UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
1335 East-West Highway
Silver Spring, MD 20910
THE DIRECTOR

APR 23 1997

To All Interested Government Agencies and Public Croups:

Under the National Environmental Policy Act, an environmental review has been performed on the following action.

TITLE: Environmental Assessment of a Final Rule to Implement Requirements for Seabird Bycatch Avoidance Devices in the Hook-and-Line Groundfish Fisheries off Alaska

LOCATION: Exclusive Economic Zone of the Bering Sea and Aleutian Islands and the Gulf of Alaska

SUMMARY: The final rule requires operators of hook-and-line vessels fishing for groundfish in the Bering Sea and Aleutian Islands management area and the Gulf of Alaska to conduct fishing operations in a specified manner and to employ specified bird avoidance techniques to reduce seabird bycatch and incidental seabird mortality. The action is necessary to mitigate hook-and-line fishery interactions with the short-tailed albatross, an endangered species protected under the Endangered Species Act, and other species.

RESPONSIBLE OFFICIAL: Steven Pennoyer
Regional Administrator
Alaska Region
National Marine Fisheries Service
709 West 9th Street
Juneau, AK 99801
Phone: 907-586-7221

The environmental review process led us to conclude that this action will not have a significant impact on the environment. Therefore, an environmental impact statement was not prepared. A copy of the finding of no significant impact, including the environmental assessment, is enclosed for your information. Also, please send one copy of your comments to me in Room 5805, OP/SP. U.S. Department of Commerce, Washington, D.C. 20230.

Sincerely,

Donna Wieting

Donna Wieting
Acting Director, Office of Ecology and Conservation

Enclosure

THE ASSISTANT ADMINISTRATOR FOR FISHERIES

ENVIRONMENTAL ASSESSMENT/REGULATORY IMPACT REVIEW/ FINAL REGULATORY FLEXIBILITY ANALYSIS

FOR A REGULATORY AMENDMENT TO REDUCE THE INCIDENTAL SEABIRD MORTALITY IN GROUNDFISH HOOK-AND-LINE FISHERIES OFF ALASKA

Prepared by

National Marine Fisheries Service
Alaska Regional Office

April 4, 1997

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Executive Summary

In early November 1996, several industry groups representing hook-and-line vessels in the Gulf of Alaska (GOA) and the Bering Sea/Aleutian Islands (BSAI) petitioned the North Pacific Fishery Management Council (Council) and the National Marine Fisheries Service (NMFS) to impose regulatory measures that are intended to reduce the incidental mortality of seabirds in their fisheries. This action was motivated by recent takes (two in 1995 and one in 1996) of the short-tailed albatross (*Diomedea albatrus),* a listed species under the Endangered Species Act (ESA). Pursuant to the ESA, the short-tailed albatross is afforded certain protections that are outlined in the section 7 consultation with the U.S. Fish & Wildlife Service (USFWS) regarding the GOA and BSAI groundfish fisheries.

Millions of birds, representing over 80 species, occur over waters of the EEZ off Alaska. The presence of "free" food in the form of offal and bait attract many birds to fishing operations. In the process of feeding, birds sometimes come into contact with fishing gear and are accidentally killed. For example, most birds taken during hook-and-line operations are attracted to the baited hooks when the gear is being set. These birds become hooked at the surface, and are then dragged underwater where they drown. The probability of a bird being caught is a function of many interrelated factors including: Type of fishing operation and gear used; length of time fishing gear is at or near the surface of the water; behavior of the bird (feeding and foraging techniques); water and weather conditions (e.g., sea state); size of the bird; availability of food (including bait and offal); and physical condition of the bird (molt, migration, health). Almost any species which occurs in these waters is susceptible to interactions with fishing gear, although a few species are especially vulnerable.

The industry-proposed measures are modeled, in part, after NMFS' regulations implementing conservation measures adopted by the Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR) (61 FR 8483, March 5, 1996) to reduce the incidental mortality of seabirds in the longline fisheries in Antarctic waters. Effective mitigation measures would reduce the incidental mortality of seabirds during longline fishing by minimizing the seabirds' attraction to fishing vessels and by preventing the seabirds from attempting to seize baited hooks, particularly during the period when the lines are set.

This Environmental Assessment/Regulatory Impact Review/Final Regulatory Flexibility Analysis (EA/RIR/FRFA) addresses regulatory measures intended to reduce seabird bycatch and incidental mortality in the hook-and-line fisheries off Alaska. The alternatives and options are as follows:

> **Alternative 1:** Status quo, no action. Any gear modifications, seabird avoidance devices, or changes in fishing methods intended to reduce the incidental mortality of seabirds would continue to be voluntary.
>
> **Alternative 2 (preferred):** Gear modifications, seabird avoidance devices, or changes in fishing methods designed to reduce the incidental mortality of seabirds would be required in regulation. The measures would apply to vessels fishing for groundfish with hook-and-line gear in the GOA and the BSAI, and Federally-permitted vessels fishing groundfish with hook-and-line gear in waters of the State of Alaska that are adjacent to the GOA and the BSAI, and that retain more round-weight equivalent of groundfish than round-weight equivalent of halibut.

1. All applicable hook-and-line fishing operations would be conducted in the following manner:

a. Use hooks that when baited, sink as soon as they are put in the water. This could be accomplished by the use of weighted groundlines and/or thawed bait.

b. Any discharge of offal from a vessel must occur in a manner that distracts seabirds, to the extent practicable, from baited hooks while gear is being set or hauled. The discharge site onboard a vessel must either be aft of the hauling station or on the opposite side of the vessel from the hauling station.

c. Make every reasonable effort to ensure that birds brought on board alive are released alive and that wherever possible, hooks are removed without jeopardizing the life of the bird.

2. All applicable hook-and-line fishing operations would be required to employ one or more of the following seabird avoidance measures:

a. Set gear between hours of nautical twilight (as specified in regulation) using only the minimum vessel's lights necessary for safety;

b. Tow a streamer line or lines during deployment of gear to prevent birds from taking hooks;

c. Tow a buoy, board, stick or other device during deployment of gear at a distance appropriate to prevent birds from taking hooks. Multiple devices may be employed; or

d. Deploy hooks underwater through a lining tube at a depth sufficient to prevent birds from settling on hooks during deployment of gear.

The required measures to reduce the incidental mortality of seabirds would be applicable to vessels using hook-and-line gear in:

Option 1: BSAI groundfish fisheries.

Option 2: Both the GOA and BSAI groundfish fisheries.

Option 3 **(preferred)**: Both the GOA and BSAI groundfish fisheries and the halibut fishery. Rulemaking to require seabird avoidance measures would be initiated separately for the halibut fishery to provide the IPHC opportunity to review the proposed measures.

Under the required ESA section 7 consultation on the 1997 GOA and BSAI groundfish fisheries, the USFWS anticipates that four short-tailed albatrosses could be taken in 1997 and 1998. If the 2-year take exceeds four, NMFS must immediately reinitiate section 7 consultation and review with USFWS the need for possible modification of the reasonable and prudent measures established to minimize take of the short-tailed albatross. Fishing operations may be altered and closures imposed through reinitiation and conclusion of the section 7 consultation.

If the 2-year take of short-tailed albatross exceeded four under either alternative, the actual economic impacts resulting from the modification of the reasonable and prudent measures established to minimize take of the short-tailed albatross would depend upon the revised measures. It could range

from measures proposed under Alternative 2 to a cessation of fishing operations. The economic impact of closures would depend upon the length of time of the closed period.

The measures required of all applicable vessels under number 1 of Alternative 2 would be expected to be of minimal or no cost. Procedural or operational changes may be required in fishing operations.

In 1995, 1,217 and 100 hook-and-line catcher vessels caught groundfish from the GOA and BSAI, respectively. Catcher/processors numbered 35 and 46 in those respective areas. Under Alternative 2, the economic impact on small entities would depend upon the option exercised (BSAI only or BSAI and GOA) and the particular measures chosen. A vessel operator would have a choice of several measures. Smaller vessels (< 100 ft (30.5 m)) may find the cost of a lining tube to be prohibitive (approximately $35,000 per vessel). Hook-and-line catcher vessels $\geq$ 60 ft (18.3 m) numbered 154 and 53 in the GOA and BSAI, respectively; the $\geq$ 60 ft (18.3 m) catcher/processors numbered 31 and 45. The other seabird bycatch avoidance devices (buoys, bird streamer lines) ranged from $50-$250 per vessel.

At its December 1996 meeting, the Council voted unanimously to recommend that all hook-and-line vessels fishing for groundfish in the GOA and BSAI must use certain seabird bycatch avoidance devices intended to reduce the incidental mortality of the short-tailed albatross and other seabird species. At its April 1997 meeting, the Council is scheduled to take action to expand these or similar measures to the Pacific halibut fishery in convention waters off Alaska. Rulemaking to require seabird avoidance measures will be initiated separately for the halibut fishery.

A proposed rule that would implement Alternative 2, Option 3 was published in the Federal Register on March 5, 1997 (62 FR 10016).

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 Groundfish of the Gulf of Alaska and the Fishery Management Plan for the Groundfish Fisheries of the Bering Sea and Aleutian Islands Area. Both fishery management plans (FMPs) were developed by the North Pacific Fishery Management Council (Council) under the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act). The Gulf of Alaska (GOA) FMP was approved by the Secretary of Commerce (Secretary) and become effective in 1978 and the Bering Sea and Aleutian Islands Area (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-Stevens 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. Effects 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 Final Regulatory Flexibility Analysis (FRFA) required by the RFA which specifically addresses the impacts of the proposed action on small businesses.

This Environmental Assessment/Regulatory Impact Review/Final Regulatory Flexibility Analysis (EA/RIR/FRFA) addresses regulatory measures intended to reduce seabird bycatch and incidental mortality in the hook-and-line fisheries off Alaska.

