

MEMORANDUM

TO: Council, SSC and AP Members  
FROM: Clarence G. Pautzke  
Executive Director  
DATE: September 18, 1995  
SUBJECT: Forage Fish and BSAI Cod Gear Allocations



ESTIMATED TIME 6 Hours (all D-4 items)
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**ACTION REQUIRED**

- (e) Initial review of forage fish amendment.
- (f) Give staff direction on analysis of Pacific cod allocation in the BSAI.

**BACKGROUND**

Forage Fish

In January 1995, the Council directed staff to prepare an EA/RIR to examine impacts of prohibiting a directed fishery on forage fish. Forage fish include capelin, smelt, sandlance, sandfish, and other schooling fishes. They are an important ecosystem component, and are preyed on by marine mammals, seabirds, as well as commercially important fish species. Recent changes in predator abundance have raised concerns that forage fish need additional protection. Alternatives analyzed were:

- Alternative 1. Status quo. Allows for potential development of a directed fishery.
- Alternative 2. Establish forage fish as a separate category in the FMPs, and prohibit a directed fishery.
- Alternative 3. Separate forage fish from "other species" complex and "non-specified species" groups, and establish annual ABC and TAC for forage species. Directed fishing would be prohibited with a low TAC.
- Alternative 4. Separate forage fish from "other species" complex and "non-specified species" groups, and include them in the prohibited species category. No retention of forage fish would be allowed.

NMFS analysts will present their results. At this meeting, the Council may review the document, make additional recommendations, and release the document for public review.

### Pacific Cod Allocation

Amendment 24 was implemented in January 1994 with a 3-year sunset clause. This amendment allocates 2% of the BSAI Pacific cod TAC to jig gear, 44% for hook and line, and 54% for trawl gear. The amendment also provides for seasonal apportionment of the fixed gear allocation, as well as a provision allowing the NMFS Regional Director to reallocate in-season any unused TAC allocation from one gear group to another. Unless the Council initiates analysis of a rollover of this amendment, regulations implementing a Pacific cod allocation will expire on December 31, 1996. If the Council wants to proceed with a rollover analysis, they can provide staff with direction at this meeting.

AGENDA D-4(e)  
SEPTEMBER 1995

**DRAFT for COUNCIL REVIEW**

ENVIRONMENTAL ASSESSMENT  
and  
REGULATORY IMPACT REVIEW  
FOR  
AMENDMENT 36 TO THE FISHERY MANAGEMENT PLAN  
FOR THE GROUND FISH FISHERY  
OF THE BERING SEA AND ALEUTIAN ISLANDS AREA  
- AND  
AMENDMENT 39 TO THE FISHERY MANAGEMENT PLAN  
FOR GROUND FISH OF THE GULF OF ALASKA  
  
TO PROHIBIT A DIRECTED FISHERY  
FOR SPECIFIED FORAGE FISH SPECIES

Prepared by

**National Marine Fisheries Service  
Alaska Region**

September 20, 1995

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## EXECUTIVE SUMMARY

The proposed action would prohibit a directed fishery on certain groundfish known as "forage fish". The intent of this measure is to limit the forage fish species (FFS) from being exploited as they are essential components in the ecosystem. For the purpose of this analysis forage fish are defined as capelin, eulachon, the remaining species included in the Family Osmeridae, Family Myctophidae, Sandlance (*Ammodytes* sp.), Family Bathylagidae and Pacific sandfish. None of the alternatives considered would be expected to change fishing activities in a manner that would affect the amount of groundfish harvested or the amount of forage fish taken as bycatch in the Alaska groundfish fisheries.

Forage fish are abundant schooling fishes preyed upon by species of marine mammals, seabirds and other commercially important fish species. Forage fish perform a critical role in the complex ecosystem functions of the Bering Sea and Aleutians Islands management area and the Gulf of Alaska by providing the transfer of energy from the primary or secondary producers to higher trophic levels. These species have little economic importance and are consequently given a low priority for scientific studies or stock analyses. However, recent changes in marine mammal, seabird, crab and commercially important fishery resource populations have raised concerns that forage fish need additional focus and protection to better understand their role in the ecosystem and the dependency of other species on forage fish for their sustainable production.

Forage fish are taken incidental to the Alaska groundfish trawl fisheries in amounts of less than 1 percent of any directed fishery (Lowell Fritz, AFSC, comm.). Forage fish are comprised of numerous species which are currently managed in the "other species" or "nonspecified species" categories defined in the Fishery Management Plan for the Groundfish Fishery of the Bering Sea and Aleutian Islands Area and in the Fishery Management Plan for Groundfish of the Gulf of Alaska (FMPs). These categories were established to account for species which are currently of slight economic value and upon which there is little, if any, directed fishing. The NMFS bottom trawl surveys are not designed to adequately sample the habitat of these "other species" and "nonspecified species" categories. Consequently, these species either have an Acceptable Biological Catch (ABC) equal to the average annual catch which is managed under the Total Allowable Catch (TAC) for the "other species" category or no annual catch limitation as part of the "nonspecified species" category. Since these species are not commercially targeted, this ABC is used to support the TACs for other targeted commercial species.

In addition, concerns exist that these species could become a commercial target unless FMPs are amended to prevent a directed fishery on these species. These concerns were presented during the North Pacific Fishery Management Council's (Council) 1994 annual amendment cycle. The Council has adopted an annual schedule for processing proposals and decision making on groundfish, salmon, crab and halibut. These cycles dictate how the Council will gather and process proposed changes to its FMPs and regulations, when decision documents will be available for public review, and when final management decisions will be made for each fishery. During this cycle, proposals are accepted and reviewed by the Council and Plan Teams and ranked according to necessity of the action.

At its September 1994 Plan Team meeting, a proposal to prohibit a directed fishery on forage fish in the waters off Alaska was submitted by members of the fishing industry (Appendix A) and was reviewed by the Council staff and Plan Teams. This proposal was ranked high in priority at the Plan Team meeting. At its January 1995 meeting, the Council recommended a draft analysis on this proposal be prepared for its review.

The proposed action would identify a FFS category and prohibit a directed fishery from occurring for specified forage fish species. Rationale for the proposal include: (1) lack of biological data regarding biomass, age structure or other parameters important for management; (2) the removal of essential food sources for groundfish, salmon, marine mammals and seabirds; (3) directed fishing for small forage fish could create significant bycatch problems for prohibited species, especially salmon; (4) presently, no commercial fishery exists for forage fish; (5) there

are no provisions that could prevent the initiation of a directed fishery for forage fish; and (6) there is a reported recent interest in initiating directed fishing for forage fish. Furthermore, little information on forage fish biomass in conjunction with an unregulated commercial fishery could jeopardize the food resources for marine mammals and seabirds.

The following alternatives, with the exception of status quo, would accomplish the same goal to prohibit a directed fishery on forage fish in Federal waters:

**Alternative 1: Status quo.** Alternative 1 (Status quo). Under the status quo alternative, all bycaught species of forage fish could be caught and retained as groundfish under either "other species" category TAC or as a "nonspecified species". Under this alternative a commercial fishery could develop for these species.

**Alternative 2:** Under Alternative 2, FMP amendments would be implemented to establish a fifth category of species or species groups that are likely to be taken in the groundfish fishery. A Forage Fish Species (FFS) category would be established in the FMPs and directed fishing on this species category would be prohibited although specified bycatch amounts could be retained.

A fifth category, Forage Fish Species (FFS) would be established to manage and protect the FFS species which are preyed upon by marine mammals, seabirds and other commercial fish species. Directed fishing on any species in the FFS category would be prohibited and only specified bycatch amounts could be retained under the (maximum retainable bycatch amounts) directed fishing standards (1 percent of any open directed fishery). Forage fish species would be taken from the "other species" and "nonspecified species" categories and established under a this new FFS category. The FFS category would have a maximum retainable bycatch amount that would be calculated as one percent of any basis species. A basis species is any species or species group that is open to directed fishing that the vessel is authorized to harvest. Record of forage fish would be necessary to provide additional data for scientific analysis. For the FFS category an ABC and TAC would not be estimated.

