. However, a recent demographic analysis suggests that salmon shark populations in the eastern and western North Pacific are stable at this time (Goldman 2002-b). Other shark species are rarely captured and incidental catches are not likely play a significant role in their stock structure because catches were small and generally occurred near the edge of their ranges.

"It should be clear from this assessment that data limitations are severe, and that further investigation is necessary to be sure that shark species are not adversely affected by groundfish fisheries. Salmon sharks in particular, and other less common pelagic sharks such as blue sharks, are not likely to be effectively sampled by bottom trawl surveys. In addition, the catchability of sharks in bottom trawl gear is unknown. Bottom trawl survey biomass estimates for shark species should be considered a relative index of abundance at best. If target fisheries develop for any shark species, effective management will be extremely difficult with the current limited information. Regardless of management decisions regarding TAC and the future structure for the "other species" management category, it is essential that we continue to improve shark species survey sampling and biological data collection if we hope to ensure their continued conservation." (NMFS, 2004c, page 1022)

3.3 Socio-economic environment

Section 3.9.2 of the PSEIS describes the harvesting and processing sectors of the Alaska groundfish fisheries (NMFS 2004b). A large number of vessels participate in the directed groundfish fisheries of the Gulf of Alaska. In 2003, an estimated 680 vessels fished with hook-and-line gear; 655 of these were catcher vessels, and 25 were catcher-processors. An estimated 138 fished with pot gear; 137 of these were catcher vessels, and 1 was a catcher processor. An estimated 114 vessels fished with trawl gear; 93 of these were catcher vessels, and 21 were catcher-processors. (NMFS, 2004c, pages 65-66) The total ex-vessel value of the groundfish catch from the GOA was about $127 million. Sablefish was, by far, the most valuable species harvested, accounting for an ex-vessel value of about $72 million. Pacific cod was the next most economically important species, accounting for an ex-vessel value of about $32 million. Pollock accounted for about $10 million. (NMFS, 2004c, page 54).

Most of the retained catch of the "other species" complex is taken incidentally in the directed groundfish fisheries. In Kodiak, one of the largest and most diverse fishing communities in the GOA, there is at present a market for spiny dogfish, squid, and octopus, although limited. In other fishing communities in

the GOA, there are limited markets for octopus. Ex-vessel prices have been reported at $0.25/lb for spiny dogfish (headed and gutted), $0.05 to $0.10/lb for squid, and $0.75 to $0.90/lb for octopus (with beaks removed) in 2005 (Thomas Pearson, NMFS, personal communication). The only directed effort reported thus far (in 2005) on "other species" is by a few vessels using pot gear to fish for octopus.

"There are currently no directed commercial fisheries for shark species in federally or State managed waters of the GOA or BSAI and most incidentally captured sharks are not retained. Spiny dogfish are allowed as retained bycatch in some ADF&G managed salmon fisheries" (NMFS, 2004c, page 1011-1014). Shark finnng is the practice of removing and retaining only the shark fins. Both federal and state regulations prohibit the finnng of sharks.

Salmon sharks are targeted in some ADF&G managed sport fisheries. There has been a "limited" salmon shark fishery in Valdez Narrows and Jack Bay, near Valdez, in late July. (NMFS, 2004c, page 1011-1014; Paust and Smith, page 201)

Detailed information on the economic and socio-economic environment of the GOA groundfish fishery can be found in the PSEIS for the groundfish fisheries of the BSAI and GOA (NMFS 2004b). Annual Economic SAFE Reports provide updated information on the economic aspects of the groundfish fisheries (NMFS 2004c). Additional information may be found in this document, in Section 5.6 of the RIR, and in Section 6.8 of the IRFA.

3.4 Related NEPA Documents

Detailed descriptions of the fishery may be found in the following reports. All of these are public documents and are readily available in printed form or over the Internet at links given in the references.

The NEPA documents listed below contain extensive information on the fishery management areas, marine resources, ecosystem, social and economic parameters of these fisheries, and the TAC setting process. Rather than duplicate their contents here, readers are referred to those documents.

The 1999 SAFE report for the GOA contains an appendix (NMFS 1999, Appendix D) which presents the first assessment of the "other species" complex in GOA, and proposes OFL and ABC levels for the major taxonomic groups. The EA/IRFA/RIR prepared for Amendment 63 to the FMP for groundfish of the GOA for skates management examined the impacts of removing skates from the "other species" complex (NMFS, 2004a). The Ecosystem Considerations section of the 2004 SAFE report contains summaries and pointers to recent studies and information applicable to understanding and interpreting the criteria used to evaluate significance of impacts that will result from setting harvest quotas at levels contemplated under the alternatives (NMFS 2004c). Additionally, the 2004 SAFE report chapter on "Other Species" in the BSAI contains an appendix which summarizes available assessment data for shark species in the GOA along with information on the incidental catch, abundance trends, distribution, and independently estimated life history parameters for shark species in the GOA.

<u>TAC-Setting EIS</u>. An SEIS on the process of TAC setting was completed in 1998 (NMFS 1998). In that document the impacts of groundfish fishing over a range of TAC levels were analyzed. The three alternatives and the sub-option were very similar to the alternatives considered in the 2005 - 2006 TAC specifications EA (NMFS 2004c). The Record of Decision in that action was affirmation of the status quo alternative for TAC-setting. The status quo included the regulations and fishery management plans as they stood in 1997. Impacts to the human environment from the federal groundfish fisheries were displayed in that EIS. Setting TAC under the status quo procedures was not found to be having significant impacts on the issues evaluated.

Annual TAC-Specification EAs. In addition to the TAC-setting EIS analysis, environmental assessments have been written to accompany annual TAC specifications since 1991. An exception occurred in 2001, when harvest specifications were promulgated by an emergency rule published in January 2001 without an accompanying NEPA analysis. That was done because the TAC specifications were set, by Congressional action, at the 2000 levels (Public Law 106-554). An EA was prepared on the 2001 TAC specifications in July 2001 (NMFS 2001). The 2005 - 2006 TAC specifications were analyzed in an EA and a FONSI determination was made prior to publication of the rule (NMFS 2005).

Steller Sea Lion Protection Measures SEIS. A supplemental environmental impact statement was completed in 2001 (NMFS 2001) to evaluate modifications of fishery management measures being made to mitigate impacts on Steller sea lions. The purpose of that SEIS was to provide information on potential environmental impacts that could occur from implementing a suite of fisheries management measures such that the western population of Steller sea lions existence is not jeopardized, nor its critical habitat adversely modified by the groundfish fisheries in the GOA and the BSAI. Alternative 4, the "area and fishery specific approach", was selected in the Record of Decision. Revision of fishery management measures in accordance with that decision have been promulgated through proposed and final rulemakings in accordance with Magnuson-Stevens Act procedures.

Groundfish Programmatic EIS. A final Programmatic Supplemental EIS (PSEIS) has been prepared to evaluate the fishery management policies embedded in the BSAI and GOA groundfish FMPs, against policy level alternatives and the setting of TACs and ABCs at various levels (NMFS 2004b). NOAA Fisheries issued a Record of Decision on August 26, 2004. With the simultaneous approval of Amendments 74 and 81 to the GOA and BSAI Groundfish FMPs, respectively, this decision implements a new management policy that is ecosystem-based and is more precautionary when faced with scientific uncertainty. While effecting the public decision-making process prescribed by the National Environmental Protection Act, the PSEIS also serves as a primary environmental document for subsequent analyses of environmental impacts on the groundfish fisheries. For more information see the http://www.fakr.noaa.gov/sustainablefisheries/seis/default.htm website.

Non-Target Species. The Council has appointed a Non-Target Species Committee to address issues associated with the management of non-targeted species that could be impacted by the groundfish fisheries. The Committee adopted a problem statement at its October, 2004 meeting, and at its November 2004 meeting, recommended that as an interim measure the Council consider a FMP amendment to revise the manner in which the annual "other species" TAC are set. The progress of the Committee may be followed at this Council website: http://www.fakr.noaa.gov/npfmc/current_issues/non_target/non_target.htm .

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

4 Environmental Impacts

4.1 Introduction

The alternatives to be analyzed for this amendment package are limited in scope to a consideration of whether or not to revise the manner in which the annual TAC for the "other species" complex is calculated. The "other species" complex consists of sharks, sculpins, octopus, and squid.

This EA examines the environmental impacts of the three alternatives from the perspective of current fishing practices, where almost all of the catch of these "other species" category fish is taken incidentally, in directed fisheries for economically important species, and from the perspective of what impacts might be expected if directed fishing for "other species" developed to the extent permissible under each of the three TAC setting alternatives.

Since this action could modify the manner in which the TAC for "other species" is set in the GOA, the authors looked at those components of the GOA ecosystem which were analyzed in the EA prepared for the 2005 – 2006 harvest specifications and adopted the significance criteria used in that document to evaluate the impacts.

Few of the environmental components in the GOA are likely to be affected. At present there is very little directed fishing for "other species" in the GOA, the vast majority of "other species" harvested are taken as incidental catch in directed fishing for targeted species. From 1997 to 2002, and in 2004 (Table 4.8.1) this incidental catch has averaged about one percent of the total harvest of groundfish in the GOA. The 1999 SAFE report concluded that, "It appears unlikely that the observed 1990 – 1998 bycatch of "other species" has had a negative effect on biomass at the species group level." For this reason, if current fishing practices were to continue, the impacts on all of the environmental components analyzed in the EA for the 2005 – 2006 harvest specifications are rated as insignificant for the three TAC setting alternatives considered in this EA. There are limited markets for some of these species in Alaska, and there are markets for some of these species elsewhere in the United States and world, so there is a potential for directed fisheries for these species to develop in the GOA in the future.

