MEMORANDUM

TO: Council, SSC and AP Members

FROM: Clarence G. Pautzke
Executive Director

DATE: January 22, 1999

SUBJECT: Seabird Protection

ESTIMATED TIME
2 HOURS

ACTION REQUIRED

Initial review of EA/RIR for additional seabird avoidance measures.

BACKGROUND

Measures implemented in 1997 to protect seabirds in the groundfish and halibut fixed gear fisheries have not prevented additional takes of the endangered short-tailed albatross in these fisheries. Two short-tailed albatross were taken in late September 1998 in the BSAI Pacific cod fishery. Both vessels that hooked these birds were using the required seabird avoidance devices.

At its December 1998 meeting, the Council approved the development of an analysis of additional seabird avoidance measures at the request of industry. The alternatives in the analysis are listed in Item C-3(a). The full analysis is included as Item C-3(b).

SEABIRD PROTECTION EA/RIR

Alternative 1: No action.

Alternative 2: Revisions to existing regulations, intended to improve and strengthen the effectiveness of the required seabird avoidance measures and reduce the bycatch of the short-tailed albatross and other seabird species.

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

1. Use groundlines which are sufficiently weighted to cause the baited hooks to sink out of reach of seabirds immediately after they are set. (This weight would be determined at a future date by experimental trials);

2. If offal is discharged while gear is being set or hauled, it must be discharged in a manner that distracts seabirds from baited hooks, to the extent practicable. The discharge site on board a vessel must either be aft of the hauling station or on the opposite side of the vessel from the hauling station. Hooks must be removed from any offal (i.e. fish heads) that is discharged; and

3. Make every reasonable effort to ensure that birds brought aboard alive are released alive and that wherever possible, hooks are removed without jeopardizing the life of the bird. (No revision is necessary to the current requirement).

4. For a vessel greater than or equal to 26 ft (7.9 m) length overall (LOA), the operator of the vessel would employ one of the following seabird avoidance measures:

   a. Tow a bird scaring line during deployment of the gear to prevent birds from taking baited hooks. The bird scaring line would be towed directly over the baited hooks and would be of a sufficient length and attached to the vessel at a sufficient height to protect the entire area behind the stern of the vessel where baited hooks are accessible to seabirds. If multiple bird scaring lines are used, they would be immediately adjacent, on each side, of the groundline bearing the baited hooks.

   b. Towed buoy bags would qualify as bird scaring lines if they are properly constructed to effectively deter and prevent seabirds from accessing baited hooks. Towing a board, stick or other device during deployment of gear no longer would qualify as an acceptable seabird avoidance measure.

   c. In addition to 4a above, deploy hooks underwater through a lining tube at a depth sufficient to prevent birds from settling on hooks during deployment of gear.

   d. In addition to 4a above, deploy gear only during the hours specified in regulation ["hours of darkness" §679.24(e)(3)(iv)], using only the minimum vessel's lights necessary for safety.

Option 2: The same revisions to existing regulations as proposed in Option 1 except that the use of lining tubes would be required on specified vessels in the following manner:

1. Catcher-processors using hook-and-line gear would be required to deploy baited hooks through a lining tube, at a depth not less than 1.5 meters when the vessel is fully laden;

2. Sufficient weights would be added to the groundline to prevent it from resurfacing after being set; and

3. This requirement would apply to:
   a. All catcher-processors using hook-and-line gear 60 ft LOA or greater,
   b. Catcher-processors using hook-and-line gear 100 ft LOA or greater, or
   c. Catcher-processors using hook-and-line gear 125 ft LOA or greater.
   d. All vessels using hook-and-line gear 60 ft LOA or greater,
   e. All vessels using hook-and-line gear 100 ft LOA or greater, or
   f. All vessels using hook-and-line gear 125 ft LOA or greater.

4. This requirement would be effective:
   a. January 1, 2000,
   b. September 15, 2000; or
   c. January 1, 2001.

Option 3: Revisions to existing regulations that would be more restrictive and would not allow options in choosing the appropriate seabird avoidance measures to be used. All applicable hook-and-line fishing operations would be conducted in the following manner:

1. Use groundlines which are sufficiently weighted to cause the baited hooks to sink out of reach of seabirds immediately after they are set. (This weight would be determined at a future date by experimental trials) (same as Option 1);

2. If offal is discharged while gear is being set or hauled, it must be discharged in a manner that distracts seabirds from baited hooks, to the extent practicable. The discharge site on board a vessel must either be aft of the hauling station or on the opposite side of the vessel from the hauling station. Hooks must be removed from any offal (fish heads) that is discharged (same as Option 1);

3. Make every reasonable effort to ensure that birds brought aboard alive are released alive and that wherever possible, hooks are removed without jeopardizing the life of the bird. (No revision is necessary to the current requirement); and

4. For a vessel greater than or equal to 26 ft (7.9 m) length overall (LOA), the operator of the vessel would employ the following seabird avoidance measures:

   a. Tow a bird scaring line during deployment of the gear to prevent birds from taking baited hooks. The bird scaring line would be towed directly over the baited hooks and would be of a sufficient length and attached to the vessel at a sufficient height to protect the entire area behind the stern of the vessel where baited hooks are accessible to seabirds. If multiple bird scaring lines are used, they would be immediately adjacent, on each side, of the groundline bearing the baited hooks.

   b. Towed buoy bags would not qualify as bird scaring lines; bird scaring lines would have streamers attached and would be properly constructed to effectively deter and prevent seabirds from accessing baited hooks. Towing a board, stick or other device during deployment of gear also would not qualify as an acceptable seabird avoidance measure.

   c. Deploy gear only during the hours specified in regulation ["hours of darkness" §679.24(e)(3)(iv)], using only the minimum vessel's lights necessary for safety.

AGENDA C-3(b)
FEBRUARY 1999

DRAFT
FOR COUNCIL REVIEW

ENVIRONMENTAL ASSESSMENT/REGULATORY IMPACT REVIEW

INITIAL REGULATORY FLEXIBILITY ANALYSIS

FOR A REGULATORY AMENDMENT TO REVISE REGULATIONS FOR SEABIRD AVOIDANCE MEASURES IN THE HOOK-AND-LINE FISHERIES OFF ALASKA TO REDUCE BYCATCH OF THE SHORT-TAILED ALBATROSS AND OTHER SEABIRD SPECIES

Prepared by

National Marine Fisheries Service
Alaska Regional Office

February 1999

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Executive Summary

At the December 1998 Council meeting, industry representatives requested that the Council revise and strengthen the seabird avoidance measures that are currently required by Federal regulation. This request was made because of the incidental takes of two short-tailed albatrosses in September 1998 and because of the industry group's perception that the use of the required seabird avoidance measures was not effectively reducing the seabird bycatch occurring on its vessels. A proposed regulatory amendment is intended to revise the seabird avoidance measures and thereby reduce seabird bycatch and incidental mortality in the hook-and-line groundfish and Pacific halibut fisheries off Alaska.

Recent takes of the endangered short-tailed albatross (two in September 1998) in the BSAI groundfish fishery highlight a seabird bycatch problem and that seabird avoidance measures must be used consistently and conscientiously if they are to be effective at reducing seabird bycatch. Under the required ESA section 7 consultation on the 1997 GOA and BSAI groundfish fisheries, the U.S. Fish & Wildlife Service (USFWS) anticipated that four short-tailed albatrosses could be taken in 1997 and 1998. The USFWS recently extended the effective period of this 1997-1998 Biological Opinion until it is superseded by a subsequent amendment to that Opinion. Two short-tailed albatrosses have been taken thus far during this period. Based on the ESA section 7 consultation on the 1998 Pacific halibut fishery, the USFWS anticipates that two short-tailed albatross could be taken in 1998 and 1999. If the 2-year incidental take limit is exceeded in either the groundfish or the halibut fisheries, 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 Groundfish Observer Program (GFOP) office has documented bycatch of other seabird species in the GOA and BSAI groundfish fisheries since 1989. Preliminary estimates of the annual seabird bycatch for the Alaska groundfish fisheries, based on 1993 to 1997 data, indicate that approximately 14,000 seabirds are taken annually in the combined BSAI and GOA groundfish fisheries (11,600 in the BSAI; 2,400 in the GOA) at the average rates of 0.090 and 0.0568 birds per 1000 hooks in the BSAI and in the GOA, respectively (USFWS 1998a).

Even though experimental testing of required measures in Alaska is still forthcoming, recent experimental work in other demersal longline fisheries on the effectiveness of line weighting, buoy bags, and lining tubes may lend valuable insight as to the use of those measures in Alaska longline fisheries. This information, in conjunction with that from the IPHC pilot tests, observer seabird data, and input from fishermen in the Alaska groundfish and halibut longline fisheries, is the basis for revising the current seabird avoidance measures. In addition to any regulatory requirements and their enforcement, bycatch reduction requires education of the fleet and the conscientious and consistent application of effective measures.

This Environmental Assessment/Regulatory Impact Review/Initial Regulatory Flexibility Analysis (EA/RIR/IRFA) addresses revising regulations for seabird avoidance measures in the hook-and-line fisheries off Alaska to reduce bycatch of the short-tailed albatross (*Phoebastria albatrus*) and other seabird species.

Alternative 1: No Action: No change in the current Federal requirements for seabird avoidance measures.

Alternative 2: Revisions to existing regulations, intended to improve and strengthen the effectiveness of the required seabird avoidance measures and reduce the bycatch of the short-tailed albatross and other seabird species.

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

1. Use groundlines which are sufficiently weighted to cause the baited hooks to sink out of reach of seabirds immediately after they are set. (This weight would be determined at a future date by experimental trials);

2. If offal is discharged while gear is being set or hauled, it must be discharged in a manner that distracts seabirds from baited hooks, to the extent practicable. The discharge site on board a vessel must either be aft of the hauling station or on the opposite side of the vessel from the hauling station. Hooks must be removed from any offal (i.e. fish heads) that is discharged; and

3. Make every reasonable effort to ensure that birds brought aboard alive are released alive and that wherever possible, hooks are removed without jeopardizing the life of the bird. (No revision is necessary to the current requirement).

4. For a vessel greater than or equal to 26 ft (7.9m) length overall (LOA), the operator of the vessel would employ one of the following seabird avoidance measures:

    a. Tow a bird scaring line during deployment of the gear to prevent birds from taking baited hooks. The bird scaring line would be towed directly over the baited hooks and would be of a sufficient length and attached to the vessel at a sufficient height to protect the entire area behind the stern of the vessel where baited hooks are accessible to seabirds. If multiple bird scaring lines are used, they would be immediately adjacent, on each side, of the groundline bearing the baited hooks.

    b. Towed buoy bags would qualify as bird scaring lines if they are properly constructed to effectively deter and prevent seabirds from accessing baited hooks. Towing a board, stick or other device during deployment of gear no longer would qualify as an acceptable seabird avoidance measure.

    c. In addition to 4a above, deploy hooks underwater through a lining tube at a depth sufficient to prevent birds from settling on hooks during deployment of gear.

    d. In addition to 4a above, deploy gear only during the hours specified in regulation ["hours of darkness" §679.24(e)(3)(iv)], using only the minimum vessel's lights necessary for safety.

Option 2: The same revisions to existing regulations as proposed in Option 1 except that the use of lining tubes would be required on specified vessels in the following manner:

A. Catcher-processors using hook-and-line gear would be required to deploy baited hooks through a lining tube, at a depth not less than 1.5 meters when the vessel is fully laden;

B. Sufficient weights would be added to the groundline to prevent it from resurfacing after being set; and

C. This requirement would apply to:

a. All catcher-processors, 60 ft LOA or greater, using hook-and-line gear,
b. catcher-processors, 100 ft LOA or greater, using hook-and-line gear, or
c. catcher-processors, 125 ft LOA or greater, using hook-and-line gear.
d. All vessels, 60 ft LOA or greater, using hook-and-line gear,
e. All vessels, 100 ft LOA or greater, using hook-and-line gear, or
f. All vessels, 125 ft LOA or greater, using hook-and-line gear.

D. This requirement would be effective:
   a. January 1, 2000,
   b. September 15, 2000; or
   c. January 1, 2001.

Option 3: Revisions to existing regulations that would be more restrictive and would not allow options in choosing the appropriate seabird avoidance measures to be used. All applicable hook-and-line fishing operations would be conducted in the following manner:

1. Use groundlines which are sufficiently weighted to cause the baited hooks to sink out of reach of seabirds immediately after they are set. (This weight would be determined at a future date by experimental trials) (same as Option 1);

2. If offal is discharged while gear is being set or hauled, it must be discharged in a manner that distracts seabirds from baited hooks, to the extent practicable. The discharge site on board a vessel must either be aft of the hauling station or on the opposite side of the vessel from the hauling station. Hooks must be removed from any offal (fish heads) that is discharged (same as Option 1);

3. Make every reasonable effort to ensure that birds brought aboard alive are released alive and that wherever possible, hooks are removed without jeopardizing the life of the bird. (No revision is necessary to the current requirement); and

4. For a vessel greater than or equal to 26 ft (7.9m) length overall (LOA), the operator of the vessel would employ the following seabird avoidance measures:

   a. Tow a bird scaring line during deployment of the gear to prevent birds from taking baited hooks. The bird scaring line would be towed directly over the baited hooks and would be of a sufficient length and attached to the vessel at a sufficient height to protect the entire area behind the stern of the vessel where baited hooks are accessible to seabirds. If multiple bird scaring lines are used, they would be immediately adjacent, on each side, of the groundline bearing the baited hooks.

   b. Towed buoy bags would not qualify as bird scaring lines; bird scaring lines would have streamers attached and would be properly constructed to effectively deter and prevent seabirds from accessing baited hooks. Towing a board, stick or other device during deployment of gear also would not qualify as an acceptable seabird avoidance measure.

   c. Deploy gear only during the hours specified in regulation ["hours of darkness" §679.24(e)(3)(iv)], using only the minimum vessel's lights necessary for safety.

To summarize the Alternative 2 options, Option 1 would: Explicitly specify that weights must be added to the groundline. Currently, the requirement is that baited hooks must sink as soon as they enter the water. It is assumed that fishermen are weighting the groundlines to achieve this performance standard. The offal discharge regulation would be amended by requiring that prior to any offal discharge, embedded hooks must be removed. Streamer lines and buoy bags may both qualify as bird scaring lines. Specific instructions are provided for proper placement and deployment of bird scaring lines. Towed boards, sticks, and other devices would no longer qualify as seabird avoidance measures. The use of bird scaring lines would be required in conjunction to using a lining tube or night-setting. Use of a lining tube or night-setting would continue to be options.

Option 2 differs from Option 1 in that it would require the use of a lining tube for specified vessels. Weights added to the groundline would be required to prevent the groundline from resurfacing after it was set.

Option 3 differs from Option 1 in the two ways: Buoy bags would not qualify as bird scaring lines and night-setting would be required of all specified vessels.

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

In 1997, 101 catcher vessels and 44 catcher/processors fished with hook-and-line gear in the BSAI , and 920 catcher vessels and 25 catcher/processors fished with hook-and-line gear in the GOA. The total number of hook-and-line catcher vessels that caught groundfish off Alaska in 1997 was 932 and the total number of hook-and-line catcher-processor vessels that caught and processed groundfish off Alaska in 1997 was 46. These numbers account for the vessels that operated in both the BSAI and GOA. In 1998, 1768 vessels landed halibut from U.S. Convention waters off Alaska, 91 percent of which were vessels less than 60 ft (18.3 m) LOA. Under both alternatives, all hook-and-line vessels would be directly affected. Under Alternative 2, vessels less than 26 ft (7.9 m) LOA would continue to be exempt from some of the seabird avoidance measures. In 1996, approximately 2.5 percent of groundfish vessels were less than 26 ft (7.9 m) LOA and 15 percent of vessels making halibut landings were less than 26 ft (7.9 m) LOA.

Under Alternative 2, the economic impact on small entities would depend upon the option exercised and the particular measures chosen. All options require the use of a bird scaring line, estimated at $50 to $250 and the use of line weights. Under Option 1, the measures required of all applicable vessels would be expected to be of minimal cost. Procedural or operational changes may be required in fishing operations. Under Option 2, the economic impact on small entities would be the cost for vessel operators required to use a lining tube ($40,000). Note, this cost could be present under Option 1 where the use of a lining tube is optional. Groundfish vessels greater than 60 ft and less than 100 ft is 119, vessels greater than 100 ft and less than 124 ft is 8, and vessels greater than 124 ft is 3. In the halibut fishery, 158 vessels are greater than 60 ft and less than 124 ft and 3 vessels are greater than 125 ft. Under Option 3, the economic impact on small entities would be the potential variable costs of night-setting.

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 Fisheries of the Bering Sea and Aleutian Islands Area. Both fishery management plans (FMP) 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 and became effective in 1978 and the Bering Sea and Aleutian Islands Area (BSAI) FMP became effective in 1982.

The Northern Pacific Halibut Act of 1982 (NPHA), P.L. 97-176, 16 U.S.C. 773c(c) authorizes the regional fishery management councils having authority for the geographic area concerned to develop regulations governing the Pacific halibut catch in U.S. waters which are in addition to but not in conflict with regulations of the International Pacific Halibut Commission (IPHC).

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 goals, objectives, and analyses of the alternatives, and section 3 includes 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 4 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 5 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/Initial Regulatory Flexibility Analysis (EA/RIR/IRFA) addresses revising regulations for seabird avoidance measures in the hook-and-line fisheries off Alaska to reduce bycatch of the short-tailed albatross (*Phoebastria albatrus*) and other seabird species.

1.1 Problem Statement

Concerns exist relating to the incidental catch of the endangered short-tailed albatross and other seabird species in the hook-and-line fisheries off Alaska. The Council and the National Marine Fisheries Service (NMFS) may need additional or revised management measures to address these concerns. Therefore, the Council and NMFS seek to institute management measures, if warranted, to address these concerns.

1.2 Purpose of and Need for the Action

Recent takes of the endangered short-tailed albatross (two in September 1998) in the BSAI groundfish fishery highlight a seabird bycatch problem and that seabird avoidance measures must be used consistently and conscientiously if they are to be effective at reducing seabird bycatch. Under the required ESA section 7 consultation on the 1997 GOA and BSAI groundfish fisheries, the U.S. Fish & Wildlife Service (USFWS) anticipated that four short-tailed albatrosses could be taken in 1997 and 1998. The USFWS recently extended the effective period of this 1997-1998 Biological Opinion until it is superseded by a subsequent amendment to that Opinion. Two short-tailed albatrosses have been taken thus far during this period. Based on the ESA

section 7 consultation on the 1998 Pacific halibut fishery, the USFWS anticipates that two short-tailed albatross could be taken in 1998 and 1999. If the 2-year incidental take limit is exceeded in either the groundfish or the halibut fisheries, 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 Groundfish Observer Program (GFOP) office has documented bycatch of other seabird species in the GOA and BSAI groundfish fisheries since 1989. Preliminary estimates of the annual seabird bycatch for the Alaska groundfish fisheries, based on 1993 to 1997 data, indicate that approximately 14,000 seabirds are taken annually in the combined BSAI and GOA groundfish fisheries (11,600 in the BSAI; 2,400 in the GOA) at the average rates of 0.090 and 0.0568 birds per 1000 hooks in the BSAI and in the GOA, respectively (USFWS 1998a).

At the December 1998 Council meeting, industry representatives requested that the Council revise and strengthen the seabird avoidance measures that are currently required by Federal regulation. This request was made because of the incidental takes of two short-tailed albatrosses in September 1998 and because of the industry group's perception that the use of the required seabird avoidance measures was not effectively reducing the seabird bycatch occurring on its vessels. A proposed regulatory amendment is intended to revise the seabird avoidance measures and thereby reduce seabird bycatch and incidental mortality in the hook-and-line groundfish and Pacific halibut fisheries off Alaska.

Even though experimental testing of required measures in Alaska is still forthcoming, recent experimental work in other demersal longline fisheries on the effectiveness of line weighting, buoy bags, and lining tubes may lend valuable insight as to the use of those measures in Alaska longline fisheries. This information, in conjunction with that from the IPHC pilot tests, observer seabird data, and input from fishermen in the Alaska groundfish and halibut longline fisheries, is the basis for revising the current seabird avoidance measures. In addition to any regulatory requirements and their enforcement, bycatch reduction requires education of the fleet and the conscientious and consistent application of effective measures.

1.3 Alternatives Considered

NMFS issued final regulations for seabird avoidance measures in the GOA and BSAI groundfish hook-and-line fisheries on April 29, 1997 (62 FR 23176) and in the Pacific halibut fishery off Alaska on March 6, 1998 (63 FR 11161). The current seabird avoidance regulations apply to operators of Federally-permitted vessels fishing for groundfish with hook-and-line gear in the GOA and the BSAI, and Federally-permitted vessels fishing for groundfish with hook-and-line gear in waters of the State of Alaska that are shoreward of the GOA and the BSAI, and to operators of vessels fishing for Pacific halibut in U.S. Convention waters off Alaska. All current applicable hook-and-line fishing operations must be conducted in the following manner:

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

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

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

4. For a vessel greater than or equal to 26 ft (7.9m) length overall (LOA), the operator of the vessel must employ one or more of the following seabird avoidance measures:

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

   b. 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;

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

   d. Deploy gear only during the hours specified in regulation ["hours of darkness" §679.24(e)(3)(iv)], using only the minimum vessel's lights necessary for safety.

1.3.1 Alternative 1: No Action: No change in the current Federal requirements for seabird avoidance measures.

1.3.2 Alternative 2: Revisions to existing regulations, intended to improve and strengthen the effectiveness of the required seabird avoidance measures and reduce the bycatch of the short-tailed albatross and other seabird species.

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

1. Use groundlines which are sufficiently weighted to cause the baited hooks to sink out of reach of seabirds immediately after they are set. (This weight would be determined at a future date by experimental trials);

2. If offal is discharged while gear is being set or hauled, it must be discharged in a manner that distracts seabirds from baited hooks, to the extent practicable. The discharge site on board a vessel must either be aft of the hauling station or on the opposite side of the vessel from the hauling station. Hooks must be removed from any offal (i.e. fish heads) that is discharged; and

3. Make every reasonable effort to ensure that birds brought aboard alive are released alive and that wherever possible, hooks are removed without jeopardizing the life of the bird. (No revision is necessary to the current requirement).

4. For a vessel greater than or equal to 26 ft (7.9m) length overall (LOA), the operator of the vessel would employ one of the following seabird avoidance measures:

   a. Tow a bird scaring line during deployment of the gear to prevent birds from taking baited hooks. The bird scaring line would be towed directly over the baited hooks and would be of a sufficient length and attached to the vessel at a sufficient height to protect the entire area behind the stern of the vessel where baited hooks are accessible to seabirds. If multiple bird scaring lines are used, they would be immediately adjacent, on each side, of the groundline bearing the baited hooks.

b. Towed buoy bags would qualify as bird scaring lines if they are properly constructed to effectively deter and prevent seabirds from accessing baited hooks. Towing a board, stick or other device during deployment of gear no longer would qualify as an acceptable seabird avoidance measure.

c. In addition to 4a above, deploy hooks underwater through a lining tube at a depth sufficient to prevent birds from settling on hooks during deployment of gear.

d. In addition to 4a above, deploy gear only during the hours specified in regulation ["hours of darkness" §679.24(e)(3)(iv)], using only the minimum vessel's lights necessary for safety.