1.1 Purpose of and Need for the Action

Recent takes of the endangered short-tailed albatross (*Diomedea albatrus)* (two in 1995 and one in 1996) in hook-and-line fisheries in the BSAI and the GOA highlight a seabird bycatch problem. Under the required ESA section 7 consultation on the 1997 GOA and BSAI groundfish fisheries, the U.S. Fish & Wildlife Service (USFWS) anticipates that four short-tailed albatrosses could be taken in 1997 and 1998. If the 2-year take exceeds four, NMFS must immediately reinitiate section 7 consultation and review with USFWS the need for possible modification of the reasonable and prudent measures established to minimize take of the short-tailed albatross.

The NMFS Observer Program office has documented bycatch of other seabird species in the GOA and BSAI groundfish fisheries since 1989 (Table 1). In 1995, the seabird bycatch in observed samples from hook-and-line vessels in the GOA and BSAI was 351 and 4,417 birds, respectively (Tables 2 & 3), and far exceeded the seabird bycatch found in other gear types. Proposed regulatory measures are intended to reduce seabird bycatch and incidental mortality in the hook-and-line fisheries off Alaska.

1.2 Alternatives Considered

1.2.1 Alternative 1: Status quo, no action. Any gear modifications, seabird avoidance devices, or changes in fishing methods intended to reduce the incidental mortality of seabirds would continue to be voluntary.

1.2.2 Alternative 2 (preferred): Gear modifications, seabird avoidance devices, or changes in fishing methods designed to reduce the incidental mortality of seabirds would be required in regulation. The measures would apply to vessels fishing for groundfish with hook-and-line gear in the GOA and the BSAI, and Federally-permitted vessels fishing groundfish with hook-and-line gear in waters of the State of Alaska that are adjacent to the GOA and the BSAI, and that retain more round-weight equivalent of groundfish than round-weight equivalent of halibut.

1. All applicable hook-and-line fishing operations would be conducted in the following manner:

   a. Use hooks that when baited, sink as soon as they are put in the water. This could be accomplished by the use of weighted groundlines and/or thawed bait.

   b. Any discharge of offal from a vessel must occur in a manner that distracts seabirds, to the extent practicable, from baited hooks while gear is being set or hauled. The discharge site onboard a vessel must either be aft of the hauling station or on the opposite side of the vessel from the hauling station.

   c. Make every reasonable effort to ensure that birds brought on board alive are released alive and that wherever possible, hooks are removed without jeopardizing the life of the bird.

2. All applicable hook-and-line fishing operations would be required to employ one or more of the following seabird avoidance measures:

   a. Set gear between hours of nautical twilight (as specified in regulation) using only the minimum vessel's lights necessary for safety;

   b. Tow a streamer line or lines during deployment of gear to prevent birds from taking hooks;

   c. Tow a buoy, board, stick or other device during deployment of gear at a distance appropriate to prevent birds from taking hooks. Multiple devices may be employed; or

   d. Deploy hooks underwater through a lining tube at a depth sufficient to prevent birds from settling on hooks during deployment of gear.

The required measures to reduce the incidental mortality of seabirds would be applicable to vessels using hook-and-line gear in:

Option 1: BSAI groundfish fisheries.

Option 2: Both the GOA and BSAI groundfish fisheries.

Option 3 (preferred): Both the GOA and BSAI groundfish fisheries and the halibut fishery. Rulemaking to require seabird avoidance measures would be initiated separately for the halibut fishery to provide the IPHC opportunity to review the proposed measures.

1.3 Background

1.3.1 Description and History of the Hook-and-Line Fishery

BSAI

Pacific cod has dominated the landings of the hook-and-line fishery. Pacific cod was taken by Japanese longline and trawl operation beginning in the early 1960's and joined by Russian vessels in 1971. The average harvest from 1971-1976 was 50,000 mt. Foreign fisheries were phased out by the domestic fleet by 1988. Catches have fluctuated around 165,000 mt since 1985. The Pacific cod total allowable catch (TAC) is apportioned by gear type and by season. Harvests are typically constrained by halibut bycatch limits.

Sablefish was targeted by Japanese freezer longliners since 1959. Catches peaked in 1962 at 28,500 mt and averaged about 13,000 mt from 1963-1972. Russians entered the fishery in 1967. Catches dropped to less than 5,000 mt in 1974, a peak in 1987 of 8,000 mt, and reduced landings since then. The sablefish TAC is apportioned among gear types. Since 1995, sablefish has been managed under the Individual Fishing Quota (IFQ) system. Twenty percent of the hook-and-line and pot gear sablefish allocation is a sablefish CDQ reserve.

Greenland turbot has been targeted by trawl and longline gear. Significant amounts are also retained as bycatch in other fisheries. Most fishing occurs along the shelf edge and slope, as well as along the Aleutian Islands. Catches averaged about 30,000 mt during the 1960's. Catches increased to 60,000 mt in 1974, and remained in the 50,000 mt range through 1983. Catch has remained at or below 10,000 mt since 1986.

Rockfish are harvested by both trawl and longline gear. Small quantities of Pacific ocean perch were also harvested by longline gear in 1995. Much of the rockfish catch in hook-and-line fisheries is incidental to other target fisheries.

In 1995, the total hook-and-line groundfish catch was 127,100 mt (Table 4). One hundred catcher vessels and 46 catcher/processors operated in the BSAI (Table 5) and targeted sablefish, Pacific cod, Greenland turbot, and rockfish.

GOA

Sablefish are an important demersal species of the slope region. Annual catches averaged about 1,500 mt in 1930-50, and exploitation rates remained low until the Japanese longline fleet expanded into the Gulf. Catches rapidly escalated during the mid 1960's and peaked in 1972. Evidence of declining stock abundance led to significant fishery restrictions from 1977 to 1985 and total catches were reduced substantially. Since 1995, sablefish has been managed under the Individual Fishing Quota (IFQ) system.

Pacific cod are a widespread demersal species found along the continental shelf from inshore waters to the upper slope. Catches of Pacific cod increased throughout most of the 1980's in response to a year class(es) which recruited to the fishery around 1980. Annual total catches dropped to about 14,000 t in 1985 as foreign effort began to be phased out, then grew again as

the capacity of the domestic fleet increased. The 1991 and 1992 catches reached record levels of approximately 77,000 t and 80,000 t, respectively. Presently, the Pacific cod stock is exploited by a multiple-gear fishery, including trawl, longline, and pot components. Trawlers account for the majority of landings with pot gear catches increasing in recent years.

Rockfish have been landed incidental to other groundfish and halibut fisheries in Southeast Alaska since the turn of the century. The directed fishery for demersal shelf rockfish in East Yakutat increased substantially in 1991. The decline in directed harvest since 1992 is a consequence of in-season management to ensure that enough TAC remains for bycatch in the halibut fishery.

In 1995, the total hook-and-line groundfish catch was 34,800 mt (Table 4). A total of 1217 catcher vessels and 35 catcher/processors operated in the GOA (Table 5) and targeted sablefish, Pacific cod, deep-water flatfish, and rockfish.

1.3.2 Description of the Gear

Hook-and-line vessels targeting Pacific cod set groundlines of varying length to a maximum of approximately seven miles, in water 25-100 fathoms deep. Typically two lines are set and hauled in a day. The vessel travels at a speed of about five knots during a two-hour set. Radar-reflecting buoys are connected to both ends of the groundline. Twelve-inch gangions with hooks are attached to the groundline at three-foot intervals. A seven-mile set would contain approximately 17,000 hooks. Most of the longline vessels in the BSAI targeting Pacific cod are freezer/longliners, many of which use autobaiting systems (pers. comm., North Pacific Longline Association).

Hook-and-line vessels targeting sablefish or Greenland turbot set gear in deeper water on the continental slope. The gear is rigged much the same as in the Pacific cod fishery, though the lengths of the groundlines are often shorter and may vary with the size of the vessel. Many smaller vessels participate in both the BSAI and GOA fisheries, and fewer are equipped with autobaiting machines.

1.3.3 Seabird Bycatch

1.3.3.1. Historical Background

Problem. Millions of birds, representing over 80 species, occur over waters of the EEZ off Alaska. The presence of "free" food in the form of offal and bait attract many birds to fishing operations. In the process of feeding, birds sometimes come into contact with fishing gear and are accidentally killed. For example, most birds taken during hook-and-line operations are attracted to the baited hooks when the gear is being set. These birds become hooked at the surface, and are then dragged underwater where they drown. The probability of a bird being caught is a function of many interrelated factors including: Type of fishing operation and gear used; length of time fishing gear is at or near the surface of the water; behavior of the bird (feeding and foraging techniques); water and weather conditions (e.g., sea state); size of the bird; availability of food (including bait and offal); and physical condition of the bird (molt, migration, health). Almost any species which occurs in these waters is susceptible to interactions with fishing gear, although a few species are especially vulnerable (NMFS, 1995).

Seabird bycatch occurs predominantly in the tuna, broadbill, hake, toothfish, and swordfish longline

fisheries in the southern hemisphere. For instance, longline fishing for tuna has been shown to cause significant mortality of albatrosses and other seabirds species and is considered to be the most likely cause of the abnormally high rates of mortality and the decline of breeding populations recorded for several southern albatrosses species (Brothers, 1995). In Tasmanian waters, the average catch rate of albatrosses by Japanese longline vessels in 1988 was 0.41 birds per 1,000 hooks, a total of 44,000 birds each year in waters south of 30°S, where 107 million hooks are set annually for southern bluefin tuna (Australian Fisheries, 1991). It has been estimated that worldwide, 180,000 birds are killed in longline fisheries annually. The issue of seabird bycatch and incidental mortality in commercial fishing operations has been heightened in recent years.