The alternatives analyzed here are intended as interim measures to better protect and conserve individual stocks within the "other species" complex in the GOA until a more comprehensive approach can be undertaken to manage those individual stocks which comprise the "other species" complex in the groundfish fisheries in Alaska.

Overall, fishing practices are not expected to change significantly under any of the alternatives considered. Those components which could be potentially affected by the alternatives, if the full TAC were to be harvested, are listed in Table 4.1.1. The sub-option to revise the maximum retainable amounts of "other species" by fishery is also discussed below, but no analysis is presented at this time.

Changes in the method of calculating the "other species" TAC are not likely to affect the catches of other groundfish species, except that a directed fishing effort using trawl gear for "other species" would likely result in some incidental catch of halibut, which would come off the PSC limit established for the shallow water species complex (consisting of pollock, Pacific cod, shallow-water flatfish, flathead sole, Atka mackerel, skates, and "other species"). In a directed fishery for "other species", using hook-and-line gear, any halibut mortality would accrue towards the PSC limit established for groundfish other than demersal shelf rockfish and sablefish. Currently, "other species" catches are taken almost entirely incidentally to directed groundfish fisheries. If groundfish fishermen were to catch the full TAC for the "other species" complex, "other species" would be placed on prohibited species status. Fishermen would then have to

discard them. There is no OFL for the "other species" complex and, since none is proposed under any of these alternatives, "other species" harvest would not lead to closure of a directed groundfish fishery. Because the changes in the method of calculating the TAC are not expected to affect the harvests of groundfish species, aside from those in the "other species" complex, they are not expected to affect the non-specified species, forage species, and prohibited species, that are harvested as bycatch in the groundfish targets.

Even if the full "other species" TAC was harvested, the aggregate harvest and associated fishing effort would be small compared to the overall harvests and effort expended in the groundfish fisheries in the GOA. Currently, only a fraction of the "other species" TAC is harvested, and that harvest is incidental to activity in other fisheries. All of the alternatives considered here are at least as restrictive as the status quo. For these reasons, this action is not expected to have significant adverse impacts on the environmental components listed in Table 4.1.1.

This chapter evaluates the impacts on "other species" themselves, because the actions contemplated could be large for these species. In addition, the analysis looks at seabirds and marine mammals, given the presence in the GOA of ESA listed species. Ecological impacts are examined, because these species play an important role in the GOA ecology. Social and economic impacts are evaluated because of potential impacts on the revenues, operating costs, and support services demanded by groundfish fishing operations.

Table 4.1.1 Resources potentially affected if the full "Other Species" TAC was harvested

Potentially Affected Component		**Potentially Affected**	
	Alternative 1	Alternative 2	Alternative 3
Target species and fisheries	No	No	No
"Other species" complex	Yes	Yes	No
Non-specified species	No	No	No
Forage fish species	No	No	No
Prohibited species	No	No	No
Marine mammals and ESA listed marine mammals	Yes	Yes	No
Seabirds and ESA listed seabirds	Yes	Yes	No
Habitat and EFH	No	No	No
Ecosystem	Yes	Yes	No
State Managed Fisheries	No	No	No
Economic and social effects	Yes	Yes	No

Potential impacts are evaluated below. The significance criteria are those used in the EA/IRFA for the "Harvest Specifications for the Years 2005-2006, Alaska Groundfish Fisheries, implemented under the authority of the BSAI and GOA groundfish fishery management plans (NMFS, 2005, Section 4.1).

4.2 Individual Species Within the "Other Species" Complex

Under Alternative 1, the status quo, the TAC for "other species" in the GOA would remain at 5 percent of the sum of the TACs of all targeted groundfish species in the GOA. These TACs are large enough to support directed fisheries for species in the "other species" complex, given currently anticipated incidental catch needs in existing directed groundfish fisheries in the GOA.

Using the estimates of ABC and OFLs listed in table 3.2.1 (See Affected Environment section 3.2), it does not appear that any of the major taxonomic groups has been, or is being, overfished (the 2004 Gulf -

wide total catch of "other species" was estimated to be 1,638 mt, NMFS Catch Accounting System). The estimated ABC for sharks may have been exceeded in 1998, but sharks are showing an increasing trend in the GOA. The biomass estimate of all sharks in the GOA in 2003, is 155,078 mt, a dramatic increase from the estimate made back in 1999 (Courtney et al. 2004). The OFL for octopus appears to have been exceeded in four of the six years, between 1997 and 2002, however Gaichas et al (1999) state that they believe the biomass of octopus and squid is substantially underestimated, resulting in a very conservative OFL and ABC for the two species groups. Again, these OFLs and ABCs as listed in table 3.2.1 were the stock assessment authors suggestions and could not be adopted for management purposes without an amendment to the GOA FMP, nor could the "other species" group be placed on bycatch status, because after subtracting anticipated incidental catch needs, the remaining TAC was sufficiently large to support directed fishing. An updated stock assessment for the "other species" complex in the GOA will be prepared when the 2005 NMFS survey information and staff time becomes available.

Because most of the "other species" catch is incidental to other directed fisheries, and there is almost no directed fishing for these "other species" occurring at this time, and because it does not appear that the stocks are being overfished, the effect on stocks of "other species" is rated insignificant with respect to fishing mortality, the spatial and temporal distribution of fishing, changes in prey availability, and impact on habitat.

Since at present the TAC for the "other species" complex is large enough to allow a directed fishery to be developed in the future targeting a single species in the "other species" complex, to the exclusion of others, and if most of the "other species" TAC were to be harvested, there could be a negative long term effect on that targeted stock. Sharks in particular are slow growing, and a low fecundity species, that have been overfished in other parts of the world (Section 3.2 of this EA). In this regard, the discussion of spiny dogfish in Section 3.2 of this EA is important. As noted in that section, spiny dogfish are slow growing, taking many years to reach sexual maturity. Some evidence suggests that 50% sexual maturity for females occurs at about 35 years. They have low fecundity. Females have a gestation period of 18-24 months, and have litters averaging 6.2 pups in British Columbia. The number of pups increases with the size of the female.

Elsewhere, available markets support directed fisheries for dogfish. Stocks of this species have been overfished in other regions worldwide. Directed fisheries tend to concentrate on larger individuals (mature females) suggesting that they target the very individuals that contribute the most to the reproductive potential of the stock. For these reasons, the growth of a directed fishery on dogfish would raise stock protection concerns.

If concerns should develop about a new directed fishery, NMFS could restrict harvests of the new target by emergency action (regulations at 50 CFR 679.25, on in-season adjustments, allowing the agency to re-specify TAC to prevent overfishing) or the Council could amend the GOA FMP to create a new target species category for the species. The Council has removed species from the "other species" complex in the past, including forage fish (moved to a non-target category), and Atka mackerel and skates (both moved to target categories). The skates process took about 15 months from the time an emerging skate fishery was identified in the spring of 2003, until a separate TAC was effectively implemented in June 2004. The fast timeline for removal of skates to a target category was facilitated by a previously initiated amendment to this effect, which was not acted upon in Council process at that time. It is possible that removal of additional species to target categories may require a longer timeline. Because there are currently no directed fisheries for these species, because the Council would be able to respond to a developing fishery, and because this action is intended to be of short duration while the Council pursues more comprehensive non-target species measures (see Section 1.4 of this EA), this alternative has been rated "not significant."

Under the preferred Alternative 2, the TAC is to be set at less than or equal to 5 percent of the sum of the TACs of the targeted groundfish species in the GOA. Under this alternative, the Council could consider the best and most recent information on the status of the "other species" complex, along with advice from its SSC, AP, and the public, when recommending a TAC for "other species" as part of the annual harvest specification process. The Council could recommend a TAC large enough to meet anticipated incidental catch needs in other directed fisheries throughout the fishing year in the GOA, or it could recommend a TAC above that level to support a developing directed fishery. The stock assessment authors' ABC estimate for 1999 might suggest an upper limit on the TAC. As Table 3.2.1 shows, the sum of the ABCs for the species in the "other species" complex, Gulf-wide, in 1999, was approximately 6,500 mt. The preferred Alternative 2 could be more restrictive than Alternative 1, and provides better potential control of "other species" harvests should directed fisheries develop for one or more of the species in the "other species" complex. For these reasons, the preferred Alternative 2 has been rated "insignificant."

Under Alternative 3, the TAC for "other species" is to be set at less than or equal to 5 percent of the sum of the TACs of targeted groundfish species in the GOA, but not larger than necessary to accommodate the "other species" incidental catches in those fisheries. As a result of this alternative, NMFS would effectively place the "other species" complex on bycatch status at the beginning of each year, when it implemented harvest specifications and associated managements measures published in the Federal Register. Incidental catch could still be retained up to the maximum retainable amount (MRA) (CFR part 679 Table 10). Alternative 3 is the most restrictive of the three alternatives, and provides greater potential control of "other species" catches should directed fisheries develop for one or more of the species in the "other species" complex. For these reasons, Alternative 3 has been rated "insignificant."

4.3 Seabirds

Under Alternative 1, the status quo, the TAC for "other species" in the GOA would remain at 5 percent of the sum of the TACs of all other assessed species in the GOA. At present the only directed effort is by a few vessels using pot gear to target small amounts of octopus. Since "other species" are currently taken as incidental catches in other directed fisheries, since these incidental catches only account for a small fraction of the available TAC, and there is little directed fishing occurring, the effect of the status quo on seabirds is rated insignificant with respect to incidental take in gear and vessel strikes, prey availability and fishery wastes, and benthic habitat.