Option 2: The same revisions to existing regulations as proposed in Option 1 except that the use of lining tubes would be required on specified vessels in the following manner:

A. Catcher-processors using hook-and-line gear would be required to deploy baited hooks through a lining tube, at a depth not less than 1.5 meters when the vessel is fully laden;

B. Sufficient weights would be added to the groundline to prevent it from resurfacing after being set; and

C. This requirement would apply to:
   a. All catcher-processors, 60 ft LOA or greater, using hook-and-line gear,
   b. catcher-processors, 100 ft LOA or greater, using hook-and-line gear, or
   c. catcher-processors, 125 ft LOA or greater, using hook-and-line gear.
   d. All vessels, 60 ft LOA or greater, using hook-and-line gear,
   e. All vessels, 100 ft LOA or greater, using hook-and-line gear, or
   f. All vessels, 125 ft LOA or greater, using hook-and-line gear.

D. This requirement would be effective:
   a. January 1, 2000,
   b. September 15, 2000; or
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Option 3: Revisions to existing regulations that would be more restrictive and would not allow options in choosing the appropriate seabird avoidance measures to be used. All applicable hook-and-line fishing operations would be conducted in the following manner:

1. Use groundlines which are sufficiently weighted to cause the baited hooks to sink out of reach of seabirds immediately after they are set. (This weight would be determined at a future date by experimental trials) (same as Option 1);

2. If offal is discharged while gear is being set or hauled, it must be discharged in a manner that distracts seabirds from baited hooks, to the extent practicable. The discharge site on board a vessel must either be aft of the hauling station or on the opposite side of the vessel from the hauling station. Hooks must be removed from any offal (fish heads) that is discharged (same as Option 1);

3. Make every reasonable effort to ensure that birds brought aboard alive are released alive and that wherever possible, hooks are removed without jeopardizing the life of the bird. (No revision is necessary to the current requirement); and

4. For a vessel greater than or equal to 26 ft (7.9m) length overall (LOA), the operator of the vessel would employ the following seabird avoidance measures:

   a. Tow a bird scaring line during deployment of the gear to prevent birds from taking baited hooks. The bird scaring line would be towed directly over the baited hooks and would be of a sufficient length and attached to the vessel at a sufficient height to protect the entire area behind the stern of the vessel where baited hooks are accessible to seabirds. If multiple bird scaring lines are used, they would be immediately adjacent, on each side, of the groundline bearing the baited hooks.

   b. Towed buoy bags would not qualify as bird scaring lines; bird scaring lines would have streamers attached and would be properly constructed to effectively deter and prevent seabirds from accessing baited hooks. Towing a board, stick or other device during deployment of gear also would not qualify as an acceptable seabird avoidance measure.

   c. Deploy gear only during the hours specified in regulation ["hours of darkness" §679.24(e)(3)(iv)], using only the minimum vessel's lights necessary for safety.

To summarize the Alternative 2 options, Option 1 would: Explicitly specify that weights must be added to the groundline. Currently, the requirement is that baited hooks must sink as soon as they enter the water. It is assumed that fishermen are weighting the groundlines to achieve this performance standard. The offal discharge regulation would be amended by requiring that prior to any offal discharge, embedded hooks must be removed. Streamer lines and buoy bags may both qualify as bird scaring lines. Specific instructions are provided for proper placement and deployment of bird scaring lines. Towed boards, sticks, and other devices would no longer qualify as seabird avoidance measures. The use of bird scaring lines would be required in conjunction to using a lining tube or night-setting. Use of a lining tube or night-setting would continue to be options.

Option 2 differs from Option 1 in that it would require the use of a lining tube for specified vessels. Weights added to the groundline would be required to prevent the groundline from resurfacing after it was set.

Option 3 differs from Option 1 in the two ways: Buoy bags would not qualify as bird scaring lines and night-setting would be required of all specified vessels.

1.4 Background

1.4.1 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. Commercial fishing for Pacific cod occurs near the edge of the

continental shelf at depths averaging 170 m in 1996. 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. Commercial fishing for sablefish occurs on the upper continental slope at depths averaging 500 m in 1996. 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 (particularly sablefish). Most fishing occurs along the shelf edge and slope at depths averaging 600 m in 1996, 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. Most of the rockfish catch in hook-and-line fisheries is caught incidentally in the sablefish, Pacific cod and Greenland turbot fisheries.

In 1998, the total hook-and-line groundfish catch was 130,489 mt, representing 8.5 percent of the total groundfish catch (Table 1). In 1997, 101 catcher vessels and 44 catcher/processors operated in the BSAI (Table 2) and targeted sablefish, Pacific cod, Greenland turbot, and rockfish. Seventeen vessels in the BSAI are eligible for the multi-species Community Development Quota program (MS-CDQ). Based on observer data collected from 1993 to 1997, the average annual estimate of total number of hooks deployed is approximately 128 million.

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 1998, the total hook-and-line groundfish catch was 25,543 mt, representing 10.4 percent of the total groundfish catch (Table 1). A total of 920 catcher vessels and 25 catcher/processors operated in the GOA (Table 2) and targeted sablefish, Pacific cod, deep-water flatfish, and rockfish. Based on observer data collected from 1993 to 1997, the average annual estimate of total number of hooks deployed is approximately 39 million.

The total number of hook-and-line catcher vessels that caught groundfish off Alaska in 1997 was 932 and the total number of hook-and-line catcher-processor vessels that caught and processed groundfish off Alaska in 1997 was 46. These numbers account for the vessels that operated in both the BSAI and GOA.

IFQ

The Pacific halibut fishery occurs primarily on the continental shelf (50 to 200 m depth) and more rarely on the upper slope (to 400 m depth). During the spring through fall fishing period, Pacific halibut move into shallow water to feed, from the greater winter spawning depths (greater than 400 m depth). In most areas, the continental shelf extends 5 to 100 km offshore, although the shelf extends nearly 800 km in the eastern Bering Sea.

The IFQ program for Pacific halibut and sablefish was implemented in 1995 to address these over-capitalized fisheries. Under the program, a specified amount of catch is available to eligible persons holding Quota Shares. The IFQ season is from March 15 to November 15. In 1998, 51 million pounds of halibut were harvested by 1768 vessels (Table 3). Based on IPHC catch and effort data, the total number of hooks deployed in 1996 was estimated to be approximately 11 million (Trumble pers. comm.).

1.4.2 Description of the Gear

Groundfish

Hook-and-line (i.e. longline) gear in Alaska is fished demersally, the gear is designed to sink to the seafloor. In 1996, the average set length was 9 km for the sablefish fishery, 16 km for the Pacific cod fishery, and 7 km for Greenland turbot. Twelve-inch gangions with hooks are attached to the groundline at regular intervals. The average hook spacing in these 3 fisheries is 1.2 m, 1.4 m, and 1.3 m, respectively. Therefore, the average number of hooks per set for the 3 fisheries is 7500, 11,428, and 5385, respectively. The gear is baited by hand or by machine, with smaller vessels generally baiting by hand and larger vessels by machine. Circle hooks are usually used, except for modified J-hooks on some vessels with machine baiters. In the Pacific cod fishery, typically two lines are set and hauled in a day. The vessel travels at a speed of approximately five to seven knots and the gear is usually deployed from the vessel stern during a two-hour set. Radar-reflecting buoys are connected to both ends of the groundline. Most of the longline vessels in the BSAI targeting Pacific cod are freezer/longliners, many of which use autobaiting systems (Sigler, NMFS pers. comm.).

Hook-and-line vessels targeting sablefish or Greenland turbot set gear in deeper water on the continental slope. Many smaller vessels participate in both the BSAI and GOA fisheries, and fewer are equipped with autobaiting machines.

Halibut

Halibut gear may vary from gear used for groundfish. Traditionally, a unit of gear, or "skate" consists of groundline, gangions, and hooks; the standard "skate" being 0.54 km long with 100 hooks spaced at 5.4 m intervals. The number of skates deployed in a string varies from 4 to 12, and depends on factors such as the

size of the fishing area and the likelihood of snagging on the bottom. Short branch lines (gangions) 1 to 1.5 m long are attached to the groundline and a hook is attached to the end of the gangion, spaced at 1.5 to 7 m intervals along the groundline. Hooks in the halibut fishery are typically size 16/0 circle hooks. Since the inception of the IFQ fishery, more fishermen are combining halibut fishing with other target species and use a smaller 13/0 hook in the mixed fisheries. Each end of the string is attached to an anchor and buoy line and marked at the surface for detection when gear is retrieved. The skates with baited hooks are set over a chute at the stern of the vessel. Average soak time is 12 hours per skate, but can vary according to fishing area, time of year, and bait used. Baits used in the halibut fishery are either fresh or frozen and historically have included herring, squid, or salmon.

Traditionally, gangions have been tied to the groundline at a set spacing (conventional gear), but more recently gangions may be attached to the groundline with a metal snap fastener (snap-on gear). Snap-on gear is used commonly on small vessels. Conventional gear is set and retrieved in coils. When snap-on gear is set, the hooks are baited and the gangions are attached to the groundline as it unwinds from the drum. Hook intervals can be changed with each set. When the gear is retrieved, the hooks are unsnapped and stored (Trumble, IPHC pers. comm.).

1.4.3 Seabird Bycatch in Hook-and-Line Fisheries

1.4.3.1 Historical Background

Millions of birds, representing over 80 species, occur over waters of the Exclusive Economic Zone (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 longline 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.

NMFS began monitoring seabird/fishery interactions off Alaska in 1990 and in 1997 required that operators of hook-and-line vessels in the BSAI and GOA groundfish fisheries use seabird avoidance measures (see Section 1.4.3.2.1). NMFS implemented regulations for seabird avoidance measures in the Pacific halibut fishery in 1998.

Several national and international initiatives highlight the need to address fisheries bycatch issues, including seabird bycatch. The United Nation's Food and Agriculture Organization (FAO) Code of Conduct for Responsible Fisheries was adopted in 1995 and contains an article (7.6.9) that calls for States to "take appropriate measures to minimize waste, discards, catch by lost or abandoned gear, catch of non-target species, both fish and non-fish species,...and promote, to the extent practicable, the development and use of selective, environmentally safe and cost effective gear and techniques." NMFS's recently published strategic document *Managing the Nation's Bycatch: Programs, Activities, and Recommendations for the National Marine Fisheries Service* (NMFS Bycatch Plan) (NMFS 1998a) includes national objectives, goals, and recommendations, all intended to address current programs and future efforts to reduce bycatch and bycatch mortality of marine resources, including protected species and seabirds. Consistent with the Code of Conduct for Responsible Fisheries, the FAO recently held a technical consultation to address seabird bycatch in longline fisheries. At this consultation, an *International Plan of Action for Reducing Incidental Catch of Seabirds in Longline Fisheries (IPOA)* was approved (see Section 1.4.3.3). NMFS believes that its complementary

implementation of the Code of Conduct for Responsible Fisheries, the NMFS Bycatch Plan, and the IPOA should result in the significant reduction of seabird bycatch in the Alaska longline fisheries. This will require the joint and cooperative efforts of NMFS, the Council, USFWS, the effected commercial longline fishing industry, environmental non-governmental organizations, and other interested groups.

1.4.3.2 Efforts to Address and Reduce Seabird Bycatch in Alaska's Longline Fisheries

1.4.3.2.1 Regulatory Measures

NMFS required operators of hook-and-line vessels fishing for groundfish in the BSAI and GOA and federally-permitted hook-and-line vessels fishing for groundfish in Alaska waters adjacent to the BSAI and to the GOA, to employ specified seabird avoidance measures to reduce seabird bycatch and incidental seabird mortality in 1997 (62 FR 23176, April 29, 1997). Measures were necessary to mitigate longline fishery interactions with the short-tailed albatross and other seabird species. Prior to 1997, measures were not required but anecdotal information suggests that some vessel operators may have used mitigation measures voluntarily. NMFS required seabird avoidance measures to be used by operators of vessels fishing for Pacific halibut in U.S. Convention waters off Alaska the following year (63 FR 11161, March 6, 1998). See the proposed rules as well as the Environmental Assessment/Regulatory Impact Review/Final Regulatory Flexibility Analysis (EA/RIR/FRFA) that were prepared for these rulemakings for further discussion of the measures and the development of the regulations (62 FR 10016, March 5, 1997; 62 FR 65635, December 15, 1997; NMFS 1997, 1998b).

Through these implementing regulations, all groundfish and Pacific halibut longline fishing operations must: 1) use baited hooks that sink as soon as they are put in the water, 2) discharge offal in a manner that distracts seabirds from baited hooks (if discharged at all during the setting or hauling of gear), and 3) make every reasonable effort to ensure that birds brought on board alive are released alive. In addition, all applicable longline vessels $\geq$ 26 ft length overall, must employ one or more of the following measures: 4) set gear at night (during hours specified in regulation), 5) tow a streamer line or lines during deployment of gear to prevent birds from taking hooks, 6) tow a buoy, board, stick or other device during deployment of gear at a distance appropriate to prevent birds from taking hooks, or 7) deploy hooks underwater through a lining tube at a depth sufficient to prevent birds from settling on hooks during the deployment of gear.

Alaska fishermen are currently are provided some flexibility in choice of options such that they can select the most appropriate and practicable methods for their vessel size, fishery, and fishing operations and conditions. A similar approach allowing the choice of options will be used in Australia's Threat Abatement Plan (TAP) for the incidental catch of seabirds during oceanic longline fishing operations (Environment Australia 1998).

Enforcement of Seabird Avoidance Regulations: The U.S. Coast Guard assumed an aggressive and pro-active policy of educating commercial longline fishers in the months prior to regulations being effective. At-sea enforcement has continued this policy in checking for compliance with regulations during at-sea boardings. Reports of these compliance checks are made in the Coast Guard's report to the Council at each of its meetings. To date, NMFS Enforcement does not have any active cases involving violations of seabird avoidance regulations. Investigation of several NMFS observer reports of non-use of required measures is underway.

1.4.3.2.2 Public Outreach and Education Regarding Seabird Bycatch Reduction

Providing information about the causes of seabird bycatch and its mitigation through the use of effective measures is a critical component in efforts to reduce the bycatch. Providing this information to all interested parties---the longline fishing industry, state and federal agencies responsible for fisheries management and

seabird conservation and management, environmental groups, and the general public is necessary. Public outreach programs regarding the reduction in seabird bycatch in Alaska longline fisheries have included: Letters and information packets mailed to fishermen, brochures, laminated albatross identification guides, newspaper articles, news releases and information bulletins, radio interviews, information on internet homepages and a seabird bycatch listserver, and an information booth and seminar at Fish EXPO (industry trade show), among others. A symposium at the February 1999 annual meeting of the Pacific Seabird Group, *"Seabird by-Catch: Trends, Roadblocks, and Solutions"* will address a wide array of seabird bycatch issues and all of the above-mentioned interested parties are expected to be in attendance. See Appendix 1 for a list that includes NMFS's seabird-related public outreach activities.

1.4.3.2.3 Observer Data Collection on Seabird Bycatch

Observer Coverage Requirements

Groundfish

Current observer coverage requirements for vessels are based on vessel length and whether participation occurs in the CDQ program. A catcher/processor or catcher vessel 125 ft (38.1 m) LOA or longer must carry an observer during 100 percent of its fishing days (100 percent coverage). A catcher/processor or catcher vessel equal to or greater than 60 ft (18.3 m) LOA, but less than 125 ft (38.1 m) LOA, that participates for more than 3 fishing days in a directed fishery for groundfish in a calendar quarter must carry an observer during at least 30 percent of its fishing days in that calendar quarter and at all times during at least one fishing trip in that calendar quarter for each of the groundfish fishery categories (30 percent coverage). Vessels less than 60 ft (18.3 m) LOA are not required to carry observers. Since 1990, between 20,000 and 30,000 observer coverage days (fishing days) occur each year in the groundfish fisheries. Regulations implementing the NMFS Groundfish Observer Program in Alaska can be found at 50 CFR Part 679.50.

Halibut

No specific observer coverage requirements exist for the Pacific halibut fishery. Prior to 1995, the Pacific halibut fishery was often fished "derby-style", sometimes with a single-day opening. It was not practical for observers to be onboard in such a setting. Approximately 91 percent of vessels making halibut landings in 1998 were less than 60 ft (18.3 m) LOA and it is often impractical for observers to be adequately accommodated on vessels this small (observer coverage is not required on groundfish vessels less than 60 ft LOA). In addition, current data requirements for IPHC's management and quota-setting purposes are met by information collected via port sampling and stock assessment surveys and data acquired by onboard observers has not been necessary (Trumble pers. comm.). If operators of vessels fishing for halibut also fish in a directed fishery for groundfish, then observer coverage requirements would apply. With the vast majority of vessels being less than 60 ft (18.3 m) LOA, most of the remaining 9 percent of vessels are in the 30 percent coverage category (Table 3).

The USFWS Biological Opinion on the effects of the Pacific halibut fishery off Alaska on the short-tailed albatross requires that all observations and takes of the seabird are monitored and reported to the USFWS (USFWS, 1998b). A USFWS form to report such encounters was distributed to groundfish and halibut fishermen in 1998. The USFWS also requires that NMFS prepare and implement a plan to investigate all options for monitoring the Pacific halibut fishery in waters off Alaska for interactions with the short-tailed albatross, including the use of onboard observers. Preparation of this plan will be initiated in 1999. Although the USFWS encourages self-reporting of short-tailed albatross encounters, substantial evidence exists that self-reporting by itself is an inadequate method for monitoring protected species encounters in a fishery (USFWS, 1998b). The USFWS encourages the use of observers on halibut vessels over 60 ft (18.3 m) LOA.

Given that observers are not required on Pacific halibut vessels, NMFS and USFWS requested the IPHC to monitor sightings of short-tailed albatross and incidental catch of seabirds by Pacific halibut fishermen during 1998. IPHC requested halibut fishermen to maintain records of sightings and incidental catch in their logbooks and the IPHC port samplers interviewed fishermen for seabird information. Despite potential reservations about the reliability of self-reported information for protected species, the pattern of seabird bycatch and short-tailed albatross sightings gained through self-reports is consistent with other available information (Trumble and Geernaert, 1999).

Monitoring Seabird Bycatch and Seabird/Fishery Interactions

The monitoring of seabird/fishery interactions by NMFS in the groundfish fisheries began in 1990 and was expanded during the 1993, 1997, and 1999 seasons. The major change in 1993 was to have observers provide genus or species identifications of incidentally caught seabirds. During species composition sampling, the observer makes a reliable (to species or species group) identification and records the numbers and weights of birds in the sample. USFWS uses this incidental mortality data by seabird species to calculate bycatch rates of the observed hauls and to extrapolate numbers of seabirds incidentally caught from the observed portions of the fleet to the unobserved portion, resulting in an estimate of total seabird bycatch. Other observer-collected information that NMFS forwards to USFWS is: Sightings of sensitive species (six species of special concern whose populations are very small or declining), any bird/vessel interactions, document collisions of birds with the vessel superstructure, and detailed information found on the leg bands of banded seabirds. NMFS is currently coordinating with the USFWS to update the seabird section of the NMFS Observer Manual. This will include the incorporation of a standardized USFWS form for the reporting of sightings of sensitive species. This is the same USFWS form that is available to fishermen to report sightings of short-tailed albatrosses.

Observers began providing information about what seabird avoidance measures were being used on longline vessels in 1997. This information collection will be expanded in early 1999 to incorporate more detailed information about the frequency of use of the measures during a fishing trip and specific characteristics of the different avoidance measures, for example, what line weighting regimes are used (number and size of weights, weight spacing on the groundline), construction and deployment characteristics of towed streamer lines and buoy bags, and if offal is discharged for the purpose of distracting seabirds away from baited hooks. Special projects are also being considered that would collect this seabird/gear interaction data on a haul-by-haul basis, rather than by the cruise or trip. The collection of more detailed and specific data will better allow for an analysis of the effectiveness of the avoidance measures at reducing seabird bycatch rates.

Number of Seabirds Taken (USFWS Analysis of Seabird Take and Estimation of Seabird Bycatch Rates): 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. 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).

NMFS has been coordinating with the USFWS in its development of statistically valid extrapolation procedures to estimate the total seabird bycatch in the Alaska groundfish fisheries. Preliminary USFWS estimates of the annual seabird bycatch in Alaska groundfish fisheries based on 1993 to 1996 data were first reported by FAO (FAO 1998a). Preliminary estimates of the annual seabird bycatch for the Alaska groundfish fisheries, based on 1993 to 1997 data, indicate that approximately 14,000 seabirds are taken annually in the combined BSAI and GOA groundfish fisheries (11,600 in the BSAI; 2,400 in the GOA) at the average rates of 0.090 and 0.0568 birds per 1000 hooks in the BSAI and in the GOA, respectively (USFWS 1998a) (Table 4). Of the estimated 14,000 seabirds that are incidentally caught, the species composition is: 67 percent fulmars, 16

percent gull species, 9 percent albatross species, and 8 percent shearwater species (Table 5). Information is not currently available as to the potential impacts of the seabird bycatch in the Alaska longline fisheries on these other seabird species populations.

USFWS Bycatch Estimation Procedures

A paper describing the seabird bycatch estimation methods and procedures developed by the USFWS, in consultation with NMFS, is currently in preparation (Stehn, USFWS pers. comm.). Standard statistical procedures for estimating a population total from a sample are used. Bycatch estimates are based on the number of seabirds by species in samples from observed hauls and the total commercial fish catch as estimated by the NMFS Blend program. The unobserved weight of fish was calculated by subtracting the weight of fish on observed hauls from the known total weight of fish. The estimated total number of birds caught was the sum of observed birds in the catch and the estimated unobserved birds. The number of unobserved birds was estimated by multiplying the ratio of number of birds caught per weight of fish caught from observed hauls times the total estimated weight of fish caught on unobserved hauls. Unobserved birds were assigned to species in proportion to the species composition of observed hauls averaging over all 5 years of data for each region and month. Both the catch rate of birds (number of birds per weight of fish, or birds per 1000 hooks) and the catch rate of fish (total weight of all fish species per hook) are assumed to be equal for observed and unobserved hauls. These assumptions may not hold, not necessarily because the presence of the observer may change the fishing practices of the skipper or crew, but rather because, for some other operational reason, the smaller (unobserved) vessels may have different catch rates than the large or mid-sized vessels. The constant catch rates for birds and/or fish among vessel size categories are untested and critical assumptions. If different catch rates do exist for different vessel size categories, then the average area catch rates and the estimates of the total seabird bycatch number may be overestimated. Preliminary information from a USFWS analysis of observer data on seabird bycatch indicates different bycatch rates occur for catcher-processor vessels and catcher vessels (Appendix 2).