**Alternative 3:** Under Alternative 3, forage fish would be broken out of the "other species" category TAC<sup>1</sup> and the "nonspecified species" category, and a forage fish species TAC would be established and maintained as bycatch only so that a directed fishery could be prohibited. Under this alternative, a TAC would be annually specified to equal 1 percent of the sum of all TACs. However, only bycatch amounts (1% of any open directed fishery) could be retained thus preventing a directed fishery. The FFS TAC category would have a maximum retainable bycatch amount that would be calculated as one percent of any basis species. A basis species is any species or species group that is open to directed fishing. This alternative would require annual regulatory maintenance in the specification process to establish the annual TAC amounts. This category could then be established as bycatch only through a FMP amendment.

**Alternative 4:** Under Alternative 4, forage fish would be broken out of the "other species" category TAC or the "non-specified species" category and be added to the prohibited species category. Under this alternative, it would be prohibited to retain forage fish and all forage fish would have to be returned to sea with a minimum of injury. This alternative would place forage fish in a category that primarily has

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<sup>1</sup> The "other species" category has an ABC and TAC estimated for the BSAI. However, the "other species" category is managed differently for the GOA. The FMP specifies that the TAC amount for the "other species" category is five percent of sum of the annual TACs for the GOA and therefore, an ABC estimation is not applicable in the GOA. The "non-specified species" category has no ABC estimated for the BSAI or GOA.

been established for allocative reasons and that contain species that have economic importance. Currently, the forage fish have no significant economic or allocation significance.

Initial analyses indicates that the effects of the alternatives are not likely to change fishing activities, however, the effects of the alternatives on the Councils intent to minimize discards are more fully met under Alternative 2 and 3.

Alternatives 2 and 3 partially fulfill industry's desire to protect marine mammals and seabird populations by prohibiting a directed fishery while fulfilling the Councils policy to minimize discard amounts by authorizing the retention of forage fish species as bycatch at a 1 percent bycatch rate. These alternatives fulfill the concerns that the ecosystem may require additional protection of these prey resources that may be necessary to provide integral food resources to marine mammals, sea birds and other commercial fish populations. In addition, enforcement concerns are minimized under these alternatives compared to Alternative 4, which would require immediate sorting and the return to sea with the minimum injury for a species category that experience nearly 100 percent mortality and are of minor economic importance. It has been noted that individuals working in the industry may retain this otherwise discarded species to supplement their diets (Myers, comm.) Under Alternative 4 this practice would be prohibited. The governments annual regulatory burden of addressing TAC and bycatch amounts for forage fish under the annual specification process would be alleviated under Alternative 2 compared to Alternative 3. Alternative 2 accomplishes the proposed amendments intent while fulfilling FMP and Magnuson Act goals with regard to reduced discard amounts with the least impact to the industry, ecosystem and government.

None of the alternatives are likely to significantly affect the quality of the human environment, and the preparation of an environmental impact statement for the proposed action is not required by Section 102(2)(C) of the National Environmental Policy Act or its implementing regulations.

The total burden to the Alaska fishing industry resulting from prohibiting a fishery on the FFS species (Alternatives 2 through 4) would be minimal because only 3 vessels have reported targeting any species in this proposed category in any given year since 1984, no annual commercial fishery has been established, available data from ADF&G is patchy and market availability for capelin varies. Under Alternatives 2 through 4, a limited impact on an average of 2 vessels per year could occur.

The maximum cost to the industry cannot be determined at this time, however, because of industries limited interest, the sporadic availability of capelin, and low catch amounts which result in a poorly developed commercial fishery. The costs of Alternative 2 through 4, therefore, are less than 5 percent of the gross annual receipts of the catcher vessels. The impacts under Alternatives 2 through 4 are not anticipated to result in a significant economic impact on a substantial number of small entities under the Regulatory Flexibility Act. None of the alternatives considered is expected to result in a "significant regulatory action" as defined in E.O. 12866.

In addition, the estimated cost of Alternatives 2 through 4 are difficult to estimate because it is unknown whether the State will prohibit a directed fishery on capelin and whether market interest for capelin will successful develop for Alaskan species.

## 1.0 INTRODUCTION

The groundfish fisheries in the Exclusive Economic Zone (EEZ) (3 to 200 miles offshore) off Alaska are managed under the Fishery Management Plan for the Groundfish Fisheries of the Gulf of Alaska and the Fishery Management Plan for the Groundfish Fishery of the Bering Sea and Aleutian Islands Area. Both FMPs were developed by the North Pacific Fishery Management Council (Council) under the Magnuson Fishery

Conservation and Management Act (Magnuson Act). The GOA FMP was approved by the Secretary of Commerce and became effective in 1978 and the BSAI FMP become effective in 1982.

Actions taken to amend FMPs or implement other regulations governing the groundfish fisheries must meet the requirements of Federal laws and regulations. In addition to the Magnuson Act, the most important of these are the 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).

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 which may address the problem. This information is included in Section 1 of this document. Section 2 contains information on the biological and environmental impacts of the alternatives as required by NEPA. Impacts on endangered species and marine mammals are also addressed in this section. Section 3 contains a Regulatory Impact Review (RIR) which addresses the requirements of both E.O. 12866 and the RFA that economic impacts of the alternatives be considered. Section 4 contains the Initial Regulatory Flexibility Analysis (IRFA) required by the RFA which specifically addresses the impacts of the proposed action on small businesses.

This Environmental Assessment/Regulatory Impact Review (EA/RIR) addresses proposed amendments to the FMPs which would prohibit a directed fishery on FFS by establishing a new species category for the FFS or moving the FFS from the categories where the FFS are currently managed. For the purpose of this analysis forage fish are defined as capelin, eulachon, Family Osmeridae, Family Myctophidae, Sandlance (*Ammodytes* sp.), Family Bathylagidae and Pacific sandfish.

### 1.1 Purpose of and Need for the Action

Significant declines in marine mammals and seabirds in the Gulf of Alaska (GOA) and the Bering Sea and Aleutian Islands management area (BSAI) have raised concerns that changes in the FFS biomass may contribute to the further decline of the marine mammals (Table A), seabirds and commercially important fish species populations. These concerns have prompted members from the fishing industry to request the Council to provide an analysis of actions that would prohibit a directed fishing on the FFS (Appendix A) in the groundfish fisheries off Alaska.

Recommendations from the International Council for the Exploration at Sea (ICES, 1994) include the examination of trends in abundance of non-target fish. One of the recommendations indicated that fishery managers should develop measures to avoid the commercial targeting of food resources that are key to marine mammals and seabirds. Establishing forage fish as a separate category would provide the mechanism to prohibit a directed fishery and the likelihood of a future fishery developing on these species which would decrease this species category's susceptibility to commercial fishing and protect prey resources for marine mammals and seabirds.

Forage fish are typically abundant, schooling species of fish which are preyed upon by marine mammals (Table B), seabirds, and other fish species. FFS provide important ecosystem functions by transferring energy from primary or secondary producers to higher trophic levels. Relatively little is known about these species, as they tend to be one of the least studied species groups because they have little economic importance which results in few scientific studies or stock analysis.

The Council's BSAI Plan Team does not use catch data from trawl surveys for biomass estimates of forage fish because these species exhibit patchy distribution which reduces the validity of these biomass estimates. Given the lack of information on the biology and populations dynamics for forage fish and species in the "other species" and "nonspecified species" categories, acceptable biological catch amounts for each species of the "other species"



group are set equal to the average annual catch. For the "nonspecified species" category an ABC is not estimated. Since a directed fishery does not currently exist for the FFS, these catch amounts represent bycatch in the groundfish fisheries off Alaska (Tables C and D).