If a directed fishery were to develop in the future, targeting "other species" using hook-and-line gear or trawl gear, an increase in the impacts on seabirds could be expected. However, under Alternative 1 even if the entire "other species" TAC were harvested in directed fisheries, the increase in directed fishing in the GOA would be approximately 4 percent. Pot gear takes relatively small numbers of seabirds. Most seabirds taken with longline gear off of Alaska are taken in the BSAI. From 1993 to 2002, the BSAI longline fisheries accounted for 93% of the seabird bycatch, and the GOA fisheries accounted for 7%. Bycatch rates are about 3 times higher in the BSAI than in the GOA. There is currently a wide range of estimates of seabird bycatch in trawl gear, however, even with the upper bound estimate of trawl bycatch, longline gear takes over half of the BSAI-GOA seabird bycatch. Information on trawl-seabird interactions is not available separately for the GOA. (NMFS, Ecosystem SAFE, 2004c, pages 204-211) Given the comparatively smaller level of trawl activity in the GOA, it is likely that most trawl seabird mortality takes place in the BSAI. Because of the relatively low bycatch of seabirds by GOA longline gear, and because of the relatively limited change in overall directed fishing in the GOA, even in the extreme case where the entire "other species" complex TAC was harvested, Alternative 1 is not expected to have a significant impact on seabirds with respect to the criteria described above. If directed fishing for "other species" did develop there could be a slight increase in discards and fish offal available for seabirds to feed on.

The preferred Alternative 2 and Alternative 3, which would set the "other species" TAC at less than or equal 5 percent or as low as incidental catch needs, for the reasons stated above are also rated insignificant.

4.4 Endangered or Threatened Species and Marine Mammals

Under Alternative 1, the status quo, the TAC for "other species" in the GOA would remain at 5 percent of the sum of the TACs for the other target groundfish species in the GOA. At present the only directed effort is by a few vessels using pot gear to target small amounts of octopus. Of the species that comprise the "other species" complex, cephalopods and sculpins are known to be prey species for marine mammals, including the Stellar sea lion (NMFS, 2000, Tables 4.5a and 4.5b; NMFS 2001, 2004b).

Because "other species" are currently taken as incidental catches in other fisheries, the incidental take only accounts for a small part of the TAC, and there is very little directed fishing occurring, the effect on endangered or threatened species and all marine mammals is rated insignificant with respect to incidental take and entanglement in marine debris, spatial/temporal concentration of the fishery, the global harvest of prey species, and disturbance.

Alternative 1, the status quo, is consistent with the Steller sea lion (SSL) protection measures adopted to prevent the adverse modification of SSL habitat, and to prevent jeopardy to the stock of SSLs. The preferred Alternative 2 could be more restrictive than Alternative 1, and Alternative 3 is more restrictive than Alternative 1, and they may increase the protection provided to SSLs. Therefore, they are not expected to modify the protection measures in a way that would adversely modify SSL habitat, or create jeopardy to the stock.

Alternative 1 would allow for the development of a directed fishery for octopus. If the fishery were to develop in the future, a decrease in the availability of octopus to marine mammals could be expected. From 1997 through 2002 the estimated catch of octopus in the GOA has ranged from 88 mt to 298 mt annually. If a directed fishery were to develop in the future, targeting "other species" using hook-and-line gear or trawl gear, an increase in effects on marine mammals could be expected. Still, under Alternative 1, even if the entire "other species" TAC were harvested, the increase in directed fishing in the GOA would be approximately 4 percent of the total groundfish catch. This is not expected to have a significant impact on marine mammals with respect to the criteria described above. As noted in Section 3.2 earlier sharks play an important role in the marine ecosystem. The largest common shark species in the GOA, Pacific sleeper sharks and salmon sharks are top level predators, and presumably they do prey on marine mammals, but to an unknown extent. If a directed fishery on large sized sharks were to develop, the removal of marine mammal predators could be expected to be of some (but unknown) benefit to marine mammals, but currently cannot be quantified because of a lack of data.

The preferred Alternative 2 and Alternative 3, which would set the "other species" TAC at less than or equal 5 percent, or as low as incidental catch needs, are also rated insignificant for the reasons stated above.

4.5 Ecological effects

As noted in the 1999 and 2004 SAFE report documents (NMFS, 1999, 2004c), "other species" are believed to play an important role in the ecology of the GOA. The information from the SAFE reports is summarized in Section 3.3 of this EA. "Sharks are top predators, so fluctuations in their populations may have significant effects on community structure." Squid, sculpin, and octopus serve as both predators and prey. (NMFS, 1999, page 14).

Because "other species" are currently taken as incidental catches in other fisheries, because the incidental take only accounts for a small part of the "other species" TAC, and because, as noted in Sections 3.3 and 4.1 of this EA, the species groups included in the "other species" complex do not appear to be overfished, ecosystem effects of these alternatives are rated insignificant with respect to predator-prey relationships, energy flow and balance, and diversity.

Alternative 1 would allow for the development of directed fisheries for these species. If a directed fishery were to develop in the future, an increase in ecosystem effects could be expected. If concerns should develop about a new directed fishery, NMFS could restrict harvests of the new target by emergency action as described in Section 4.2, or the Council could amend the GOA FMP to create a new target species category for the species. The Council has removed species from the "other species" complex in the past, including forage fish (moved to a non-target category), and Atka mackerel and skates (both moved to target categories). The Council took action to remove forage fish due to the importance of those species in the ecosystem as prey species. The Council then further restricted the take on this category by prohibiting directed fishing on forage fish as well as placing limitation on allowable bycatch retention, and on the sale, barter, trade or other commercial exchange and prohibited the processing of forage fish in commercial processing facilities. The Council could take similar actions for species in this complex, if there is any indication of ecological effects based upon directed fishing of either top predators or important prey species from this complex. At this time there has been no indication of this effect, however recent studies have indicated that squid may represent a more important prey species than was previously assumed (Aydin 2005).

Because there are currently no directed fisheries for these species, because the Council would be able to respond to a developing fishery, and because the Council is pursuing a comprehensive non-target species measure, this alternative has been rated "not significant."

The preferred Alternative 2 and Alternative 3, which would set the "other species" TAC at less than or equal 5 percent, or as low as incidental catch needs, are more restrictive with respect to ecosystem effects, and are also rated insignificant.

4.6 Potential Impacts on the Social and Economic Environment

Under Alternative 1 directed fisheries for "other species" could continue to be developed in the GOA. At present market opportunities are limited. However, should markets be developed in the future and directed fishing for "other species" increase, contributions for this source to the social and economic health of the region could increase. This is not likely in the near future as the market demand for "other species" is being met by the retention of incidental catch in directed fisheries for allocated target species in the GOA and BSAI. Alternatives 2 and 3, which would set the "other species" TAC at less than or equal 5 percent or as low as incidental catch needs. Alternative 2 does not constrain the development of a directed fishery, while Alternative 3 does.

In the EA/FRFA for the 2005-2006 Annual Specifications, GOA gross revenues for the different alternatives were estimated using an assumed first wholesale price for "other species" of $485/mt. (NMFS, 2005, page 208). The price estimate was prepared from data used to prepare the 2004 Economic SAFE. At this price level, the entire 2005 "other species" TAC would have a total gross value of about $7 million dollars. Gross value is not a measure of profits, and the fact that only a small part of the TAC is currently retained, and that almost none of it is the subject of a directed fishery, suggests that it's not currently profitable to harvest the full "other species" TAC. Changes in markets, fishing technology, or stock biomass, could change this, however, and lead to directed fisheries in the GOA. The actual

revenues from these species in 2005, are likely to be far less, because only a small part of the TAC is likely to be taken incidentally, and/or retained. The estimate of total 2005 first wholesale gross revenues in the GOA (valued at 2003 prices) was about $232 million. (NMFS, 2005, page 97). Thus, at current estimated prices, even large changes in the retained catch of species in the "other species" complex will only have a small impact (about 3%) on industry gross revenues. While these revenue estimates are only approximations, this conclusion would hold for large intervals around the revenue estimates.

If the entire TAC for the "other species" complex were to be taken, under any of the three alternatives considered, the result would be that "other species" would be placed on prohibited status for the remainder of the fishing year. Since there is no overfishing level established for "other species", there would be no additional closures to directed fishing for other groundfish targets, which incidentally take some of the "other species" complex as bycatch.

Alternatives 1, 2, and 3 are rated insignificant for social and economic impacts based on the above discussion and the following reasons:

1. "Other species" are currently taken almost entirely incidentally.
2. Incidental harvests are only a small part of the TAC.
3. Even if the TAC were taken, fishing for groundfish target species would not be closed.
4. Changes in revenues associated with harvests would be small relative to overall GOA groundfish revenues, even if the entire TAC were taken.

4.7 Cumulative Effects

Past or potentially foreseeable future actions that could affect the environmental significance of these alternatives include: (a) technological or market changes that make directed fisheries for one or more of these species economically viable, and (b) NPFMC development and implementation of FMP amendments governing the management of non-target species.

The cumulative impacts of these events, in combination with the alternatives considered earlier in this chapter, are not expected to change the significance findings in the earlier sections of this chapter. These impacts would continue to be rated, "not significant."

It was noted that under Alternative 1, directed fisheries could be developed on individual stocks such as spiny dogfish or octopus. If a large proportion of the TAC were harvested by targeting on an individual stock within the "other species" complex, the result could be detrimental over the long term to that targeted stock. Also, there could be a slight increase in interactions with seabirds, a slight increase in the entanglement of marine mammals, a slight decrease in the availability of prey to marine mammals, and a slight increase in social and economic benefits to fishing communities in the GOA.

This action is intended to be a short-term, proactive approach to provide greater protection to individual stocks of fish within the "other species" complex while a more comprehensive action to protect these individual stocks within the "other species" complex is undertaken by the Council. For this reason the cumulative effects resulting from any of the alternatives considered would be of short term duration.

If a significantly larger directed fishery on a particular stock within the "other species" complex developed rapidly, the Council could, as was done with Atka mackerel and skates in the GOA, remove that targeted stock from the "other species" complex by FMP amendment (an action which could take one to two years to implement). Moreover, as described in Section 4.2, NMFS could take emergency action to protect the targeted stock if necessary.