CCAMLR. Noting the need to reduce the incidental mortality of seabirds during longline fishing by minimizing their attraction to fishing vessels and by preventing them from attempting to seize baited hooks, particularly during the period when the lines are set, the CCAMLR adopted conservation measures in 1996 to reduce the possibility of incidental mortality of seabirds during longline fishing (CCAMLR, 1996). The implementing regulations were agreed to by consensus of the 23 member countries and NMFS published regulations March 5, 1996 (61 FR 8483) that apply to U.S. vessels fishing in Convention for the Conservation of Antarctic Marine Living Resources (Convention) waters. The conservation measures regulate catches in Convention waters. In summary, the measures require:

- Fishing operations be conducted in such a manner that baited hooks sink as soon as possible after they are put in the water.
- The use of thawed bait.
- Longlines must be set only at night and only the minimum ship's lights necessary for safety shall be used.
- Dumping of offal shall be avoided as far as possible while longlines are being set or hauled; if discharge of offal is unavoidable, the discharge must take place on the opposite side of the vessel to that where longlines are set or hauled.
- Every effort should be made to ensure that birds captured alive during longlining are released alive and that wherever possible hooks are removed without jeopardizing the life of the bird concerned.
- A streamer line designed to discourage birds from settling on baits during deployment of longlines shall be towed (specification of the streamer line is provided).

Compliance with CCAMLR regulations is monitored by designated inspectors and international scientific observers. Of the 40 vessels fishing in CCAMLR waters in 1996, five were inspected. Observers collect biological data and monitor compliance with regulations. CCAMLR itself does not have any provisions for the enforcement of its regulations. Enforcement of the regulations is the responsibility of member countries.

IUCN. The World Conservation Congress of the International Union for the Conservation of Nature (IUCN) adopted a resolution at its October 1996, session that calls upon the IUCN, its members, all States, and regional fisheries institutions to reduce incidental seabird mortality within longline fisheries to insignificant levels for affected species. IUCN is a union of more than 850 governments and non-governmental organizations working on issues of the environment and sustainable development. The final resolution was adopted by approximately 75 national governments, with only Japan and Panama in opposition. The resolution commended CCAMLR for adopting conservation measures that call for minimizing the incidental taking of seabirds on longlines in Antarctic waters and commended the efforts now underway by some longline fishermen to reduce incidental mortality of seabirds, and

encouraged their increased involvement in developing and implementing effective measures for reducing incidental mortality of seabirds. All longline vessels fishing with the New Zealand EEZ must now deploy a tori line (seabird avoidance device) of the type recommended by CCAMLR while longline setting (Duckworth, 1995). It is noteworthy to highlight that New Zealand has required seabird bycatch mitigation measures in its longline fisheries since 1992.

1.3.3.2 Seabirds in Alaska

Seabird populations in Alaska are large and diverse owing to the extensive and nutrient-rich coastal estuaries and offshore areas, and the availability of large stocks of forage fish and other prey. Such areas in Alaska provide breeding, feeding, and migrating habitat for 66 species of seabirds of which 38 breed in Alaska at about 1,600 colonies. Alaska's breeding population of the 38 seabird species is estimated to be 50 million birds which is about 96 percent of all seabirds breeding in the continental United States. Another 50 million seabirds of 28 species migrate from breeding areas in the central and south Pacific to spend the summer offshore the coast of Alaska. Seabird breeding populations in the BSAI and the GOA are estimated at about 22 million and 8 million birds, respectively (Wohl et.al., 1995). See Section 2.2 for a discussion of the short-tailed albatross.

Population trends and productivity are monitored every 1 to 3 years at approximately 6 colonies in each area. The species monitored are common and thick-billed murres (*Uria aalge* and *U. lomvia*), red-legged and black-legged kittiwake (*Rissa brevirostris* and *R. tridactyla*), northern fulmar (*Fulmarus glacialis*), tufted puffin, fork-tailed and Leach's storm-petrel (*Oceanodroma furcata* and *O. leucorrhorhoa*) and red-faced and pelagic cormorant (*Phalacrocorax urile* and *P. penicillatus*). Declines in kittiwake and murre populations have been recorded in the Pribilof Islands and St. Matthew Island. Kittiwake nesting success there has been low over the past 15 years, in association with inadequate food resources. The red-legged kittiwake, whose principal breeding colony in the world is on St. George Island, has been reduced by 50 percent since 1976. The species has been proposed for listing as threatened. In contrast, monitored populations in the Aleutian Islands area generally have been stable or have increased.

Declines have been documented for common murres throughout most of the GOA. Declines equaled or exceeded those found in areas affected by the *Exxon Valdez* oil spill. Declines at specific colonies ranged from 39 to 96 percent since 1989. They also noted large declines in the GOA in either breeding success or adult populations for black-legged kittiwakes, marbled and Kittlitz's murrelets, cormorants, and horned puffins.

Indirect competition between groundfish fisheries and seabirds does exist potentially. Seabirds eat small fish and large pelagic invertebrates. Seabird prey on schooling fish up to 15 cm in length. Kittiwakes and northern fulmars take fish at the surface; murres, cormorants, and puffins dive and pursue fish underwater. Although seabirds take fish opportunistically, and most species also consume invertebrates, they rely on forage fish when rearing their young. The birds require dense schools within foraging range of the breeding colony (foraging range is 3 to 100 km, depending on species). For kittiwakes and fulmars, the schools also must be at the surface. In most parts of the North Pacific, at a given place and time, only single suitable species of forage fish usually is available. Age 0 and 1 pollock are a major prey of seabirds. However, years of good breeding success, especially for kittiwakes, usually depend on availability of sand lance or capelin, which have a higher energy content and form dense schools near shore (NPFMC, September 1996).

The Circumpolar Seabird Working Group has identified the main causes for the steady population decline in some seabird species. The top five causes are: Heavy hunting pressure, mortality in commercial fishing operations, human disturbances in seabird colonies, oil pollution, and introduced predators. The principal seabird species taken incidentally in groundfish gear include murres and shearwaters in trawls and northern fulmars, albatrosses, and gulls on longlines.

1.3.3.3 International Seabird Populations

Seabirds are a very visible and important natural resource in the Arctic. Many species of seabirds occurring in Alaska have circumpolar and southern hemisphere distributions; some seabirds populations are shared between Alaska and some of the other seven Arctic nations. Alaska also shares seabird populations with nations farther south, some of whose breeding species spend the northern summer in Alaskan waters. Seabirds may share common foraging and wintering areas, and exchanges between breeding colonies may occur in the Arctic. Seabirds sharing common areas and resources in the Arctic are also impacted by similar human activities. Some shared seabird populations are declining, are unstable, or are listed as endangered or threatened by some Arctic countries. Traditionally, research, management, and conservation activities for international seabird populations have been conducted unilaterally with little coordination, exchange of information, or common direction, and without the use of uniform protocols for data collection and analyses. Clearly, research, management, and conservation activities for shared, internationally important, and vulnerable seabird resources can be more effective with a cooperative and coordinated approach (USFWS, 1992). Similarly, CCAMLR has expressed concern about the potential impact on seabirds from the Convention area of fisheries adjacent to the Convention area where use of mitigating conservation measures is not a requirement (CCAMLR, 1996).

1.3.3.4 Seabird Bycatch Avoidance Efforts to Date

The USFWS recently amended its 1995 Biological Opinion on the NMFS Interim Incidental Take Exemption Program and outlined reasonable and prudent measures that NMFS must implement with regard to the short-tailed albatross (USFWS, 1997). The current non-discretionary measures are as follows, the last two were added in the 1997 amendment to the Biological Opinion:

- Observer data on short-tailed albatross sightings and fishery interactions is collected. Observers are trained in seabird identification and provided with instructions and materials for reporting short-tailed albatross observations.
- Incidental take of any short-tailed albatross is reported to USFWS.
- Short-tailed albatross that are found in fishing equipment, but still appear healthy, are released as soon as identification is confirmed.
- Dead short-tailed albatrosses are tagged with complete catch information and delivered to USFWS.
- An information program is conducted each year to inform fishermen about: 1) Need and possible methods for avoiding entanglement of short-tailed albatross in fishery gear, 2) request reports of short-tailed albatross sightings, and 3) encourage compliance with (MARPOL) and related treaties to protect marine animals including the short-tailed albatross. This program may consist of electronic bulletin board and Internet announcements, distribution of written materials, newspaper or radio announcements, or any other appropriate means.
- Vessels in the hook-and-line fishery of the GOA/BSAI areas shall be required, as soon as possible but no later than October 1, 1997, to use seabird bycatch avoidance devices and

methods during fishing activities.

- A research plan outlining specific plans for testing of seabird bycatch avoidance gear and methods shall be completed before January 1, 1998.

USFWS included the following discretionary conservation recommendations to NMFS in the 1997 amendment to the Biological Opinion.

1. In cooperation with USFWS, initiate discussions with the Department of State to lead to data exchanges with other nations whose vessels fish with longline gear in the Pacific. Such data will allow us to determine the incidental take and mortality of seabirds by time and area and are essential to assess the need for additional conservation measures on an international scale.

2. Continue cooperative efforts with USFWS to identify demographic parameters of the Torishima Island breeding population of short-tailed albatrosses with the goal of using these data to quantify the level of take which would appreciably reduce the survival and recovery of the species.

3. In cooperation with USFWS, initiate efforts to conduct a population viability analysis using demographic data and available information on sources and magnitudes of threats to the species.