1.4.3.2.4 Seabird Test Plan

The USFWS Biological Opinion on the effects of the BSAI and GOA groundfish fisheries on the short-tailed albatross required NMFS to develop a plan to evaluate the effectiveness of the seabird avoidance measures that were required in 1997. During the public comment period of the proposed rule (62 FR 10016, March 5, 1997), critics of the proposed regulations argued that the more stringent measures required by Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR) in southern oceans should be adopted in Alaska's fisheries. Although similar to NMFS regulations in many ways, CCAMLR regulations are more restrictive in that they require vessels to set longlines only at night, and to deploy streamer lines at all times during fishing operations. At that time, no scientific data existed on the effectiveness of any deterrent measures in Alaska's fisheries. The appropriateness of the CCAMLR measures for the conditions of the BSAI and GOA was therefore unknown. NMFS and USFWS agreed to endorse more flexible requirements initially for Alaska to allow fishermen, managers and scientists to experiment with devices and determine their effectiveness. Testing the effectiveness of seabird bycatch avoidance measures will allow NMFS to better ascertain if they are effective in the Alaskan fisheries. Once measures have been tested, NMFS will be better able to revise regulations to maximize their effectiveness. This may include specific performance standards for the seabird avoidance measures, if appropriate (NMFS 1997).

The Biological Opinion issued by USFWS in 1998 on the effects of the Pacific halibut fishery off Alaska on the short-tailed albatross required NMFS to apply the plan developed to test the effectiveness of seabird avoidance measures in the groundfish fisheries to the Pacific halibut fishery also. The plan must also be implemented and a final report on the evaluation of avoidance measures submitted to USFWS by December 31, 2000.

NMFS completed and submitted to USFWS a *Test Plan to Evaluate Effectiveness of Seabird Avoidance Measures Required in Alaska's Hook-and-Line Groundfish and Halibut Fisheries* (Test Plan; NMFS 1998c). The Test Plan focuses on three key components to evaluate the effectiveness of seabird avoidance measures: 1) Experimental testing of avoidance measures, 2) collection of information on avoidance measures by observers on commercial vessels, and 3) solicit and gather information from fishermen on the effectiveness of seabird avoidance measures. Funds have recently been identified to carry out the experimental tests and testing should begin in the spring or early summer of 1999. As noted previously, the observer data that is collected on longliners has been amended to more directly reflect on the effectiveness of the measures that are used. NMFS continues to communicate with fishermen to address the effectiveness of the avoidance measures they are using. A seminar on this topic was held at the 1997 Fish Expo [jointly sponsored with North Pacific Longline Association (NPLA) and USFWS] and information was solicited at the 1998 Fish Expo.

1.4.3.3 Global Perspective of Incidental Catch of Seabirds in Longline Fisheries

Seabirds are being taken incidentally in various commercial longline fisheries in the world, and concerns are arising about the impacts of that incidental take. Seabird bycatch also has an adverse impact on fishing productivity and profitability. Governments, nongovernmental organizations, and commercial fishery associations are petitioning for regulatory measures to reduce the mortality of seabirds in longline fisheries in which seabirds are incidentally taken.

Seabird Bycatch Rates in Global Longline Fisheries: Longline fisheries in which seabird bycatch occurs are: tuna, broadbill (swordfish) and billfish in the South Pacific; toothfish in the Southern Ocean, and halibut, black cod, tuna, billfish, Pacific cod, Greenland halibut, cod, haddock, tusk and ling in the Northern Oceans (Pacific and Atlantic). The species of seabirds most frequently taken are albatrosses and petrels in the South Pacific and South Atlantic fisheries, Northern fulmar in the North Atlantic and albatrosses, gulls and fulmars in the North Pacific fisheries. See Chapter 4 of FAO Fisheries Circular No. 937 (FAO 1998a) for a detailed description of known seabird bycatch rates. See Table 6 for a summary of the these bycatch rates.

Seabird Avoidance Measures Currently Required in Global Longline Fisheries: Responding to the need to reduce the incidental mortality of seabirds in commercial fishing in the southern oceans, CCAMLR adopted mitigation measures in 1992 to reduce seabird bycatch by its 23 member countries. Under the auspices of the CCSBT, Australia, Japan and New Zealand have studied and taken seabird mitigation measures in their southern bluefin tuna longline fishery since 1992, and in 1995 CCSBT adopted the recommendation relating to ecologically related species especially the incidental mortality of seabird by longline fishing which stipulate the policy on data and information collection, mitigation measures and education and information dissemination. The United States. also adopted, by regulation, seabird bycatch reduction measures for its groundfish longline fisheries in the BSAI and GOA in 1997, and for the Pacific halibut fishery off Alaska in 1998. The United States is currently considering seabird bycatch mitigation measures in the Hawaiian pelagic longline fisheries. See Table 12 of FAO Fisheries Circular No. 937 (NMFS 1998d Attachment C) for an account of current regulations for reducing seabird bycatch in longline fisheries.

Although a choice of options will be available for use in Australia's pelagic longline operations (Table 7), the options will be more strictly defined than those offered currently in the Alaska demersal fisheries. The TAP was written to meet the Australian government's obligations under their Endangered Species Protection Act 1992 following the listing of the incidental catch of seabirds during oceanic longline fishing operations as a key threatening process. Mitigation measures in the TAP must be implemented by 1999 by specified longline fishing operations in the Australian Fishing Zone (AFZ). This is the first time that domestic vessels in the AFZ will be required to use seabird avoidance measures. In 1995, streamer lines were required to be used on domestic vessels fishing south of 30°S and on all foreign vessels as a condition of obtaining a fishing permit for the AFZ.

NMFS's Involvement in the FAO Initiative to Reduce the Incidental Catch of Seabirds in Longline Fisheries: One of the objectives of the Food and Agriculture Organization's (FAO) Code of Conduct for Responsible Fisheries is to promote the protection of aquatic resources (FAO 1995). The Code also contains an article (7.6.9) promoting management measures to minimize the catch of nontarget, non-fish species and promoting the development and use of selective, environmentally safe and cost effective gear and techniques.

Pursuant to a proposal at the 22nd Session of the FAO's Committee on Fisheries (COFI) in March 1997 that FAO organize, in collaboration with Japan and the United States, an expert consultation on the issue, representatives of FAO, the Governments of Japan and the United States agreed to organize an FAO Consultation on the subject in October 1998. The objective of the FAO Consultation was to produce an International Plan of Action (IPOA) for implementing mitigation guidelines to reduce incidental catches of seabirds in longline fisheries to be considered for adoption by the 23rd Session of COFI in February 1999.

In preparation of the FAO Consultation a group of experts from FAO, Japan, the United States and other major regions which have problems with incidental catch of seabirds was established. This group was known as the Seabird Technical Working Group (STWG). FAO appointed the 16 members of the STWG. The members of the STWG were involved in the preparation and review of three background papers on 1) a description of pelagic and demersal longline fisheries (areas, catches, technology and fishing effort) ; 2) review of the incidental catch of seabird in specific longline fisheries; and 3) a review of seabird bycatch mitigation measures and their effect on other marine species and two draft documents on 1) Guidelines for measures to reduce seabird bycatch; and 2) a Plan of Action for implementation of the proposed guidelines. The STWG met in Tokyo, Japan in March 1998. A preliminary version of the compiled background papers, *The Incidental Catch of Seabirds by Longline Fisheries: Worldwide Review and Technical Guidelines for Mitigation*, has been issued (FAO 1998a) and will be finalized and published in the FAO Fisheries Technical Paper Series in 1999.

The consultation on the Management of Fishing Capacity, Shark Fisheries, and the Incidental Catch of Seabirds in Longline Fisheries was held in plenary session in Rome, Italy, October 26-30, 1998. It was attended by 81 members of FAO and by observers from a non-member nation of FAO, a specialized agency of the United Nations, as well as ten intergovernmental organizations and eight international non-governmental organizations. The United States Delegation was headed by Terry Garcia, Assistant Secretary of Commerce for Oceans and Atmosphere, and well-represented by staff from NMFS, NOAA, USFWS, Department of State and several advisors from non-governmental groups. The Draft IPOA for the Reduction of Incidental Catch of Seabirds in Longline Fisheries (see Section 10.3, Appendix 3) was approved and is summarized below. It will be considered for adoption at FAO's next COFI meeting in February 1999.

IPOA Summary: The IPOA describes concrete and specific steps for reducing the incidental catch of seabirds in longline fisheries at the national, regional, and global levels, calling for national plans of action by 2001. Countries are to conduct assessments of seabird bycatch and, if necessary, develop National Plans of Action (NPOAs). Suggested elements of an NPOA include: Prescription of mitigation measures; plans for research and development of improved measures or practices and evaluation of the effectiveness of such measures and practices; plans for outreach programs to raise awareness and educate about the IPOA, the NPOA, and the need to reduce seabird bycatch; and data collection programs, including observer programs, to determine the incidental catch of seabirds in longline fisheries and the effectiveness of mitigation measures. Attached to the IPOA are technical notes to provide assistance to countries in developing their NPOAs and in identifying appropriate technical and operational mitigation measures to reduce seabird bycatch (FAO 1998b).

2.0 GOALS, OBJECTIVES, AND ANALYSES OF ALTERNATIVES

2.1 Goal of the Amendment

The goal of a regulatory amendment is to revise existing regulations for seabird avoidance measures such that bycatch of the short-tailed albatross is reduced. This could benefit the endangered short-tailed albatross population and also reduce the risk of potential serious economic impacts to the Alaska longline fisheries if the incidental take limit under the section 7 ESA consultation were exceeded and fishery closures became an option for consideration under the section 7 consultation process. Bycatch reductions of other seabird species could also be expected.

2.2 Objective of the Amendment

The objective of the amendment is to revise the current seabird avoidance requirements to improve their effectiveness at reducing seabird bycatch. This could be achieved by: 1) providing improved requirements for the construction and/or deployment of measures, 2) adding new measures, 3) deleting current measures.

2.3 Analyses of Alternatives

Use of Seabird Avoidance Measures on Observed Vessels: Based on data from observed longline trips from 1997 through July 1998, the most commonly used mitigation measure was towing a buoy bag (74 percent), followed by sinking baited hooks quickly, streamer lines, offal discharge on opposite side of vessel, night setting of gear, and use of an underwater lining tube (1.6 percent of trips, 1 vessel). Most observed trips used more than one device at a time (Table 8).

Effectiveness of the Required Seabird Avoidance Measures: Significant reduction in seabird bycatch is dependent upon the consistent and conscientious use of measures that are constructed and deployed carefully to be effective. Effective measures or practices meet one or several of the following criteria: 1) prevent baited hooks from being visible to seabirds, 2) prevent seabirds from accessing baited hooks, and 3) decrease the incentive for seabirds to follow longline vessels. To date, NMFS has not scientifically tested the effectiveness of required seabird avoidance measures in Alaskan fisheries; some pilot experiments addressing the use and effectiveness of buoy bags were conducted by IPHC in 1998 and preliminary results are available (Trumble, 1999). As noted previously, NMFS has developed a Test Plan to evaluate the effectiveness of these measures, and experimental tests are anticipated to begin in spring or summer 1999. Results from these experiments conducted over two field seasons are expected later in 2000. The information collected thus far by observers regarding use of avoidance measures is difficult to evaluate because the data are not on a haul-specific basis and therefore it is not known if measures were used consistently for each set of the trip. Neither is it possible to ascertain from these data the quality of the avoidance measure used and this has been found to be critical to its effectiveness at reducing seabird bycatch (Brothers 1996). NMFS has received valuable input from fishermen and observers regarding their experiences with what measures seem to work and those that don't.

At this time, NMFS does not have the necessary information to consider revising current regulations with regard to areas fished or additional vessel size categories that could be exempt from certain seabird avoidance requirements (see Appendix 2). Industry queries have been made as to the necessity for seabird avoidance measures on smaller vessels and those fishing waters in Southeast Alaska. For vessels less than 60 ft (18.3 m) LOA, special studies with an observer onboard would be required to obtain pertinent seabird bycatch information.

Recent experimental work in other demersal longline fisheries on the effectiveness of line weighting, buoy bags, and lining tubes may lend valuable insight as to the use of those measures in Alaska longline fisheries and will be discussed below. This information, in conjunction with that from the IPHC pilot tests, observer seabird data, and input from fishermen in the Alaska groundfish and halibut longline fisheries, is the basis for the analysis of the proposed regulatory amendment.

2.3.1 Alternative 1: No Action--no change in the current Federal requirements for seabird avoidance measures.

Seabird avoidance measures were first required in the BSAI and GOA groundfish longline fisheries in April 1997 (see section 1.3 for the list of measures). Based on current annual estimates of total seabird bycatch and observed seabird bycatch rates, it is not evident what effect the avoidance measures may have had on bycatch rates in 1997. In the BSAI groundfish longline fishery, two short-tailed albatross were reported taken in 1998 and estimates of the total number of seabirds taken and the observed seabird bycatch rate in 1997 are higher than those from 1993, 1994, and 1996 but lower than those from 1995 (Tables 5,6). In contrast, no short-tailed albatross has been reported taken in the GOA groundfish longline fishery since 1995 and estimates of the total number of seabirds taken and the observed seabird bycatch rate in 1997 are much lower than those from 1993 to 1996 (Tables 4,5). It is possible that physical, oceanographic factors affecting seabird distribution, prey availability, seabird natural mortality, seabird mortality incidental to longline fisheries, and others may play a role in observed seabird bycatch rates (NMFS 1998e).

Despite not being able to quantifiably measure the effectiveness of the current seabird avoidance requirements at this time (see Appendix 2), reasonable revisions could be made that could achieve the objective of the regulatory amendment.

2.3.2 Analysis of Alternative 2: Revisions to existing regulations, intended to improve and strengthen the effectiveness of the required seabird avoidance measures and reduce the bycatch of the short-tailed albatross and other seabird species.

2.3.2.1 Analysis of Alternative 2: Option 1 (Line weighting, no embedded hooks, bird scaring line)

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

1. **Use groundlines which are sufficiently weighted to cause the baited hooks to sink out of reach of seabirds immediately after they are set. (This weight would be determined at a future date by experimental trials);**

Sinking baited hooks quickly was used on 40 percent of observed trips on longline vessels in 1997 and 1998 (Table 8). The current regulation specifies the performance that must be achieved, not the method that must be used to achieve it. The two most common methods of sinking longline gear are applying additional weights to the groundline and thawing baits. The latter method is appropriate for pelagic longline fisheries, not demersal (FAO 1998a). Given that all Alaska longline fisheries are demersal, it has been assumed that fishermen are applying weights to the groundline to comply with this requirement. Because demersal gear actually sets on the ocean floor, theoretically the only limitations on attaching weights is the hydraulic line-hauling capacity and the method of weight attachment and detachment (FAO 1998a).

The purpose of applying additional weights to the groundline is to cause the gear to sink more quickly such that seabirds cannot reach the baited hooks. Precisely how fast a bait needs to sink so that seabirds cannot take it

is generally dependent upon 3 factors: 1) Whether additional bait protection such as a bird scaring line is being used, 2) the vessel's line-setting speed, and 3) the foraging capabilities of the seabirds present. To account for these variables and to achieve consistent, reliable benefit from appropriate line weighting necessitates a generalized approach---applying as much weight as frequently as possible within the limits of feasibility. The line weighting regimes may differ in each of the longline fisheries according to the method and gear used (FAO 1998a).

Although albatross and most other seabirds in Alaska are surface feeders, they can still reach baited hooks 1 to 2 and possibly 3 m below the water's surface (Gould pers. comm.). By sinking fishing gear quickly AND protecting the vulnerable zone behind the vessel with a surface deterrent(s), seabird bycatch should be significantly reduced. Line sink rates will vary as a function of the line weighting regime used, line setting speed, propeller turbulence, 'line hook-ups' (when hooks snag on line setting gear as the longline is being deployed), and 'weight pull-backs' (occurs when line weights are pulled from the vessel by the drag of the line already deployed). Preliminary investigations in the demersal Patagonian toothfish fishery found that a line weighting regime of 4kg/40m was effective at sinking gear to a sufficient depth, as tested on a 150 ft autoliner vessel (Robertson 1998). A similar regime is being promoted in New Zealand, 5kg/40m (J. Molloy pers. comm.). Several fishermen in Alaska longline fisheries are finding that smaller weights applied more frequently (0.5kg/20m) are effectively sinking the gear to a sufficient depth on smaller vessels (M. Lundsten pers. comm.). The small weights are spliced directly into the groundline. Many seabird experts around the world believe that for demersal fisheries, sufficiently weighting the groundline may be one of the most effective and practicable methods available to significantly reduce the bycatch of seabirds (N. Brothers pers.comm.). Line weighting is one of the mitigation measures identified in the FAO's IPOA (FAO 1998b).

2. **If offal is discharged while gear is being set or hauled, it must be discharged in a manner that distracts seabirds from baited hooks, to the extent practicable. The discharge site on board a vessel must either be aft of the hauling station or on the opposite side of the vessel from the hauling station. Hooks must be removed from any offal (i.e. fish heads) that is discharged; and**

2. *Offal Discharge Methods:* Seven to ten percent of observed trips on longline vessels used some type of offal discharge measure, either discharging from the opposite side of the vessel during the setting or hauling of gear, or not discharging offal at all during the set or haul. The purpose of addressing offal discharge is to minimize the attractiveness of the vessel or the gear deployment area to seabirds. If seabirds are not attracted to the vessel in the first place, then the likelihood of snagging one on a baited hook is decreased greatly. Many vessel operators have indicated that it is not practicable to not discharge offal, particularly during haul operations. Some evidence suggests that discharging of homogenized offal during line settings greatly reduced the incidental of seabirds, mainly because the birds were more attracted by offal than by baited hooks (Cherel *et.al.* 1996).

Alternative 2, Option 1 proposes to revise the current regulation by adding a requirement that hooks be removed from any offal (i.e. fish heads) that are discharged. Scavenging birds can become hooked in this manner and although not immediately life-threatening, hooked birds may realize negative effects to their survival. Removing embedded hooks prior to fish heads being discharged is one of the mitigation measures identified in the FAO's IPOA (FAO 1998b).

3. **Make every reasonable effort to ensure that birds brought aboard alive are released alive and that wherever possible, hooks are removed without jeopardizing the life of the bird. (No revision is necessary to the current requirement).**

4. **For a vessel greater than or equal to 26 ft (7.9m) length overall (LOA), the operator of the vessel would employ one of the following seabird avoidance measures:**

   a. **Tow a bird scaring line during deployment of the gear to prevent birds from taking baited hooks. The bird scaring line would be towed directly over the baited hooks and would be of a sufficient length and attached to the vessel at a sufficient height to protect the entire area behind the stern of the vessel where baited hooks are accessible to seabirds. If multiple bird scaring lines are used, they would be immediately adjacent, on each side, of the groundline bearing the baited hooks.**

   b. **Towed buoy bags would qualify as bird scaring lines if they are properly constructed to effectively deter and prevent seabirds from accessing baited hooks. Towing a board, stick or other device during deployment of gear no longer would qualify as an acceptable seabird avoidance measure.**

Buoy Bag Towed Behind Vessel During Setting of Gear: Seventy-four percent of observed trips on longline vessels used this measure (Table 8). Construction of the buoy bag varies, from one to several buoys of varied sizes being towed from the vessel's stern. The line attaching the buoy(s) to the vessel should be high enough (e.g. to a pole, the mast, baithouse, etc.) to clear 15-25ft above the sea surface at the stern. The minimum length of the line should be 150-200 ft, or approximately 2 boat lengths. These dimensions will vary according to setting speed, longer lengths required for faster setting speeds. The intent is to have the buoy bag suspended directly over the fishing gear as it is being set, preventing seabirds from accessing the 'vulnerable zone' behind the stern, that area where they could access baited hooks before the gear has had time to sink to a sufficient depth. Some fishermen are towing 2 buoy bags (or streamer lines), one on either side of the fishing gear. Especially in windy conditions, at least one of the lines would be over the fishing gear. Preliminary results from an experiment conducted on a Norwegian longline vessel indicate that towed floats (i.e. buoy bag) reduced significantly the number of seabirds caught on baited hooks compared to when no seabird avoidance device was used (Løkkeborg 1998). Three different avoidance measures were tested---towed floats, streamer line, and an underwater setting funnel (i.e. lining tube). During 11 sets for each of these methods, 2, 0, and 6 seabirds, respectively, were caught compared to 74 seabirds when no avoidance device was used.

IPHC conducted preliminary experiments in summer 1998 to evaluate the effectiveness of buoy bags in reducing the potential for seabird bycatch (Trumble 1999). The number of bait attacks by seabirds (i.e. attempts by seabird to take baited hooks) was observed for sets when a buoy bag was towed compared to sets when no deterrent device was used (control). These observations were made for both sets using sablefish gear and sets using halibut gear. Bait attacks with the buoy bag deployed averaged 3.2 per skate for sablefish gear and 1.9 for halibut gear. Bait attacks with no deterrent device in use averaged 6.5 and 3.6 per skate for sablefish and halibut gear, respectively. The number of bait attacks with the buoy bag was about half the number as when no device was used. Sablefish gear experienced about twice the number of attacks per skate as did the halibut gear, both with and without the bird bag, even though the sablefish gear had 4 times as many hooks (Trumble 1999).

Streamer Line Towed Behind the Vessel During the Setting of Gear: Twenty-one percent of observed trips on longline vessels used this measure (Table 8). The purpose of towing a streamer line is like that of a buoy bag, to prevent seabirds from accessing the vulnerable zone behind a vessel, where baited hooks are still accessible until they have sunk deep enough that the birds cannot reach them. Streamer lines will have buoys and/or weights attached at the end of the line (to keep the line taut so it doesn't tangle with the deploying gear) and will have 6 to 10 paired streamers suspended from the line, over the area where the fishing gear is being deployed. Like all of the avoidance measure construction materials, a durable and sturdy material should be

used. A wide variety of streamer constructions have been devised, the key being an unpredictable movement that the birds do not become accustomed to. Some fishermen report using two streamer lines, one on either side of the fishing gear (M. Lundsten, pers.comm.). The effectiveness of streamer lines at reducing seabird bycatch has been directly tested in only a few experiments (Løkkeborg 1992, 1996, 1998). More frequently, its effectiveness has been noted through the analyses of observer data, other scientific observations, and anecdotal information. Worldwide, it is probably the most common seabird avoidance measure in use today. It is required in specified fisheries by country or convention in Australia, Japan, New Zealand, South Africa, United Kingdom (Falkland Islands/Malvinas), United States (as an option), CCAMLR, and CCSBT. It is estimated that the use of effective bird scaring lines may reduce seabird bycatch by 80 percent (FAO 1998a).

Correctly positioned bird scaring lines are one of the mitigation measures identified in the FAO's IPOA. The IPOA notes that both streamer lines and towing buoys are examples of bird scaring lines (FAO 1998b).

Other Devices: Ten percent of observed trips on longline vessels used some 'other' device--examples are fire hose, paddlewheel, plastic streamers tied near stern, gun, and air horn. Water cannons may be effective at reducing seabird bycatch but the distance astern to which the water reached was considered to be inadequate. Noise deterrents may have some effect, albeit very limited, if used sparingly so birds do not become habituated to the sounds (FAO 1998a). Little is known about the effectiveness of the other devices.