Under the preferred Alternative 2, to the extent to which the TAC for "other species" is reduced below 5 percent, the effects noted above in the event of the full harvest and utilization of the "other species" TAC, would be reduced. Under Alternative 3, setting the "other species" TAC at incidental catch levels, the development of directed fisheries for "other species" would be restricted to the MRA levels in effect. The effects of Alternative 3 would be most similar to those at present where the vast majority of "other species" harvested in the GOA are taken as incidental catch in other directed fisheries.

4.8 Sub-Option: Revise the MRA of "Other Species" by Fishery

The Council, at its February 2005 meeting, did not specify how to revise the maximum retainable amounts (MRA) for "other species". For the purposes of discussion, the authors suggest three possible approaches. As discussed above, a likely range of alternatives could fall in the range of the current minimum (0 percent) and maximum (35 percent). These approaches could be applied to any of the three alternatives. With the exception noted earlier for sharks in the Eastern GOA, the State sets bycatch allowances for retention at levels established for the federal managed fisheries.

a) Status Quo. The "other species" MRAs would remain at their current level of 20 percent in all fisheries, with the exception of the arrowtooth MRA, which would remain at 0 percent.
b) (Preferred) Set the "other species" MRAs for all fisheries at 20 percent. This would only change the MRA for "other species" in the arrowtooth fishery, increasing the MRA from 0 percent to 20 percent in recognition that an expanding directed fishery for arrowtooth with trawl gear is like to have some intrinsic bycatch needs.
c) Set the "other species" MRA in each fishery equal to the average incidental catch of "other species" in each fishery. This approach would likely reduce the MRA in most fisheries, except for arrowtooth where it would be increased. As discussed above, if "other species" were on bycatch status, this approach could lead to additional regulatory discards. Incidental catch needs in each fishery could be estimated using observer data.

The impacts of Sub-option A would be that when the "other species" complex is closed to directed fishing (which occasionally occurs at present when halibut PSC limits are reached) vessels which participate in fisheries open to directed fishing would continued to be allowed to retain up to 20 percent "other species" catch. Twenty percent is more than is currently taken as incidental catch. However, vessels targeting arrowtooth would be required to discard all "other species" incidentally caught, even if there were markets for them. An MRA of zero percent is less than is currently taken as incidental catch in the arrowtooth fishery.

The impacts of the preferred Sub-option B would be the same as under Sub-option A, except that a vessel targeting arrowtooth, when the "other species" complex was closed, would be allowed to retain up to 20 percent "other species". In earlier years, when the arrowtooth fishery was underdeveloped and under utilized, the MRAs for species on bycatch status were similar to that for other open targeted fisheries. This led to the practice of targeting arrowtooth as a basis to be used for topping off on other more valuable species, such as sablefish, rockfish, and Pacific cod. As a result, to discourage this practice, MRAs for all groundfish were set at zero in the arrowtooth fishery. When the arrowtooth fishery began to be developed and utilized, the MRA for Pacific cod and pollock in the arrowtooth fishery was raised from zero to 5 percent, and when the arrowtooth fishery was on bycatch status, the MRA for arrowtooth in remaining open fisheries was raised from 20 to 35 percent (CFR part 679 Table 10). The preferred Sub-option B would allow "other species", when on bycatch status, to be retained up to 20 percent in the arrowtooth fishery, avoiding most if not all regulatory discards of marketable fish.

The impacts of Sub-option C would be to restrict retention of the "other species" complex, when on bycatch status, to some level deemed appropriate for each fishery open to directed fishing. On average the catch of the "other species" complex constitutes about 1 percent of the total catch of groundfish in the GOA on an annual basis. For the major fisheries, discussed below, these rates have mostly ranged between 0.15 and 2.15 percent of the annual catch in each targeted fishery. However, there are some instances where for a limited period of time and within a limited area and fishery, the incidental catch of marketable "other species" has been as high as 10 percent.

Table 4.8.1 Annual Catch of "Other Species" in the GOA groundfish fisheries. 1997 though 2002 and 2004.

Year	Total GOA Groundfish Catch (mt)	"Other species" Catch (mt)	Percent "Other Species"
1997	230,448	2,276	1.0 %
1998	245,516	3,102	1.3 %
1999	227,614	2,148	0.9 %
2000	204,398	1,788	0.9 %
2001	182,011	1,633	0.9 %
2002	165,664	1,694	1.0 %
2004	168,475	1,638	1.0 %
Catch data for 2003 is not presently available, but will be included in future stock assessments. The 2003 data is relatively difficult to use because of the transition from the use of the blend data to the catch accounting system that year.			

The data presented in Table 4.8.1 come from observer data and NMFS Blend data for the years 1997 through 2002 (Gaichas 2002), and from the NMFS Catch Accounting System for 2004. Although the catch of "other species" has ranged from 1,633 mt to 3,102 mt annually, it has averaged 1 percent of the total annual catch of groundfish in the GOA. The "other species" catch reported in Tables 3.2.1 and 4.8.1 differs from that reported in Table 3.1.1, as the catch of skates is not included. Estimates of incidental catch of "other species" in the commercial Pacific halibut fishery is not available at this time and is not included in Table 4.8.1, above, and the tables that follow.

Tables 4.8.2 through 4.8.7 break down the estimated "other species" catch by major taxonomic group and by general fishery target, for the years 1997 through 2002 (compiled from estimates provided by S. Gaichas, 2005, personal communication). The major fishery targets are pollock, Pacific cod, flatfish, rockfish, and sablefish. The harvest of Atka mackerel is not included, as it is taken primarily as incidental catch in the rockfish fisheries. The harvest of skates is also not included because during this time period they were managed as part of the "other species" complex. Arrowtooth was not included as a separate target, because during this period most arrowtooth was taken as incidental catch in directed fisheries. Arrowtooth was included in the more general flatfish category. Harvests of "other species" in the State managed groundfish fisheries are also not included in the tables below. These fisheries include pollock in Prince William Sound, Pacific cod in the GOA, and sablefish in Southeast Inside Waters (Area 659). The catch from all gear types is combined.

Estimates of the harvest of "other species" in the halibut fishery are not available at this time. The 2003 SAFE report included estimates of skate catch in the directed Pacific halibut fishery in the GOA. From 1997 through 2002 the catch of skates in the Pacific halibut fishery was estimated to range from 1,087 mt to 1,587 mt, and averaged 48 percent of the skate catch in the groundfish fisheries. This information was used by fishery managers to help set a directed fishing allowance for skates in the GOA. It would be very useful to include estimates of the catch of "other species" in the halibut fishery as a part of future stock assessments for the "other species" complex. NMFS staff plans to include estimates of the incidental catch of "other species" in the commercial halibut fishery in future assessments. While these amounts are not known, fishermen have reported that on occasion the incidental catch of sharks in the halibut fishery has been high. The authors believe the catch of "other species" in the halibut fishery in the GOA may be

comparable to the catch of other species in the Pacific cod fishery in the GOA. Those "other species" incidentally taken in the halibut fishery include primarily spiny dogfish, Pacific sleeper sharks, and sculpins.

Table 4.8.2 1997 "Other species" catch by fishery in the GOA (amounts are in mt)

Fishery	Target Catch	Sharks	Sculpins	Octopus	Squid	Total "Other Species"	% of Target Catch
Pollock	89,893	53.7	17.3	0.8	66	137.8	0.15%
Pacific cod	68,474	130.4	370.6	193.8	0.7	695.5	1.02%
Flatfish	33,498	191.8	470.8	13.0	8.8	684.4	2.04%
Rockfish	19,584	374.7	35.6	2.2	7.8	420.3	2.15%
Sablefish	13,264	185.1	3.4	22.4	0.3	211.2	1.59%
Total	224,713	935.7	897.7	232.2	83.6	2,149.2	0.96%

Table 4.8.3 1998 "Other species" catch by fishery in the GOA (amounts are in mt)

Fishery	Target Catch	Sharks	Sculpins	Octopus	Squid	Total "Other Species"	% of Target Catch
Pollock	128,805	131.1	7.3	3.6	45.5	187.5	0.15%
Pacific cod	62,199	757.0	350.8	99.7	0.6	1,208.1	1.94%
Flatfish	23,261	97.8	121.5	7.8	7.2	234.3	1.01%
Rockfish	19,449	5.9	43.8	0.7	5.6	56.0	0.29%
Sablefish	12,774	1,396.2	2.1	0.3	0.2	1,398.8	10.95%
Total	241,488	2,338.0	525.5	112.1	59.1	3,084.7	1.28%

Table 4.8.4 1999 "Other species" catch by fishery in the GOA (amounts are in mt)

Fishery	Target Catch	Sharks	Sculpins	Octopus	Squid	Total "Other Species"	% of Target Catch
Pollock	93,442	160.7	8.6	0.0	20.3	189.6	0.20%
Pacific cod	67,971	679.0	440.3	163.2	1.1	1,283.6	1.89%
Flatfish	25,029	71.4	21.2	2.5	10.5	105.6	0.42%
Rockfish	23,672	7.8	70.2	0.5	7.0	85.5	0.36%
Sablefish	12,227	92.9	4.0	0.2	1.8	98.9	0.81%
Total	222,321	1,011.8	544.3	166.4	40.7	1,763.2	0.79%

Table 4.8.5 2000 "Other species" catch by fishery in the GOA (amounts are in mt)