NMFS, USFWS, and the US Geological Survey, Biological Resources Division, are cooperating to obtain accurate information on the mortality of seabirds related to trawl, longline, and pot vessels fishing groundfish in the GOA and BSAI. This cooperative project will also address questions about the effects of various levels of take on the world-wide population of short-tailed albatrosses. Bird monitoring activities by NMFS began in 1990 and were expanded during the 1993 season. The major change was to ask observers to provide detailed information on the identity of incidentally caught seabirds. Other observer-collected information that NMFS forwards to USFWS is: Sightings of sensitive species, sightings of miscellaneous species, bird/vessel interactions, gear-related mortality, intended and direct mortality, use of deterrent devices by the vessel, and detailed information found on the leg bands of banded seabirds.

USFWS, in cooperation with NMFS, is developing a stochastic population model for the short-tailed albatross which will determine the level of mortality that the species can sustain without affecting its recovery. A final report is anticipated in early 1997.

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. 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 statement (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 effects 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 and scavengers, changes in the population structure of target fish stocks, and changes in the marine ecosystem community structure; (2) changes in the physical and biological structure of the marine 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 annual groundfish TAC amounts on the biological environment and associated effects on marine mammals, seabirds, and other threatened or endangered species are discussed in the final EA for the annual groundfish TAC specifications (NMFS, 1997).

2.2 Effects on Endangered or Threatened Species

Endangered and threatened species under the ESA that may be present in the GOA and BSAI include:

Endangered

Northern right whale	*Balaena glacialis*
Sei whale	*Balaenoptera borealis*
Blue whale	*Balaenoptera musculus*
Fin whale	*Baleanoptera physalus*
Humpback whale	*Megaptera novaeangliae*
Sperm whale	*Physeter macrocephalus*
Snake River sockeye salmon	*Oncorhynchus nerka*
Short-tailed albatross	*Diomedea albatrus*

Threatened

Steller sea lion	*Eumetopias jubatus*
Snake R. spring and summer chinook salmon	*Oncorhynchus tshawytscha*
Snake R. fall chinook salmon	*Oncorhynchus tshawytscha*
Spectacled eider	*Somateria fischeri*

Listed or candidate species of seabirds include the endangered short-tailed albatross (*Diomedea albatrus*). The world breeding population of the short-tailed albatross was estimated to be 400 birds in 1988, and has now increased to over 700 (Richardson, 1994). As the population increases, the potential for interactions with commercial fisheries increases. However, the short-tailed albatross population is steadily increasing due to its protection on the breeding grounds (two islands in Japan and a recent report on Midway Island). Currently no evidence exists as to whether or not groundfish fisheries are impeding their recovery.

Past observations indicate that as with other albatrosses, older short-tailed albatrosses are present in Alaska primarily during the summer and fall months along the shelf break from the Alaska Peninsula to the GOA, although 1- and 2-year old juveniles may be present at other times of the year. Consequently, these albatrosses generally would be exposed to fishery interactions most often during the summer and fall.

Albatrosses are surface feeders that take principally small fish (e.g., larval and juvenile walleye pollock and sablefish), squid, and zooplankton, much of which is presumed to be of little commercial interest. The importance of commercial fish species in the diet of the short-tailed albatross and the effects of the commercial fishery on this species are not well known, but direct competition for food supplies is probably not a substantial problem for this species.

Formal consultation was concluded on the effects of the groundfish fisheries on the short-tailed albatross and other species listed under the ESA under the jurisdiction of the USFWS on July 3, 1989. That consultation concluded that BSAI and GOA groundfish fisheries would adversely affect the short-tailed albatross and would result in the incidental take of up to two birds per year, but would not jeopardize the continued existence of that species. The short-tailed albatross could be affected by: 1) Direct injury or mortality from fishing equipment, 2) entanglement or ingestion of plastics and other debris disposed overboard from fishery vessels; 3) injury resulting from contact with petroleum products spilled or leaked from vessels, and 4) competition for food resources. Subsequently, section 7 consultation has been reinitiated for major changes to the FMP or fishery that might affect the short-tailed albatross. These have been informal consultations, and have concluded that no additional adverse effects beyond those in the aforementioned formal consultation would occur.

These subsequent informal consultations include: 1) 1992 BSAI and GOA TAC specifications, January 17, 1992; 2) 1993 BSAI and GOA TAC specifications, February 1, 1993, and clarified February 12, 1993; 3) delay of the second quarter pollock fishing season in the GOA, December 22, 1992; 4) careful release of halibut in hook-and-line fisheries, March 12, 1993; 5) delay of the second pollock fishing seasons in the BSAI and GOA, March 12, 1993; 6) BSAI FMP Amendment 28, April 14, 1993; 7) GOA FMP Amendment 31, July 21, 1993; 8) 1994 BSAI and GOA TAC specifications, February 14, 1994; 9) experimental trawl fishery, Kuskokwim Bay to Hooper Bay, June 22, 1994; 10) 1995 BSAI and GOA TAC specifications, February 7, 1995; and 11) 1996 BSAI and GOA TAC specifications, June 12, 1996, and clarified October 1, 1996. Although any mortality caused by commercial fishing would be a cause for concern, based on the best available information, the expected incidental take of up to two short-tailed albatrosses during harvest of 1996 groundfish TACs is not expected to jeopardize the continued existence of the listed species.

The 1989 USFWS biological opinion for an incidental take of two short-tailed albatrosses was based on a historical incidental take of two birds. In February 1996, NMFS requested that USFWS consider raising the incidental take of short-tailed albatross from two to four birds. In October 1996, USFWS indicated that the take level would remain at two birds and that reinitiation of section 7 consultation would be required. NMFS reinitiated consultation on the 1997 GOA and BSAI fisheries in November 1996. That consultation was concluded February 19, 1997, when USFWS issued an amendment to the 1989 Biological Opinion. The Biological Opinion was amended as follows: (1) Hereafter, the scope of section 7 consultations will be limited to the hook-and-line fisheries which are likely to adversely affect short-tailed albatrosses, (2) the incidental take was revised to four short-tailed albatrosses during the 2-year period of 1997 and 1998, and (3) two reasonable and prudent measures were added (see section 1.3.3.4).

Five short-tailed albatross takes have been reported in the Alaskan groundfish fisheries from 1983 to 1996. These occurred in the months of July, August, September, and October (2). Short-tailed albatross sightings in the BSAI and/or GOA have occurred in all months from April to November (Sherburne, 1993).

The first reported take of a short-tailed albatross in the Alaskan groundfish fisheries was in July 1983, north of St. Matthew Island. The bird was found dead in a fish net. A second take occurred in October 1987, and was caught by a vessel fishing for halibut in the GOA.

A juvenile short-tailed albatross was taken in the western Gulf of Alaska IFQ sablefish longline fishery south of the Krenitzin Islands on August 28, 1995. The captain of the vessel reported that hundreds of albatrosses were caught and drowned on sets of squid-baited hooks (the others were Laysan and black-footed albatrosses). A NMFS-certified observer reported that longlines may have been inadequately weighted to assure rapid descent of baited hooks (A. Grossman, NMFS-PRMD, memo dated September 14, 1995). NMFS requested reinitiation of a formal consultation on the 1995 BSAI and GOA TAC specifications on September 8, 1995.

A take of a short-tailed albatross in the IFQ sablefish fishery occurred on October 8, 1995, in the Bering Sea; NMFS was notified of the bird death on November 14 at the closure of the IFQ longline fishery. By the time USFWS confirmed the bird's identification, the groundfish TACs were reached and NMFS had closed the fisheries. The reason for the second taking was also attributed to insufficient weighting of the longlines (A. Grossman, NMFS-PRMD, memo dated February 13, 1996).

The fifth short-tailed albatross was taken September 27, 1996, in the BSAI. The 5-year old adult bird was taken in a hook-and-line fishery.

All five albatrosses had been banded on their Japanese breeding grounds and their bands were recovered, allowing scientists to verify identification and age.

Beginning in 1994, NMFS informed participants in the commercial fisheries of the need and possible methods for avoiding entanglement of short-tailed albatross in fishing gear as well as requested reports on sightings and encouraged compliance with MARPOL (news releases, 1 in 1994, 2 in 1995 and 3 in 1996). A direct mailing to 1,740 hook-and-line fishermen in the GOA and the BSAI occurred in December 1996, and a mailing to 10,000 IFQ permit holders occurred in February 1997. An informational brochure is anticipated for distribution in March 1997. This would be accomplished as a cooperative effort with the industry and the Council. NMFS will reinitiate consultation if allowable incidental takes of listed species are exceeded, if new information on fisheries effects on listed species becomes available, if the subject fisheries are significantly modified, including increases in TAC specifications exceeding 10 percent, or if new listings occur of species or of designations of critical habitats that may be affected by the fisheries.

The bycatch of albatrosses by the North Pacific fishing fleet could impact the population of this species. NMFS, USFWS, and the US Geological Survey, Biological Resources Division are cooperating to obtain accurate information on the mortality of seabirds related to trawl, longline, and pot vessels fishing groundfish in the EEZ of the GOA and BSAI. USFWS, in cooperation with NMFS, is developing a population model for the short-tailed albatross which will determine the level of mortality that the species can sustain without affecting its recovery.

The effects of no action under status quo, Alternative 1, have been previously addressed in the aforementioned formal and informal consultations. Alternative 2 is expected to minimize fishery interactions between the short-tailed albatross and other seabird species and the hook-and-line fishery and is expected to mitigate the fisheries' effects on endangered or threatened species or their critical habitats. Fishing activities conducted under either alternative will not effect any critical habitat or other threatened or endangered species in any manner not already considered in previous formal and informal consultations on these fisheries.

2.3 Impacts on Seabirds not Listed under the ESA

Over 80 species of seabirds occur over waters off Alaska and could potentially be impacted by interactions with the GOA and BSAI groundfish fisheries. See section 1.3.3 for a detailed discussion.