Capelin, eulachon, Family Osmeridae, Family Myctophidae, Sandlance (*Ammodytes* sp.), Family Bathylagidae and Pacific sandfish are managed under the FMPs. The forage fish species are managed either under the "other species" or "non-specified species" categories in the BSAI and GOA, which were established to account for species which are currently of slight economic value and upon which there is little, if any, directed fishing (SAFE; 1995). Forage fish species and species group categories that are contained in the "other species" category are: capelin, eulachon, and Family Osmeridae (other smelts). A single TAC applies to the entire "other species" category and the ABC is estimated as the average annual catch in the BSAI. In the GOA the "other species" category is calculated as 5 percent of the sum of the TACs and ABCs. Forage fish species and species categories that are contained in the "nonspecified species" category include: sandlance (*Ammodytes*), Pacific Sandfish, Family Myctophidae (lanternfish) and Family Bathylagidae. A TAC for the "nonspecified species" category is not specified or managed but is defined in the FMPs as the amount taken incidentally while fishing for other groundfish. No reporting is required and no ABC is estimated for this category.

The FFS have the potential to have economic value in the future. Market interest for capelin has increased since 1992 partially due to the recent decline in the Atlantic capelin stocks. The limited annual harvest of capelin is due to sporadic market conditions, processing limitations, and fluctuation of available capelin biomass, however, declining Atlantic stocks have potential to change the market interest for capelin. Insufficient data and management measures exist to manage each species separately in the "other species" and "non-specified species" categories in Federal waters. The 1995 Stock Assessment and Fishery Evaluation Report states that if any significant directed fishing on any component of the "other species" category develops, particularly those that serve as prey for marine mammals and seabirds, then future assessments should reflect this change by separating the these species out (SAFE, 1995). Therefore, actions to address concerns on the FFS are warranted for capelin.

Although there is little commercial fishing on these species, documentation exists of a small and sporadic commercial fishery on capelin as early as the 1960's (ADFG, 1993). The largest harvest was taken in 1984 (489 mt; sorted) and existed for the capelin species only. Prior to 1993, capelin were most recently landed in 1987. During 1993, in Nunavachak Bay on May 14 through May 16, 31 mt of capelin were harvested. Data reveal that no more than three vessels per year participated in a capelin fishery. Data from 1994 indicate that less than 1 mt of capelin was commercially harvested by one boat. Data from 1992 also indicate that less than 1 mt of capelin was commercially harvested. Market interest for capelin could increase, however, due to a recent decline of Atlantic capelin stocks.

In 1984, 1,321 mt of capelin were landed (489 mt sorted) in the Togiak district of Bristol Bay. In this fishery only roe bearing females are retained although some interest in selling the males for meal to zoos has been expressed. Since roe bearing capelin typically spawn at specific areas and migrate toward the shore in the spring to meet their requirements with regard to specific grain-size and sea temperatures it is generally considered that the majority of spawning occurs in State waters. ADF&G has jurisdiction of this potential fishery. If concerns that a commercial fishery is warranted for capelin then these concerns could be incorporated when ADF&G decides its policy with regard to forage fish and the mechanisms it will use to manage the capelin species and the other species contained in the forage fish category. Presently, commercial fishing for capelin is open by regulation, not managed by emergency order, and is restricted by few regulations.

The opportunity for a directed fishery on the forage fish species exists under the constraints imposed by the TACs set under the annual specification process and the optimum yield for the groundfish complex set forth in the FMPs. Directed fishing for species in the "nonspecified species" category is authorized under the constraints imposed by the optimum yield for the groundfish complex set forth in the FMPs. Presently, species contained

in the proposed FFS category are not actively managed by the State of Alaska, however, cooperative State and Federal management would be necessary because forage fish are typically distributed in State waters during the spawning times of the year.

Capelin resources are difficult to estimate as relative abundances of spawning populations are difficult to survey because capelin prefer to spawn at night nearshore but have also been observed spawning offshore at night. Capelin occur in large localized concentrations making them an especially difficult species to assess. In Kodiak capelin of all sizes are found nearshore throughout the year (Pahlke, 1985). Because these species reside both inshore and offshore it is essential to have the cooperation of the State of Alaska to protect the forage fish in Alaska State waters.

Heavy exploitation of FFS can cause an imbalance in the predator-prey relationships. Alaskan marine mammals and seabird populations have been declining since 1975. It has been theorized that these declines may be attributed to the effects of commercial fishing activities off Alaska. Since the passage of the Magnuson Act, the fisheries off Alaska have grown to account for a significant portion of all U.S. landings. Whether or not food availability is the reason for declining marine mammals and seabird populations, the change in prey species abundance and composition is a plausible explanation although a cause-effect relationship has yet to be determined (Table B).

Commercially important groundfish exploit the forage fish species as they are a prey resources (Hamre, 1992). The consequences of commercial fishing activities, particularly the harvest of forage fish, are theorized as causing declines in marine mammals, seabird and commercial groundfish populations. Populations of Red and Black-legged Kittiwakes have declined by 30 to 50 percent on the Pribilof Islands since 1976. Throughout Alaska, the productivity of kittiwakes is low. Although the reasons for these trends are not understood, several hypotheses have been advanced to explain the observed patterns of population and productivity in kittiwakes. One hypothesis stipulates that the decline in stock abundance is due to reduced food availability caused by commercial fishing, oceanographic changes, increased winter mortality, poor breeding, and status quo (the situation is normal and will rebound back to past levels). In all likelihood the productivity of kittiwakes, and possibly also their population size, is regulated by food availability in the summer (Hatch; 1993).

The sea lion decline in southwestern Alaska has been chronic for the past 15 years and continues. Sea lion numbers have dropped by 63 percent in Southwestern Alaska between 1985 and 1992 (Sease et. al., 1993). Although changes in the abundances of forage fish populations are not understood as commercial groundfish surveys do not include or adequately sample many of the potential important prey species, the available data suggests that some of these forage fish species decreased in abundance from the late 1970s to the present. Capelin abundance was high in the Bering Sea in the 1970's but has since declined (NMFS, 1995).

In general, no information exists to indicate that the current level of forage fish bycatch in the Alaska groundfish fishery presents critical conservation issues. However, recent concern about the declining marine mammals and seabird populations have prompted the fishing industry to address issues that could prevent the further decline of these marine mammal and seabird species (Appendix A). Recent literature suggests that the small schooling forage fish and juvenile species of pollock, Atka mackerel and other targeted species provide a major food source to marine mammals and seabirds (see Literature cited section).

Regardless of the rationale that may explain the declines of marine populations, management measures to reduce any additional stresses have been proposed. At its September 1994 Plan Team meeting, a proposal to prohibit a directed fishery on forage fish in the waters off Alaska was submitted and reviewed by the Council staff and Plan Teams. This proposal was ranked high in priority at the Plan Team meeting. At its January 1995 meeting, the Council recommended a draft analysis on this proposal be prepared for its review.

The proposed action would identify a FFS category and prohibit a directed fishery from occurring for specified forage fish species. Rational for the proposal include: (1) lack of biological data regarding biomass, age structure or other parameters important for management of forage fish species; (2) the removal of essential food sources for groundfish, salmon, marine mammals and seabirds; (3) directed fishing for small forage fish could create significant bycatch problems for prohibited species, especially salmon; (4) presently there is no commercial fishery for FFS; (5) there are no provisions that could prevent the initiation of a directed fishery for forage fish; and (6) there is a reported recent interest in initiating directed fishing for forage fish. Furthermore, little information on forage fish biomass in conjunction with a unregulated commercial fishery could jeopardize the food resources for marine mammals and seabirds.

From 1972 to 1992 the stocks of capelin have dramatically declined in the Gulf of Alaska according to observations from both scientists and the fishing industry. Although current data from trawl surveys is not well suited for accurate biomass estimation, marine mammals and seabirds have echoed that trend in the Gulf of Alaska.

Currently, forage fish are predominately taken incidental to the Alaska groundfish trawl fisheries. The bycatch of on capelin, eulachon, Family Osmeridae, Family Myctophidae, and Pacific sandfish occur predominately in the yellowfin sole and pollock fisheries with trawl gear (Table A). The bycatch of forage fish in the commercial fisheries, however, is not the focus of this analysis. The purpose of this analysis is to protect marine mammals, seabirds, and commercially important groundfish by preventing a commercial fishery on the FFS because this species category is an important prey component in the ecosystem. Bycatch data are included to provide a recent catch history of these species.