Option 1 would not prohibit the use of towing other devices but rather require that they be used in combination with a bird scaring line. Because no currently used mitigation measure in any longline fishery is thought to be absolutely effective, the use of measures in combination has been promoted (CCAMLR 1996, FAO 1998a,b).

c. In addition to 4a above, deploy hooks underwater through a lining tube at a depth sufficient to prevent birds from settling on hooks during deployment of gear.

d. In addition to 4a above, deploy gear only during the hours specified in regulation ["hours of darkness" §679.24(e)(3)(iv)], using only the minimum vessel's lights necessary for safety.

As referenced above, because no currently used mitigation measure in any longline fishery is thought to be absolutely effective, the use of measures in combination has been promoted. For more specific information about the use of lining tubes and night-setting, see Options 2 and 3 below.

2.3.2.2 Analysis of Alternative 2: Option 2 (Lining tube, line weighting, no embedded hooks, bird scaring line)

Option 2: The same revisions to existing regulations as proposed in Option 1 except that the use of lining tubes would be required on specified vessels in the following manner:

A. Catcher-processors using hook-and-line gear would be required to deploy baited hooks through a lining tube, at a depth not less than 1.5 meters when the vessel is fully laden;

B. Sufficient weights would be added to the groundline to prevent it from resurfacing after being set; and

C. This requirement would apply to:
a. All catcher-processors, 60 ft LOA or greater, using hook-and-line gear,
b. catcher-processors, 100 ft LOA or greater, using hook-and-line gear, or

c. catcher-processors, 125 ft LOA or greater, using hook-and-line gear.
d. All vessels, 60 ft LOA or greater, using hook-and-line gear,
e. All vessels, 100 ft LOA or greater, using hook-and-line gear, or
f. All vessels, 125 ft LOA or greater, using hook-and-line gear.

D. This requirement would be effective:
a. January 1, 2000,
b. September 15, 2000; or
c. January 1, 2001.

One purpose of setting gear underwater through a lining tube is to deploy the gear at a depth that is not accessible by seabirds. Two studies have noted a reduction in bait loss and seabird bycatch when a lining tube is used (Løkkeborg 1996, 1998). In both studies, fewer birds were caught with a lining tube than compared to when no avoidance was used (28:99, 6:74) but more birds were caught with a lining tube than when a streamer line was used (28:2, 6:0).

At least 4 methods have been or are being developed to set gear underwater; the baited hooks being delivered from the vessel so that they first emerge in the water, out of sight of nearby birds. The lining tube can be of sufficient diameter to permit the line, hooks, buoys, etc. to pass down it and exit underwater astern or have a grooved side for external deployment of buoys, weights, etc. Theoretically, underwater setting could virtually eliminate seabird bycatch (FAO 1998a). But, current information indicates that the device has some design deficiencies compromising the essential capabilities of any underwater setting device to: 1) deliver hooks deep enough, 2) withstand the substantial forces acting upon it, 3) not create additional problems, such as increased bait loss or line wear (FAO 1998a). Problems have been noted with the line escaping from the tube, through a groove along its length (P. Ryan, J. Silden, J. Youngblood pers. comm.). This effectively brings the line back to the surface where seabirds are able to access the baited hooks. Design improvements to a springed locking mechanism may have resolved this problem. Another concern is whether or not propeller turbulence causes the line, after it leaves the tube, to come back to the surface (Robertson pers. comm.). This could be remedied by extending the tube beyond the propeller turbulence (if possible) or applying weights to the groundline to cause it to sink more rapidly after exiting the lining tube. Tests carried out on Norwegian vessels indicated that the pitch angle of the vessel affects the lining tube's efficiency. In the beginning of a trip, when the vessel has not taken on fish, the tube goes deeper into the water and works well. Once the catch is loaded (middle and forward part of vessel), the tube sets the line closer to the water's surface with loss in efficiency (S. Løkkeborg pers.comm.). Sea condition is also a factor that can affect the performance of the lining tube.

Currently, only one vessel in the Alaska longline fisheries has installed a lining tube. The custom installation occurred in the summer of 1997 and required the vessel to be dry-docked. A preliminary analysis of the number of albatross caught on that vessel indicate annual albatross bycatch rates (number of birds/1000 hooks) of: 0.0012, 0.004, 0.0039, 0, and 0.0207 for 1994 to 1998 (Table 9). The vessel company and Mustad (gear manufacturer) indicated that problems occurred with the groundline escaping from the lining tube. The vessel skipper noticed a greater number of birds caught during these times. Improvements were made to the lining tube in the summer of 1998; the high bycatch in 1998 may be attributable to the problems with the lining tube in the early part of the year. After the lining tube was fine-tuned and used in conjunction with a buoy bag, the skipper reported greatly reduced seabird bycatch, with no albatross being caught.

The two short-tailed albatross takes in 1998 occurred on catcher-processor (i.e. freezer-longliner) vessels; thus the industry proposal at the Council's December 1998 meeting to require lining tubes on freezer-longliners only. Some evidence suggests that large vessels which provide a continuous supply of food may attract more seabirds than smaller vessels and experience a higher seabird bycatch rate (Barnes *et. al.* 1997). Variations between vessels in the numbers of observed seabird catches appeared to be related, at least in part, to the extent

to which birds accumulate around vessels. This, in turn, is a function of the length of time that offal is discarded. Smaller vessels are not as attractive to scavenging seabirds as are larger vessels, which provide a continuous supply of food. Smaller vessels fishing off the southwest cape in South Africa do not accumulate large numbers of scavenging birds, because hauling and setting periods are much shorter and erratic and the offal is only available to birds for short periods and in small quantities (Christian Boix, pers. comm.). A very preliminary analysis of seabird bycatch observer data from 1993 to 1997 suggests that the bycatch rate on freezer-longliners is twice that of catcher vessels (Appendix 2).

Currently, only one manufacturer (O. Mustad) produces the lining tube. Mustad is currently exploring the possibilities for licensing with a North American manufacturer. Installations are custom to the vessel and must occur in a shipyard. Thus far, all installations worldwide (60 vessels) have occurred on vessels over 100 ft LOA but the manufacturer indicated lining tubes could be installed on vessels no smaller than 60 ft LOA.

Underwater setting devices are one of the mitigation measures identified in the FAO's IPOA. The IPOA notes that the devices are still under development but could have high effectiveness (FAO 1998b).

2.3.2.3 Analysis of Alternative 2: Option 3 (Line weighting, streamer line, night setting)

Option 3: **Revisions to existing regulations that would be more restrictive and would not allow options in choosing the appropriate seabird avoidance measures to be used. All applicable hook-and-line fishing operations would be conducted in the following manner:**

1. **Use groundlines which are sufficiently weighted to cause the baited hooks to sink out of reach of seabirds immediately after they are set. (This weight would be determined at a future date by experimental trials) (same as Option 1);**

2. **If offal is discharged while gear is being set or hauled, it must be discharged in a manner that distracts seabirds from baited hooks, to the extent practicable. The discharge site on board a vessel must either be aft of the hauling station or on the opposite side of the vessel from the hauling station. Hooks must be removed from any offal (fish heads) that is discharged (same as Option 1);**

3. **Make every reasonable effort to ensure that birds brought aboard alive are released alive and that wherever possible, hooks are removed without jeopardizing the life of the bird. (No revision is necessary to the current requirement); and**

4. **For a vessel greater than or equal to 26 ft (7.9m) length overall (LOA), the operator of the vessel would employ the following seabird avoidance measures:**

    a. **Tow a bird scaring line during deployment of the gear to prevent birds from taking baited hooks. The bird scaring line would be towed directly over the baited hooks and would be of a sufficient length and attached to the vessel at a sufficient height to protect the entire area behind the stern of the vessel where baited hooks are accessible to seabirds. If multiple bird scaring lines are used, they would be immediately adjacent, on each side, of the groundline bearing the baited hooks. (Same as Option 1)**

    b. **Towed buoy bags would not qualify as bird scaring lines; bird scaring lines would have streamers attached and would be properly constructed to effectively**

deter and prevent seabirds from accessing baited hooks. Towing a board, stick or other device during deployment of gear also would not qualify as an acceptable seabird avoidance measure.

c. **Deploy gear only during the hours specified in regulation ["hours of darkness" §679.24(e)(3)(iv)], using only the minimum vessel's lights necessary for safety.**

See Section 2.3.2.1 for discussions of line weighting, streamer lines, and buoy bags.

Gear Set at Night: Approximately seven percent of observed trips of longline vessels used this measure. This practice has been identified worldwide as the most effective measure available and capable of virtually eliminating seabird mortality in some fishing areas. Despite its potential efficacy, night-setting has remained relatively unpopular among fishermen. In high latitude areas, such as Alaska, night-setting is not a feasible option in the summer. It can pose other restrictions to smaller-sized vessels where fishing efficiency may be compromised (vessel size-related seaworthiness and catch and fuel-carrying capacity) (FAO 1998a). Sand flea predation on target catch that occurs in certain areas at night may also pose practical and economic problems. Night-setting is required by CCAMLR and is an option in Alaska and will be an option under the Australian TAP.

Also important to consider when analyzing the use of night-setting is the feeding behavior of seabirds. Although most seabirds are diurnal feeders, the Laysan's albatross and the Northern fulmar are known to feed at night (NMFS 1998e) and the endangered short-tailed albatross may also forage at night (Sherburne 1993).

Given this information regarding night-setting in Alaska fisheries, the NMFS Seabird Test Plan recommends preparation of a report that would analyze the potential benefits and the potential problems that are associated with night-setting in Alaska's fisheries (NMFS 1998c).

Night-setting is one of the mitigation measures identified in the FAO's IPOA. The IPOA notes that this method is generally recognized as being highly effective, but effectiveness can vary between fishing grounds and also seasonally according to the seabirds species. Effectiveness of this measure may be reduced around the full moon (FAO 1998b).

3.0 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 need for the proposal are described in section 1, the alternatives considered are presented in section 2, and the list of preparers is in section 9. This section contains the discussion of the environmental impacts of the alternatives including impacts on threatened and endangered species and marine mammals.

3.1 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 supplemental environmental impact statement for the annual groundfish TAC specifications (NMFS 1998e). An initial analysis of the effects of the IFQ management system for the halibut fisheries off Alaska on the biological environment and associated effects on marine mammals, seabirds, and other threatened or endangered species was done in the environmental impact statement for the action (NMFS 1992).

3.2 Impacts on Endangered, Threatened or Candidate Species

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

Endangered

Western population Steller sea lion	*Eumetopias jubatus*
Northern right whale	*Balaena glacialis*
Sei whale	*Balaenoptera borealis*
Blue whale	*Balaenoptera musculus*
Fin whale	*Balaenoptera physalus*
Humpback whale	*Megaptera novaeangliae*
Sperm whale	*Physeter macrocephalus*
Snake River sockeye salmon	*Oncorhynchus nerka*
Short-tailed albatross	*Phoebastria albatrus*

Threatened

Eastern population 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*
Steller's eider	*Polysticta stelleri*

Current Population Status of the Short-tailed Albatross. The short-tailed albatross (*Phoebastria albatrus*) is a large pelagic bird whose current range includes the Bering Sea and the Gulf of Alaska, it once ranged throughout most of the North Pacific Ocean. Originally numbering in the millions, the worldwide population of breeding age birds is currently approximately 500 individuals and the worldwide total population is approximately 1100 individuals (Hasegawa pers. comm.; the population was estimated at 400 in 1988, 700 in 1994). Breeding colonies are located on two islands in Japan, the primary colony being on Torishima Island, 370 miles south of Tokyo. Dr. Hasegawa visited Torishima in November 1998 as a part of his continuing investigation of the status of the short-tailed albatross breeding population. He found 213 active breeding pairs (the female of each pair lays one egg), an increase of 19 eggs from last season (10 percent increase). Hasegawa estimates the Torishima population to be approximately 950 individuals and the Senkaku Island population to be about 150 individuals. By the end of May when the young of this season fledge, the world population could number 1200 individuals.

Listing of the Short-tailed Albatross. The short-tailed albatross was originally designated as endangered under the Endangered Species Conservation Act of 1969 on the list of foreign-listed species. When the ESA replaced the 1969 Act in 1973, it was included as a foreign species but not as a native species. The USFWS is correcting this administrative error and has proposed the domestic listing of the short-tailed albatross under the ESA (63 FR 58692, November 2, 1998). See the proposed listing for detailed information on the life history, demographics, and population status of the short-tailed albatross (Attachment B). It was always the intent of the USFWS to protect the species where it occurred under the authority of the ESA, thus the USFWS and NMFS have consulted with each other since 1989 under section 7 of the ESA on the impacts of the BSAI and GOA groundfish fisheries on the short-tailed albatross.

Section 7 Consultations on the Short-tailed Albatross. 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 the 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 consultations were reinitiated for major changes to the FMP or fishery that might affect the short-tailed albatross. These were informal consultations, and concluded that no additional adverse effects beyond those in the aforementioned formal consultation would occur.

These subsequent informal consultations included: 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 was 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 would 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 Table 10 for current ESA requirements). NMFS has reinitiated formal consultation with USFWS for the BSAI and GOA hook-and-line fisheries that would occur after December 31, 1998. The USFWS recently extended the effective period of this 1997-1998 Biological Opinion until it is superseded by a subsequent amendment to that Opinion (USFWS 1998d).

In 1997, NMFS initiated a section 7 consultation with USFWS on the effects of the Pacific halibut fishery off Alaska on the short-tailed albatross. USFWS issued a Biological Opinion in 1998 that concluded that the Pacific halibut fishery off Alaska was not likely to jeopardize the continued existence of the short-tailed albatross (USFWS, 1998). USFWS also issued an Incidental Take Statement of two short-tailed albatross in two years (1998 and 1999), reflecting what the agency anticipated the incidental take could be from the fishery action. Under the authority of ESA, USFWS identified non-discretionary reasonable and prudent measures that NMFS must implement to minimize the impacts of any incidental take. The combined reasonable and prudent measures from the 1998 Biological Opinion on the effects of the Pacific halibut fishery on the short-tailed albatross and the 1997 Biological Opinion on the effects of the BSAI and GOA groundfish hook-and-line fisheries on the short-tailed albatross are listed in Table 2 and discussed further in a section below. USFWS' conservation recommendations resulting from the aforementioned formal consultations are also listed in Table 11.

Reported Incidental Takes of Short-tailed Albatross. Seven short-tailed albatross takes have been reported in the Alaskan groundfish fisheries from 1983 to 1998 (Table 12). These occurred in the months of July, August, September (3), 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 (between 60°N, 180° and 58°o.5' N, 175°W). 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 (59° 27.7'N, 145° 53.3'W).

A juvenile short-tailed albatross was taken in the western Gulf of Alaska IFQ sablefish longline fishery south of the Krenitzin Islands (53° 31'N, 165° 38'W) 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 (57° 01'N, 170° 39'W); 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 (58° 41.3'N, 177° 02.6'W). The 5-year old adult bird was taken in a hook-and-line fishery.

The sixth and seventh short-tailed albatross were taken in the hook-and-line BSAI groundfish (Pacific cod) fishery. The sixth bird was taken on September 21, 1998 at 57°30'N, 173°57'W. It was 8 years old. In a separate incident, one short-tailed albatross was observed taken on September 28, 1998 at 58°27'N, 175°16'W but the specimen was not able to be retained. Identification of the bird was confirmed by USFWS seabird experts. The confirmation was based upon the observer's description of key characteristics that matched that of a subadult short-tailed albatross to the exclusion of all other species. A second albatross was also taken on September 28 but the species could not be confirmed (3 species of albatross occur in the North Pacific). Both vessels were using seabird avoidance measures when the birds were hooked.

Except for the second take in 1998, leg bands were recovered from all of the short-tailed albatross takes allowing scientists to verify identification and age. Since 1977, Dr. Hiroshi Hasegawa of Toho University has banded all short-tailed albatross chicks at their breeding colony on Torishima.

Both alternatives are expected to reduce fishery interactions between the short-tailed albatross and other seabird species and the hook-and-line fishery and are expected to mitigate the fisheries' effects on endangered or threatened species or their critical habitats. The extent and the degree to which each alternative and its options would reduce these fishery interactions may vary and is not known. 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.

3.3 Impacts on Other Seabird Species

Over 80 species of seabirds occur over waters off Alaska and could potentially be impacted by interactions with the BSAI and GOA groundfish fisheries and the Pacific halibut fishery (NMFS 1997, 1998b,e). Little is known about the effects of the incidental take of seabirds in Alaska longline fisheries on seabird populations. USFWS conducts an Alaska breeding seabird monitoring program for the purpose of collecting data to enable the assessment of conservation needs of seabirds. Breeding success is monitored to predict future population trends and as a reflection of fluctuations in the marine environment (Byrd *et. al.* 1998). Further analyses would be necessary to determine if the incidental take in longline fisheries effected these seabird breeding populations.

3.4 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.

3.5 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.

3.6 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.

_____ _____

Assistant Administrator for Fisheries, NOAA

Date

4.0 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."

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

The most recent description of the BSAI and GOA groundfish hook-and-line fisheries is contained in the SAFE Report: Economic Status of the Groundfish Fisheries Off Alaska, 1997 (Greig *et al* 1998). 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. Data for 1997 indicate that in the BSAI, 101 catcher vessels and 44 catcher/processors fished with hook-and-line gear, and 920 catcher vessels and 25 catcher/processors fished with hook-and-line gear in the GOA. The total number of hook-and-line catcher vessels that caught groundfish off Alaska in 1997 was 932 and the total number of hook-and-line catcher-processor vessels that caught and processed groundfish off Alaska in 1997 was 46. These numbers account for the vessels that operated in both the BSAI and GOA. A recent description of the Pacific halibut fishery is contained in IPHC's annual report (IPHC 1998). In 1998, 1768 vessels landed halibut from U.S. Convention waters off Alaska, 91 percent of which were vessels less than 60 ft (18.3 m) LOA.

Under both alternatives, all hook-and-line vessels would be directly affected. Under Alternative 2, vessels less than 26 ft (7.9 m) LOA would continue to be exempt from some of the seabird avoidance measures. In 1996, approximately 2.5 percent of groundfish vessels were less than 26 ft (7.9 m) LOA and 15 percent of vessels making halibut landings were less than 26 ft (7.9 m) LOA (NMFS 1998b).

4.2 Economic and Social Impacts of the Alternatives

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. The incidental take limit established for 1998 and 1999 in the Pacific halibut fishery off Alaska is two short-tailed albatrosses. If the 2-year take is exceeded in either fishery, 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 the incidental take limit, 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.

The incidental take limit for short-tailed albatrosses could be exceeded under either alternative. If the regulatory revisions under Alternative 2 (all options) improve and strengthen the current seabird avoidance measures, then the likelihood of encountering and taking a short-tailed albatross would be reduced. Therefore, the likelihood of a fishery closure and its ensuing economic impacts would be reduced.

4.2.1 Impacts of Alternative 1 - No Action

The no action alternative would not revise the current requirements for seabird avoidance measures.

4.2.2 Impacts of Alternative 2 - Revisions to Current Seabird Bycatch Avoidances Measures

4.2.2.1 Impacts of Alternative 2: Option 1 (Line weighting, no embedded hooks, bird scaring line)

The revised measures required of all applicable vessels under this option would be expected to be of minimal cost. Procedural or operational changes may be required in fishing operations. It has been assumed that fishermen are already applying weights to the groundline to comply with the current requirement to sink baited hooks quickly. If this is so, then no or minimal costs would be associated with this revised measure. If weights

are not currently being used, the cost would depend on the number of weights used. A 5-lb. 'cannonball' weight costs $5.65. Other materials could also be used as additional weights on the groundline. Estimated costs for bird scaring lines are $50 to $250. Using a lining tube and night-setting are optional measures. See Alternative 2, Options 2 and 3, respectively, for costs associated with those measures.

4.2.2.2 Impacts of Alternative 2: Option 2 (Lining tube, line weighting, no embedded hooks, bird scaring line)

The estimated cost for a lining tube, including installation is approximately $40,000 per vessel. The number of vessels impacted varies under this option, depending on if the requirement applies to freezer-longliners only and what vessel size category.

	Vessel length class	Vessel Type	Number of vessels in Alaska in 1997 (Table 2)
a.	≥ 60 ft	c/p	42
b.	≥ 100 ft	c/p	34
c.	> 124 ft	c/p	26
d.	≥ 60 ft	c/p & c/v	172
e.	≥ 100 ft	c/p & c/v	45
f.	> 124 ft	c/p & c/v	29

4.2.2.3 Impacts of Alternative 2: Option 3 (Line weighting, streamer line, night setting)

The economic impact for required night-setting is not known but could be more burdensome for small vessels if this measure presents compromises to fishing efficiency (vessel size-related seaworthiness and catch and fuel-carrying capacity) (FAO 1998a). Unknown economic impacts could occur if harvest catch CPUE is reduced due to sand flea predation on catch that reportedly may occur at night.

If night-setting potentially increases the likelihood of a vessel encountering and taking a short-tailed albatross (because of the bird's possible nocturnal feeding behavior), then direct economic impacts could be severe if the incidental take limit were exceeded and closure of the fishery was an option under consideration.

4.3 Administrative, Enforcement and Information Costs

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

5.0 INITIAL 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 Small Business Administration 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 access of $3,000,000 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. NMFS has determined that 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 changed annual gross revenues by more than 5 percent, total costs of production by more than 5 percent, or compliance costs for small entities by at least 10 percent compared with 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.

Under Section 603(c) of the RFA, each IRFA must contain a description of any significant alternatives to the proposal that accomplish the statutory objectives and minimize the significant economic impact of the proposal on small entities. These alternatives could include:

(1) The establishment of differing compliance or reporting requirements or timetables that take into account the resources available to small entities;

(2) The clarification, consolidation, or simplification of compliance and reporting requirements under the rule for such small entities;

(3) The use of performance rather than design standards;

(4) An exemption from coverage of the rule, or any part thereof, for such small entities.

5.1 Economic Impact on Small Entities

Most catcher vessels harvesting groundfish and halibut off Alaska meet the definition of a small entity under the RFA. In 1997, 932 catcher vessels using hook-and-line gear caught groundfish off Alaska. In 1998, 1768 vessels landed halibut from U.S. Convention waters off Alaska. Note, some of the vessels fish in both fisheries. No changes to regulatory measures are called for under Alternative 1, therefore, small entities would not be economically impacted in any additional ways as a result of regulatory action.

Under Alternative 2, the economic impact on small entities would depend upon the option exercised and the particular measures chosen. All options require the use of a bird scaring line, estimated at $50 to $250 and the use of line weights. Under Option 1, the measures required of all applicable vessels would be expected to be of minimal cost. Procedural or operational changes may be required in fishing operations. Under Option 2, the economic impact on small entities would be the cost for vessel operators required to use a lining tube ($40,000). Note, this cost could be present under Option 1 where the use of a lining tube is optional. Groundfish vessels greater than 60 ft and less than 100 ft is 119, vessels greater than 100 ft and less than 124 ft is 8, and vessels greater than 124 ft is 3. In the halibut fishery, 158 vessels are greater than 60 ft and less than 124 ft and 3 vessels are greater than 125 ft. Under Option 3, the economic impact on small entities would be the potential variable costs of night-setting.