2.3.1 Seabird Bycatch in the Alaskan Fisheries

The NMFS Observer Program has documented bycatch of seabird species in the GOA and BSAI groundfish fisheries (see Section 1.3.3.4) since 1989 (Table 1). In 1995, the seabird bycatch in observed samples from hook-and-line vessels in the GOA and BSAI was 351 and 4,417 birds, respectively (Tables 2 & 3), and far exceeded the seabird bycatch found in other gear types. Until statistically valid extrapolation procedures can be developed by NMFS, it is inappropriate at this time to extrapolate from the known seabird takes in observer samples to the total fleet catch. It will be important to take time and area fishing effort, seabird take reports from outside the observer sample, and seabird distribution into consideration.

Preliminary estimates of the incidental mortality of seabirds in Alaska groundfish fisheries between 1989 and 1993 indicates that about 85 percent of the total average seabird mortality in all groundfish fisheries during this time occurred in the BSAI (Wohl et.al., 1995). This preliminary data may be an overestimate due to several factors in the BSAI: Increased groundfish harvest, higher populations or concentrations of seabirds, and higher levels of observer coverage may have reflected a greater percentage of seabird mortality in the BSAI. Although 88 percent of the groundfish in the two regions is harvested by trawlers, about 88 percent of the total seabird mortality occurred in the hook-and-line fisheries (Wohl et.al., 1995).

2.3.2 *Research on Effectiveness of Seabird Bycatch Avoidance*

A recent New Zealand study (Duckworth, 1995) assessed the influence that 15 monitored environmental and fishery related factors had on seabird bycatch rates, and gauged the effectiveness of various mitigation measures. Data collected by observers on vessels in the Japanese southern bluefin tuna longline fishery in New Zealand in 1989-93 was analyzed. Three factors had a major influence on seabird bycatch rates: 1) Area in which gear was deployed, 2) the presence and quality of a tori line (bird streamer line), and 3) the phase of the moon for night sets. In another New Zealand study, the estimated number of total seabirds caught in New Zealand waters declined from 3,652 in 1988 to 360 in 1992, probably as a result of mitigation measures introduced progressively by the industry and government regulation (Murray et.al., 1993). Use of tori lines to prevent seizing baits had an effect, as did setting gear in total darkness.

The streamer line is one of the seabird avoidance devices that would be required under Alternative 2. Duckworth (1995) found that the quality of a streamer line, both in construction and materials used,

played a major role in the streamer line's effectiveness in preventing seabirds from seizing baited hooks. In fact, the difference in bycatch rates between sets which used no streamer line and sets which used a poorly-constructed streamer line, was not significant. Sets which used a high-quality streamer line were significantly less likely to catch seabirds than sets which used a poor-quality streamer line or no streamer line at all. The purpose of the streamer line is to 'scare' birds away from the stern of the vessel when gear is deployed and baited hooks are present near or on the water's surface. A well-constructed streamer line thrashes about unpredictably, thus the seabirds do not become habituated to its movement. The key characteristics of an effective streamer line were:

- Height above the water line at which the streamer line is attached to a pole-- ideal height was 4 to 8 m above sea level;
- Length of streamer line-- ideal length was a minimum of 150 to 175 m;
- Number of streamers attached to a streamer line--5-10 pairs;
- Streamers made of a heavy, flexible material that will allow the streamers to flop unpredictably;
- Streamers should just skim above the water's surface (over the baited hooks).

When night fishing, more seabirds were caught when the moon was full or nearly full (Duckworth, 1995). This implies that the birds required light by which to see the baited hooks. One implication to the Alaskan fisheries is to minimize the use of vessel's lights when fishing at night, thereby reducing the ability of seabirds to see and dive for baited hooks. This measure would be required under Alternative 2.

Sherburne (1993) notes that scent tracking of food may be an important behavioral component exhibited by the short-tailed albatross. Southern hemisphere albatross species appear to depend more on daylight and the visual ability to see food items. Furthermore, the importance of squid in the short-tailed albatross diet and the fact that squid rise at night suggests that short-tailed albatross may have nocturnal feeding habits. This could impact the effectiveness of night fishing on reducing the take of short-tailed albatrosses.

A recent Norwegian study compared the effectiveness of a bird streamer line and a lining tube in impacting both bait loss and seabird bycatch on longline vessels (Løkkeborg, 1996). The purpose of a lining tube is to deploy baited hooks underwater, thus making them unavailable to seabirds from the air. Results indicated that the use of either a lining tube or a streamer line effectively reduced both bait loss and seabird bycatch compared to the use of no device at all. The streamer line was found to be more effective than the lining tube. A lining tube is another option under Alternative 2.

Although the other measures that would be required under Alternative 2 have not been rigorously tested, strong circumstantial evidence exists to indicate these measures, or a combination of measures, would minimize the effects of the hook-and-line fishery on seabirds (Brothers et.al., 1995; Gorman, 1996; Lundsten, 1996; Swenson, 1996; Unknown, 1991) . The 1997 Biological Opinion requires that NMFS develop a research program outlining specific plans for testing of seabird bycatch avoidance gear and methods.

NMFS, USFWS, and the Western Pacific Fishery Management Council are currently addressing a seabird bycatch problem in the longline swordfish fishery in Hawaii. The Western Pacific Council funded the translation and printing of guides to distribute to longline fishermen in the northern islands. The guide provides information on how to reduce fishery interactions with seabirds. USFWS has held

education workshops to instruct fishermen how to use bycatch avoidance methods. NMFS is modifying the fisherman logbook to request data on the bycatch avoidance methods used while fishing. This will allow NMFS to address the effectiveness of the methods used. The following seabird bycatch avoidance measures are recommended for use in the longline swordfish fishery: Bird streamer line, weighted hooks, bait casters, towing 'broomsticks', no discard of bait at sea, gear deployment at night, deflate swim bladders of bait, use of thawed bait, and reduced lighting at vessel's stern (pers. comm.)

2.4 Impacts on Marine Mammals

Marine mammals not listed under the ESA 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*).

None of the alternatives are expected to have a significant effect on marine mammals.

2.5 Coastal Zone Management Act

Implementation of any of the alternatives 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.

2.6 Conclusions or Finding of No Significant Impact

None of the alternatives are likely to significantly impact 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.

P. Kruse — 4/18/97

Assistant Administrator for Fisheries, NOAA — Date

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.

This section also addresses the requirements of both E.O. 12866 and the RFA to provide adequate information to determine whether an action is "significant" under E.O. 12866 or will result in "significant" impacts on small entities under the RFA.

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:

> (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."

3.1 Identification of the Individuals or Groups that may be Affected by the Proposed Action

The most recent description of the groundfish fishery is contained in the Draft Economic Status of the Groundfish Fisheries Off Alaska, 1995 (Kinoshita et al. 1996). The report includes information on the catch and value of the fisheries, the numbers and sizes of fishing vessels and processing plants, and other economic variables that describe or affect the performance of the fisheries. Preliminary data for 1995 indicate that in the BSAI, 100 catcher vessels and 46 catcher/processors fished with hook-and-line gear, and 1,217 catcher vessels and 35 catcher/processors fished with hook-and-line gear in the GOA. Under Option 1 of Alternative 2, only the BSAI hook-and-line vessels would be directly affected. Under Option 2 of Alternative 2, both GOA and BSAI hook-and-line vessels would be directly affected.

3.2 Economic and Social Impacts of the Alternatives

3.2.1 Impacts of Alternative 1 - Status Quo

The status quo alternative would not require any gear modifications, seabird avoidance devices, or changes in fishing methods intended to reduce the incidental mortality of seabirds. Such measures would continue to be voluntary.

Under the required ESA section 7 consultation on the 1997 GOA and BSAI groundfish fisheries, the USFWS anticipates that four short-tailed albatrosses could be taken in 1997 and 1998. If the 2-year take exceeds four, NMFS must immediately reinitiate section 7 consultation and review with USFWS the need for possible modification of the reasonable and prudent measures established to minimize take of the short-tailed albatross. It is possible that fishing operations would be altered and closures imposed during the reinitiated section 7 consultation.

If the 2-year take of short-tailed albatross exceeded four, the actual economic impacts resulting from the modification of the reasonable and prudent measures established to minimize take of the short-tailed albatross would depend upon the revised measures. It could range from measures proposed under Alternative 2 (see below for economic impacts) to closures. The economic impact of closures would depend upon the length of time of the closed period.

3.2.2 Impacts of Alternative 2 - Require Seabird Bycatch Avoidances Measures in the Groundfish Hook-and-Line Fisheries

The measures required of all applicable vessels under number 1 of Alternative 2 (see below) would be expected to be of minimal or no cost. Procedural or operational changes may be required in fishing operations.

- Use hooks that when baited, sink as soon as they are put in the water. This could be accomplished by the use of weighted groundlines or thawed bait.
- Any discharge of offal from a vessel must occur in a manner that distracts seabirds, to the extent practicable, from baited hooks while gear is being set or hauled. The discharge site onboard a vessel must either be aft of the hauling station or on the opposite side of the vessel from the hauling station.
- Every reasonable effort shall be made to ensure that birds brought on board alive are released alive and that wherever possible, hooks are removed without jeopardizing the life of the bird.

Under number 2, the costs would depend on which and how many of the measures were used.

2. One or more of the following measures would be employed at all times when hooks are being set:

   - Gear must be set only during hours specified (between the times of nautical twilight), using only the minimum vessel's lights necessary for safety;
   - Tow a streamer line or lines during deployment of gear to prevent birds from taking hooks;
   - Tow a buoy, board, stick, broom, or other like device during deployment of gear, at a distance appropriate to prevent birds from taking hooks. Multiple devices may be employed; or
   - Deploy hooks underwater through a lining tube at a depth sufficient to prevent birds from settling on hooks during deployment of gear.