Technically, there are three reasonable ways to prohibit a directed fishery on the FFS (Alternatives 2 through 4). With cooperative from the State of Alaska, Alaska Department of Fish and Game this Federally proposed measure could prevent a directed fishery from developing.

## **1.2 Alternatives Considered**

**1.2.1 Alternative 1: Status quo.** Alternative 1 (Status quo). Under the status quo alternative, all bycaught species of forage fish could be caught and retained as groundfish under either "other species" category TAC or as a "nonspecified species". Under this alternative a commercial fishery could develop for these species.

**1.2.2 Alternative 2:** Under Alternative 2, FMP amendments would be implemented to establish a fifth category of species or species groups that are likely to be taken in the groundfish fishery. A Forage Fish Species (FFS) category would be established in the FMPs and directed fishing on this species category would be prohibited although specified bycatch amounts could be retained.

Presently, the FMPs contain four categories of groundfish species or species groups that are likely to be taken in the groundfish fishery which are primarily grouped for allocative and economic reasons. These four categories are: (1) Prohibited species--those species and species groups the catch of which must be returned to the sea with a minimum injury; (2) Target species--those species which are commercially important; (3) Other species--those species and species groups which currently are of slight economic value and are not generally targeted upon; and (4) Nonspecified species--those species and species groups generally of no current economic value taken by the groundfish fishery in Federal waters only as incidental catch.

A fifth category, Forage Fish Species (FFS) would be established to manage and protect the FFS species which are preyed upon by marine mammals, seabirds and other commercial fish species. Directed fishing on any species in the FFS category would be prohibited and only specified bycatch amounts could be retained under the (maximum retainable bycatch amounts) directed fishing standards (1 percent of any open directed fishery).

Forage fish species would be taken from the "other species" and "nonspecified species" categories and established under a new category. The FFS category would have a maximum retainable bycatch amount that would be calculated as one percent of any basis species. A basis species is any species or species group that is open to directed fishing that the vessel is authorized to harvest. Record of forage fish would be necessary to provide additional data for scientific analysis. For the FFS category an ABC and TAC would not be estimated.

**1.2.3 Alternative 3:** Under Alternative 3, forage fish would be broken out of the "other species" category TAC<sup>2</sup> and the "non-specified species" category, and a forage fish species TAC would be annually established and maintained as bycatch only so that a directed fishery could be prohibited. Under this alternative, a TAC would be annually specified to equal 1 percent of the sum of all TACs. However, only bycatch amounts (1% of any open directed fishery) could be retained thus preventing a directed fishery. The FFS TAC category would have a maximum retainable bycatch amount that would be calculated as one percent of any basis species. A basis species is any species or species group that is open to directed fishing. This alternative would require annual regulatory maintenance in the specification process to establish the annual TAC amounts. This category could then be established as bycatch only through a FMP amendment.

**1.2.4 Alternative 4:** Under Alternative 4, forage fish would be broken out of the "other species" category TAC or the "non-specified species" and be added to the prohibited species category. Under this alternative, it would be prohibited to retain forage fish and all forage fish would have to be returned to sea with a minimum of injury. This alternative would place forage fish in a category that primarily has been established for allocative reasons that contain species that have economic importance. Currently, the forage fish have no significant economic or allocation significance.

## **2.0 NEPA REQUIREMENTS: ENVIRONMENTAL IMPACTS OF THE ALTERNATIVES**

An environmental assessment (EA) is required by the National Environmental Policy Act of 1969 (NEPA) to determine whether the action considered will result in significant impact on the human environment. The environmental analysis in the EA provides the basis for this determination and must analyze the intensity or severity of the impact of an action and the significance of an action with respect to society as a whole, the affected region and interests, and the locality. If the action is determined not to be significant based on an analysis of relevant considerations, the EA and resulting finding of no significant impact (FONSI) would be the final environmental documents required by NEPA. An environmental impact study (EIS) must be prepared for major Federal actions significantly affecting the human environment.

An EA must include a brief discussion of the need for the proposal, the alternatives considered, the environmental impacts of the proposed action and the alternatives, and a list of document preparers. The purpose and alternatives were discussed in Sections 1.1 and 1.2, and the list of preparers is in Section 8. This section contains the discussion of the environmental impacts of the alternatives including impacts on threatened and endangered species and marine mammals.

### **2.1 Environmental Impacts of the Alternatives**

The environmental impacts generally associated with fishery management actions are effects resulting from 1) harvest of fish stocks which may result in changes in food availability to predators, changes in the population structure of target fish stocks, and changes in community structure; 2) changes in the physical and biological

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<sup>2</sup> The "other species" category has an ABC and TAC estimated for the BSAI. However, the "other species" category is managed differently for the GOA. The FMP specifies that the TAC amount for the "other species" category is five percent of sum of the annual TACs for the GOA and therefore, an ABC estimation is not applicable in the GOA. The "non-specified species" category has no ABC estimated for the BSAI or GOA.

structure of the benthic environment as a result of fishing practices, e.g., effects of gear use and fish processing discards; and 3) entanglement/entrapment of non-target organisms in active or inactive fishing gear. A summary of the effects of the 1995 groundfish total allowable catch amounts on the biological environment and associated impacts on marine mammals, seabirds, and other threatened or endangered species are discussed in the final environmental assessment for the 1995 groundfish total allowable catch specifications (NMFS 1995a).

Alternatives 1 through 4 are not expected to change fishing activities in a manner that would affect the amount of groundfish harvested or the amount of FFS taken as bycatch in the Alaska fisheries. Relative to the status quo alternative, Alternatives 2 through 4 would eliminate the potential for a commercial fishery on forage fish in Federal waters under current regulations. No effect will result from Alternatives 1 through 4 on the biological or physical environment resulting from prohibiting a directed fishery on FFS. However, Alternatives 2 through 4, would prohibit the potential for a directed fishery of forage fish, which would have positive benefits to seabirds, marine mammals, groundfish and other prohibited species by preventing a commercial fishery in the future.

## 2.2 Impacts on Endangered, Threatened or Candidate Species

Listed and candidate species that may be present in the GOA and BSAI are discussed in detail in the EA/RIR/IRFAs conducted on the annual total allowable catch specifications.

The following species are currently listed under the ESA and could be present in the BSAI and GOA management areas are:

### Endangered Species

Northern right whale	<u>Balaena glacialis</u>
Sei whale	<u>Balaenoptera borealis</u>
Blue whale	<u>Balaenoptera musculus</u>
Fin whale	<u>Balaenoptera physalus</u>
Humpback whale	<u>Megaptera novaeangliae</u>
Sperm whale	<u>Pyseter macrocephalus</u>
Snake River sockeye salmon	<u>Oncorhynchus nerka</u>
Snake River fall chinook salmon	<u>Oncorhynchus tshawytscha</u>
Short-tailed albatross	<u>Diomedea albatrus</u>

### Threatened Species

Steller sea lion	<u>Eumetopias jubatus</u>
Snake River spring/summer chinook salmon	<u>Oncorhynchus tshawytscha</u>
Spectacled eider	<u>Somateria fischeri</u>

Other species that are not presently listed but that are categorized by the U.S. Fish and Wildlife Service as candidate species are as follows:

Steller's eider	<u>Polysticta stelleri</u>
Marbled murrelet	<u>Brachyramphus marmoratus</u>
Red-legged kittiwake	<u>Rissa brevirostris</u>
Kittlitz's murrelet	<u>Brachyramphus brevirostris</u>

Alternatives 1 through 4 would not affect the amount of forage fish harvested as bycatch in the Alaska groundfish fisheries. Since none of the alternatives would cause a change in current fishing practices or total harvests, adoption of any alternative will have no effect on listed species or designated critical habitat. However, Alternatives 2 through 4 would prohibit a commercial fishery on the FFS. Therefore, Alternatives 2 through 4 provide increased protection for key prey species of marine mammals, seabirds and other commercially important groundfish.