The incidental take limit for short-tailed albatrosses could be exceeded under either alternative. If the regulatory revisions under Alternative 2 (all options) improve and strengthen the current seabird avoidance measures, then the likelihood of encountering and taking a short-tailed albatross would be reduced. Therefore, the likelihood of a fishery closure and its ensuing economic impacts would be reduced.

If the anticipated take of short-tailed albatross were exceeded in either the groundfish fishery or the halibut fishery under either alternative, the actual economic impacts resulting from a modification of the reasonable and prudent measures established to minimize take of the short-tailed albatross would depend upon the revised measures, which 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 changes 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 due to the incidental take limit being exceeded. The likelihood of this happening may be greater under Alternative 1.

Alternatives that addressed modifying reporting requirements for small entities were not considered in this analysis. Such alternatives are not relevant to this action and would not mitigate the impacts on small entities. The proposed seabird avoidance measures are based on performance standards rather than design standards, therefore alleviating a potential economic burden to small entities. Some of the scenarios in Option 2 (not requiring a lining tube of catcher vessels) would also alleviate a potential economic burden to small entities.

6.0 SUMMARY AND CONCLUSIONS

Recent takes of the endangered short-tailed albatross (two in September 1998) in the BSAI groundfish fishery highlight a seabird bycatch problem and that seabird avoidance measures must be used consistently and conscientiously if they are to be effective at reducing seabird bycatch. 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. The USFWS recently extended the effective period of this 1997-1998 Biological Opinion until it is superseded by a subsequent amendment to that Opinion. Based on the ESA section 7 consultation on the 1998 Pacific halibut fishery, the USFWS anticipates that two short-tailed albatross could be taken in 1998 and 1999. If the 2-year incidental take limited is exceeded in either the groundfish or the halibut fisheries, 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 Groundfish Observer Program office has documented bycatch of other seabird species in the GOA and BSAI groundfish fisheries since 1989. Preliminary estimates of the annual seabird bycatch for the Alaska groundfish fisheries, based on 1993 to 1997 data, indicate that approximately 14,000 seabirds are taken annually in the combined BSAI and GOA groundfish fisheries (11,600 in the BSAI; 2,400 in the GOA) at the average rates of 0.090 and 0.0568 birds per 1000 hooks in the BSAI and in the GOA, respectively.

At the December 1998 Council meeting, industry representatives requested that the Council revise and strengthen the seabird avoidance measures that are currently required by Federal regulation. This request was made because of the incidental takes of two short-tailed albatrosses in September 1998 and because of the industry group's perception that the use of the required seabird avoidance measures was not effectively reducing the seabird bycatch occurring on its vessels. A proposed regulatory amendment is intended to revise the seabird avoidance measures and thereby reduce seabird bycatch and incidental mortality in the hook-and-line groundfish and Pacific halibut fisheries off Alaska.

The reduction of seabird bycatch in Alaska longline fisheries should be possible given that practicable and cost-effective seabird avoidance measures are available. Their absolute effectiveness in Alaska demersal longline fisheries has not been demonstrated experimentally, but evidence from the use of these measures elsewhere in the world indicates that, if measures are used properly and consistently, seabird bycatch should be reduced.

Even though experimental testing of required measures in Alaska is still forthcoming, recent experimental work in other demersal longline fisheries on the effectiveness of line weighting, buoy bags, and lining tubes may lend valuable insight as to the use of those measures in Alaska longline fisheries. This information, in conjunction with that from the IPHC pilot tests, observer seabird data, and input from fishermen in the Alaska groundfish and halibut longline fisheries, is the basis for revising the current seabird avoidance measures. In addition to any regulatory requirements and their enforcement, bycatch reduction requires education of the fleet and the conscientious and consistent application of effective measures.

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

In 1997, 101 catcher vessels and 44 catcher/processors fished with hook-and-line gear in the BSAI , and 920 catcher vessels and 25 catcher/processors fished with hook-and-line gear in the GOA. The total number of hook-and-line catcher vessels that caught groundfish off Alaska in 1997 was 932 and the total number of hook-and-line catcher-processor vessels that caught and processed groundfish off Alaska in 1997 was 46. These numbers account for the vessels that operated in both the BSAI and GOA. In 1998, 1768 vessels landed halibut from U.S. Convention waters off Alaska, 91 percent of which were vessels less than 60 ft (18.3 m)

LOA. Under both alternatives, all hook-and-line vessels would be directly affected. Under Alternative 2, vessels less than 26 ft (7.9 m) LOA would continue to be exempt from some of the seabird avoidance measures. In 1996, approximately 2.5 percent of groundfish vessels were less than 26 ft (7.9 m) LOA and 15 percent of vessels making halibut landings were less than 26 ft (7.9 m) LOA.

Under Alternative 2, the economic impact on small entities would depend upon the option exercised and the particular measures chosen. All options require the use of a bird scaring line, estimated at $50 to $250 and the use of line weights. Under Option 1, the measures required of all applicable vessels would be expected to be of minimal cost. Procedural or operational changes may be required in fishing operations. Under Option 2, the economic impact on small entities would be the cost for vessel operators required to use a lining tube ($40,000). Note, this cost could be present under Option 1 where the use of a lining tube is optional. Groundfish vessels greater than 60 ft and less than 100 ft is 119, vessels greater than 100 ft and less than 124 ft is 8, and vessels greater than 124 ft is 3. In the halibut fishery, 158 vessels are greater than 60 ft and less than 124 ft and 3 vessels are greater than 125 ft. Under Option 3, the economic impact on small entities would be the potential variable costs of night-setting.

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.

Table 1.

GROUNDFISH HOOK-AND-LINE FISHERY STATISTICS

Groundfish hook-and-line target species include: BSAI--Pacific cod, sablefish, Greenland turbot, and rockfish; GOA--sablefish, Pacific cod, rockfish

1998	Total Catch (mt)			
	BSAI	GOA		
all groundfish	1.54 million	245 K		
H&L portion	130 K	25.5 K		
% H&L of Total	8.5%	10.4%		
# of permitted vessels	BSAI (only)	GOA (only)	BSAI & GOA	
<60'	25	1032	378	
≥60'	6	51	317	
total	31	1083	695	1809

1997	Total Catch (mt)			
	BSAI	GOA		
all groundfish	1.74 million	230 K		
H&L portion	154 K	28.4 K		
% H&L of Total	8.9 %	12.3 %		
# of permitted vessels	BSAI (only)	GOA (only)	BSAI & GOA	
<60'	23	953	343	
≥60'	6	45	274	
total	29	998	617	1644

1996	Total Catch (mt)			
all groundfish	1.75 million	202 K		
H&L portion	116 K	27.9 K		
% H&L of Total	6.6%	13.8%		
# of permitted vessels	BSAI (only)	GOA (only)	BSAI & GOA	
<60'	26	1070	386	
≥60'	2	47	315	
total	28	1117	701	1846

Table 2.--Numbers of vessels that caught groundfish off Alaska by area, vessel length class (feet), 1992-97. (excluding catcher-processors)

	Gulf of Alaska				Bering Sea and Aleutian				All Alaska			
	Vessel length class				Vessel length class				Vessel length class			
	<60	60-99	100-124	>124	<60	60-99	100-124	>124	<60	60-99	100-124	>124
Number of Vessels												
Hook & Line												
1993	998	143	9	1	29	27	2	0	1006	151	11	1
1994	1149	181	14	0	60	26	1	0	1165	185	15	0
1995	901	148	14	2	73	60	3	0	935	151	17	2
1996	821	140	8	5	59	54	4	2	848	141	9	6
1997	791	118	8	3	49	49	3	0	802	119	8	3

Numbers of vessels that caught and processed groundfish off Alaska by area and vessel length class (feet), 1992-97.

Number of Vessels												
Hook & Line												
1993	2	13	14	25	0	12	14	34	2	14	14	34
1994	3	13	12	24	1	15	13	28	3	16	13	28
1995	4	9	8	15	1	7	11	28	4	9	11	28
1996	4	6	8	9	1	7	10	26	4	7	10	26
1997	2	6	8	9	3	7	8	26	4	8	8	26

Note: Includes only vessels that fished part of Federal TACs.
Source: 1997 Economic SAFE Document, Tables 28 and 29. Blend estimates, NMFS permits.

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

Table 3.

PACIFIC HALIBUT FISHERY STATISTICS

1998	51 million pound commercial take
1997	51 million pound commercial take
1996	47 million pound commercial take

# of vessels making halibut landings in 1998

<60'	1610
≥60' & <125'	155
≥125'	3
total	1768

Table 4. USFWS Observed Seabird Bycatch Rates

SEABIRD EA&IR, TABLE 4.
FEB 99
AGENDA ITEM C-3

Observed catch rates of seabirds in the Alaska longline fishery

	Number of hauls observed	Total birds caught	Hooks observed	Birds per 1000 hooks	Standard error (Birds per 1000 hooks)	Birds per mton of fish	% of the total estim. catch observed
Bering Sea / Aleutian Islands							
1993	8,315	1,942	30,419,531	0.0638	0.0151	0.0772	29.20%
1994	8,544	2,700	33,835,813	0.0798	0.0157	0.0996	27.16%
1995	8,560	4,851	34,677,010	0.1399	0.0223	0.1557	26.97%
1996	8,247	2,011	33,804,018	0.0595	0.0109	0.0711	26.32%
1997	9,064	4,122	40,034,977	0.1030	0.0201	0.1146	25.15%
5 yr total	42,730	15,626	172,771,349				
annual avg.	8,546	3,125	34,554,270	0.0904	0.0174	0.1058	26.75%
Gulf of Alaska							
1993	2,392	318	5,824,543	0.0546	0.0100	0.0786	10.83%
1994	969	127	2,434,457	0.0522	0.0129	0.0683	6.26%
1995	2,339	374	5,475,360	0.0683	0.0263	0.0829	13.77%
1996	1,793	252	3,653,352	0.0690	0.0201	0.0859	10.27%
1997	1,420	77	2,831,507	0.0272	0.0140	0.0274	10.32%
5 yr total	8,913	1,148	20,219,219				
annual avg.	1,783	230	4,043,844	0.0568	0.0184	0.0710	10.39%

Table 5. USFWS Estimated Annual Total Seabird Bycatch, by Species Group

Estimated seabird bycatch in the Alaska longline fishery

	Short-tailed Albatross	Laysan Albatross	Black-footed Albatross	Northern Fulmar	Gull spp	Shearwater spp	Other spp	TOTAL
Bering Sea / Aleutian Islands								
1993	0	475	11	4,367	920	482	24	6,255
1994	1	350	40	6,606	1,918	968	35	9,883
1995	1	550	52	11,911	3,097	1,765	56	17,376
1996	2	237	23	5,278	1,339	725	43	7,604
1997	1	439	27	12,156	3,095	1,242	42	16,960
5 yr total	5	2,051	153	40,318	10,368	5,182	199	58,078
annual avg.	1	410	31	8,064	2,074	1,036	40	11,616
Gulf of Alaska								
1993	0	459	647	1,684	160	114	11	3,065
1994	0	414	803	1,451	143	94	8	2,904
1995	0	266	984	1,279	148	101	9	2,778
1996	0	277	496	1,208	107	66	6	2,153
1997	0	110	123	604	64	37	4	939
5 yr total	0	1,526	3,053	6,227	621	412	38	11,839
annual avg.	0	305	611	1,245	124	82	8	2,368
annual Total	1	715	641	9,309	2,198	1,119	48	13,983

Table 6 SEABIRD BYCATCH RATES AS REPORTED IN FAO FISHERIES CIRCULAR No. 937, Chapter 4: Incidental Catch of Seabirds by Longline Fisheries

Geographic Area	Fishery Type and Species	Bycatch Rate; Seabirds Caught (no. Birds/1000 hooks)
Northeastern Atlantic Ocean and Mediterranean Sea (Norway study)	Demersal/cod, haddock, tusk, ling, wolffish	1.75; 0.04[1]fulmars
Northwestern Atlantic Ocean (Canada, Greenland)	Demersal/cod, hake, haddock	not known?
Northeastern Pacific Ocean (U.S.)	Demersal/cod, halibut, sablefish	0.08 (BSAI and GOA)fulmars, gulls, albatross
Northwestern Pacific Ocean (China, Japan, Korea, Russia, Taiwan)	Demersal/pollock, cod	not known?
Central and South America	Demersal/hake, kingclip, Patagonian toothfish	
Mexico and Venezuela		not known
Brazil		0.3 albatross, petrels, shearwaters
Uruguay		0.41 albatross
Argentina		'appears high'albatross
Chile		not knownalbatross
Peru, Ecuador, Colombia		not known
Southern Africa	Demersal/semi-pelagic/hake, kingclip	0.44; 0.043[1]white-chinned petrel
Australasian (New Zealand)	Demersal/ling, snapper, trevalla	no rate availablealbatross, petrels
Southern Ocean	Demersal/Patagonian toothfish	0.22 to 0.67albatross, petrels, shearwaters
Atlantic Ocean & Mediterranean Sea	Pelagic/tuna, swordfish, sharks	little knowngulls, petrels, shearwaters
South Atlantic		4.7 albatross, petrels
Pacific Ocean	Pelagic/tuna	not known?
Hawaii		0.276, 0.083Laysan albatross, Black-footed alb.
Southern Ocean	Pelagic/tuna	
Australia		0.41 albatross, petrels
New Zealand		0.04 to 1.9albatross, petrels

[1]First number represents rate with no mitigation measures in place; 2nd number represents rate with mitigation measures in place

Table 7.

MITIGATION OPTIONS AVAILABLE 'DOWN UNDER'
AUSTRALIA'S THREAT ABATEMENT PLAN

The objective of the Threat Abatement Plan is to reduce seabird bycatch in all fishing areas, seasons or fisheries to below 0.05 seabirds per 1000 hooks, based on current fishing levels.

Mitigation Measures to be Required in the Domestic and Foreign Pelagic Longline Fisheries

- All vessels use a bird scaring line of approved design.
- All vessels retain all offal during line setting or hauling and discharge it when not line setting or hauling.
- All options will require monitoring by an approved observer program.

Vessel operators must adopt one of the 3 options below on an annual basis:

Option 1:

- All baits will be set at night.

Option 2:

All vessels fishing during the day will:

- Use lines which are sufficiently weighted to cause the baits to sink out of reach of diving seabirds immediately after they are set. This weight will be determined by experimental trials;
- Demonstrate an ability to thaw baits before lines are set; and
- Use thawed baits on their hooks.
- Day setting operations will require a higher level of observer coverage.

Option 3:

- Vessels which can demonstrate a technique of setting and hauling longlines which does not make the hooks/baits available to seabirds can be issued with a permit to operate without any of the restrictions in Options 1 and 2 above.

Table 8.

USE OF SEABIRD AVOIDANCE MEASURES ON HOOK-AND-LINE VESSELS IN THE GOA AND BSAI GROUNDFISH FISHERIES
ON TRIPS FROM 12/31/96 THROUGH 7/17/98
AS REPORTED BY NMFS GROUNDFISH OBSERVERS[1]

Seabird Avoidance Measure	% of Observed Trips Using the Measure[2]
Buoy, board, or floating device towed behind vessel during setting	74.1
Sink baited hooks quickly	39.9
Streamer line towed behind vessel during setting of gear	20.6
Other device used[3]	9.9
Offal discharged from opposite side of vessel during setting or hauling	9.5
Offal never discharged during setting or hauling of gear	7.4
Gear set at night	6.6
Gear deployed underwater using lining tube	1.6
No device used	2.1[4]

---

[1]NMFS groundfish observers began collecting this data in April 1997.

[2] Most trips used more than one device at a time.

[3] Other devices included: fire hose, bleach bottle, 'don't know', paddlewheel, chumming, plastic streamers near stern, gun, air horn

[4] 2.1% represents percent of trips after the regulation effective date of May 29, 1997 that did not use any seabird avoidance measures. 6 additional trips did not use seabird avoidance measures (4.5% of the trips observed) but these trips occurred before vessel operators were required to use seabird avoidance measures.

Table 9.

ANNUAL SEABIRD BYCATCH RATES AND ESTIMATES OF TOTAL SEABIRDS CAUGHT ON VESSEL WITH LINING TUBE[1]

Year	Albatross Bycatch Rate[2] Estimate of Total No.	Estimate of Total No. of Albatross Caught[3]	Other Seabirds Bycatch Rate[2]	Other Seabirds of Other Seabirds Caught[3]
1994	0.0012	4	0.0267	77
1995	0.004	17	0.2521	1074
1996	0.0039	23	0.0937	560
1997	0 albatross caught	0	0.0401	281
1998	0.0207	106	0.2125	1086

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[1]lining tube was installed summer 1997; problems with operation of tube in early 1998; repaired in summer 1998

[2]bycatch rate expressed as number of birds per 1000 hooks

[3]estimate of total birds caught based on total hooks set

Table10.

NMFS REQUIREMENTS UNDER THE ENDANGERED SPECIES ACT

The current non-discretionary reasonable and prudent measures in the USFWS Biological Opinions (BO) for the groundfish (G) and Pacific halibut (H) fisheries off Alaska are as follows:

- Observer data on STALB sightings and fishery interactions is collected. Observers are trained in seabird identification and provided with instructions and materials for reporting STALB observations. (G)
- Incidental take of any STALB is reported to USFWS. (G&H)
- STALB observations are reported to USFWS. (H)
- STALB that are found in fishing equipment, but still appear healthy, are released as soon as identification is confirmed. (G)
- Dead STALB are tagged with complete catch information and delivered to USFWS. (G&H)
- 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 STALB sightings, and 3) encourage compliance with (MARPOL) and related treaties to protect marine animals including the STALB, 4) STALB identification, and 5) ways to avoid taking STALB when they are sighted near bait. (G&H)
- Vessels operators are required to use seabird bycatch avoidance devices and methods during fishing activities. (G&H)
- A test plan to evaluate the effectiveness of seabird bycatch avoidance gear and methods shall be completed and implemented. A final report of the evaluation is due December 31, 2000. (G&H)
- NMFS shall prepare a plan to investigate all options for monitoring the Pacific halibut fishery and will institute changes to the fishery appropriate to the results of the investigation.

Table 11.

CONSERVATION RECOMMENDATIONS

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

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

The following conservation recommendations were made in the 1998 Pacific halibut Biological Opinion:

5. Develop and/or evaluate new seabird avoidance measures.

6. Suggest to fishermen actions they may take to prevent the taking of STALB that have alighted near their longline gear.

7. Educate fishermen in the proper care of injured seabirds.

8. Consider temporary adjustments to the fishery during the times when STALB are most abundant in the areas fished by Pacific halibut longliners in waters off Alaska.

9. The USFWS encourages self-reporting of STALB encounters. However, substantial evidence exists that self-reporting by itself is an inadequate method for monitoring protected species encounters in a fishery. The USFWS strongly discourages the use of self-reporting as a sole method for monitoring this fishery, and strongly encourages the use of observers on Pacific halibut longline vessels over 60 ft in length.

Table 12.

SHORT-TAILED ALBATROSS REPORTED TAKES IN ALASKA FISHERIES

- July, 1983-- north of St. Matthew Island (between 60N, 180 and 58.5N, 175W), found dead in a fish net
- October, 1987-- vessel fishing for halibut in the GOA (59 27.7N, 145 53.3W)
- August 28, 1995-- juvenile taken in the western Gulf of Alaska IFQ sablefish longline fishery south of the Krenitzin Islands (53 31N 165 38W)
- October 8, 1995--take in the IFQ sablefish fishery in the Bering Sea (57 01N, 170 39W)
- September 27, 1996-- 5-year old adult bird in a hook-and-line fishery (58 41.3N, 177 02.6W)
- September 21, 1998--8-year old adult bird in the cod hook-and-line fishery; the adult had bred successfully for the 2 previous seasons (57 30N, 173 57W)
- September 28, 1998--sub-adult bird in the cod hook-and-line fishery 58 27N, 175 16W)

Except for the 2nd take in 1998, leg bands were recovered from all of the above albatrosses allowing scientists to verify identification and age. Since 1977, Dr. Hiroshi Hasegawa has banded all short-tailed albatross chicks at their breeding colony on Torishima Island, Japan.

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10.0 APPENDICES

10.1 APPENDIX 1: TIMELINE OF NMFS ALASKA REGION SEABIRD ACTIVITIES

1989 FWS issues BO under section 7 of the Endangered Species Act (ESA) that groundfish fisheries off Alaska (particularly longline and gillnet) have the potential for taking the endangered STALB. Incidental take set at 2 birds per year; this is based on what historically has been taken (take in 1983 and in 1987).

1989 First pilot NMFS observer program for high seas squid fishery in North Pacific (NP); information collected on marine mammal and bird takes. Japanese squid fishery expanding in NP in mid-70's.

1990 Squid observer training program relocated to NMFS Groundfish Observer Program (GFOP). Pat Gould brought in as Principal Investigator of seabird component of High Seas Driftnet Program. Gould recognizes need for GFOP to collect more extensive seabird bycatch data.

1992 Pilot program targeting longline fisheries initiated. Special project NMFS observers use special data forms, bird ID, take numbers, number of hooks, whether caught during set or retrieval.

1993 GFOP expands above seabird duties to all groundfish NMFS observers to include: 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, detailed information found on leg bands of banded seabirds, and Seabird Daily Notes--record notes associated with seabirds.

1994 to present: Numerous NMFS news releases, support of privately produced brochure to notify/educate public and industry about methods to reduce seabird bycatch.

1995 FWS amends BO on STALB to require that NMFS collect fishery observer data. Coordination with FWS to begin process of estimating total seabird take in groundfish fisheries.

1996 Nov: NP longline industry petitions the North Pacific Fishery Management Council (Council) for regulations to reduce seabird bycatch in longline fisheries.

1997

Feb: FWS amends BO on STALB, incidental take revised to 4 birds per 2 years; reasonable and prudent measures revised to require regulations for seabird avoidance measures and to require development of a plan to test the effectiveness of such measures; conservation recommendations added.

Mar: Proposed rule published in Federal Register that would require groundfish hook-and-line vessels to use seabird avoidance measures. (62 FR 10016)

Mar: Begin involvement in United Nation's Food and Agriculture Organization (FAO) initiative to reduce incidental catch of seabirds in global longline fisheries; NMFS and FWS are co-leads for Interagency Seabird Team.

Apr: Final rule published in Federal Register requiring groundfish hook-and-line vessels to use seabird avoidance measures. (62 FR 23176); regulations effective May 29, 1997.

Apr: GFOP begins collecting information from groundfish observers (at debriefing) on what types of seabird avoidance measures are being used by longline vessels in the GOA and BSAI groundfish fisheries.

Jun: Council recommends similar measures for Pacific halibut fishery.

Aug: NMFS and FWS, and International Pacific Halibut Commission (IPHC) staff and industry representatives observe deployment of seabird avoidance gear on F/V Frontier Spirit, a freezer-longliner, in Puget Sound.

Aug: GFOP transmits seabird bycatch data and seabird notes from observer logbooks to FWS.

Sep: NMFS staff (US co-lead) meet with FWS (US co-lead), Japan representatives, and FAO representative in Anchorage, Alaska, on FAO seabird consultation initiative.