Per vessel costs associated with number 2 measures:

Buoy or bag of buoys	$50-$100
Streamer line	$200-$250
Lining tube for underwater deployment	$35,000

It is possible that the lining tube would only be an appropriate choice of bycatch avoidance devices by the larger vessels (≥ 100 ft (30.5 m)). Smaller vessels may find the cost of a customized lining tube to be prohibitive. In 1995, 31 and 45 catcher/processors were ≥ 60 ft (18.3 m) in the GOA and BSAI, respectively and 154 and 53 catcher vessels in those respective areas were ≥ 60 ft (18.3 m)(Table 5).

3.3 Administrative, Enforcement and Information Costs

No significant costs for administration, enforcement, or information requirements are expected under any of the alternatives.

4.0 FINAL REGULATORY FLEXIBILITY ANALYSIS

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. The IRFA must also include a description of alternatives that could minimize economic impacts on small entities.

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 percent 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.

4.1 Economic Impact on Small Entities

Most catcher vessels harvesting groundfish off Alaska meet the definition of a small entity under the RFA. In 1995, 1,217 and 100 hook-and-line catcher vessels caught groundfish from the GOA and BSAI, respectively. Catcher/processors numbered 35 and 46 in those respective areas. No regulatory measures are called for under Alternative 1, therefore, small entities would not be economically impacted as a result of regulatory action.

Under number 1 of Alternative 2, the measures required of all applicable vessels would be expected to be of minimal or no cost. Procedural or operational changes may be required in fishing operations. The mandatory measures include: (1) Use hooks that when baited, sink as soon as they are put in the water which could be accomplished by the use of weighted groundlines or thawed bait, (2) any discharge of offal from a vessel must occur in a manner that distracts seabirds, to the extent practicable, from baited hooks while gear is being set or hauled, and (3) every reasonable effort shall be made to ensure that birds brought on board alive are released alive and that wherever possible, hooks are removed without jeopardizing the life of the bird. Under number 2 of Alternative 2, the costs would depend on which and how many of the measures were used. One or more of the measures would be employed at all times when hooks are being set. The economic impact on small entities would depend upon the option exercised (BSAI only or BSAI and GOA) and the particular measures chosen. A vessel operator would have a choice of several measures. It is anticipated that the smaller vessels (< 60 ft ((18.3 m)) would not require the use of a lining tube (approximately $35,000 per vessel). Hook-and-line catcher vessels ≥ 60 ft (18.3 m) numbered 154 and 53 in the GOA and BSAI, respectively; the ≥ 60 ft (18.3 m) catcher/processors numbered 31 and 45. The other seabird bycatch avoidance devices (buoys, bird streamer lines) ranged from $50-$250 per vessel. If the 2-year take of short-tailed albatross exceeded four under either alternative, the actual economic impacts resulting from the modification of the reasonable and prudent measures established to minimize take of the short-tailed albatross would depend upon the revised measures. It could range from measures proposed under Alternative 2 to closures. The economic impact of closures would depend upon the length of the closures. Such economic impacts on small entities could result in a reduction in annual gross revenues by more than 5 percent and could, therefore, potentially have a significant economic impact on a substantial number of small entities.

The economic impacts on small entities could be minimized under Alternative 1 in that no regulatory measures would be required. Several measures available under Alternative 2 would also minimize the economic impacts on small entities. Very significant impacts on small entities could occur if closures

were imposed. The likelihood of this happening is greater under Alternative 1. In the final rule implementing the seabird avoidance measures, NMFS has taken steps to minimize economic impacts on small entities consistent with the objectives of the Magnuson-Stevens Act. These steps include: (1) Allowing a choice of measures to be used, and (2) including options that may already be in use. Alternative 2, Option 3 was determined to be the least burdensome alternative on small entities. Alternative 1-- Status Quo was rejected as more burdensome on small entities because if the incidental take were exceeded and closures were imposed, the likely effect of Alternative 1 would be a significant loss of fishing opportunity for all small entities involved in the groundfish hook-and-line fishery.

The proposed rule to implement seabird avoidance measures was published in the Federal Register on March 5, 1997 (62 FR 10016) and comments were invited on the IRFA. No comments were received on the IRFA.

5.0 SUMMARY AND CONCLUSIONS

In early November 1996, several industry groups representing hook-and-line vessels in the GOA and the BSAI petitioned the Council and NMFS to impose regulatory measures that are intended to reduce the incidental mortality of seabirds in their fisheries. This action was motivated by recent takes (two in 1995 and one in 1996) of the short-tailed albatross (*Diomedea albatrus),* a listed species under the ESA. Pursuant to the ESA, the short-tailed albatross is afforded certain protections that are outlined in the section 7 consultation with the USFWS regarding the GOA and BSAI groundfish fisheries.

Millions of birds, representing over 80 species, occur over waters of the EEZ off Alaska. The presence of "free" food in the form of offal and bait attract many birds to fishing operations. In the process of feeding, birds sometimes come into contact with fishing gear and are accidentally killed. For example, most birds taken during hook-and-line operations are attracted to the baited hooks when the gear is being set. These birds become hooked at the surface, and are then dragged underwater where they drown. The probability of a bird being caught is a function of many interrelated factors including: Type of fishing operation and gear used; length of time fishing gear is at or near the surface of the water; behavior of the bird (feeding and foraging techniques); water and weather conditions (e.g., sea state); size of the bird; availability of food (including bait and offal); and physical condition of the bird (molt, migration, health). Almost any species which occurs in these waters is susceptible to interactions with fishing gear, although a few species are especially vulnerable.

The industry-proposed measures are modeled, in part, after NMFS' regulations implementing conservation measures adopted by the CCAMLR (61 FR 8483, March 5, 1996) to reduce the incidental mortality of seabirds in the longline fisheries in Antarctic waters. Effective mitigation measures would reduce the incidental mortality of seabirds during longline fishing by minimizing the seabirds' attraction to fishing vessels and by preventing the seabirds from attempting to seize baited hooks, particularly during the period when the lines are set.

The alternatives for seabird bycatch avoidance measures are described in Sections 1 and 2 of this document.

Under the required ESA section 7 consultation on the 1997 GOA and BSAI groundfish fisheries, the USFWS anticipates that four short-tailed albatrosses could be taken during 1997 and 1998. If the 2-year take exceeds four, NMFS must immediately reinitiate section 7 consultation and review with

USFWS the need for possible modification of the reasonable and prudent measures established to minimize take of the short-tailed albatross.

If the 2-year take of short-tailed albatross exceeded four under either alternative, the actual economic impacts resulting from the modification of the reasonable and prudent measures established to minimize take of the short-tailed albatross would depend upon the revised measures. It could range from measures proposed under Alternative 2 to closures. The economic impact of closures would depend upon the length of time of the closed period.

The measures required of all applicable vessels under number 1 of Alternative 2 would be expected to be of minimal or no cost. Procedural or operational changes may be required in fishing operations.

In 1995, 1,217 and 100 hook-and-line catcher vessels caught groundfish from the GOA and BSAI, respectively. Catcher/processors numbered 35 and 46 in those respective areas. Under Alternative 2, the economic impact on small entities would depend upon the option exercised (BSAI only or BSAI and GOA) and the particular measures chosen. A vessel operator would have a choice of several measures. Smaller vessels (< 100 ft (30.5 m)) may find the cost of the lining tube prohibitive (approximately $35,000 per vessel). Hook-and-line catcher vessels $\geq$ 60 ft (18.3 m) numbered 154 and 53 in the GOA and BSAI, respectively; the $\geq$ 60 ft (18.3 m) catcher/processors numbered 31 and 45. The cost of the other seabird bycatch avoidance devices (buoys, bird streamer lines) ranged from $50-$250 per vessel.

None of the alternatives is expected to result in a "significant regulatory action" as defined in E.O. 12866.

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 NEPA or its implementing regulations.

6.0 REFERENCES

Brothers, N. 1996. Longline fishing dollars and sense: catching fish not birds using bottom set or mid-water set longlines. Parks & Wildlife Service, Tasmania, Australia, 80 pp.

_____ 1996. Catching fish not birds: a guide to improving your longline fishing efficiency. Australian Longline Version, Parks & Wildlife Service, Tasmania, Australia, 73 pp.

_____, A. Foster, and G. Robertson. 1995. The influence of bait quality on the sink rate of bait used in the Japanese longline tuna fishing industry: an experimental approach. CCAMLR Science 2:123-129.

CCAMLR. 1996. Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR) Report and CCAMLR Scientific Committee Report.

Duckworth, Kim. 1995. Analysis of factors which influence seabird bycatch in the Japanese southern bluefin tuna longline fishery in New Zealand waters, 1989-93. New Zealand Fisheries Assessment Research Document 95/26, Ministry of Fisheries, Wellington, 60 pp.

Gorman, Terry. 1996. Seabird deaths: the difference between surface tuna longlining and bottom longlining. Professional Fisherman--Australian Fisheries, April, p. 18.

Kinoshita, D., Greig, A., Colpo, D. and J. Terry. 1996. Economic Status of the Groundfish Fisheries Off Alaska, 1995. Draft. NMFS--Alaska Fisheries Science Center, Seattle.

Løkkeborg, S. 1996. Seabird bycatch and bait loss in longlining using different setting methods. Unpublished paper prepared for CCAMLR, July.

Lundsten, M.S. 1996. Avoiding seabirds while longlining. Alaska Fisherman's Journal, August, p. 18.

Murray, T.E., J.A. Bartle, S.R. Kalish, and P.R. Taylor. 1993. Incidental capture of seabirds by Japanese southern bluefin tuna longline vessels in New Zealand waters, 1988-1992. Bird Conservation International 3:181-210.