### **2.3 Impacts on Marine Mammals**

Marine mammals not listed under the Endangered Species Act that may be present in the GOA and BSAI include cetaceans, [minke whale (Balaenoptera acutorostrata), killer whale (Orcinus orca), Dall's porpoise (Phocoenoides dalli), harbor porpoise (Phocoena phocoena), Pacific white-sided dolphin (Lagenorhynchus obliquidens), and the beaked whales (e.g., Berardius bairdii and Mesoplodon spp.)] as well as pinnipeds [northern fur seals (Callorhinus ursinus), and Pacific harbor seals (Phoca vitulina)] and the sea otter (Enhydra lutris).

Alternatives 1 through 4 would not affect the amount of groundfish harvested or the amount of forage fish taken as bycatch in the Alaska groundfish fisheries. However, Alternatives 2 through 4 would prohibit a directed fishery on the FFS in the future. Therefore, Alternatives 2 through 4 provide increased protection for prey species important to many species of marine mammals.

### **2.4 Coastal Zone Management Act**

Implementation of each of the alternatives considered would be conducted in a manner consistent, to the maximum extent practicable, with the Alaska Coastal Management Program within the meaning of Section 30(c)(1) of the Coastal Zone Management Act of 1972 and its implementing regulations.

### **2.5 Conclusions or Finding of No Significant Impact**

None of the alternatives is likely to significantly affect the quality of the human environment, and the preparation of an environmental impact statement for the proposed action is not required by Section 102(2)(C) of the National Environmental Policy Act or its implementing regulations.

## **3.0 REGULATORY IMPACT REVIEW: ECONOMIC AND SOCIOECONOMIC IMPACTS OF THE ALTERNATIVES**

This section provides information about the economic and socioeconomic impacts of the alternatives including identification of the individuals or groups that may be affected by the action, the nature of these impacts, quantification of the economic impacts if possible, and discussion of the trade offs between qualitative and quantitative benefits and costs.

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 nevertheless essential to consider. Further, in choosing among alternative regulatory approaches, agencies should select those approaches that maximize net benefits

(including potential economic, environment, public health and safety, and other advantages; distributive impacts; and equity), unless a statute requires another regulatory approach.

Executive Order 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:

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

A regulatory program is "economically significant" if it is likely to result in the effects described above. The RIR is designed to provide information to determine whether the proposed regulation is likely to be "economically significant."

A brief discussion of potential costs and benefits of this action is provided for purposes of assessing the alternatives considered.

The total burden to the Alaska fishing industry resulting from prohibiting a fishery on the FFS species (Alternatives 2 through 4) would be minimal because only 3 vessels have reported targeting any species in this proposed category in any given year since 1984, no annual commercial fishery has been established, available data from ADF&G is patchy and market availability for capelin varies. Under Alternatives 2 through 4, a limited impact on an average of 2 vessels per year could occur.

The only known directed fishery and commercial sale of any of the species of fish in the FFS category was for capelin. From 1984 through 1994, a maximum of three vessels per year harvested capelin commercially. The commercial harvest of capelin usually occurs directly after or during the herring season and is dependent on the buyers availability to market capelin products. During this period, a minimum of 1 mt of capelin was harvested in 1994 and a maximum of 1,321 mt were landed (489 mt sorted) in 1984. Roe bearing females are sorted from the entire landing.

The capelin fishery is experimental and efforts to develop a commercial interest in this fishery are slow. This is largely due to the industry's present market interest which is focused on herring roe and salmon at the time when the capelin fishery is most viable. If a capelin fishery could be successfully developed the price of capelin roe could be comparable to herring roe prices. The capelin biomass, however, would most likely remain sporadic.

Since the capelin fishery largely occurs in the State of Alaska's waters, it would be desirable for the State to prohibit a directed fishery on the forage fish species defined in this analysis if appropriate. Potential costs to individuals that target forage fish are anticipated to be insignificant. The ex-vessel price for capelin is 6 dollar per pound roe bearing females caught in 1993 and 1994, and 20 cents per pound for capelin processed as bait or used as meal to feed zoo animals.

The maximum cost to the industry cannot be determined at this time, however, because of industries limited interest, the sporadic availability of capelin, and low catch amounts which result in a poorly developed commercial fishery. The costs of Alternative 2 through 4, therefore, are less than 5 percent of the gross annual receipts of the catcher vessels. The impacts under Alternatives 2 through 4 are not anticipated to result in a significant economic impact on a substantial number of small entities under the Regulatory Flexibility Act. None of the alternatives considered is expected to result in a "significant regulatory action" as defined in E.O. 12866.

Although benefits to marine mammals, seabirds, and commercially important groundfish species under Alternatives 2 through 4 cannot be quantified, it was hypothesized that eliminating the potential for a future fishery increases the likelihood of food availability and could potentially help diminish the declining trend of these species. Alternative 2 best provides the protection needed for marine species with the least amount of impact to the fishing industry, enforcement, and fishery management. Alternatives 3 and 4, however, would accomplish the same goal but not without some additional costs to the fishing industry, enforcement and fishery managers.

### **3.1 Reporting Costs**

Additional reporting costs or burden would entail the recordkeeping for three additional species that were formerly included in the "nonspecified species" category for which no records were previously necessary. Nonspecified species are defined under the FMP as any species not listed under prohibited, targeted, or the "other" species category.

### **3.2 Administrative, Enforcement and Information Costs**

NMFS would not require additional staff personnel to administer, monitor, and enforce Alternatives 1 through 4 of this action. However, additional staff time and resources would be required. The least amount of additional resources and staff time would be required under Alternatives 1 and 2. Alternatives 3 and 4 would cause a larger increase in resources in terms of administrative, enforcement and information costs relative to Alternative 2. Alternatives 3 and 4 are more burdensome because they require additional administrative and enforcement costs compare to Alternative 2.

## **4.0 ECONOMIC IMPACT ON SMALL ENTITIES**

The objective of the Regulatory Flexibility Act is to require consideration of the capacity of those affected by regulations to bear the direct and indirect costs of regulation. If an action will have a significant impact on a substantial number of small entities an Initial Regulatory Flexibility Analysis (IRFA) must be prepared to identify the need for the action, alternatives, potential costs and benefits of the action, the distribution of these impacts, and a determination of net benefits.

NMFS has defined all fish-harvesting or hatchery businesses that are independently owned and operated, not dominant in their field of operation, with annual receipts not in excess of \$2,000,000 as small businesses. In addition, seafood processors with 500 employees or fewer, wholesale industry members with 100 employees or fewer, not-for-profit enterprises, and government jurisdictions with a population of 50,000 or less are considered small entities. A "substantial number" of small entities would generally be 20% of the total universe of small entities affected by the regulation. A regulation would have a "significant impact" on these small entities if it reduced annual gross revenues by more than 5 percent, increased total costs of production by more than 5 percent, or resulted in compliance costs for small entities that are at least 10 percent higher than compliance costs as a percent of sales for large entities.



If an action is determined to affect a substantial number of small entities, the analysis must include:

- (1) a description and estimate of the number of small entities and total number of entities in a particular affected sector, and total number of small entities affected; and
- (2) analysis of economic impact on small entities, including direct and indirect compliance costs, burden of completing paperwork or recordkeeping requirements, effect on the competitive position of small entities, effect on the small entity's cashflow and liquidity, and ability of small entities to remain in the market.

The catch of capelin in the years 1993 and 1994 was low because the biomass was low for those years. Therefore, the potential for a small vessel to have demonstrated a history of catch for those years may not be represented due to the reduced strength of the return. Some vessels claim to be interested in pursuing the capelin fishery as these fish have a short life history (3 years) and are removed from the forage fish biomass anyhow. However, the productivity (spawning cycle) would be compromised if a directed fishery was authorized by the State of Alaska. These vessels claim to have the capacity to handle 500 to 600 tons of capelin if select fish had been available in quantities.