Sep: NMFS staff attend FWS-sponsored public seminar by Dr. Hiroshi Hasegawa, world expert on the STALB; NMFS staff meet with Dr. Hasegawa, FWS, and university staff to discuss impacts to STALB population.

Nov: NMFS, FWS, and industry participation in Fish EXPO conference, "Fisherman to Fisherman: Seabird Avoidance in North Pacific Longline Fisheries"; joint sponsors for information booth.

Nov: Letters to 2500 Federal Fisheries Permit Holders asking that STALB sightings be reported to FWS. Letters enclosed laminated identification chart of NP albatrosses.

1998

Jan: NMFS distributes laminated identification chart of NP albatrosses to 6000 Individual Fishing Quota (IFQ) Permit Holders (i.e. halibut and sablefish).

Feb: NMFS publishes proposed rule in Federal Register that would require seabird avoidance measures in the Pacific halibut fishery and exempt vessels less than 26 ft LOA in this fishery and the GOA and BSAI groundfish fisheries from some of the measures (62 FR 65635).

Mar: Final rule published in Federal Register requiring vessels in Pacific halibut fisheries to use seabird avoidance measures (63 FR 11161) and exempting vessels less than 26 ft LOA in this fishery and the GOA and BSAI groundfish fisheries from some of the measures; regulations effective April 6, 1998.

Mar: IPHC News Release regarding the above regulations and notice that IPHC port samplers will interview fishermen for information on seabirds.

Mar: NMFS and FWS staff are invited to participate in the FAO's Seabird Technical Working Group (STWG) meeting in Tokyo. The STWG's objective is to draft a Plan of Action for implementing guidelines to reduce incidental catches of seabirds in longline fisheries.

Mar: NMFS staff provide script advice to New England Aquarium staff that are producing a video on fishery bycatch. Script specifically mentions incidental catch of seabirds in longline fisheries.

Apr: NMFS submits to FWS the "Test Plan to Evaluate Effectiveness of Seabird Avoidance Measures Required in Alaska's Hook-and-Line Groundfish and Halibut Fisheries", as required by the 1997 FWS BO. NMFS begins process to secure funding for Test Plan's implementation.

Jun: NMFS Seabird Coordinator hired to address seabird bycatch management issues and the requirements within section 7 consultations on effects of the groundfish and halibut fisheries off Alaska on the STALB.

Sep: NMFS transmits 1993-1997 commercial fisheries catch data to USFWS for use in extrapolation of seabird bycatch estimates for the GOA and BSAI groundfish fisheries.

Oct: NMFS staff (Hawaii and Alaska) attend "Black-footed Albatross Population Biology Workshop" co-sponsored by the Western Pacific Regional Fishery Management Council, FWS, and NMFS.

Oct: NMFS and FWS staff on the US delegation to the FAO's technical consultation on the "Reduction of Incidental Catch of Seabirds in Longline Fisheries" held in Rome, Italy.

Nov: NMFS distributes seabird bycatch information with annual mailing of NMFS groundfish fisheries permits. Information includes: info. bulletin of recent STALB takes, measures to avoid seabirds, FWS's STALB encounter form.

Nov: NMFS provides above seabird bycatch information at Fish Expo in Seattle and seeks industry comment on effective use of seabird avoidance measures.

Dec: NMFS presents Seabird Bycatch Report at North Pacific Fishery Management Council meeting.

1999

Feb: NMFS and USFWS staff participation in the symposium, *Seabird Bycatch: Trends, Roadblocks, and Solutions* at the annual meeting of the Pacific Seabird Group.

10.2 APPENDIX 2: INITIAL USFWS ANALYSIS OF SEABIRD BYCATCH RATES AND EFFECTIVENESS OF BIRD DETERRENT DEVICES IN ALASKAN LONGLINE FISHERIES

Robert Stehn, USFWS,
Migratory Bird Management, Anchorage
25 Jan 99

The NMFS fisheries observer program collects data on bycatch of all species of fish, invertebrates, birds, and mammals in a sample of hauls on a sample of vessels. Tabulation of the 1993-1997 data from Bering Sea and Gulf of Alaska longline vessels in the Alaskan groundfish fishery includes 51,643 observed hauls with a incidental catch of 16,778 birds on an estimate of 192,962,191 hooks. Overall catch rate in the sample was 0.087 birds per 1,000 hooks.

Catcher/processors (vessel type code = 1) dominate the observer sample with 183 million hooks versus 10 million observed hooks in the sample of catcher-only (code = 3) vessels. Large vessels (>125 feet) have 100% observer coverage, medium vessels (60-124 feet) have 30% coverage, and small vessels (<60 feet) have 0% observer coverage of fishing days. Assuming that all code = 1 vessels are >125 feet and all code = 3 vessels are 60-124 feet, the sampling fraction is constant within each vessel code class. Therefore within each class, the relative proportions of fishing effort (hooks observed) and seabird catch across geographic zones or time periods will be accurately reflected by the observer sample.

Most of the catcher/processor fishing effort was in the Bering Sea, whereas most catcher-only vessels operated in the Gulf of Alaska (Table 1). The first 5 months of 1993-1997 included 68% of catcher/processor and 61% of the catcher-only fishing effort (Table 1); fishing seasons are closed after quotas are reached. For catcher/processor vessels from 1993-1997, the January-May period in the central Bering Sea accounted for 33% of the birds taken (Table 2) and 36% of their fishing effort (Table 1). Even after re-scaling the x-axis on catcher-only vessels to expand for 30% versus 100% sampling, catcher/processors in the Bering Sea numerically account for most of the observed take of seabirds (Fig. 1). Although this region, time period, and vessel type accounted for the largest number of birds (and largest fishing effort), the rate of catch expressed as birds per 1000 hooks was not maximal.

Seabird catch rate for catcher-only vessels was 0.0321 birds per thousand hooks (= 328 / 10,223,294) (Table 3) compared to 0.0900 birds per thousand hooks (= 16,450 / 182,738,897) for catcher/processor vessels. Thus the rate for catcher-only vessels was 35.6% of the rate for catcher/processor vessels, 2.81 times smaller. This difference may be confounded by geographic differences because catcher/processor vessels were most frequently in the Bering Sea (83% of their total effort) in contrast to only 7% of the total effort for catcher-only vessels. Although a much smaller sample, both vessel types occurred in the Aleutian Islands and Gulf of Alaska regions where the average seabird catch rate was 0.0335 for catcher-only vessels, 41.1% of the rate of 0.0815 birds per 1000 hooks for catcher/processors. Regional and seasonal variation also occurred. For catcher-only vessels, the January-May seabird catch rates were 88.5, 61.6, and 57.5% of the catch rates observed on catcher/processors in the Aleutian Islands, western Gulf, and eastern Gulf of Alaska, respectively (Table 3). For catcher-only vessels, the June-December seabird catch rates were 28.0, 26.3, and 18.1% of the catcher/processor rates, respectively (Table 3).

Annual variation in the seabird catch rate occurred, but patterns were complicated by variation by season, region, and vessel-type (Fig. 2). The catch rate in 1997 was relatively low for catcher-only vessels in most regions both early and late in the year. For catcher/processors, the seabird catch rates were low in the Aleutian

Islands and Gulf of Alaska, but rates in the Bering Sea were relatively high in comparison with other years especially later in the year.

The influence of bird deterrent devices on the seabird catch rate was unclear. Devices were required after May 29, 1997 although observers reported that devices were in use on most vessels prior to May. In a post-cruise debriefing interview, observers were asked to recall bird deterrent devices and methods used on each vessel. If multiple methods were used, for this analysis I gave precedence to tori lines and then to buoys. Adding weights to lines, thawing bait, distraction by offal discharge, or setting at night were not considered separately but were categorized as "other" methods if used alone. These methods were commonly used in combination with buoys or tori lines. I calculated the mean and variance in seabird catch rate from all observed hauls on vessels with the reported the use of that device. The largest sample size was for catcher/processors in the central Bering Sea where buoys seemed to lower seabird catch rate early in the year, however buoys were not effective after May when tori lines apparently lowered catch rates (Fig. 3). In other regions for catcher/processors, and for all regions for catcher-only vessels, greater variability, lower catch rate, and smaller sample size obscured any pattern or significant differences among bird deterrent devices (Fig. 3).

Variation in physical characteristics among vessels, differences in conditions during the set (speed, wake turbulence, wind speed, direction, sea-state), gear differences (weight, groundline, gangion, hook, or bait), differences related to offal discharge, or the number of vessel-following birds could all have a potentially large influence on catch rate of seabirds. Analysis that included specific data on these factors for each vessel and each longline set could be very informative if such data could be accurately collected. Inclusion of such variables as covariates would likely provide a much more sensitive measure as to the effectiveness of bird deterrent devices. It is probable that unmeasured differences among vessels account for the complicated patterns observed among regions, time periods, and years. Confounded unmeasured variables associated with vessels probably hide any differences in seabird catch rate due to the use of bird deterrent devices.

An alternative to more complete data collection to statistically control for the large variability among hauls and vessels would be to undertake an experimental approach to test the effectiveness of bird deterrent devices. The vessel characteristics would be constant, and conditions during setting could be matched across replicated series of longline sets with the only difference being the bird deterrent device in use. It is of course important that vessel characteristics and deterrent devices employed are representative of practices employed by commercial vessels in the fishery.

The seabird take on small vessels (<60 feet) without any observer data probably more closely resembles catcher-only vessels (60-124 feet) than larger catcher/processor vessels. Although programming and calculations remain incomplete at this time, work in progress should provide for better estimates of average catch rate and total take of seabirds by species for each vessel type, geographic zone, month, and year. Estimation methods will incorporate different observer sampling rates and seabird catch rates by vessel size class, and also expand by geographic zones in proportion to an estimate of total commercial catch in each zone.

Table 1. Proportion of the total observed hooks in various regions and time periods using 1993-1997 combined data from observed longline vessels.__

	Eastern Bering Sea	Central Bering Sea	Aleutian Islands	Western Gulf of Alaska	Eastern Gulf of Alaska	Sum	Total Hooks
Catcher/processor vessels							
Jan-May	0.2046	0.3557	0.0754	0.0412	0.0069	0.6837	124,946,715
Jun-Dec	0.1275	0.1403	0.0301	0.0162	0.0022	0.3163	57,792,182
All year	0.3322	0.4959	0.1055	0.0574	0.0090	1.0000	182,738,897
Catcher-only vessels							
Jan-May	0.0250	0.0038	0.0295	0.3923	0.1642	0.6147	6,284,410
Jun-Dec	0.0364	0.0068	0.1103	0.1478	0.0840	0.3853	3,938,884
All year	0.0614	0.0106	0.1398	0.5401	0.2482	1.0000	10,223,294

Eastern Bering Sea = NMFS zones 508, 509, 512, 513, 514, 516, 517, 518, 519
Central Bering Sea = zones 521, 523, 524, 530 (west of 170 degrees longitude)
Aleutian Islands = zones 541, 542, 543 (both north and south sides, west of 170 degrees)
Western Gulf of Alaska = zones 610, 620, 630 (west of 147 degrees longitude)
Eastern Gulf of Alaska = zones 640, 650

Table 2. Proportion of total observed sample of birds caught in various regions and time periods from 1993-1997 combined data.

	Eastern Bering Sea	Central Bering Sea	Aleutian Islands	Western Gulf of Alaska	Eastern Gulf of Alaska	Sum	Total Birds
Catcher/processor vessels							
Jan-May	0.1505	0.3276	0.0822	0.0295	0.0037	0.5935	9763
Jun-Dec	0.1972	0.1691	0.0202	0.0150	0.0051	0.4065	6687
All year	0.3476	0.4966	0.1024	0.0445	0.0088	1.0000	16450
Catcher-only vessels							
Jan-May	0.0217	0.0000	0.0798	0.4854	0.1437	0.7307	240
Jun-Dec	0.0093	0.0000	0.0581	0.1009	0.1010	0.2693	88
All year	0.0310	0.0000	0.1380	0.5863	0.2447	1.0000	328

Table 3. Average catch rate of seabirds per 1000 hooks for various regions and time periods from 1993-1997 combined data.

	Eastern Bering Sea	Central Bering Sea	Aleutian Islands	Western Gulf of Alaska	Eastern Gulf of Alaska	Total	Total Birds
Catcher/processor vessels							
Jan-May	0.0662	0.0829	0.0981	0.0645	0.0488		9763
Jun-Dec	0.1392	0.1085	0.0604	0.0833	0.2128		6687
All year	0.0942	0.0902	0.0874	0.0698	0.0879	0.0900	16450
Catcher-only vessels							
Jan-May	0.0278	0.0000	0.0869	0.0397	0.0281		240
Jun-Dec	0.0082	0.0000	0.0169	0.0219	0.0386		88
All year	0.0162	0.0000	0.0317	0.0348	0.0316	0.0321	328

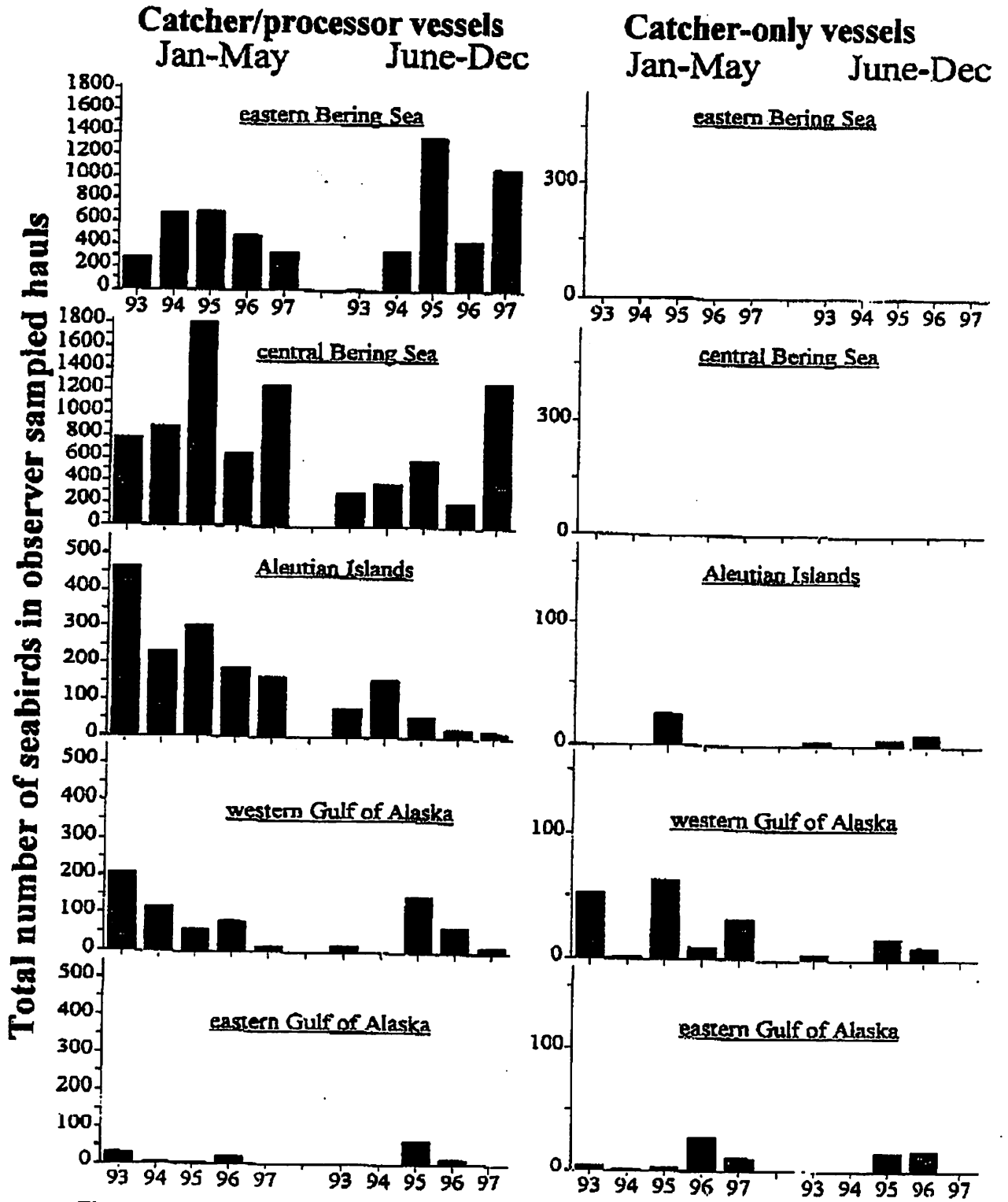

Figure 1. Total seabirds caught in the observer sample of hauls in 1993-1997 as classified by vesseltype, geographic region, and time of year. The sampling effort is not equal in all areas or time periods. The x-axis for catcher-only vessels is scaled to visually expand for a 30% observer sampling frequency compared to a 100% sample for catcher/processors.

APPENDIX 2, FIG. 1 (SEABIRD EARLR)

AGENDA ITEM C-3
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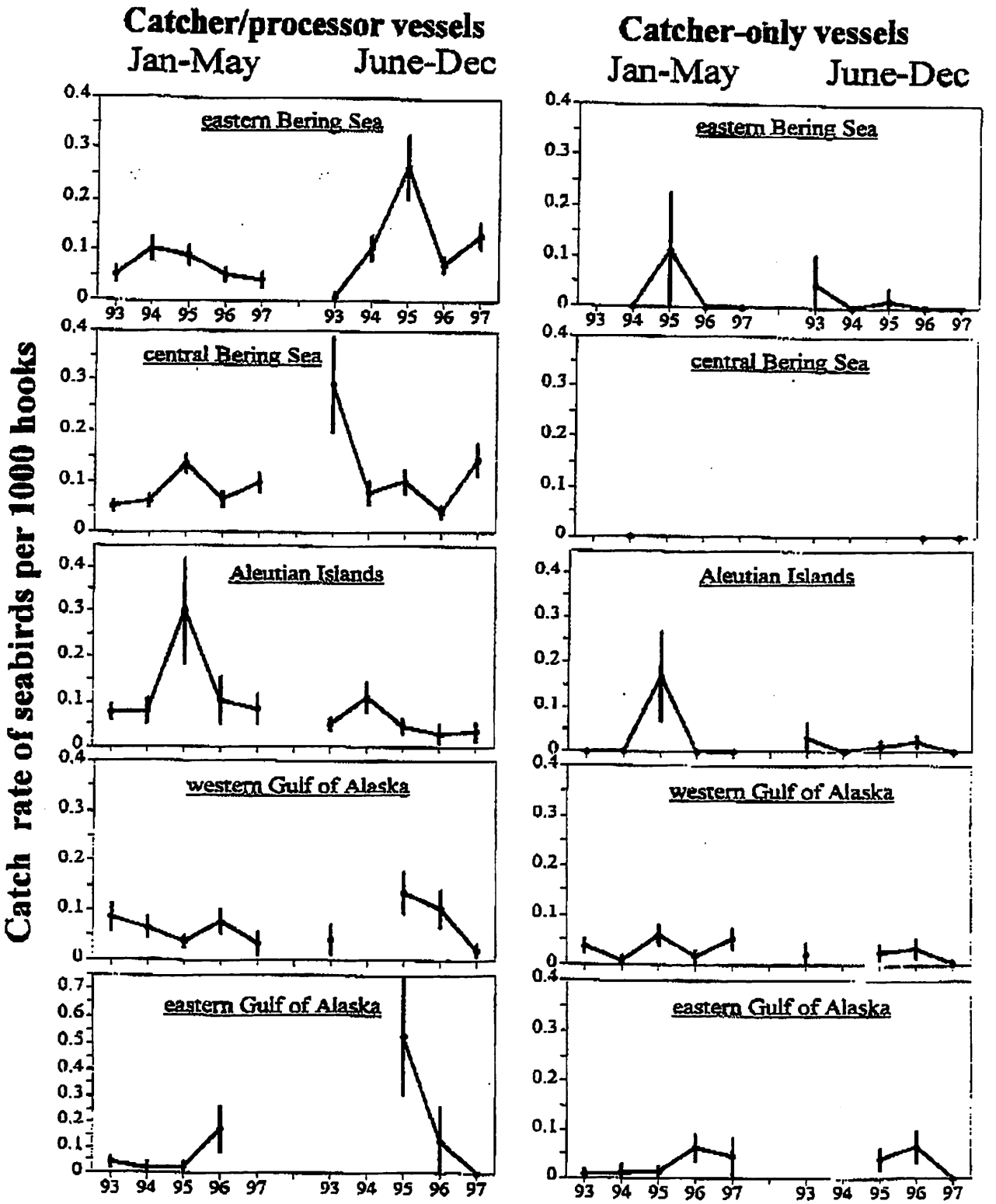

Figure 2. Incidental catch rate of seabirds from 1993-1997 classified by vesseltype, geographic region, and time of year. Vertical lines indicate 95% confidence intervals of the mean catch rate based on variation among all observed hauls.

APPENDIX 2, FIGURE 2 (SEABIRD EARIR)

AGENDA C-3
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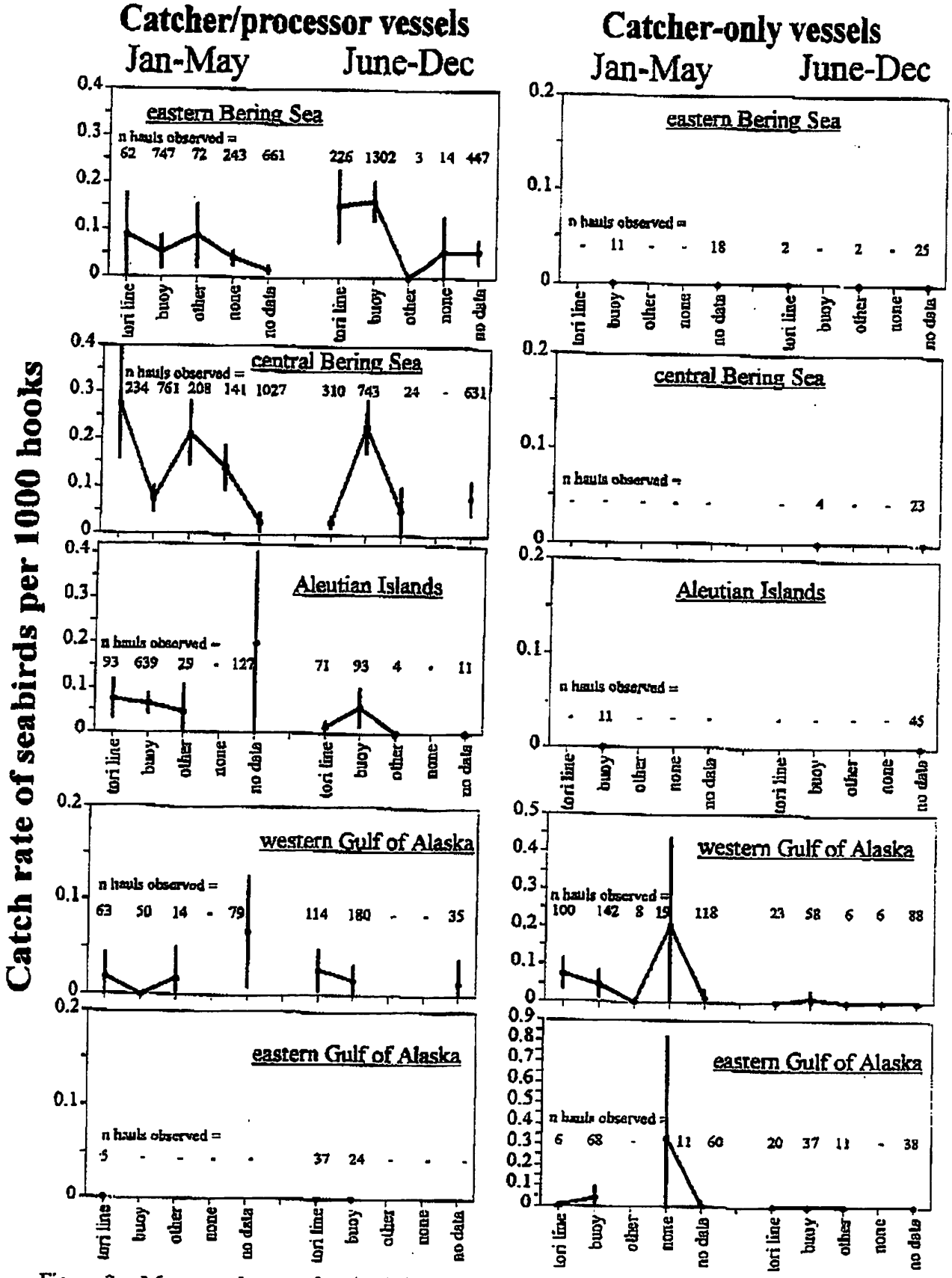

Figure 3. Mean catch rate of seabirds in 1997 classified by the bird deterrent devices reported used as recalled by observers in follow-up interviews. Precedence was given to tori lines and then buoys if multiple devices were reported. Vertical lines indicate 95 % confidence intervals of the mean catch rate based on variation among all observed hauls.