Fishery	Target Catch	Sharks	Sculpins	Octopus	Squid	Total "Other Species"	% of Target Catch
Pollock	50,712	242.1	2.6	0.0	6.8	251.5	0.50%
Pacific cod	42,345	409.7	684.2	153.5	0.2	1,247.6	1.02%
Flatfish	34,119	139.8	211.6	1.9	5.0	358.3	1.05%
Rockfish	21,872	152.6	36.3	0.2	6.6	195.7	0.89%
Sablefish	12,484	172.6	5.1	0.5	0.0	178.2	1.43%
Total	161,532	1,116.8	939.8	156.1	18.6	2,231.3	1.38%

Table 4.8.6 2001 "Other species" catch by fishery in the GOA (amounts are in mt)

Fishery	Target Catch	Sharks	Sculpins	Octopus	Squid	Total "Other	% of Target

						Species"	Catch
Pollock	70,485	222.0	0.6	0.2	74.2	297.0	0.42%
Pacific cod	41,614	240.0	295.4	72.1	1.2	608.7	1.46%
Flatfish	31,781	171.8	218.4	13.2	6.6	410.0	1.29%
Rockfish	21,127	28.9	47.2	0.0	8.8	84.9	0.40%
Sablefish	12,127	190.1	18.4	2.0	0.1	210.6	1.74%
Total	177,134	852.8	580.0	87.5	90.9	1,611.2	0.91%

Table 4.8.7 2002 "Other species" catch by fishery in the GOA (amounts are in mt)

Fishery	Target Catch	Sharks	Sculpins	Octopus	Squid	Total "Other Species"	% of Target Catch
Pollock	50,712	147.7	38.4	0.0	27.6	213.7	0.42%
Pacific cod	42,345	81.5	445.2	265.4	0.0	792.1	1.87%
Flatfish	34,126	106.0	353.0	31.0	8.4	499.6	1.46%
Rockfish	21,873	4.5	80.3	0.7	6.7	92.2	0.42%
Sablefish	12,484	85.1	2.1	1.0	0.0	88.2	0.71%
Total	161,540	424.8	919.0	298.1	42.7	1,684.6	1.04%

Estimates of the amount and composition of "other species" catch in the groundfish fisheries can vary greatly from year to year. The estimated catch of sharks in the sablefish fishery ranged from 85.1 mt in 2002, to 1,396.2 mt in 1998. In the major targeted fisheries the incidental catch of "other species" ranged from 0.15 percent to 2.15 percent, with the notable exception of the sablefish fishery in 1998 (Table 4.8.3). The amount of sharks reportedly taken in the sablefish fishery in 1998 is somewhat suspect (it may be too high), as it is based on a very limited amount of information. From January 1 through April 20, 2005, NMFS estimates that 1,359 mt of "other species" were harvested in the GOA. Of this amount, 618 mt were retained for processing. Those retained fish included 25 mt of sculpins, 12 mt of sharks, 64 mt of octopus, and 541 mt of squid (Table 4.8.8). The squid was almost entirely taken incidentally to the pollock fisheries in the Shelikof Strait. This amount is over ten times the 1997 – 2002 average annual catch of squid (about 50 mt annually). The 541 mt of squid represents only about 2 percent of the Shelikof pollock catch of approximately 25,000 mt. However, some of the individual landings of pollock included as much as 10 percent squid by weight. Squid were delivered to the port of Kodiak, Alaska in sufficient quantities that they could be processed (Tom Pearson, NMFS, personal communication). These data suggest that an MRA of 10 percent for "other species" would be sufficient to allow most of the incidental catch to be retained (if so desired), with few regulatory discards. An MRA of 20 percent or even higher could allow for a limited development of markets (by topping off) even if "other species" were on bycatch status. However, unless the species on bycatch status is more valuable than the targeted species there is little incentive to top off on a less valuable species.

Table 4.8.8 Retained catch of "other species" in the GOA 2003 – 2005 (amounts are in mt)

Year	Sharks	Sculpins	Octopus	Squid
2003	11	54	44	45
2004	10	58	147	109
2005*	12	25	64	541

*Retained catch through April 20, 2005. Source NMFS Catch Accounting System.

5 Regulatory Impact Review

5.1 Introduction

This Regulatory Impact Review (RIR) evaluates regulatory alternatives that would modify the annual determination of the TAC for the "other species" complex in the GOA. This RIR has been prepared to meet the requirement contained in Presidential Executive Order 12866, to evaluate the costs and benefits of regulatory actions.

The "other species" complex includes shark, sculpin, octopus, and squid. These species are taken as incidental catches in directed groundfish fisheries. Skates were included in the "other species" complex category until 2004; they were taken from this category and made a target species, after a commercial fishery targeting them emerged in 2003.

Currently, the GOA "other species" complex TAC is set equal to 5% of the sum of the TACs for the target groundfish species. The alternatives under consideration in this RIR would allow the Council to set the "other species" complex TAC at a level less than or equal to 5%. Three different alternatives provide for, or prohibit, setting TACs to accommodate a directed fishery. Three options for the calculation of maximum retainable amounts (MRAs) are also discussed.

In June 2005, the Council chose TAC Alternative 2, along with MRA Sub-option B, as its preferred alternative.

5.2 What is a Regulatory Impact Review?

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

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

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

- Have an annual effect on the economy of $100 million or more or adversely affect in a material way the economy, a sector of the economy, productivity, competition, jobs, local or tribal governments or communities;
- Create a serious inconsistency or otherwise interfere with an action taken or planned by another agency;
- Materially alter the budgetary impact of entitlements, grants, user fees, or loan programs or the rights and obligations of recipients thereof; or

- Raise novel legal or policy issues arising out of legal mandates, the President's priorities, or the principles set forth in this Executive Order.

5.3 Statutory authority for this action

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

5.4 Purpose and need for this action

Section 1.2 of the EA provides a detailed history of the evolution of the "other species" complex in the GOA FMP. The following problem statement was crafted by the Council Non-target Species Committee and reviewed by the Council at their February 2005 meeting:

> *In May of 2004, a final rule was published that removed skates from the "other species" complex in the Gulf of Alaska. This rule established ABCs and TACs, based on survey biomass, for Big, Longnose and other skates and thus provided a measure of protection against possible overfishing of skates in the Gulf of Alaska. Those species remaining in the "other species" complex include sharks, sculpins, squid, and octopi. The complex is open for directed fishing. While no ABC or OFL is set for this complex, TAC is defined as 5% of the combined TACs of all other groundfish species in the GOA.*
>
> *While recognizing that no members of the complex are targeted, the non-target species committee also noted that the removal of skates from the complex resulted in the potential for increased harvest of the remaining "other species". This is because the harvest of skates no longer accrues to the "other species" category. In addition, when a member is removed, the sum of all the single species TACs increases, resulting in an increase of the "other species" TAC when the 5% default TAC is applied. Ideally, the TAC for the "other species" complex would be lowered when a member such as skates is removed. Unfortunately, biomass estimates for most of the species in this group cannot be determined reliably by trawl surveys, and the remaining species still exist in a group with TAC determined by the TACs of other groundfish species in the Gulf of Alaska. Lacking any means of determining a survey-based TAC for this group leads to the conclusion that when members are removed, the Council should consider reducing the percentage basis for the "other species" TAC to something less than 5% of the combined members.*

5.5 Description of the alternatives under consideration

The alternatives for this action are described in detail in Chapter 2 of the EA. There are three alternatives, and three MRA options which could each be applied to each alternative. In summary the alternatives and options are:

> *Alternative 1 (No action):* Status quo. "other species" complex TAC = 5% sum of target TACs.

Alternative 2 (Preferred) : "other species" complex TAC $\leq$ 5% sum of target TACs. TAC can be established such that a directed fishery is possible.

Alternative 3: "other species" complex TAC $\leq$ 5% sum of target TACs. TAC established to meet incidental catch needs. Directed fishery prohibited.

MRA Options (applicable to all alternatives):

The Council, at its February 2005 meeting, did not specify the manner in which "other species" complex MRA measures would be revised. For the purposes of discussion, the authors suggested three possible approaches to revising the MRAs:

a) Status Quo. The "other species" complex MRAs would remain at current level of 20 percent in all fisheries with the exception of arrowtooth which would remain at 0 percent.

b) (Preferred) Set the "other species" complex MRAs for all fisheries at 20 percent. This would only change the MRA for "other species" complex in the arrowtooth fishery, increasing the MRA from 0 percent to 20 percent in recognition that an expanding directed fishery for arrowtooth with trawl gear is likely to have some intrinsic bycatch needs.

c) Set the "other species" complex MRA in each fishery equal to the average incidental catch of "other species" complex in each fishery. This approach would likely reduce the MRA in most fisheries except for arrowtooth where it would be increased. As discussed above, if "other species" complex were on bycatch status this approach could lead to additional regulatory discards. Incidental catch needs in each fishery could be estimated using observer data**.**

5.6 Background information on the fishery

Chapter 3, in the EA in this document, provides background information on the role of the "other species" complex in the groundfish fisheries of the GOA. Section 3.3 summarizes information on the economic and socio-economic environment. Section 4.6 of the EA provides information on the potential social and economic impacts to the human environment from the alternatives under consideration. Section 6.7 of the IRFA in this document provides estimates of the number of small entities (defining small entities using U.S. Small Business Administration criteria) that may be directly regulated by this action, and describes them. Section 6.8 of the IRFA discusses adverse economic impacts on these directly regulated small entities. Section 3.9.2 of the PSEIS describes the harvesting and processing sectors of the Alaska groundfish fisheries (NMFS 2004b). Some key points made elsewhere in this document include:

- Almost all "other species" catches are currently made incidentally to harvests of targeted groundfish species.
- Small amounts of octopus are currently targeted, but the amounts are small compared to incidental harvests, and can't be reported because of confidentiality restrictions.
- Limited markets exist for incidental harvests of some of these species, and markets elsewhere do support directed fisheries for these, such as spiny dogfish, octopus, and squid. It is possible for directed fisheries to emerge for some of these species. The likelihood of these markets emerging, or the likely magnitude of associated directed fisheries, cannot currently be predicted.
- Atka mackerel and skates were formerly included in the "other species" complex in the GOA, and were removed when directed fisheries emerged for these species. A directed skate fishery emerged in 2003, and skates were given target species status in 2004.