NMFS. December, 1995. Manual for biologists aboard domestic groundfish vessels, 1996. NOAA, NMFS, Alaska Fisheries Science Center, Seattle, WA.

____1996. Final Environmental Assessment for 1996 Groundfish Total Allowable Catch Specifications Implemented 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. NMFS. Alaska Region, Juneau, Alaska. 35 p.

____1997. Environmental Assessment for 1997 Groundfish Total Allowable Catch Specifications Implemented 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. NMFS. Alaska Region, Juneau, Alaska January, 56 p.

NPFMC February, 1993. Fishery Management Plan for the Gulf of Alaska Groundfish Fishery.

_____ 1996. EA/RIR/IRFA for a regulatory amendment to the BSAI FMP to allow pot longlines in the Bering Sea sablefish fishery.

_____ July, 1996. EA/RIR/IRFA for Amendment 46 to the BSAI FMP, Pacific cod allocations.

_____ September, 1996. Preliminary Stock Assessment and Fishery Evaluation Report for the Groundfish Resources of the Bering Sea/Aleutian Islands Regions as projected for 1997. Compiled by the BSAI Plan Team.

____1996. Final Environmental Assessment for 1996 Groundfish Total Allowable Catch Specifications Implemented 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. NMFS. Alaska Region, Juneau, Alaska. 35 pp.

Richardson, S. 1994. Status of the short-tailed albatross on Midway Atoll. Elepaio 54:35-37.

Sherburne, J. 1993. Status Report on the Short-tailed Albatross, Diomedea albatrus. Alaska Natural

Heritage Program, Environment and Natural Resources Institute, University of Alaska Anchorage. Anchorage. 58pp.

Swenson, Eric. 1996. Ducking birds: fleets work to protect seabirds--and their future. Pacific Fishing, August, pp. 25-30.

University of Alaska Sea Grant College Program 1995. Solving Bycatch: Considerations for today and tomorrow, Seattle, WA.

Unknown. January, 1991. Inventions save albatross...and profits. Australian Fisheries pp. 34-36.

USFWS. 1989. Formal consultation with the U.S. Fish and Wildlife Service pursuant to Section 7 of the Endangered Species Act. Biological Opinion, July 3, 1989. Communication to NMFS. Alaska Region, Juneau, Alaska.

_____ 1992. Alaska Seabird Management Plan. Unpublished report, USFWS, Anchorage, 102 pp.

_____ 1995. Amended Biological Opinion on the NMFS Interim Incidental Take Exemption Program. USFWS communication to NMFS, February 7.

_____ 1997. Amended Biological Opinion on the NMFS Interim Incidental Take Exemption Program. USFWS communication to NMFS, February 19.

Witherell, David. October, 1996. Groundfish of the Bering Sea and Aleutian Islands Area: A Species Profile, North Pacific Fishery Management Council.

Wohl, K.D., P.J. Gould, and S.M. Fitzgerald. 1995. Incidental mortality of seabirds in selected commercial fisheries in Alaska. Paper submitted to the Circumpolar Seabird Working Group, Ottawa, Canada, March, 50 pp.

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9.0 LIST OF TABLES

Table 1. Estimated average annual incidental mortality of seabirds in selected Alaska's commercial fisheries, 1989-1993. Effort in days represent the number of days in which sampling occurred. The sampling may have been only a subset of the entire haul for a given day. The percent of catch monitored varied from year to year and only the range (minimum-maximum) is provided in the table.

FISHERY	Observer Effort (Days)	Range of % of Catch monitored		Estimated Average Annual mortality
Bering Sea Groundfish				
Longline (1990-1993)	15,932	64-80		7,250
Pot (1990-1993)	1,603	43-64		10
Joint Venture Trawl (1989-1990)	6,114	43-56		0
Trawl (1989-1993)	48,378	49-69		910
Gulf of Alaska Groundfish				
Longline (1990-1993)	3,704	13-27		1,420
Pot (1990-1993)	814	3-11		0
Trawl (1989-1993)	9,714	5-45		10
			SUBTOTAL	9,600
Prince William Sound Salmon				
Drift and Set Gillnet (1990-1991)	-	-		1,230
Unimak Pass Salmon				
Drift Gillnet (1990)	-	-		340
			TOTAL	11,170

Table from K.D. Wohl, P.J. Gould, and S.M. Fitzgerald 1995. Incidental mortality of seabirds in selected commercial fisheries in Alaska. Submitted to the Circumpolar Seabird Working Group, Ottawa, Canada, March, 50 pp.

Table 2. Number of seabirds reported in observer samples in 1995 in the Gulf of Alaska.

Gear Description	Species Name	Number in sample
Non-pelagic trawl	Shearwater--Unidentified	1
Hook-and-line	Fulmar, Northern	115
Hook-and-line	Albatross--Unidentified	93
Hook-and-line	Albatross, Black-footed	56
Hook-and-line	Seabirds--Unidentified	28
Hook-and-line	Albatross, Laysan	22
Hook-and-line	Gull--Unidentified	20
Hook-and-line	Shearwater, Dark--Unidentified	5
Hook-and-line	Gull, Glaucous-winged	3
Hook-and-line	Shearwater, Sooty	2
Hook-and-line	Kittiwake, Black-legged	2
Hook-and-line	Gull, Herring	2
Hook-and-line	Shearwater--Unidentified	1
Hook-and-line	Shearwater, Short-tailed	1
Hook-and-line	Storm Petrel--Unidentified	1
Trawl gear	TOTAL	1
Hook-and-line	TOTAL	351
	GOA TOTAL	352

Notes.

1. Number in sample are the number of birds which were actually in the observer sample (remembering that not all fish in a set are sampled).
2. Until statistically valid extrapolation procedures are developed by NMFS, it is inappropriate to extrapolate from the known seabird takes in observer samples to the total fleet catch.
3. It will be important to take time and area fishing effort, take reports from outside the observer sample, and seabird distribution into consideration for an extrapolation procedure.
4. In 1995, 2 short-tailed albatrosses were reported by observers, one in the BSAI and one in the GOA hook-and-line fishery. Since they were collected outside of the observer sample, they are not reflected in this table.

Table 3. Number of seabirds reported in observer samples in 1995 in the Bering Sea/Aleutian Islands.

Gear Description	Species Name	Number in sample
Non-pelagic trawl	Albatross--Unidentified	1
Non-pelagic trawl	Seabirds--Unidentified	1
Pelagic trawl	Fulmar, Northern	7
Pelagic trawl	Seabirds--Unidentified	3
Pelagic trawl	Alcid--Unidentified	1
Pelagic trawl	Auklet/Murrelet--Unidentified	1
Pot	Fulmar, Northern	2
Pot	Auklet/Murrelet--Unidentified	2
Pot	Shearwater, Sooty	1
Pot	Gull--Unidentified	1
Hook-and-line	Fulmar, Northern	2448
Hook-and-line	Gull--Unidentified	909
Hook-and-line	Seabirds--Unidentified	558
Hook-and-line	Albatross, Laysan	104
Hook-and-line	Tubenoses--Unidentified	83
Hook-and-line	Shearwater--Unidentified	50
Hook-and-line	Storm Petrel--Unidentified	36
Hook-and-line	Gull, Glaucous-winged	26
Hook-and-line	Albatross--Unidentified	19
Hook-and-line	Albatross, Black-footed	18
Hook-and-line	Gull, Glaucous	17
Hook-and-line	Shearwater, Sooty	16
Hook-and-line	Shearwater, Dark--Unidentified	13
Hook-and-line	Kittiwake, Black-legged	10
Hook-and-line	Gull, Herring	5
Hook-and-line	Shearwater, Short-tailed	3
Hook-and-line	Cormorant--Unidentified	1
Hook-and-line	Murre, Thick-billed	1
Trawl gear	TOTAL	14
Pot gear	TOTAL	6
Hook-and-line	TOTAL	4417
	1995 BSAI TOTAL	4437

Notes

1. Number in sample are the number of birds which were actually in the observer sample (remembering that not all fish in a set are sampled).
2. Until statistically valid extrapolation procedures are developed by NMFS, it is inappropriate to extrapolate from the known seabird takes in observer samples to the total fleet catch.
3. It will be important to take time and area fishing effort, take reports from outside the observer sample, and seabird distribution into consideration for an extrapolation procedure.
4. In 1995, 2 short-tailed albatrosses were reported by observers, one in the BSAI and one in the GOA hook-and-line fishery. Since they were collected outside of the observer sample, they are not reflected in this table.

Table 4.--Gulf of Alaska groundfish catch by species, gear, and target fishery, 1994-95 (1,000 metric tons, round weight).

	Species											
	Pollock	Sable fish	Pacific cod	Arrow tooth	Flathd. sole	Rex sole	Flat deep	Flat shallow	Rock fish	Atka mack.	Other	Total
Year/Gear/Target												
1994												
Hook and line												
Sablefish	.0	20.1	.3	.8	.0	-	.0	.0	1.6	-	.4	23.2
Pacific cod	.0	.0	6.6	.0	.0	-	.0	.0	.1	.0	.2	6.9
Rockfish	.0	.0	.1	.0	-	-	.0	-	.9	-	.0	1.0
Total	.0	20.1	6.9	.9	.0	.0	.0	.0	2.6	.0	.6	31.1
1995												
Hook and line												
Sablefish	.0	18.5	.3	1.0	.0	-	.1	.0	1.3	-	.4	21.5
Pacific cod	.1	.0	10.8	.6	.0	.0	.0	.0	.1	.0	.7	12.3
Flat deep	-	.0	-	.0	-	-	.1	-	.0	-	.0	.1
Rockfish	-	.0	.0	.0	-	-	.0	-	.8	-	.0	.8
Total	.1	18.6	11.1	1.6	.0	.0	.1	.0	2.1	.0	1.1	34.8

Bering Sea and Aleutian Islands groundfish catch by species, gear, and target fishery, 1994-95 (1,000 metric tons, round weight).