APPENDIX 2, FIG.3 (SEABIRD EARIR) 63 AGENDA ITEM C-3 FEB 99

10.3 APPENDIX 3: FAO'S PROVISIONAL AND UNOFFICIAL TEXT OF THE SEABIRD IPOA

CONSULTATION ON THE MANAGEMENT OF FISHING CAPACITY, SHARK FISHERIES AND INCIDENTAL CATCH OF SEABIRDS IN LONGLINE FISHERIES

Rome, 26-30 October 1998

APPENDIX E

INTERNATIONAL PLAN OF ACTION FOR REDUCING INCIDENTAL CATCH OF SEABIRDS IN LONGLINE FISHERIES

Introduction

1. Seabirds are being incidentally caught in various commercial longline fisheries in the world, and concerns are arising about the impacts of this incidental catch. Incidental catch of seabirds may also have an adverse impact on fishing productivity and profitability. Governments, non-governmental organizations, and commercial fishery associations are petitioning for measures to reduce the mortality of seabirds in longline fisheries in which seabirds are incidentally taken.

2. Key longline fisheries in which incidental catch of seabirds are known to occur are: tuna, swordfish and billfish in some particular parts of oceans; Patagonian toothfish in the Southern Ocean, and halibut, black cod, Pacific cod, Greenland halibut, cod, haddock, tusk and ling in the northern oceans (Pacific and Atlantic). The species of seabirds most frequently taken are albatrosses and petrels in the Southern Ocean, northern fulmars in the North Atlantic and albatrosses, gulls and fulmars in the North Pacific fisheries.

3. Responding to the need to reduce the incidental catch of seabirds in commercial fisheries in the Southern Ocean, the Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR) adopted mitigation measures in 1992 for its 23 member countries to reduce incidental catch of seabirds.

4. Under the auspices of the Commission for the Conservation of Southern Bluefin Tuna (CCSBT), Australia, Japan and New Zealand have studied and taken seabird mitigation measures in their southern bluefin tuna longline fishery since 1994, and in 1995 CCSBT adopted the recommendation relating to ecologically related species, including the incidental mortality of seabirds by longline fishing. The recommendation stipulates the policy on data and information collection, mitigation measures, as well as education and information dissemination. All member nations of CCSBT have made the use of bird scaring lines (tori poles) mandatory in their fisheries.

5. The United States of America also adopted, by regulation, measures for reducing incidental catch of seabirds for its groundfish longline fisheries in the Bering Sea/Aleutian Islands and Gulf of Alaska in 1997, and for its halibut fishery in 1998. The United States is currently developing measures to mitigate the incidental catch of seabirds in the Hawaiian pelagic longline fisheries. Several other countries with longline fisheries have likewise adopted similar mitigation measures.

Origin

6. Noting an increased awareness about the incidental catch of seabirds in longline fisheries and its potential negative impacts on seabird populations, a proposal was made at the Twenty-second Session of the Committee on Fisheries (COFI) in March 1997 that FAO organize an expert consultation, using extra-budgetary funds, to develop Guidelines leading to a Plan of Action to be submitted at the next Session of COFI aiming at a reduction in such incidental catch.

7. The *International Plan of Action for reducing incidental catch of seabirds in longline fisheries* (IPOA-SEABIRDS) has been developed through the meeting of a Technical Working Group in Tokyo 25-27 March 1998[1] and the Consultation on the Management of Fishing Capacity, Shark Fisheries and Incidental Catch of Seabirds in Longline Fisheries held 26-30 October 1998 and its preparatory meeting held in Rome 22-24 July 1998[2].

8. The IPOA-SEABIRDS is to be implemented in a manner consistent with the FAO Code of Conduct for Responsible Fisheries[3] and any applicable rules of international law and in conjunction with relevant international organizations.

Objective

9. The objective of the IPOA-SEABIRDS is to reduce the incidental catch of seabirds in longline fisheries where this occurs.

Implementation

10. The IPOA-SEABIRDS is voluntary. All concerned States[4] are encouraged to implement it.

11. The IPOA-SEABIRDS applies to States in the waters of which longline fisheries are being conducted by their own or foreign vessels and to States that conduct longline fisheries on the high seas and in the exclusive economic zones (EEZ) of other States.

12. In implementing the IPOA-SEABIRDS States should carry out a set of activities. The exact configuration of this set of activities will be based on an assessment of the incidental catch of seabirds in longline fisheries.

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[1] See: "Report of the Technical Working Group on Reduction of Incidental Catch of Seabirds in Longline Fisheries. Tokyo, Japan, 25–27 March 1998. FAO Fisheries Report No. 585

[2] See report: "Preparatory Meeting for the Consultation on the Management of Fishing Capacity, Shark Fisheries and Incidental Catch of Seabirds in Longline Fisheries". Rome, 22–24 July, 1998. FAO Fisheries Report No. 584.

[3] Article 7.6.9 of the Code provides that States should take appropriate measures to minimize waste, discards, catch by lost or abandoned gear, catch of non-target species, both fish and non-fish species, and negative impact on associated or dependent species in particular endangered species. It further provides that States and sub-regional or regional fisheries management organizations and arrangements should promote, to the extent practicable, the development and use of selective, environmentally safe and cost effective gear and techniques. Article 8.5 of the Code provides guidance on the role of fishing gear selectivity in responsible fisheries.

[4] In this document the term "State" applies *mutatis mutandis* also to "fishing entities" other than States and to any other entity, or organization, to which countries have transferred their right to set policies and manage fisheries.

13. States with longline fisheries should conduct an assessment of these fisheries to determine if a problem exists with respect to incidental catch of seabirds. If a problem exists, States should adopt a National Plan of Action for reducing the incidental catch of seabirds in longline fisheries (NPOA-SEABIRDS). (See the attached "Technical Note on developing a National Plan of Action for reducing the incidental catch of seabirds in longline fisheries".) When developing the NPOA-SEABIRDS experience acquired in regional management organizations should be taken into account as appropriate. FAO should provide a list of experts and a mechanism of technical assistance to countries in connection with development of NPOA-SEABIRDS.

14. States which determine that an NPOA-SEABIRDS is not necessary should review that decision on a regular basis, particularly taking into account changes in their fisheries, such as the expansion of existing fisheries and/or the development of new longline fisheries. If, based on a subsequent assessment, States determine that a problem exists, they should follow the procedures outlined in paragraph 13, and implement an NPOA-SEABIRDS within two years.

15. The assessment should be included as a part of each relevant State's NPOA-SEABIRDS.

16. Each State is responsible for the design, implementation and monitoring of its NPOA-SEABIRDS.

17. States recognize that each longline fishery is unique and the identification of appropriate mitigation measures can only be achieved through on-the-spot assessment of the concerned fisheries. Technical and operational mitigation measures are presently in use or under development in some longline fisheries where incidental catch of seabirds occurs. Measures developed by different States are listed in the Technical Note attached to this document. This list does not prejudice the right of States to decide to use any of these or other suitable measures that may be developed. A more comprehensive description and discussion of the mititagion measures currently used or under development can be found in FAO Fisheries Circular No. 937.

18. States should start the implementation of the NPOA-SEABIRDS no later than the COFI Session in 2001.

19. In implementing their NPOA-SEABIRDS States should regularly, at least every four years, assess their implementation for the purpose of identifying cost-effective strategies for increasing the effectiveness of the NPOA-SEABIRDS.

20. States, within the framework of their respective competencies and consistent with international law, should cooperate through regional and subregional fisheries management organizations or arrangements, and other forms of cooperation, to reduce the incidental catch of seabirds in longline fisheries.

21. In implementing the IPOA-SEABIRDS States recognize that cooperation among States which have important longline fisheries is essential to reduce the incidental catch of seabirds given the global nature of the issue. States should strive to collaborate through FAO and through other arrangements in research, training and the production of information and promotional material.

22. States should report on the progress of the assessment, development and implementation of their NPOA-SEABIRDS as part of their biennial reporting under the Code of Conduct for Responsible Fisheries.

Resource requirements for FAO

23. FAO will, as directed by its Conference, and as part of its regular programme activities support States in the implementation of the IPOA-SEABIRDS.

24. FAO will, as directed by its Conference, support development and implementation of NPOA-SEABIRD through specific, in-country technical assistance projects with Regular Programme funds and by use of extra-budgetary funds made available to the Organization for this purpose.

25. FAO will, through COFI, report biennially on the state of progress in the implementation of the IPOA-SEABIRDS.

Technical Note on developing a National Plan of Action for reducing the incidental catch of seabirds in longline fisheries (NPOA-SEABIRDS)

This is not an exclusive or necessarily all-encompassing list but provides guidance for preparation of the NPOA-SEABIRDS.

The NPOA-SEABIRDS is a plan that a State designs, implements and monitors to reduce the incidental catch of seabirds in longline fisheries.

I. Assessment

1. The purpose of the assessment is to determine the extent and nature of a State's incidental catch of seabirds in longline fisheries where it occurs.

2. The assessment may include, but is not limited to, the collection and analysis of the

- Criteria used to evaluate the need for an NPOA-SEABIRDS
- Fishing fleet data (numbers of vessels by size).
- Fishing techniques data (demersal, pelagic, methods).
- Fishing areas.
- Fishing effort by longline fishery (seasons, species, catch, number of hooks/year/fishery).
- Status of seabird populations in the fishing areas, if known.
- Total annual catch of seabirds (numbers per 1000 hooks set/species/longline fishery.
- Existing mitigation measures in use and their effectiveness in reducing incidental catch of seabirds.
- Incidental catch of seabirds monitoring (observer program, etc).
- Statement of conclusions and decision to develop and implement an NPOA-SEABIRDS.

II NPOA - SEABIRDS

The NPOA-SEABIRDS may contain the following elements:

1. Prescription of mitigation measures

- The NPOA-SEABIRDS should prescribe appropriate mitigation methods. These should have a proven efficiency, and be cost-effective for the fishing industry. If effectiveness of mitigation measures can be improved by combining different mitigation measures or devices, it is likely that each State will find it advantageous to implement a number of different measures that reflect the need and particular circumstances of their specific longline fishery.

2. Research and development

- The NPOA-SEABIRDS should contain plans for research and development, including those aiming: (i) to develop the most practical and effective seabird deterrent device; (ii) to improve other technologies and practices which reduce the incidental capture of seabirds; and (iii) undertake specific research to evaluate the effectiveness of mitigation measures used in the longline fisheries, where this problem occurs.

3. Education, training and publicity

- The NPOA-SEABIRDS should prescribe means to raise awareness among fishers, fishing associations and other relevant groups about the need to reduce the incidental catch of seabirds in longline fisheries where this occurs; National and International Plans of Action and other information on the incidental catch of seabirds in longline fisheries; and to promote the implementation of the NPOA-SEABIRDS among national industry, research and its own administration.

- Provide information about technical or financial assistance for reducing the incidental catch of seabirds.

- Preferably design and implementation of outreach programmes for fishers, fisheries managers, gear technologists, maritime architects, shipbuilders, and conservationists and other interested members of the public should be described in the plan. These programmes should aim at improving the understanding of the problem resulting from incidental catch of seabirds and the use of mitigation measures. The outreach programme may include educational curricula, and guidelines disseminated through videos, handbooks, brochures and posters. The programme should focus on both the conservation aspects of this issue and on the economic benefits of expected increased fishing efficiency *inter alia* by eliminating bait loss to seabirds.

4. Data Collection

- Data collection programmes should collect reliable data to determine the incidental catch of seabirds in longline fisheries and the effectiveness of mitigation measures. Such programmes may make use of onboard observers.

Technical note on some optional technical and operational measures for reducing the incidental catch of seabirds

I. Introduction

To reduce the incidental catch of seabirds, it is essential to reduce the number of encounters between seabirds and baited hooks. It should be noted that, if used in combination, the options could improve mitigation effectiveness.

For each of the measures, the effectiveness and the cost involved for fishers are briefly presented. In this presentation, "effectiveness" is defined as to what extent the measures reduces incidental catch of seabirds; "cost" is defined as the initial cost or investment and any ongoing operational costs.

Other technical options are currently under development and fishers and researchers in the field may develop new mitigation measures, so the list of measures is likely to increase over time.

If effectiveness of mitigation measures can be improved by combining different mitigation measures or devices, each State may find it advantageous to implement different measures that are more suitable for their conditions and reflect the needs of their specific longline fisheries.

The list below should not be considered mandatory or exhaustive and FAO shall maintain a data base of measures that are in use or under development.

II. Technical measures

1. Increase the sink rate of baits

a. Weighting the longline gear

Concept: Increase the sinking speed of baited hooks and reduce their exposure time to seabirds.
Effectiveness: Studies have shown that appropriate line-weighting can be highly effective in avoiding bait loss to birds.
Cost: The cost is the initial purchase of the weighting material (either heavier gear or weights) and any ongoing replacement of weights lost during fishing.

b. Thawing bait

Concept: Overcome buoyancy problems in bait by thawing and/or puncturing swim bladders
Effectiveness: Rate of incidental catch of seabirds is reduced when thawed baits are used. It has also been shown that bait fish with deflated swim bladders sink more quickly than those with inflated swim bladders did.*Cost:* Possible costs include bait thawing rack, or extra weight to compensate flotation resulting from the air bladder.

c. Line-setting machine

Concept: Increase line sinking rate by removing line tension during gear deployment
Effectiveness: Although no quantitative assessments have been done, this practice would result in the line sinking more rapidly thereby reducing availability of baited hooks to seabirds.
Cost: For some fisheries, initial costs may include purchase of a line-setting device.

2. Below-the-water setting chute, capsule, or funnel

Concept: Prevent access by seabirds to baited hooks by setting line under water.
Effectiveness: Underwater setting devices are still under development but could have high effectiveness.*Cost:* Initial cost would include purchase of the underwater setting device.

3. Bird-scaring line positioned over or in the area where baited hooks enter the water

Concept: Prevent seabirds access to baited hooks where they enter the water. The bird scaring line is designed to discourage birds from taking baited hooks by preventing their access to baited hooks. Design specifications may vary by vessel, fishing operation, and location and are critical to its effectiveness. Streamer lines and towing buoys are examples of these techniques.
Effectiveness: A number of studies and anecdotal observations have demonstrated significant effectiveness of these devices when properly designed and used.*Cost*: Low initial cost for the purchase and installation of bird scaring line.

4. Bait casting machine

Concept: Places bait in area protected by a bird scaring line and outside the turbulence caused by the propeller and the ships wake.
Effectiveness: Deployment of bait under the protection zone of the bird-scaring line reduces the availability of baited hooks to seabirds. The extent to which bait loss is reduced by the use of bait casting machines, used either without a bird-scaring line or in such a manner that baits are not protected by a bird-scaring line, is yet to be determined.
Cost: High, initial costs may include purchase of a bait-casting device.

5. Bird scaring curtain

Concept: To deter seabirds from taking baited hooks during the haul by using a bird scaring curtain.
Effectiveness: Anecdotal evidence indicates that the bird-scaring curtain can effectively discourage birds from seizing baits in the hauling area.
Cost: Low, cost for materials.

6. Artificial baits or lures
Concept: Reduce palatability or availability of baits.
Effectiveness: New baits are still under development and effectiveness has yet to be resolved.
Cost: Currently unknown

7. Hook modification

Concept: Utilize hook types that reduce the probability of birds getting caught when they attack a baited hook.
Effectiveness: Hook size might effect the species composition of incidental caught seabirds. The effect of modification of hooks is, however, poorly understood.
Cost: Unknown.

8. Acoustic deterrent

Concept: Deterring birds from the longline using acoustic signals, such as high frequency, high volume, distress call, etc
Effectiveness: Low probability of being effective as background noises are loud and habituation to noises is common among seabirds.
Cost: Unknown

9. Water cannon

Concept: Concealing baited hooks by using high pressure water.
Effectiveness: There is no definite conclusion about the effectiveness of this method.
Cost: Unknown.

10. Magnetic deterrent

Concept: Perturbing the magnetic receptors of the birds by creating magnetic fields.
Effectiveness: No indication of effect in practical experiments.
Cost: Unknown.

III. Operational Measures

1. Reduce visibility of bait (Night setting)

Concept: Set during hours of darkness and reduce illumination of baited hooks in the water.
Effectiveness: This method is generally recognized as being highly effective. However, effectiveness can vary between fishing grounds and also seasonally according to the seabird species. Effectiveness of this measure may be reduced around the full moon.
Cost: A restriction of line setting to the hours of darkness may affect fishing capacity, especially for smaller longliners. Small costs may be incurred to make vessel lighting appropriate.

Such restriction can also entail investing in costly technology for maximizing fishing efficiency in a shorter period of time.

2. Reduce the attractiveness of the vessels to seabirds

Concept: Reducing the attractiveness of vessels to seabirds will reduce the potential for seabirds being incidentally caught. Materials (e.g. fish discards, garbage) discharged from vessels should be at a time or in a way that makes them least available to birds or least likely to cause them harm. This includes avoidance of the dumping of discarded fish, offal, fish heads, etc. with embedded hooks. If

dumping offal is unavoidable, it should be done on the opposite side of the vessel to where lines are being set or in such a manner that birds are not attracted to the vessel (e.g. at night).
Effectiveness: The issue of offal discharge is a complex one, and there have been conflicting results regarding effects of various procedures in the studies done to date.
Cost: Low; in some situations costs may be associated with providing for offal containment or reconfiguration of offal discharge systems on the vessel.

3. Area and seasonal closures

Concept: Reduce incidental catch of seabirds when concentrations of breeding or foraging seabirds can be avoided.
Effectiveness: Area and seasonal closures could be effective (such as in high density foraging areas or during the period of chick care when parental duties limit the distances adults can fly from breeding sites) although displacement of fishing fleet to other seabird areas needs to be considered.
Cost: Unknown, but a restriction on fishing by area or season may effect fishing capacity.

4. Give preferential licensing to vessels that use mitigation measures that do not require compliance monitoring

Concept: Incentive provided for effective use of mitigation measures that do not require compliance monitoring.
Effectiveness: May be highly effective in stimulating the use of mitigation measures and development of fishing systems that reduce incidental catch of seabirds
Cost: Unknown.

5. Release live birds

Concept: If despite the precautions, seabirds are incidentally caught, every reasonable effort should be made to ensure that birds brought onboard alive are released alive and that when possible hooks should be removed without jeopardizing the life of the birds
Effectiveness: Depends on the number of birds brought onboard alive and this is considered small by comparison to the numbers killed in line setting.
Cost: Unknown

NATIONAL MARINE FISHERIES SERVICE

ALASKA REGION

A PROPOSED REGULATORY AMENDMENT TO REDUCE SEABIRD BYCATCH IN COMMERCIAL LONGLINE FISHERIES OFF ALASKA

Prepared by the National Marine Fisheries Service
for a Meeting of the
North Pacific Fishery Management Council

Anchorage, Alaska
February 1-7, 1999

CONTENTS

Problem:

Seabirds are attracted to 'food' (bait & offal) associated with fishing vessels. In longline operations, birds may gain access to baited hooks, become hooked, and pulled underwater and drowned with the setting gear.

- At the Dec. 1998 Council meeting, freezer-longliner industry representatives requested the Council to revise & strengthen current seabird avoidance measures, why?

    - 2 STALB taken in Sept. 1998
    - current measures may not always be used as carefully as they must be to be effective

INCIDENTAL TAKE STATEMENT

Through the section 7 consultation process under the Endangered Species Act, NMFS consults with USFWS to establish an incidental take limit---the take that is anticipated to occur from the fisheries. If the incidental take level is exceeded, NMFS must immediately stop the action causeing the take and reinitiate consultation.

- **<u>BSAI and GOA groundfish hook-and-line fisheries</u>:**
  - **Incidental take level is 4 birds for 2-year period of 1997 and 1998.**
  - **Zero STALB were reported taken in 1997; 2 in 1998.**
  - **The 1997-1998 take level will be extended into 1999, until superseded.**

- **<u>Pacific halibut fishery</u>:**
  - **Incidental take level is 2 birds for 2-year period beginning 1998.**
  - **Zero STALB were reported taken in 1998.**

Solutions:

- Reduce attractiveness of vessel to seabirds

- Prevent or distract seabirds from accessing area where gear is set

How?

- Education & outreach

- Conscientious & consistent use of effective seabird avoidance measures by fishermen

CURRENT SEABIRD AVOIDANCE MEASURES REQUIRED OF VESSEL OPERATORS IN THE GROUNDFISH HOOK-AND-LINE FISHERIES IN THE BSAI AND GOA AND THE PACIFIC HALIBUT FISHERY OFF ALASKA
(62 FR 23176, April 29, 1997; 63 FR 11161, March 6, 1998)

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

   a. Use hooks that when baited, sink as soon as they are put in the water.

   b. If offal is discharged while gear is being set or hauled, it must be discharged in a manner that distracts seabirds from baited hooks, to the extent practicable. The discharge site on board 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 birds.

2. All applicable hook-and-line vessels $\geq$ 26 ft LOA are required to employ one or more of the following seabird avoidance measures:

   a. Deploy gear only during hours specified in regulation (i.e. hours of darkness) 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.

Proposed Regulatory Amendment to Revise Current Regulations: Alternatives

Alternative 1: No Action: No change in the current Federal requirements for seabird avoidance measures.