Documented capelin harvests in the Togiak district are:

Year	Dates	# Vessels	Sorted Weight	Landed Weight
1984	5/23-5/31	n/a	489	1,321
1986	5/17-5/22	38	88	139
1993	5/14-5/16	2	n/a	31
1994	6/4	1	n/a	2

The total burden to the Alaska fishing industry resulting from prohibiting a fishery on the FFS species (Alternatives 2 through 4) would be minimal because only 3 vessels have reported targeting any species in this proposed category in any given year since 1984, no annual commercial fishery has been established, available data from ADF&G is patchy and market availability for capelin varies. Under Alternatives 2 through 4, a limited impact on an average of 2 vessels per year could occur.

The only known directed fishery and commercial sale of any of the species of fish in the FFS category was for capelin. From 1984 through 1994, a maximum of three vessels per year harvested capelin commercially. The commercial harvest of capelin usually occurs directly after or during the herring season and is dependent on the buyers availability to market capelin products. During this period, a minimum of 1 mt of capelin was harvested in 1994 and a maximum of 1,321 mt were landed (489 mt sorted) in 1984. Roe bearing females are sorted from the entire landing.

The capelin fishery is experimental and efforts to develop a commercial interest in this fishery are slow. This is largely due to the industry's present market interest which is focused on herring roe and salmon at the time when the capelin fishery is most viable. If a capelin fishery could be successfully developed the price of capelin roe could be comparable to herring roe prices.

Since the capelin fishery largely occurs in the State of Alaska's waters, it would be desirable for the State to prohibit a directed fishery on the forage fish species defined in this analysis if appropriate. Potential costs to individuals that target forage fish are anticipated to be insignificant. The ex-vessel price for capelin is 6 dollar per pound roe bearing females caught in 1993 and 1994, and 20 cents per pound for capelin processed as bait or used as meal to feed zoo animals.

The maximum cost to the industry cannot be determined at this time, however, because of industries limited interest, the sporadic availability of capelin, and low catch amounts which result in a poorly developed commercial fishery. The costs of Alternative 2 through 4, therefore, are less than 5 percent of the gross annual receipts of the catcher vessels. The impacts under Alternatives 2 through 4 are not anticipated to result in a significant economic impact on a substantial number of small entities under the Regulatory Flexibility Act. None of the alternatives considered is expected to result in a "significant regulatory action" as defined in E.O. 12866.

In addition, the estimated cost of Alternatives 2 through 4 are difficult to estimate because it is unknown whether the State will prohibit a directed fishery on capelin and whether market interest for capelin will successfully develop for Alaskan species.

## 5.0 SUMMARY AND CONCLUSIONS

The proposed action would prohibit a directed fishery on the FFS. The purpose of this action is to protect species that have little economic importance commercially but are essential components in the ecosystem because they provide food transfers to marine mammals, seabirds and other commercially important groundfish species and therefore are of biological importance to predators reliant on the FFS. Alternatives 1 through 4 are not expected to change fishing activities in a manner that would affect the amount of groundfish harvested or the amount of forage fish taken as bycatch in the Alaska trawl fisheries. The purpose of this measure would be to prevent a future directed fishery on the forage fish species stocks. For the purpose of this analysis forage fish are defined as capelin, eulachon, Family Osmeridae, Family Myctophidae, Sandlance (*Ammodytes* sp.), Family Bathylagidae and Pacific sandfish.

Initial analyses indicates that the effects of the alternatives are not likely to change fishing activities, however, the effects of the alternatives on the Councils intent with regard to reducing discard are more fully met under Alternative 2.

Alternative 2 partially fulfills industry's desire to prohibit a directed fishery while fulfilling the Councils policy to address minimizing discards by authorizing the retention of FFS at a maximum retainable bycatch of 1 percent of any open directed fishery under the directed fishing standards. Alternative 2 fulfills the concerns that the ecosystem may require additional protection of these food sources that may be necessary and provide integral food resources to marine mammals, sea birds and other commercial fish populations. In addition, enforcement concerns are minimalized under Alternative 2 compared to Alternative 4, which would require immediate sorting and the return to sea with the minimum injury for a species category that experiences nearly 100 percent mortality and is of minor economic importance. The governments annual regulatory burden of addressing ABC, TAC, and bycatch amounts for forage fish under the annual specification process would be alleviated under Alternative 2 compared to Alternative 3. Alternative 2 accomplishes the proposed amendments intent while fulfilling FMP and Magnuson Act goals with regard to reduction of discards with the least impact to the industry, ecosystem and government.

Under Alternative 2, the establishment of a fifth category entitled Forage Fish Species, would protect a species group that currently has little economic value but has considerable importance to seabirds, marine mammals and commercially important fish species. The other four categories of groundfish species or species groups that are likely to be taken in the groundfish fishery are primarily grouped for allocative and economic reasons. The establishment of a fifth category would benefit the environment and add protection to seabirds, marine mammals and other commercially important groundfish species and provide a category in the FMPs that is biologically based. This category contains species that may disrupt the food chain for marine mammals, seabirds and other commercial fish species. The purpose of this measure would be to protect these species which are important to the ecosystem and many of which have declining stocks.

Alternatives 1 through 4 would not be expected to change fishing activities in a manner that would affect the amount of groundfish harvested or the amount of forage fish taken as bycatch in the Alaska trawl fisheries. Alternative 2 would however, eliminate the possibility of a directed fishery on forage fish with a minimum regulatory impact. None of the alternatives are likely to significantly affect the quality of the human environment, and the preparation of an environmental impact statement for the proposed action is not required by Section 102(2)(C) of the National Environmental Policy Act or its implementing regulations.

The total burden to the Alaska fishing industry resulting from prohibiting a fishery on the FFS species (Alternatives 2 through 4) would be minimal because only 3 vessels have reported targeting any species in this proposed category in any given year since 1984, no annual commercial fishery has been established, available data from ADF&G is patchy and market availability for capelin varies. Under Alternatives 2 through 4, a limited impact on an average of 2 vessels per year could occur.

The maximum cost to the industry cannot be determined at this time, however, because of industries limited interest, the sporadic availability of capelin, and low catch amounts which result in a poorly developed commercial fishery. The costs of Alternative 2 through 4, therefore, are less than 5 percent of the gross annual receipts of the catcher vessels. The impacts under Alternatives 2 through 4 are not anticipated to result in a significant economic impact on a substantial number of small entities under the Regulatory Flexibility Act.

None of the alternatives considered is expected to result in a "significant regulatory action" as defined in E.O. 12866. The impacts under Alternative 2 through 4 therefore, are not anticipated to result in a significant economic impact on a substantial number of small entities under the Regulatory Flexibility Act.

Finally, it would be necessary for the State of Alaska to prohibit a directed fishery on forage fish species in order for this measure to be effective, because most spawning occurs in the nearshore waters that are under State jurisdiction.

## **6.0 REFERENCES**

ADFG. 1993 Annual Management Report for Bristol Bay Area. Regional Information Report 2A94-01 ADFG Anchorage Regional Office 333 Raspberry Road, Anchorage AK 99518-1599

Castellini, Michael. 1993 Report of the Marine Mammal Working Group. Is it Food? Addressing Marine Mammal and Seabird Declines. Workshop Summary. Alaska Sea Grant Report 93-01.

Hamre, Johannes. 1992. Interrelation Between Environmental Changes and Fluctuating Fish Populations in the Barents Sea.

Institute of Marine Research, P.O. Box 1870, N-5024 Bergen-Nordnas, Norway.

Hatch, Scott A. 1993. Population Dynamics and Breeding Ecology of Kittiwakes in the Bering Sea - Review and Proposal. U.S. Fish and Wildlife Service, 1011 East Tudor, Anchorage, Alaska, 99503

International Council for the Exploration at Sea. 1994. Report of the Working Group of Ecosystem Effects of Fishing Activities. Copenhagen, Denmark.