- Even if the entire "other species" complex were caught and retained in 2005, the revenues generated would have been small compared to overall GOA fishery gross revenues (about 3%).
- Actual incidental catches of the species in the "other species" complex are small compared to the available TAC. In 2004, about 13% of the TAC was taken.
- The annual catches of species in the "other species" complex have been small compared to total GOA groundfish catches (on the order of 1% per year).

5.7 Analysis of the alternatives

Alternative 1

This action is the status quo. Under Alternative 1, the Council would set the "other species" TAC equal to 5% of the sum of the TACs for targeted groundfish species in the GOA. The Council would not leave itself discretion to deviate from the TAC associated with this 5% level in any given year. In the short run, NMFS has the ability to take emergency action to constrain newly emerging directed fisheries for one or more of the "other species" complex in the event of a resource emergency affecting the "other species"; in the medium term, the Council could adopt an FMP amendment to move a species or species group from the "other species" complex to target fishery status.

This action would provide for incidental catches at current levels, and would provide opportunities for the development of target fisheries for shark, octopus, squid, or sculpin. This action would not provide any additional protection for the four species groups treated as "other species"." If a directed fishery developed on one of the species in the complex, there is a potential for overfishing; this might be mitigated by NMFS or Council action, as described above.

This alternative interacts with the proposed MRA sub-option approaches in the following ways:

Sub-option A	Sub-option B	Sub-option C
Status Quo. The "other species" complex MRAs would remain at the current level of 20 percent in all fisheries, with the exception of arrowtooth, which would remain at 0 percent.	Set the "other species" complex MRAs for all fisheries at 20 percent	Set the "other species" complex MRAs in each fishery equal to the average incidental catch of the "other species" in each fishery
This is the status quo option. There would be no additional costs or benefits from the choice of this combination. In the past, problems with holding and processing arrowtooth prevented it from being a target species in its own right. More recently, ways have been found to address these problems, and a directed arrowtooth fishery has emerged. The potential for the expansion of the arrowtooth flounder fishery may lead to an increase in regulatory discards of the "other species", when on bycatch status, by fishermen targeting arrowtooth, given the zero MRA i. However, this would be mitigated by the ability of fishermen to deliver "other species" as a target.	The increased arrowtooth MRA might reduce the frequency of regulatory discards of "other species", however fishermen could also deliver these as targeted "other species" harvests under this alternative, assuming markets emerge and it is economically "rational" to do so.	This option would not affect fishing operations. An increased arrowtooth MRA might reduce the frequency of regulatory discards of the "other species", while reductions in the MRAs for the "other species" complex might increase them. However, fishermen have the ability to land these as targeted "other species" harvests under this alternative, assuming markets emerge and it is economically "rational" to do so.

Alternative 2 (Preferred)

Under Alternative 2, the Council would be able to set the "other species" complex TAC at levels up to and including 5% of the sum of the TACs for targeted groundfish species in the GOA. Under Alternative 2, the Council would be free to set the "other species" complex TAC to accommodate directed fisheries for some of the "other species", as well as the incidental catches of these species. The TAC for the "other species" complex could not exceed 5% of the total sum of the TACs for all target species.

As noted in Section 4.2 of the EA, under this alternative the Council could consider the best and most recent information on the status of the "other species" complex, along with advice from its SSC, AP, and public testimony, when recommending a TAC for the "other species" complex. The Council could recommend a TAC large enough to meet anticipated incidental catch needs in other directed fisheries throughout the fishing year in the GOA, or it could recommend a TAC above that level, to support a developing directed fishery. This option gives the Council additional control over harvests, and thus introduces a precautionary element into management. These benefits may be modest, given currently low harvests of the "other species" complex.

The likelihood that Alternative 2 would impose costs on fishermen appears low. It's unlikely to impose any costs under current conditions, since TACs could be set to accommodate incidental and targeted harvests. Fishermen currently taking "other species" as incidental catches can continue to do so. Alternative 2 also allows the Council to provide for the development of target fisheries on one or more of the "other species" should they develop. It does not itself, therefore, appear to restrict fish harvests or fishing revenues, although it creates an opportunity for the Council to do so in subsequent TAC specifications recommendations

This alternative interacts with the proposed MRA sub-option approaches in the following ways:

Sub-option A	**Sub-option B (Preferred)**	**Sub-option C**
Status Quo. The "other species" complex MRAs would remain at the current level of 20 percent in all fisheries with the exception of arrowtooth, which would remain at 0 percent.	Set the "other species" complex MRAs for all fisheries at 20 percent	Set the "other species" complex MRAs in each fishery equal to the average incidental catch from the "other species" complex in each fishery
The combination of Alternative 2 and Option A appear to create a situation that is very close to the status quo. Current levels of incidental and targeted activity could continue and there would be no change in the MRAs.	The effect of this option is to increase the arrowtooth MRA from 0 to 20 percent. The Alternative 1, Option B conclusions apply here as long as the "other species" directed fishery is open. The increased arrowtooth MRA might reduce the frequency of discards of "other species" when "other species" target fisheries are closed.	Similarly, the Alternative 1, Option C conclusions apply here, as long as the "other species" directed fishery is open. This option would not affect fishing operations. The increased arrowtooth "other species" MRA might reduce the frequency of incidental catch discards of "other species", while reductions in the "other species" MRAs for the other target species complex might increase them. However, fishermen have the ability to land these as directed "other species" harvests under this alternative, as long as the "other species" directed fishery is open.

Alternative 3

Under Alternative 3, the Council would be able to set "other species" TACs at levels up to and including 5% of the sum of the TACs for targeted groundfish species in the GOA, so long as the TACs chosen were no greater than the levels required to meet incidental harvest needs in fisheries for those groundfish targets.

Alternative 3 would constrain the Council's annual "other species" TAC determination to a greater extent than Alternative 2. For this reason, it may provide more protection to the stocks of the individual species included in the complex.

Alternative 3 does not have the potential to create significant immediate effects on the gross revenues of any fishing fleet. Currently harvests from directed "other species" fishing are very small.[1] In 2004, 320 metric tons of "other species" (sculpin, shark, octopus, and squid; this excludes skates, which became a target species in 2004) were retained; very small amounts (all octopus) were retained in a directed fishery. By March 15, 2005, GOA fishing operations had taken about 371 metric tons of "other species" incidentally. Most of this, 300 metric tons, was squid taken in Central GOA pelagic trawl fisheries. Very small amounts of "other species" were retained in directed "other species" fishing. (NMFS, AKR, SF, Catch Accounting System. March 15, 2005).

However, there is the possibility that, without the restriction included in this alternative, target fishing for some of these species would increase in the future. The alternative could limit these opportunities. There is insufficient data on the potential income that might be derived in that case to estimate the economic impact of the foregone fishing opportunities. This action would not prevent fishing operations from delivering small amounts of a targeted "other species" during a year if these fell within the limits imposed by the relevant MRA option.

If a new fishery began to develop, and the Council sought to encourage the continuing development of that fishery, the species would have to be removed from the "other species" complex, and made a target species. The experience in the skate fishery in 2003 and 2004 may shed light on the process of moving from the identification of a problem, to the change in the status of a member of the "other species" complex to a target species. The directed skate fishery emerged in 2003. June 11, 2004, was the effective date for the regulatory change necessary to move skates from the "other species" complex to target species status. Skate harvests for all of 2004 were counted against the new TACs.

This period of slightly over a year probably represents the minimum amount of time it would take to implement an action of this nature. In this instance, the process was facilitated by the fact that much of the analysis for Amendment 63, removing skates from the "other species" complex, had already been undertaken.

[1] Confidentiality rules, triggered by the small numbers of fishing operations and processors involved in directed "other species" fishing, make it impossible to report the volumes of "other species" taken in directed "other species" fisheries.

This alternative interacts with the proposed MRA sub-option approaches in the following ways:

Sub-option A	Sub-option B	Sub-option C
Status Quo. The "other species" complex MRAs would remain at the current level of 20 percent in all fisheries with the exception of arrowtooth which would remain at 0 percent.	Set the "other species" complex MRAs for all fisheries at 20 percent	Set the "other species" complex MRAs in each fishery equal to the average incidental catch of "other species" in each fishery
Under Alternative 3, fishermen have limited opportunities to target the "other species" complex. This option, combined with Alternative 3, would require fishermen targeting arrowtooth to discard catches of "other species" from the complex.	Under Alternative 3, the fishermen have limited opportunities to target the "other species" complex. This option, which increases the arrowtooth MRA for the "other species" complex to 20 percent, would reduce the potential for regulatory discards of "other species" taken as incidental catches.	This sub-option places tighter potential constraints on "other species" harvests and may contribute more than other options to maintaining the sustainability of "other species" fish stocks. With an MRA equal to an historical average, fishermen who catch above the average will have to discard the excess. Since fishermen can occasionally sell incidental catch, this may mean a reduction in revenues. There is enough fluctuation in incidental catches (for example, squid from 2004 to 2005) that the average from one year might not be appropriate in another year.

5.8 Summary of significance criteria

As noted in Section 4.6 of the EA, the potential value of the entire "other species" complex, if the entire TAC were taken, is on the order of $7 million. If the TAC were taken, and "other species" were placed on prohibited status, they would have to be discarded, but fisheries taking them incidentally would not have to be closed. Therefore, none of these alternatives appears to have the potential to impose costs of $100 million on the U.S. economy. These alternatives do not appear to "adversely affect in a material way the economy, a sector of the economy, productivity, competition, jobs, the environment, public health or safety, or State, local, or tribal governments or communities..."