	Species												
	Pollock	Sable fish	Pacific cod	Arrow tooth	Flathd. sole	Rock sole	Turbot	Yellow fin	Flat other	Rock fish	Atka mack.	Other	Total
Year/Gear/Target													
1994													
Hook and line													
Sablefish	.0	1.6	.0	.2	.0	.0	2.3	.0	.0	.3	.0	.1	4.5
Pacific cod	2.8	.1	86.2	1.5	.1	.0	.3	.2	.2	.2	.1	10.5	102.0
Turbot	.0	.1	.1	.1	-	.0	1.2	-	.0	.0	.0	.1	1.6
Total	2.8	1.9	86.3	1.8	.1	.0	3.8	.2	.2	.5	.1	10.7	109.3
1995													
Hook and line													
Sablefish	.0	1.3	1.3	.3	.0	.0	1.7	-	.0	.2	.0	.3	5.2
Pacific cod	3.1	.0	102.1	1.8	.3	.0	.3	.1	.0	.1	.1	10.7	118.5
Turbot	.0	.2	.1	.2	.0	.0	2.2	-	.0	.0	.0	.4	3.2
Rockfish	.0	.0	.0	.0	-	-	.0	-	.0	.1	-	.0	.1
Total	3.1	1.6	103.5	2.2	.3	.0	4.2	.1	.0	.4	.1	11.5	127.1

Notes: Totals may include additional categories. The target, calculated by AFSC staff, is based on processor, week, processing mode, NMFS area, and gear.

Source: Blend estimates, National Marine Fisheries Service, 7600 Sand Point Way N.E., BIN C15700, Seattle, WA 98115-0070.

(This table extracted from Tables 6&7 of "Draft Economic Status of the Groundfish Fisheries off Alaska, 1995" in the Preliminary SAFE Report for the Groundfish Resources of the BSAI Regions as Projected for 1997, prepared September 1996.)

Table 5.--Numbers, mean length, and mean registered tons of vessels that caught groundfish off Alaska by area, vessel length class (feet), catcher type, and gear, 1992-96.

	Gulf of Alaska				Bering Sea and Aleutian				All Alaska			
	Vessel length class				Vessel length class				Vessel length class			
	<60	60-124	125-230	>230	<60	60-124	125-230	>230	<60	60-124	125-230	>230
Number of vessels												
Catcher vessels (excluding catcher-processors)												
Catcher type/Gear/Year												
Hook and line												
1992	1517	175	3	0	63	41	0	0	1527	182	3	0
1993	1285	136	0	0	35	21	0	0	1292	142	0	0
1994	1335	180	0	0	30	23	0	0	1339	184	0	0
1995	1063	153	1	0	47	53	0	0	1072	157	1	0
Jan-Jun1996	743	110	2	0	14	34	1	0	743	111	3	0
Catcher-processors												
Catcher type/Gear/Year												
Hook and line												
1992	3	24	19	0	0	27	32	0	3	29	34	0
1993	4	27	23	0	1	30	29	0	4	31	29	0
1994	3	29	20	0	2	31	24	0	3	33	24	0
1995	4	17	14	0	1	21	24	0	4	22	24	0
Jan-Jun1996	3	13	9	0	1	18	23	0	3	19	23	0
Mean vessel length (feet)												
Catcher vessels (excluding catcher-processors)												
Catcher type/Gear/Year												
Hook and line												
1992	40	75	163	-	42	71	-	-	40	76	163	-
1993	40	74	-	-	47	71	-	-	40	74	-	-
1994	41	75	-	-	48	70	-	-	41	75	-	-
1995	41	74	135	-	49	70	-	-	41	75	135	-
Jan-Jun1996	43	73	128	-	51	71	127	-	43	73	127	-
Catcher-processors												
Catcher type/Gear/Year												
Hook and line												
1992	52	98	154	-	-	102	157	-	52	100	139	-
1993	55	99	155	-	57	101	158	-	55	100	158	-
1994	54	98	155	-	57	98	162	-	54	96	162	-
1995	53	97	152	-	56	102	160	-	53	102	160	-
Jan-Jun1996	54	96	146	-	58	102	158	-	54	101	159	-
Mean registered net tons												
Catcher vessels (excluding catcher-processors)												
Catcher type/Gear/Year												
Hook and line												
1992	21	81	272	-	26	82	-	-	21	82	272	-
1993	21	80	-	-	30	83	-	-	21	80	-	-
1994	22	82	-	-	28	82	-	-	22	82	-	-
1995	22	78	134	-	33	86	-	-	22	79	134	-
Jan-Jun1996	23	69	162	-	33	85	130	-	28	70	138	-
Catcher-processors												
Catcher type/Gear/Year												
Hook and line												
1992	39	142	397	-	-	169	421	-	39	164	433	-
1993	47	143	393	-	63	157	421	-	47	154	421	-
1994	48	144	415	-	57	138	461	-	48	134	461	-
1995	33	116	445	-	30	147	429	-	33	146	429	-
Jan-Jun1996	40	120	381	-	52	152	407	-	40	149	407	-

Source: Blend estimates, fish tickets, Norpac data, federal permit file, CFEC vessel data, National Marine Fisheries Service, 7600 Sand Point Way N.E., BIN C15700, Seattle, WA 98115-0070.

(This table extracted from Table 25 of "Draft Economic Status of the Groundfish Fisheries off Alaska, 1995" in the Preliminary SAFE Report for the Groundfish Resources of the BSAI Regions as Projected for 1997, prepared September 1996.)

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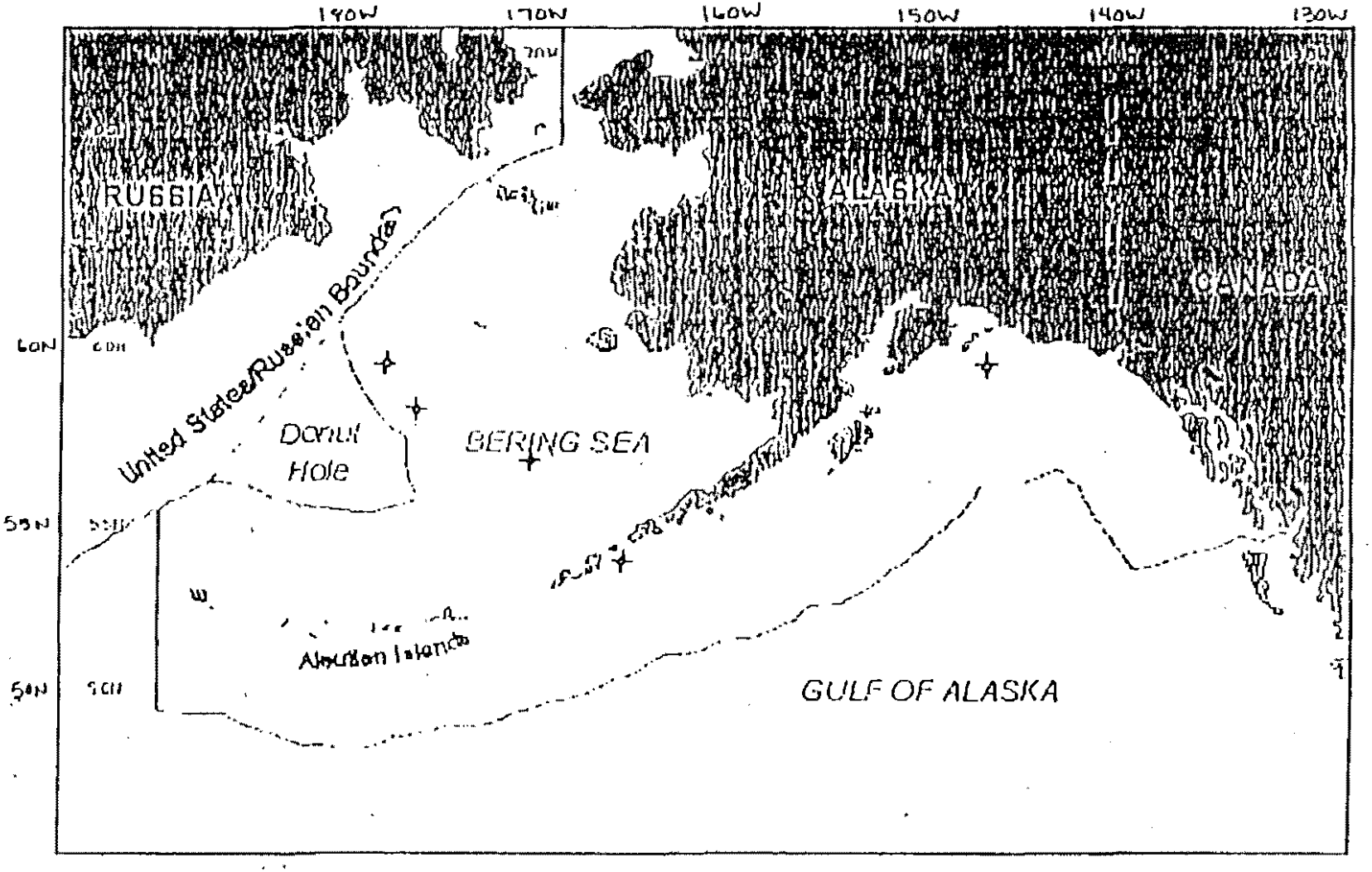
Figure 1. Approximate locations of five short-tailed albatross takes, 1983-1996. Based on lat/longs in observer reports.



Exclusive Economic Zone off Alaska