National Marine Fisheries Service (NMFS). 1995. Final environmental assessment for 1995 Groundfish Total Allowable Catch Specifications. NMFS, P.O. Box 21668, Juneau, AK 99802-1668

National Marine Fisheries Service (NMFS). 1994b. Biological opinion on the effects of the North Pacific Groundfish Fisheries on Salmon. January 19, 1994. 28 p.

National Marine Fishery Service (NMFS). 1995. Draft Status Review of the United States Steller Sea Lion (*Eumetopias jubatus*). July 1995. NMML. Alaska Fisheries Science Center, NMFS, NOAA, 7600 Sand Point Way NE, Seattle, WA 98115-0070/

Pahlke, Keith. 1985 Preliminary Studies of Capelin (*Mallotus villosus*) in Alaskan Waters. Informational Leaflet No. 250. State of Alaska, Department of Fish and Game, P.O. Box 3-2000, Juneau, Alaska 99802.

Sease, J.L., J.P. Lewis, D.C. McAllister, R.L. Merrick, S.M. Mellows. 1993. Aerial and Ship-based Surveys of Steller Sea Lions (*Eumetopias jubatus*) in Southeast Alaska, the Gulf of Alaska and Aleutian Island during June and July 1992. Department of Commerce, NOAA, Technical Memorandum NMFS AFSC-17, 57pp.

7.0 Tables A-D

Table A. Trends in numbers of Pribilof fur seals, Steller sea lions, and harbor seals in parts of the Gulf of Alaska and Bering Sea.

Year	Pribilof fur seal <sup>1</sup>	Steller sea lion <sup>2</sup>	Harbor seal <sup>3</sup>
1950	451,000		
1955	461,000		
1960	320,000	140,115	
1965	253,768		
1970	230,485		
1975	278,261	103,976	
1976	298,000		6,919
1977	235,200		6,617
1978	247,100		4,839
1979	245,932		3,836
1980	203,825		
1981	179,444		
1982	203,581		1,575
1983	165,941		
1984	173,274		1,390
1985	182,258	67,617	
1986	167,656		1,270
1987	171,422		
1988	202,300		1,014
1989	171,530	24,953	
1990	201,310	27,860	960

<sup>1</sup>Number of pups born at St. Paul Island; from York and Kozloff (1987) and NMFS (unpublished data).

<sup>2</sup>Index counts of adults and juveniles on rookeries and haulouts from the Kenai Peninsula to Kiska Island; from Loughlin et al. (1990) and Merrick et al. (1987, 1991).

<sup>3</sup>Mean counts of seals hauled out on Tugidak Island during the fall molt; from Pitcher (1990) and ADF&G (unpublished data).

**Table B. Importance of various prey in the diets of Pribilof fur seals, Steller sea lions, and harbor seals the Gulf of Alaska and Bering Sea.**

<b>Ranking</b>	<b>Pribilof fur seal<sup>1</sup></b>	<b>Steller sea lion<sup>2</sup></b>	<b>Harbor seal<sup>3</sup></b>
1	Squids (33.3)	Pollock (58.3)	Pollock (21.4)
2	Capelin (30.6)	Squids (4.2)	Octopus (18.3)
3	Pollock (25.1)	Herring (20.6)	Capelin (10.4)
4	Atka mackerel (3.5)	Capelin (7.4)	Eulachon (11.6)
5	Herring (2.9)	Pacific cod (0.9)	Herring (6.4)
6	Bathylagidae (2.9)	Salmon (5.1)	Pacific cod (3.2)
7	Salmon (1.1)	Octopus (<0.1)	Shrimps (3.3)
8	Flatfishes (0.6)	Sculpins (1.3)	Flatfishes (2.6)
9	Sablefish (0.2)	Flatfishes (0.3)	Salmon (4.4)
10	Sand lance (0.2)	Rockfishes (0.8)	Squids (1.6)

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<sup>1</sup>Rankings based on modified volume, numbers in parentheses are modified volumes; from Perez and Bigg (1991).

<sup>2</sup>Rankings based on combination rank index, numbers in parentheses are percent of total sample volume; from Pitcher (1981).

<sup>3</sup>Rankings based on modified index of relative importance, numbers in parentheses are percent of total sample volume; from Pitcher (1980).

**Table C. Estimated Osmerid catches by gear type in the Gulf of Alaska from 1990 - 1993 (mt).**

<b>I. 1990 GOA Other Species Bycatch By Fishery and Gear</b>		
<b>Fishery</b>	<b>Gear</b>	<b>Smelts (mt)</b>
Arrowtooth	TWL	0.1
Bottom Pollock	HAL	-
	TWL	21.9
Cod	HAL	0.2
	POT	3.9
	TWL	6.8
Deepwater Flatfish	TWL	-
Other	TWL	-
Pelagic Pollock	TWL	27.8
Rockfish	HAL	0.2
	TWL	66.0
Sablefish	HAL	0.3
	TWL	0.0
Shallow flatfish	TWL	0.0
<b>Gulf of Alaska Total</b>		<b>127.2</b>

<b>II. 1991 GOA Other Species Bycatch By Fishery and Gear</b>		
<b>Fishery</b>	<b>Gear</b>	<b>Smelts (mt)</b>
Arrowtooth	TWL	1.3
Bottom Pollock	TWL	5.9
Cod	HAL	-
	POT	1.0
	TWL	16.6
Deepwater Flatfish	TWL	-
Other	TWL	-
Pelagic Pollock	TWL	13.3
Rockfish	HAL	-
	TWL	126.6
Sablefish	HAL	0.1
	TWL	-
Shallow flatfish	TWL	0.4
<b>Gulf of Alaska Total</b>		<b>165.2</b>



**III. 1992 GOA Other Species Bycatch By Fishery and Gear**

<b>Fishery</b>	<b>Gear</b>	<b>Smelts (mt)</b>
Arrowtooth	HAL TWL	- 0.1
Bottom Pollock	HAL TWL	- 155.8
Cod	HAL POT TWL	109.4 15.2 5.6
Deepwater Flatfish	TWL	-
Other	TWL	-
Pelagic Pollock	TWL	71.9
Rockfish	HAL TWL	2.9 164.7
Sablefish	HAL	2.2
Shallow flatfish	HAL TWL	- 2.9
<b>Gulf of Alaska Total</b>		<b>530.7</b>

<b>IV. 1993 GOA Other Species Bycatch By Fishery and Gear</b>		
<b>Fishery</b>	<b>Gear</b>	<b>Smelts (mt)</b>
Arrowtooth	HAL	-
	TWL	2.1
Bottom Pollock	TWL	110.9
Cod	HAL	14.2
	POT	24.1
	TWL	18.3
Deepwater Flatfish	TWL	-
Other	TWL	-
Pelagic Pollock	TWL	13.2
Rockfish	HAL	3.0
	TWL	108.7
Sablefish	HAL	6.1
	TWL	0.1
Shallow flatfish	TWL	7.9
<b>Gulf of Alaska Total</b>		<b>308.6</b>

**Table D. Estimated Osmerid catches by gear type in the Bering Sea and Aleutian Islands from 1990 - 1993**

<b>I. 1990 BSAI by Target Species Fishery and Gear</b>		
<b>Fishery</b>	<b>Gear</b>	<b>Smelts (mt)</b>
Arrowtooth	TRW	-
Atka mackerel	TRW	-
Bottom Pollock	TRW	0.3
Cod	HAL	-
	POT	-
	TRW	0.0
Other Flatfish	TRW	-
Pelagic Pollock	TRW	0.9
Rockfish	HAL	-
	TRW	0.4
Rock sole	TRW	-
Sablefish	HAL	-
	TRW	0.1
Greenland turbot	HAL	-
	TRW	0.1
Yellowfin sole	TRW	30.0
<b>BSAI Total</b>		<b>31.8</b>