NMFS has not identified any factors that would (a) "Create a serious inconsistency or otherwise interfere with an action taken or planned by another agency"; (b) "Materially alter the budgetary impact of entitlements, grants, user fees, or loan programs or the rights and obligations of recipients thereof"; or (c) "Raise novel legal or policy issues arising out of legal mandates, the President's priorities, or the principles set forth in the executive order."

6 Initial Regulatory Flexibility Analysis (IRFA)

6.1 Introduction

This Initial Regulatory Flexibility Analysis (IRFA) evaluates the impacts of regulatory alternatives that would modify the determination of the TAC for the "other species" complex in the GOA on directly regulated small entities. This IRFA has been prepared to meet the statutory requirements of the Regulatory Flexibility Act.

The "other species" complex includes sharks, sculpins, octopi, and squids. These species are taken as incidental catches in directed groundfish fisheries. Skates were included in the "other species" complex

until 2004; they were taken from this complex and given target species status, after a directed skate fishery emerged in 2003.

Currently, the "other species" complex TAC is set equal to 5% of the sum of the TACs for the target species. The alternatives to the status quo, under consideration in this IRFA would allow the Council to set the "other species" complex TAC at a level less than or equal to 5%. Three different alternatives provide for, or prohibit, setting TACs to accommodate a directed fishery. Three options for modification of maximum retainable amounts (MRAs) are also discussed.

In June 2005, the Council chose TAC Alternative 2, along with MRB Sub-option B, as its preferred alternative.

6.2 What is the Regulatory Flexibility Act?

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

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

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

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

6.3 IRFA Requirements

Under 5 U.S.C., Section 603(b) of the RFA, each IRFA is required to contain:

A description of the reasons why action by the agency is being considered;

A succinct statement of the objectives of, and the legal basis for, the proposed rule;

A description of and, where feasible, an estimate of the number of small entities to which the proposed rule will apply (including a profile of the industry divided into industry segments, if appropriate);

A description of the projected reporting, record keeping and other compliance requirements of the proposed rule, including an estimate of the classes of small entities that will be subject to the requirement and the type of professional skills necessary for preparation of the report or record;

An identification, to the extent practicable, of all relevant Federal rules that may duplicate, overlap or conflict with the proposed rule;

A description of any significant alternatives to the proposed rule that accomplish the stated objectives of the proposed action, consistent with applicable statutes, and that would minimize any significant economic impact of the proposed rule on small entities. Consistent with the stated objectives of applicable statutes, the analysis shall discuss significant alternatives, such as:

1) The establishment of differing compliance or reporting requirements or timetables that take into account the resources available to small entities;
2) The clarification, consolidation, or simplification of compliance and reporting requirements under the rule for such small entities;
3) The use of performance rather than design standards;
4) An exemption from coverage of the rule, or any part thereof, for such small entities.

6.4 What is a Small Entity?

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

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

The SBA has established size criteria for all major industry sectors in the US including fish harvesting and fish processing businesses. A business involved in fish harvesting is a small business if it is independently owned and operated and not dominant in its field of operation (including its affiliates) and

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

The SBA has established "principles of affiliation" to determine whether a business concern is "independently owned and operated." In general, business concerns are affiliates of each other when one concern controls or has the power to control the other or a third party controls or has the power to control both. The SBA considers factors such as ownership, management, previous relationships with or ties to another concern, and contractual relationships, in determining whether affiliation exists. Individuals or firms that have identical or substantially identical business or economic interests, such as family members, persons with common investments, or firms that are economically dependent through contractual or other relationships, are treated as one party with such interests aggregated when measuring the size of the concern in question. The SBA counts the receipts or employees of the concern whose size is at issue and those of all its domestic and foreign affiliates, regardless of whether the affiliates are organized for profit, in determining the concern's size. However, business concerns owned and controlled by Indian Tribes, Alaska Regional or Village Corporations organized pursuant to the Alaska Native Claims Settlement Act (43 U.S.C. 1601), Native Hawaiian Organizations, or Community Development Corporations authorized by 42 U.S.C. 9805 are not considered affiliates of such entities, or with other concerns owned by these entities solely because of their common ownership.

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

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

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

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

6.5 Reason for Considering the Proposed Action

Section 1.2 of the EA provides a detailed history of the evolution of the "other species" complex in the GOA FMP. The following problem statement was crafted by the Council Non-target Species Committee and reviewed by the Council at their February 2005 meeting:

> *In May of 2004, a final rule was published that removed skates from the "other species" complex in the Gulf of Alaska. This rule established ABCs and TACs, based on survey biomass, for Big, Longnose and other skates and thus provided a measure of protection against possible overfishing of skates in the Gulf of Alaska. Those species remaining in the "other species" complex include sharks, sculpins, and octopi. The complex is open for directed fishing. While no ABC or OFL is set for this complex, TAC is defined as 5% of the combined TACs of all other groundfish targets in the GOA.*
>
> *While recognizing that no members of the complex are targeted, the non-target species committee also noted that the removal of skates from the complex resulted in the potential for increased harvest of the remaining "other species". This is because the harvest of skates no longer accrues to the "other species" category. In addition, when a member is removed, the sum of all the single species TACs increases, resulting in an increase of the "other species" TAC when the 5% default TAC is applied. Ideally, the TAC for the "other species" complex would be lowered when a member such as skates is removed. Unfortunately, biomass estimates for most of the species in this group cannot be determined reliably by trawl surveys, and the remaining species still exist in a group with TAC determined by the TACs of other groundfish species in the Gulf of Alaska. Lacking any means of determining a survey-based TAC for this group leads to the conclusion that when members are removed, the Council should consider reducing the percentage basis for the "other species" TAC to something less than 5% of the combined members.*[1]
>
> [1]While the passage reads "…, the council should consider reducing the percentage basis for the "other species" TAC to something less than 5 % of the combined members." And seems to suggest that the "combined members" being referenced applies to the "other species" complex, it is, in fact , the "combined members" of the groundfish target species to which the sentence refers.

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

The objectives of this action are to: (1) protect the long run sustainability of the stocks that comprise the "other species" complex, while the Non-target Species Committee develops longer term FMP measures to manage non-target species; (2) allow fishermen the opportunity to develop and service emerging markets for the species included within the "other species" complex; and (3) minimize the potential for regulatory discards.

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

6.7 Number and description of directly regulated small entities

The directly regulated small entities are those entities that fish for groundfish in the GOA, and which make incidental catches of sculpin, shark, octopus, and squid in the course of these operations.

In 2003 (the most recent year for which complete information on the number of participating vessels has been compiled), 803 small catcher vessels and 13 small catcher-processors were directly regulated under the SBA criteria. Most of these (655 catcher vessels and 9 catcher-processors) were hook-and-line vessels. In addition, there were 138 vessels using pot gear (137 catcher vessels and one catcher processor) and 96 vessels using trawls (93 catcher vessels and three catcher-processors). (Econ SAFE, Table 26.2, page 62)

These estimates of small vessel numbers are probably high for several reasons. The analysis only takes account of operational revenues from Federally managed groundfish fisheries. It does not include revenues from other Federally managed fisheries, or from State managed fisheries. These other revenue sources, however, would be relevant to the determination of operation size under SBA criteria. Thus, at least some of these operations are likely to have gross revenues greater than $3.5 million. Moreover, this analysis has not taken account of affiliations among operations. In many instances, operations are affiliated. For example, many fishermen own shares in more than one fishing vessel in order to diversify their risks. AFA catcher vessels also operate in the GOA and these vessels are considered large by reason of their participation in AFA cooperatives in the BSAI. AFA affiliation may particularly bias the small trawler count upwards.

These vessels had average gross revenues of $190,000 from Federally managed groundfish fishing. Average revenues were $170,000 (at ex vessel) for catcher vessels, and $1,530,000 (at first wholesale) for catcher-processors. Hook-and-line catcher vessels grossed $120,000, pot catcher vessels grossed $160,000, and trawl catcher vessels grossed $570,000. Because of confidentiality restrictions, there are not enough catcher-processor pot or trawl vessels to permit the reporting of average gross revenues. There are enough small hook-and-line catcher processors to report this average; these vessels averaged $1,550,000. (Econ SAFE, Table 26.4, page 64).

6.8 Adverse Economic Impacts on Directly Regulated Small Entities

A detailed discussion of the impacts of the alternatives and options may be found in Section 5.7 of the RIR. The following analysis draws on this earlier discussion.

All alternatives provide for the “other species” incidental catch needs of fisheries targeting groundfish in the GOA. No existing fisheries should experience adverse impacts from any of these alternatives. No small entity participating in an existing groundfish target fishery should be adversely impacted by these alternatives.

Alternative 1 is the TAC setting status quo. This alternative does not appear to create adverse impacts on directly regulated small entities under any of the three options.

Alternative 2 allows the Council to continue providing for incidental catches at existing or increased levels, and allows the Council to increase TACs to accommodate developing fisheries. Like Alternative 1, this alternative does not appear to create adverse impacts for directly regulated small entities.

Alternative 3 allows the Council to set TACs to accommodate incidental “other species” catches, but not targeted catches. Targeted fisheries for the “other species” complex would be precluded by this alternative. This is not expected to impose any immediate costs on small entities, because targeted catches from the “other species” complex are currently very small. This alternative may make it more difficult for future targeted fisheries to develop for sculpins, sharks, octopi, or squids. It is impossible to

predict whether or not this would occur, or what costs would be borne by small entities. The development of a fishery for one of the "other species" is not precluded, since fishermen could deliver "other species" taken as incidental catches, so long as the amounts did not exceed their MRAs for these species. If it became apparent that a significant fishery was developing, the Council could move the relevant species from the "other species" complex and give it target species status.

The three MRA sub-options under consideration could have implications for small entity revenues. Sub-option A leaves the "other species" MRA in the arrowtooth fishery at zero, and has the potential to increase regulatory discards if the arrowtooth fishery expands. This could reduce revenues fishermen might have earned on incidental catches of one or more of the remaining "other species" from the complex. Sub-option B sets the "other species" MRA in the arrowtooth fishery at 20% and mitigates the potential for these costs.

As noted in Section 4.8 of the EA, incidental catch of "other species" in directed fisheries (other than arrowtooth) rarely exceeded 2% of the target species catch in the period from 1997 to 2002. Sub-option C sets the "other species" complex MRAs for all target species equal to historical averages. For many species, the MRA under this option would be less than the current 20% (although a increase from zero would represent an increase in the MRA for arrowtooth). With an MRA equal to an historical average MRA, fishermen who catch above the historical average will have to discard the excess. Since fishermen can on occasion sell incidental catches of "other species" complex fish, this may mean a reduction in revenues. There is enough fluctuation in incidental catches (for example, in squid from 2004 to 2005) that the average from one year might not be a good estimate for another.

6.9 Recordkeeping and reporting requirements

The analysis did not identify any new "projected reporting, record keeping and other compliance requirements" associated with the proposed FMP amendment and regulatory changes.

6.10 Duplicating, overlapping, or conflicting Federal rules

This analysis did not reveal any federal rules that duplicate, overlap, or conflict with the proposed action.

6.11 Comparison of preferred and other alternatives

As noted in Section 6.3, an IRFA should have "A description of any significant alternatives to the proposed rule that accomplish the stated objectives of the proposed action, consistent with applicable statutes, and that would minimize any significant economic impact of the proposed rule on small entities."

In June 2005, the Council chose Alternative 2 and Option B.

As noted in Section 6.8, Alternative 1, the status quo, did not create adverse impacts for directly regulated small entities, but Alternative 3, which precludes targeted fisheries for the "other species" complex, may. While Alternative 1 does not impose greater adverse impacts on small entities than the preferred alternative, Alternative 2, it does not meet the action objectives of providing additional protection to the "other species" complex.

As noted in Section 6.8, Option A, the status quo, has the potential to cause regulatory discards in the arrowtooth fishery, and potentially reduce revenues to fishermen. Option B, which sets a 20% MRA, has the potential to mitigate and reduce this impact. Option B, therefore, reduces adverse impacts on directly regulated small entities compared to the status quo. Option C, also has an increased potential to increase

regulatory discards, and thus may result in potentially greater adverse impacts than Alternative B. Of the three options, therefore, the Council has chosen the one with the least potential for adverse impacts on directly regulated small entities.

7 References

Aydin, K. 2005. Multispecies modeling and fisheries management needs. Presentation to the Science and Statistical Committee of the North Pacific Fishery Management Council. February 2005. Seattle, WA.

Courtney, D., S. Gaichas, J. Bolt, K. Goldman, and C. Tribuzio. (2004) Sharks in the Gulf of Alaska, Eastern Bering Sea, and Aleutian Islands. In Stock assessment and fishery evaluation report for the groundfish resources of the Bering Sea and Aleutian Islands for 2005. Appendix. North Pacific Fishery Management Council, 605 W 4th Ave., Suite 306, Anchorage, AK 99501

Gaichas, S., L. Fritz, and J. N. Ianelli. (1999). "Other species" considerations for the Gulf of Alaska. In Stock assessment and fishery evaluation report for the groundfish resources of the Gulf of Alaska. Appendix D. North Pacific Fishery Management Council, 605 W 4th Ave., Suite 306, Anchorage, AK 99501.

Gaichas, S. K. (2002). Squid and "other species" in the Bering Sea and Aleutian Islands. In Stock assessment and fishery evaluation report for the groundfish resources of the Bering Sea and Aleutian Islands for 2003. North Pacific Fishery Management Council, 605 W 4th Ave., Suite 306, Anchorage, AK 99501.

Hiatt, Terry, Ron Felthoven, Chang Seung, and Joe Terry. (2004). Stock Assessment and Fishery Evaluation Report for the Groundfish Fisheries of the Gulf of Alaska and Bering Sea/Aleutian Island Area: Economic Status of the Groundfish Fisheries Off Alaska, 2003. Economic and Social Sciences Research Program, REFM, Alaska Fisheries Science Center, National Marine Fisheries Service. 7600 Sand Point Way N.E., Seattle, Washington 98115-6349. November 19, 2004.

Lowe, S. and R. Lauth. (2003). Assessment of Gulf of Alaska Atka Mackerel. In: Stock Assessment and Fishery Evaluation Report for the Groundfish Resources of the Gulf of Alaska. Compiled by the Plan Team for the Groundfish Fisheries of the Gulf of Alaska. North Pacific Fishery Management Council, 605 West 4tyh Ave. Ste 306, Anchorage, AK, 99587.

Musgrave, D.L., Weingartner, T.J., and Royer, T.C. 1992. Circulation and Hydrography in the Northwest Gulf of Alaska. Deep-Sea Research, 39, pp1499-1519.

National Marine Fisheries Service (NMFS). (1979). Environmental Assessment for Proposed Amendment 5 to the Fishery Management Plan for the Groundfish of the Gulf of Alaska. NMFS, Alaska Region, Juneau, Alaska.

NMFS. (1998). Final Supplemental Environmental Impact Statement: Groundfish Total Allowable Catch Specifications and Prohibited Species Catch Limits Under the Authority of the Fishery Management Plans for the Groundfish Fishery of the Bering Sea and Aleutian Islands Area and Groundfish of the Gulf of Alaska. December 1998. DOC, NOAA, National Marine Fisheries Service, AK Region, P.O. Box 21668, Juneau, AK 99802-1668. p. 692 + Appendices and Comments.

NMFS. (1999a). Gulf of Alaska Stock Assessment and Fishery Evaluation Report. Appendix D. "Other Species" Considerations for the Gulf of Alaska." By Sarah Gaiches, Lowell Fritz, and James N. Ianelli. Alaska Fisheries Science Center. Accessed at http://www.afsc.noaa.gov/refm/docs/historic_assess/othspp99.pdf on March 7, 2005.

NMFS. (1999b). Environmental Assessment for the Total Allowable Catch Specifications for the Year 2000 Alaska Groundfish Fisheries. NMFS P.O. Box 21668, Juneau, AK 99801.

NMFS. (2000). Section 7 consultation of the authorization of the Bering Sea and Aleutian Islands groundfish fishery under the BSAI FMP and the authorization of the Gulf of Alaska groundfish

fishery under the GOA FMP. Office of Protected Resources Division, NMFS. November 30, 2000. p.352.

NMFS. (2001). "EA/RIR for the Extension and Revisions of the Emergency Interim Rule for 2001 Harvest Specifications for the Alaska Groundfish Fisheries and for Steller Sea Lion Protective Fisheries Management Measures." No FONSI. EA transmittal letter dated July 20, 2001, DOC, NOAA, National Marine Fisheries Service, AK Region, P.O. Box 21668, Juneau, AK 99802-1668. p. 306.

NMFS. (2004a). Environmental Assessment/Initial Regulatory Flexibility Analysis for the Harvest Specifications for the Years 2004 Alaska Groundfish Fisheries Implemented Under the Authority of the BSAI and GOA Groundfish Fishery Management Plans and Amendment 63 to the Fishery Management Plan for Groundfish of the Gulf of Alaska for Skates Management and Regulatory Impact Review for Amendment 63 to the Fishery Management Plan for Groundfish of the Gulf of Alaska for Skates Management. January 2004. DOC, NOAA, National Marine Fisheries Service, AK Region, P.O. Box 21668, Juneau, AK 99802-1668.

NMFS. (2004b). Alaska Groundfish Fisheries. Final Programmatic Supplemental Environmental Impact Statement for the Alaska Groundfish Fisheries Implemented Under the Authority of the Fishery Management Plans for the Groundfish Fishery of the Gulf of Alaska and the Groundfish of the Bering Sea and Aleutian Islands Area. Anchorage, Alaska. June 2004. Accessed at http://www.fakr.noaa.gov/sustainablefisheries/seis/default.htm on September 3, 2004.

NMFS. (2004c). Environmental Assessment/Initial Regulatory Flexibility Analysis for the Harvest Specifications for the Years 2005 - 2006 Alaska Groundfish Fisheries Implemented Under the Authority of the BSAI and GOA Groundfish Fishery Management Plans. November 2004. DOC, NOAA, National Marine Fisheries Service, AK Region, P.O. Box 21668, Juneau, AK 99802-1668.

North Pacific Fishery Management Council (NPFMC). (1993). Environmental Assessment for Proposed Amendment 31 to the Fishery Management Plan for Groundfish of the Gulf of Alaska. North Pacific Fishery Management Council. PO Box 103136, Anchorage, Alaska 99501.

NPFMC. (2004). Stock Assessment and Fishery Evaluation Report for BSAI Groundfish. Appendix. "Sharks in the Gulf of Alaska, Eastern Bering Sea, and Aleutian Islands." By Dean Courtney, Sarah Gaiches, Jennifer Boldt, Kenneth J. Goldman, and Cindy Tribuzio. Alaska Fisheries Science Center. Accessed at http://www.afsc.noaa.gov/refm/docs/2004/BSAIsharks.pdf on March 7, 2005.

NPFMC. (2005). Fishery Management Plan for Groundfish of the Gulf of Alaska. NPFMC. 605 4th Ave, Suite 306. Anchorage, Alaska. 99501. January 2005.

Paust, Brian and Ronald Smith. (1989) Salmon Shark Manual. The Development of a Commercial Salmon Shark, *Lamna ditropis*, Fishery in the North Pacific. University of Alaska Sea Grant Program. Alaska Sea Grant Reprot 86-01. Revised 1989.

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