<b>II. 1991 BSAI by Target Species Fishery and Gear</b>		
<b>Fishery</b>	<b>Gear</b>	<b>Smelts (mt)</b>
Arrowtooth	HAL TRW	- 0.2
Atka mackerel	TRW	-
Bottom Pollock	TRW	2.8
Cod	HAL POT TRW	- - 0.4
Other Flatfish	TRW	-
Pelagic Pollock	TRW	57.2
Rockfish	HAL TRW	- 0.1
Rock sole	TRW	1.5
Sablefish	HAL TRW	- -
Yellowfin sole	TRW	229.9
<b>BSAI Total</b>		<b>292.1</b>

<b>III. 1992 BSAI by Target Species Fishery and Gear</b>		
<b>Fishery</b>	<b>Gear</b>	<b>Smelts (mt)</b>
Arrowtooth	TRW	-
Atka mackerel	TRW	0.1
Bottom Pollock	TRW	5.8
Cod	HAL POT TRW	- - -
Other Flatfish	TRW	-
Pelagic Pollock	TRW	97.4
Rockfish	HAL TRW	- -
Rock sole	TRW	0.2
Sablefish	HAL	-
Greenland turbot	HAL	-
Yellowfin sole	TRW	188.0
<b>Gulf of Alaska Total</b>		<b>291.5</b>

<b>IV. 1993 BSAI by Target Species Fishery and Gear</b>		
<b>Fishery</b>	<b>Gear</b>	<b>Smelts (mt)</b>
Arrowtooth	HAL TRW	- -
Atka mackerel	TRW	-
Bottom Pollock	TRW	0.6
Cod	HAL POT TRW	0.1 - 0.0
Pelagic Pollock	TRW	9.8
Rockfish	HAL TRW	- -
Rock sole	TRW	0.8
Sablefish	HAL TRW	- -
Greenland turbot	HAL TRW	- -
Yellowfin sole	TRW	117.5
<b>BSAI Total</b>		<b>128.8</b>

## **8.0 LIST OF PREPARERS**

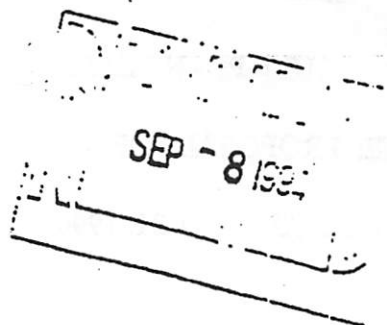
Ellen R. Varosi and Rebecca Campbell  
National Marine Fisheries Service  
Alaska Regional Office  
P.O. Box 21668  
Juneau, Alaska 99802-1668

## **9.0 AGENCIES AND INDIVIDUALS CONSULTED**

Lowell Fritz  
National Marine Fisheries Service  
Alaska Fisheries Science Center  
7600 Sand Point Way N.E.  
Building 4  
Seattle, Washington 98115

Herman Savikko  
Alaska Department of Fish and Game  
Commercial Fisheries Management and Development Division  
P.O. Box 25526  
Juneau, AK 99802-5526

## APPENDIX A



September 7, 1994

Richard Lauber  
Chairman, NPFMC  
605 West 4th Avenue  
Anchorage, AK 99501

Dear Mr. Lauber,

I am writing to ask for Council consideration of a proposal to ban fishing for capelin, sand lance and other forage fish in the waters off Alaska.

Unlike the North Atlantic, the Northeast Pacific does not have large-scale fish meal production from fishing on capelin and other small forage fish. This may be a contributing factor to why groundfish stocks in the North Pacific have been sustained at higher levels than in the North Atlantic.

I have heard reports of interest expressed in capelin meal fishing or fishing for roe-bearing capelin. There are numerous reasons why this type of fishing should not be allowed including the following:

- 1) There is currently no directed fishing for small forage fish (capelin, sand lance, etc.) in the waters under the jurisdiction of the North Pacific Fishery Management Council.
- 2) Directed fishing for small forage fish could remove important food sources for groundfish, salmon, marine birds, and marine mammals.
- 3) Directed fishing for small forage fish could create significant bycatch problems for prohibited species, especially salmon.
- 4) There is no tool available to the Council at present to prevent the initiation of directed fishing for small forage fish.
- 5) There is reported recent interest in initiating directed fishing for small forage fish; and
- 6) There are no biological data regarding biomass, age structure or other parameters important for management.

Long John Silver's  
Restaurants, Inc.  
101 Jernico Drive  
P.O. Box 11988  
Lexington, KY 40579

Direct Line:  
606.263.6000  
Fax Line:  
606.263.6145

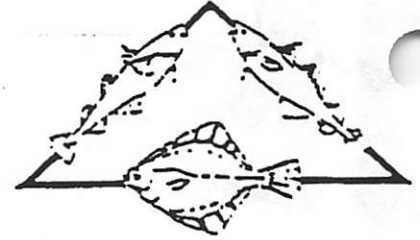


# Salmon Data Bank

TO: GULF PLAN TEAM

RE: PROPOSAL FOR REGULATORY CHANGE

DATE: AUGUST 31, 1994



The following proposal is being prepared for submission to the North Pacific Fishery Management Council. It will most probably be sent in by someone other than myself, but in the interest of receiving Plan Team comments I am presenting it to the Plan Team at the August meeting.

Chris Blackburn

## PROPOSAL TO PROHIBIT COMMERCIAL FISHING ON CAPELIN EXCEPT UNDER A SPECIAL PERMIT WHEN DATA NEEDS ARE MET

This proposal calls for the NPFMC to prohibit any commercial fishery on capelin. However, the proposal does provide for a limited fishery to occur under a special permit if

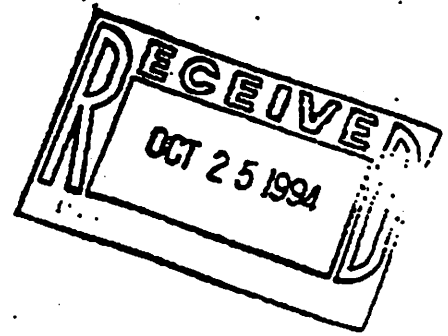
1. The biomass of capelin in the area where the fishery is to occur is known and
2. The regional director, in consultation with the Council, finds the proposed fishery does not jeopardize marine mammals or marine birds or fish which feed on capelin and
3. The fishery is carefully monitored and scientific data collected.

Currently capelin is a species under the "other species" category and a large scale roe fishery could occur, as it does in the North Atlantic, without any notification to the Council or NMFS.

Considering the apparent importance of capelin in the diet of marine birds, mammals and commercial fish species and the growing efforts to consider the ecosystem in management decisions, we feel it is important to prevent a capelin fishery from starting. The provisions for a special permit were added to allow flexibility in the future should the status of capelin, the marine environment and/or scientific knowledge change.

October 24, 1994

North Pacific Fisheries Management Council  
605 West 4th Ave  
Anchorage, AK 99501



Dear Council Members:


I wish to comment on items 5 and 6 which have been assigned to Staff Tasking. Both seek to ban directed fishing for capelin in Alaska waters.

Large concentrations of capelin have spawned on the beaches of Bristol Bay, especially in the Port Mollar and Togiak districts. Abundance varies greatly from year to year. Small scale fisheries for roe capelin have been conducted at various times since 1979. I have personally been involved in those fisheries, most recently in 1993 and 1994 at Togiak with T-NP, a joint venture partnership. Biomass in those years was not as great as we have seen in the past and production was negligible due to fish size and male/female ratio requirements. However, we were prepared to handle 5-600 tons of roe capelin had the proper fish been available. For 1995 T-NP expects to be capable of handling at least that amount for roe, bait and zoo food markets.

During the years of strong capelin showing, the biomass has been estimated as high as 500,000 tons at Togiak alone. The literature suggests that virtually all capelin die after spawning. Our small fishery takes place just prior to spawning. These fish are already essentially removed from the forage fish biomass in the Bering Sea and will not be returning.

Our domestic inshore capelin fishery poses little threat to the Bering Sea forage fish biomass and provides an opportunity for small boat fishermen to pursue their livelihoods.

Sincerely,

  
Emil "Beaver" Nelson  
Box 130, Homer, AK 99603  
907-235-8778