Alternative 2: Revisions to existing regulations, intended to improve and strengthen the effectiveness of the required seabird avoidance measures and reduce the bycatch of the short-tailed albatross and other seabird species.

Three options:

Option 1--> line weighting, no embedded hooks, bird scaring line

Option 2--> same as Option 1 plus lining tubes

Option 3--> line weighting, streamer line, night-setting

OPTION #1

- Weights must be added to the groundline.
- Prior to any offal discharge, embedded hooks must be removed.
- Specific instructions provided for proper placement and deployment of bird scaring lines.
- Streamer lines and buoy bags may both qualify as bird scaring lines.
- Towed boards, sticks, and other devices would no longer qualify as seabird avoidance measures.
- Bird scaring lines would be required in conjunction to using a lining tube or night-setting.
- Use of a lining tube or night-setting would continue to be options.

OPTION #2

Same as Option 1 except that the use of a lining tube would be required for specified vessels. Weights added to the groundline would be required to prevent the groundline from resurfacing after it was set.

OPTION #3

Same as Option 1 except in the following two ways:

- **Buoy bags would not qualify as bird scaring lines.**
- **Night-setting would be required of all specified vessels.**

OPTION #1

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

1. Use groundlines which are sufficiently weighted to cause the baited hooks to sink out of reach of seabirds immediately after they are set. (This weight would be determined at a future date by experimental trials);

2. If offal is discharged while gear is being set or hauled, it must be discharged in a manner that distracts seabirds from baited hooks, to the extent practicable. The discharge site on board a vessel must either be aft of the hauling station or on the opposite side of the vessel from the hauling station. Hooks must be removed from any offal (i.e. fish heads) that is discharged; and

3. Make every reasonable effort to ensure that birds brought aboard alive are released alive and that wherever possible, hooks are removed without jeopardizing the life of the bird. (No revision is necessary to the current requirement).

4. For a vessel greater than or equal to 26 ft (7.9m) length overall (LOA), the operator of the vessel would employ one of the following seabird avoidance measures:

    a. Tow a bird scaring line during deployment of the gear to prevent birds from taking baited hooks. The bird scaring line would be towed directly over the baited hooks and would be of a sufficient length and attached to the vessel at a sufficient height to protect the entire area behind the stern of the vessel where baited hooks are accessible to seabirds. If multiple bird scaring lines are used, they would be immediately adjacent, on each side, of the groundline bearing the baited hooks.

    b. Towed buoy bags would qualify as bird scaring lines if they are properly constructed to effectively deter and prevent seabirds from accessing baited hooks. Towing a board, stick or other device during deployment of gear no longer would qualify as an acceptable seabird avoidance measure.

    c. In addition to 4a above, deploy hooks underwater through a lining tube at a depth sufficient to prevent birds from settling on hooks during deployment of gear.

    d. In addition to 4a above, deploy gear only during the hours specified in regulation ["hours of darkness" §679.24(e)(3)(iv)], using only the minimum vessel's lights necessary for safety.

OPTION #2

Option 2: The same revisions to existing regulations as proposed in Option 1 except that the use of lining tubes would be required on specified vessels in the following manner:

A. Catcher-processors using hook-and-line gear would be required to deploy baited hooks through a lining tube, at a depth not less than 1.5 meters when the vessel is fully laden;

B. Sufficient weights would be added to the groundline to prevent it from resurfacing after being set; and

C. This requirement would apply to:
a. All catcher-processors, 60 ft LOA or greater, using hook-and-line gear,
b. catcher-processors, 100 ft LOA or greater, using hook-and-line gear, or
c. catcher-processors, 125 ft LOA or greater, using hook-and-line gear.
d. All vessels, 60 ft LOA or greater, using hook-and-line gear,
e. All vessels, 100 ft LOA or greater, using hook-and-line gear, or
f. All vessels, 125 ft LOA or greater, using hook-and-line gear.

D. This requirement would be effective:
a. January 1, 2000,
b. September 15, 2000; or
c. January 1, 2001.

OPTION #3

Option 3: Revisions to existing regulations that would be more restrictive and would not allow options in choosing the appropriate seabird avoidance measures to be used. All applicable hook-and-line fishing operations would be conducted in the following manner:

1. Use groundlines which are sufficiently weighted to cause the baited hooks to sink out of reach of seabirds immediately after they are set. (This weight would be determined at a future date by experimental trials) (same as Option 1);

2. If offal is discharged while gear is being set or hauled, it must be discharged in a manner that distracts seabirds from baited hooks, to the extent practicable. The discharge site on board a vessel must either be aft of the hauling station or on the opposite side of the vessel from the hauling station. Hooks must be removed from any offal (fish heads) that is discharged (same as Option 1);

3. Make every reasonable effort to ensure that birds brought aboard alive are released alive and that wherever possible, hooks are removed without jeopardizing the life of the bird. (No revision is necessary to the current requirement); and

4. For a vessel greater than or equal to 26 ft (7.9m) length overall (LOA), the operator of the vessel would employ the following seabird avoidance measures:

    a. Tow a bird scaring line during deployment of the gear to prevent birds from taking baited hooks. The bird scaring line would be towed directly over the baited hooks and would be of a sufficient length and attached to the vessel at a sufficient height to protect the entire area behind the stern of the vessel where baited hooks are accessible to seabirds. If multiple bird scaring lines are used, they would be immediately adjacent, on each side, of the groundline bearing the baited hooks.

    b. Towed buoy bags would not qualify as bird scaring lines; bird scaring lines would have streamers attached and would be properly constructed to effectively deter and prevent seabirds from accessing baited hooks. Towing a board, stick or other device during deployment of gear also would not qualify as an acceptable seabird avoidance measure.

    c. Deploy gear only during the hours specified in regulation ["hours of darkness" §679.24(e)(3)(iv)], using only the minimum vessel's lights necessary for safety.

NMFS SEABIRD TEST PLAN

Purpose: Evaluate the effectiveness of the seabird avoidance measures that are required in Alaska's groundfish and halibut longline fisheries.

Objectives:

- **Obtain high quality information on the effectiveness of seabird avoidance measures in the North Pacific.**
- **Reduce the bycatch of seabirds in Alaska's longline fishery.**
- **Minimize future risk to Alaska's longline fisheries by maximizing the effectiveness of seabird avoidance measures and reducing the likelihood of STALB mortalities.**
- **Continue to use a partnership approach with industry, the resource agencies and others to address the issue of seabird bycatch.**

IMPLEMENTATION OF SEABIRD TEST PLAN

Test Plan focuses on 3 related components:

- Controlled, experimental testing of avoidance measures
- Collection of information on avoidance measures by observers on commercial vessels
- Solicit and gather information on effectiveness of avoidance measures from fishermen

Experimental tests are being scheduled to begin in 1999.

Information collection on avoidance measures from observers and fishermen was initiated in 1997 and is continuing as well as being expanded.

BASIS FOR REVISIONS TO CURRENT REQUIREMENTS

- Recent experimental studies in other demersal longline fisheries
- Observer seabird data
- Input from fishermen & other interested parties
- IPHC pilot tests on effectiveness of measures

Table 2.--Numbers of vessels that caught groundfish off Alaska by area, vessel length class (feet), 1992-97. (excluding catcher-processors)

	Gulf of Alaska				Bering Sea and Aleutian				All Alaska			
	Vessel length class				Vessel length class				Vessel length class			
	<60	60-99	100-124	>124	<60	60-99	100-124	>124	<60	60-99	100-124	>124
Number of Vessels												
Hook & Line												
1993	998	143	9	1	29	27	2	0	1006	151	11	1
1994	1149	181	14	0	60	26	1	0	1165	185	15	0
1995	901	148	14	2	73	60	3	0	935	151	17	2
1996	821	140	8	5	59	54	4	2	848	141	9	6
1997	791	118	8	3	49	49	3	0	802	119	8	3

Numbers of vessels that caught and processed groundfish off Alaska by area and vessel length class (feet), 1992-97.

Number of Vessels												
Hook & Line												
1993	2	13	14	25	0	12	14	34	2	14	14	34
1994	3	13	12	24	1	15	13	28	3	16	13	28
1995	4	9	8	15	1	7	11	28	4	9	11	28
1996	4	6	8	9	1	7	10	26	4	7	10	26
1997	2	6	8	9	3	7	8	26	4	8	8	26

Note: Includes only vessels that fished part of Federal TACs.

Source: 1997 Economic SAFE Document, Tables 28 and 29. Blend estimates, NMFS permits.

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

GROUNDFISH HOOK-AND-LINE FISHERY STATISTICS

Groundfish hook-and-line target species include: BSAI--Pacific cod, sablefish, Greenland turbot, and rockfish; GOA--sablefish, Pacific cod, rockfish

1998	Total Catch (mt)	
	BSAI	GOA
all groundfish	1.54 million	245 K
H&L portion	130 K	25.5 K
% H&L of Total	8.5%	10.4%

# of permitted vessels	BSAI (only)	GOA (only)	BSAI & GOA	
<60'	25	1032	378	
≥60'	6	51	317	
total	31	1083	695	1809

1997	Total Catch (mt)	
	BSAI	GOA
all groundfish	1.74 million	230 K
H&L portion	154 K	28.4 K
% H&L of Total	8.9 %	12.3 %

# of permitted vessels	BSAI (only)	GOA (only)	BSAI & GOA	
<60'	23	953	343	
≥60'	6	45	274	
total	29	998	617	1644

1996	Total Catch (mt)	
all groundfish	1.75 million	202 K
H&L portion	116 K	27.9 K
% H&L of Total	6.6%	13.8%

# of permitted vessels	BSAI (only)	GOA (only)	BSAI & GOA	
<60'	26	1070	386	
≥60'	2	47	315	
total	28	1117	701	1846

PACIFIC HALIBUT FISHERY STATISTICS

1998	51 million pound commercial take
1997	51 million pound commercial take
1996	47 million pound commercial take

# of vessels making halibut landings in 1998

<60'	1610
≥60' & <125'	155
≥125'	3
total	1768

Observed catch rates of seabirds in the Alaska longline fishery

	Number of hauls observed	Total birds caught	Hooks observed	Birds per 1000 hooks	Standard error (Birds per 1000 hooks)	Birds per mton of fish	% of the total estim. catch observed
Bering Sea / Aleutian Islands							
1993	8,315	1,942	30,419,531	0.0638	0.0151	0.0772	29.20%
1994	8,544	2,700	33,835,813	0.0798	0.0157	0.0996	27.16%
1995	8,560	4,851	34,677,010	0.1399	0.0223	0.1557	26.97%
1996	8,247	2,011	33,804,018	0.0595	0.0109	0.0711	26.32%
1997	9,064	4,122	40,034,977	0.1030	0.0201	0.1146	25.15%
5 yr total	42,730	15,626	172,771,349				
annual avg.	8,546	3,125	34,554,270	0.0904	0.0174	0.1058	26.75%
Gulf of Alaska							
1993	2,392	318	5,824,543	0.0546	0.0100	0.0786	10.83%
1994	969	127	2,434,457	0.0522	0.0129	0.0683	6.26%
1995	2,339	374	5,475,360	0.0683	0.0263	0.0829	13.77%
1996	1,793	252	3,653,352	0.0690	0.0201	0.0859	10.27%
1997	1,420	77	2,831,507	0.0272	0.0140	0.0274	10.32%
5 yr total	8,913	1,148	20,219,219				
annual avg.	1,783	230	4,043,844	0.0568	0.0184	0.0710	10.39%

SEABIRD EA&IR, TABLE 4.
FEB 96
AGENDA ITEM C-3

Estimated seabird bycatch in the Alaska longline fishery

	Short-tailed Albatross	Laysan Albatross	Black-footed Albatross	Northern Fulmar	Gull spp	Shearwater spp	Other spp	TOTAL
Bering Sea / Aleutian Islands								
1993	0	475	11	4,367	920	482	24	6,255
1994	1	350	40	6,606	1,918	968	35	9,883
1995	1	550	52	11,911	3,097	1,765	56	17,376
1996	2	237	23	5,278	1,339	725	43	7,604
1997	1	439	27	12,156	3,095	1,242	42	16,960
5 yr total	5	2,051	153	40,318	10,368	5,182	199	58,078
annual avg.	1	410	31	8,064	2,074	1,036	40	11,616
Gulf of Alaska								
1993	0	459	647	1,684	160	114	11	3,065
1994	0	414	803	1,451	143	94	8	2,904
1995	0	266	984	1,279	148	101	9	2,778
1996	0	277	496	1,208	107	66	6	2,153
1997	0	110	123	604	64	37	4	939
5 yr total	0	1,526	3,053	6,227	621	412	38	11,839
annual avg.	0	305	611	1,245	124	82	8	2,368
annual Total	1	715	641	9,309	2,198	1,119	48	13,983

SEABIRD EARW, TABLE 5.
AGENDA ITEM C-3
FEB 99

USE OF SEABIRD AVOIDANCE MEASURES ON HOOK-AND-LINE VESSELS IN THE GOA AND BSAI GROUNDFISH FISHERIES ON TRIPS FROM 12/31/96 THROUGH 7/17/98 AS REPORTED BY NMFS GROUNDFISH OBSERVERS[1]

Seabird Avoidance Measure	% of Observed Trips Using the Measure[2]
Buoy, board, or floating device towed behind vessel during setting	74.1
Sink baited hooks quickly	39.9
Streamer line towed behind vessel during setting of gear	20.6
Other device used[3]	9.9
Offal discharged from opposite side of vessel during setting or hauling	9.5
Offal never discharged during setting or hauling of gear	7.4
Gear set at night	6.6
Gear deployed underwater using lining tube	1.6
No device used	2.1[4]

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[1] NMFS groundfish observers began collecting this data in April 1997.

[2] Most trips used more than one device at a time.

[3] Other devices included: fire hose, bleach bottle, 'don't know', paddlewheel, chumming, plastic streamers near stern, gun, air horn

[4] 2.1% represents percent of trips after the regulation effective date of May 29, 1997 that did not use any seabird avoidance measures. 6 additional trips did not use seabird avoidance measures (4.5% of the trips observed) but these trips occurred before vessel operators were required to use seabird avoidance measures.

WHAT WE KNOW NOW ON EFFECTIVENESS OF SEABIRD AVOIDANCE MEASURES

***Buoy Bag Towed Behind Vessel During Setting of Gear* (74%):**

- Should be suspended directly over the fishing gear as it is being set, to prevent seabirds from accessing the 'vulnerable zone'.
- Construction dimensions will vary, longer lengths needed for faster setting speeds.
- Some fishers are effectively towing 2 buoy bags (or streamer lines), one on either side of the fishing gear.
- Norwegian study indicates that towed floats (i.e. buoy bag) reduced significantly the seabird bycatch.
    - Three different avoidance measures were tested--towed floats, streamer line, and an underwater setting funnel (i.e. lining tube).
    - During 11 sets for each of these methods, 2, 0, and 6 seabirds, respectively, were caught compared to 74 seabirds when no avoidance device was used.
- IPHC pilot study found reduced number of bait attacks made by seabirds when buoy bag used, compared to no device.
- Bird scaring lines, both streamer lines & buoy bags, are a recognized seabird measure by the FAO.

Sinking Baited Hooks Quickly, Through the Use of Weights applied to the Groundline (40%):

- **Cause the gear to sink more quickly such that seabirds cannot reach the baited hooks.**
- **How fast gear needs to sink depends on 1) if bird scaring line is used, 2) vessel's line-setting speed, & 3) foraging capabilities of seabirds present**
- **By sinking fishing gear quickly AND protecting the vulnerable zone behind the vessel with a buoy bag or streamer line, seabird bycatch should be significantly reduced.**
- **Line sink rates will vary as a function of the line weighting regime used, line setting speed, propeller turbulence, and other factors.**
- **Study in the demersal Patagonian toothfish fishery found that a line weighting regime of 4kg/40m was effective at sinking gear to a sufficient depth. A similar regime is being promoted in New Zealand, 5kg/40m.**
- **Several fishers in Alaska longline fisheries are finding that smaller weights applied more frequently (0.5kg/20m) is effectively sinking the gear to a sufficient depth.**
- **Seabird experts around the world believe that longline sink rate has the capacity to override in importance all other factors affecting seabird takes in demersal fisheries. Recognized seabird measure of the FAO.**

Streamer Line Towed Behind the Vessel During the Setting of Gear (21%):

- Used to prevent seabirds from accessing the 'vulnerable zone', where until baited hooks have sunk deep enough that birds cannot reach them.

- Streamer lines will have buoys and/or weights attached at the end of the line (to keep the line taut) and will have 6 to 10 paired streamers suspended from the line, over the area where the fishing gear is being deployed.

- Effectiveness directly tested in only a few experiments. More frequently, its effectiveness has been noted through the analyses of observer data, other scientific observations, and anecdotal information.

- Worldwide, it is probably the most common seabird avoidance measure in use today & is recognized by the FAO.

Other Devices (10%):

- Examples are spraying of fire hose, paddlewheel, plastic streamers tied near stern, gun, and air horn.

- Water cannons may be effective but distance the water reached was considered to be inadequate.

- Noise deterrents may have some limited effect if used sparingly so birds do not become habituated to the sounds.

- Little is known about the effectiveness of the other devices.

Offal Discharge Methods(7-10%):

- **Discharge from the opposite side of the vessel during set or haul, or do not discharge offal at all during set or haul.**
- **Purpose is to minimize the attractiveness of the vessel or the gear deployment area to seabirds. Then the likelihood of snagging a bird on a baited hook is decreased greatly.**
- **Many vessel operators have indicated that it is not practicable to not discharge offal, particularly during haul operations.**
- **Some evidence suggests that discharging of homogenized offal during line settings greatly reduced the incidental of seabirds, mainly because the birds were more attracted by offal than by baited hooks.**
- **Removal of embedded hooks from fish heads prior to discharge should reduce threats to seabirds; recognized seabird measure of the FAO.**

Gear Set at Night (7%):

- **Identified worldwide as the most effective measure available and capable of virtually eliminating seabird mortality in some fishing areas; still relatively unpopular among fishers. Recognized as a seabird measure by the FAO.**

- **In high latitude areas, such as Alaska, night-setting is not possible in the summer.**

- **May restrict smaller-sized vessels by compromising fishing efficiency.**

- **Sand flea predation at night on target catch &/or bait may pose practical and economic problems.**

- **Feeding behavior of seabirds must be considered--most seabirds are diurnal; fulmars & Laysan albatross known to feed at night; short-tailed albatross ???**

- **Night-setting is required by CCAMLR and is an option in Alaska and will be an option under the Australian TAP.**

Gear Deployed Underwater using a Lining Tube:

- Currently, only one vessel in the Alaska longline fisheries has installed a lining tube.
- High cost (~$40K) may be prohibitive to many fishers.
- One purpose of setting gear underwater through a lining tube is to deploy the gear at a depth that is not accessible by seabirds.
- Two studies have indicated a reduction in bait loss and seabird bycatch when a lining tube is used. In both studies, fewer birds were caught with a lining tube than compared to when no avoidance was used (28:99, 6:74) but more birds were caught with a lining tube than when a streamer line was used (28:2, 6:0).
- Device may have design deficiencies compromising the essential capabilities of any underwater setting device: 1) deliver hooks deep enough, 2) withstand the substantial forces acting upon it, 3) to not create additional problems, such as increased bait loss or line wear (FAO 1998a).
- Problems noted with the line escaping from the tube, line resurfaces and seabirds are able to access the baited hooks. Design improvements to a springed locking mechanism may have resolved this problem.
- Propeller turbulence may cause the line, after it leaves the tube, to come back to the surface. This could be remedied by extending the tube beyond the propeller turbulence (if possible) or applying weights to the groundline to cause it to sink more rapidly after exiting the lining tube.
- Tests carried out on Norwegian vessels indicated that the pitch angle of the vessel affects the lining tube's efficiency. In the beginning of a trip, when the vessel has not taken on fish, the tube goes deeper into the water and works well. Once the catch is loaded (middle and forward part of vessel), the tube sets the line closer to the water's surface with loss in efficiency.
- Sea condition is also a factor that can affect the performance of the lining tube.

ANNUAL SEABIRD BYCATCH RATES AND ESTIMATES OF TOTAL SEABIRDS CAUGHT ON VESSEL WITH LINING TUBE[1]

Year	Albatross Bycatch Rate[2]	Estimate of Total No. of Albatross Caught[3]	Other Seabirds Bycatch Rate[2]	Estimate of Total No. of Other Seabirds Caught[3]
1994	0.0012	4	0.0267	77
1995	0.004	17	0.2521	1074
1996	0.0039	23	0.0937	560
1997	0 albatross caught	0	0.0401	281
1998	0.0207	106	0.2125	1086

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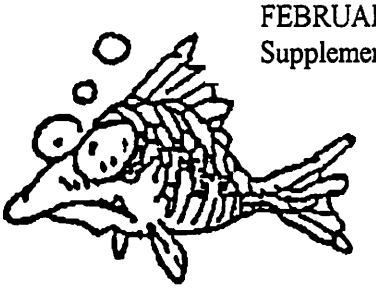
[1]lining tube was installed summer 1997; problems with operation of tube in fall97 & spring 98; repaired in summer 1998

[2]bycatch rate expressed as number of birds per 1000 hooks

[3]estimate of total birds caught based on total hooks set

The vessel company and Mustad (gear manufacturer) indicated that problems occurred with the groundline escaping from the lining tube. The vessel skipper noticed a greater number of birds caught during these times. Improvements were made to the lining tube in the summer of 1998; the high bycatch in 1998 may be attributable to the problems with the lining tube in the early part of the year.

North
Pacific
Longline
Association



Agenda C-3

January 26, 1999

Mr. Richard B. Lauber, Chariman
North Pacific Fishery Management Council
605 West 4th Avenue
Anchorage, AK

RE: Seabird Avoidance Research; Lining Tubes; Line Setting Device

Dear Rick:

A short time ago the University of Washington Sea Grant program was awarded a Saltanstall-Kennedy (S/K) grant to study the efficacy of seabird avoidance measures. Representatives from industry, NMFS, USFWS and gear manufacturers met last Friday to discuss the work to be done.

In the course of those discussions it was mentioned that in some foreign studies baited lines set through a lining tube were seen to rise to the surface under certain conditions. Naturally we are concerned about the effectiveness of lining tubes in our fisheries off Alaska, under our fishing conditions. Information from the **F/V Norton Sound** indicates that it is effective there. However, both NMFS and USFWS advised that the lining tube be observed scientifically and found effective before it is prescribed for the fleet. Industry wants a foolproof seabird avoidance system now, but we agree that it should be tested before it is required. It will be tested during the S/K research this year. We hope analysis of this alternative will continue, but we will not be able to take final action in April as we had hoped.

We also hope to test a newly-developed line setting device. This consists of a pair of hydraulically-driven rollers that pull the groundline and baited hooks through the autobaiter and set the line slack behind the boat, so it can sink. The line-setting machine is the size of a large breadbox, and costs something like $5,000 - far less than the lining tube. Alternatively, they may be employed together. A Norwegian fisherman testing the device reports that "The birds are fooled. They come around the boat, but there is nothing to eat." It is also said to increase the baiting efficiency of the autobaiters by providing a steady pull on the groundline rather than the jerky pull that occurs in rough weather.

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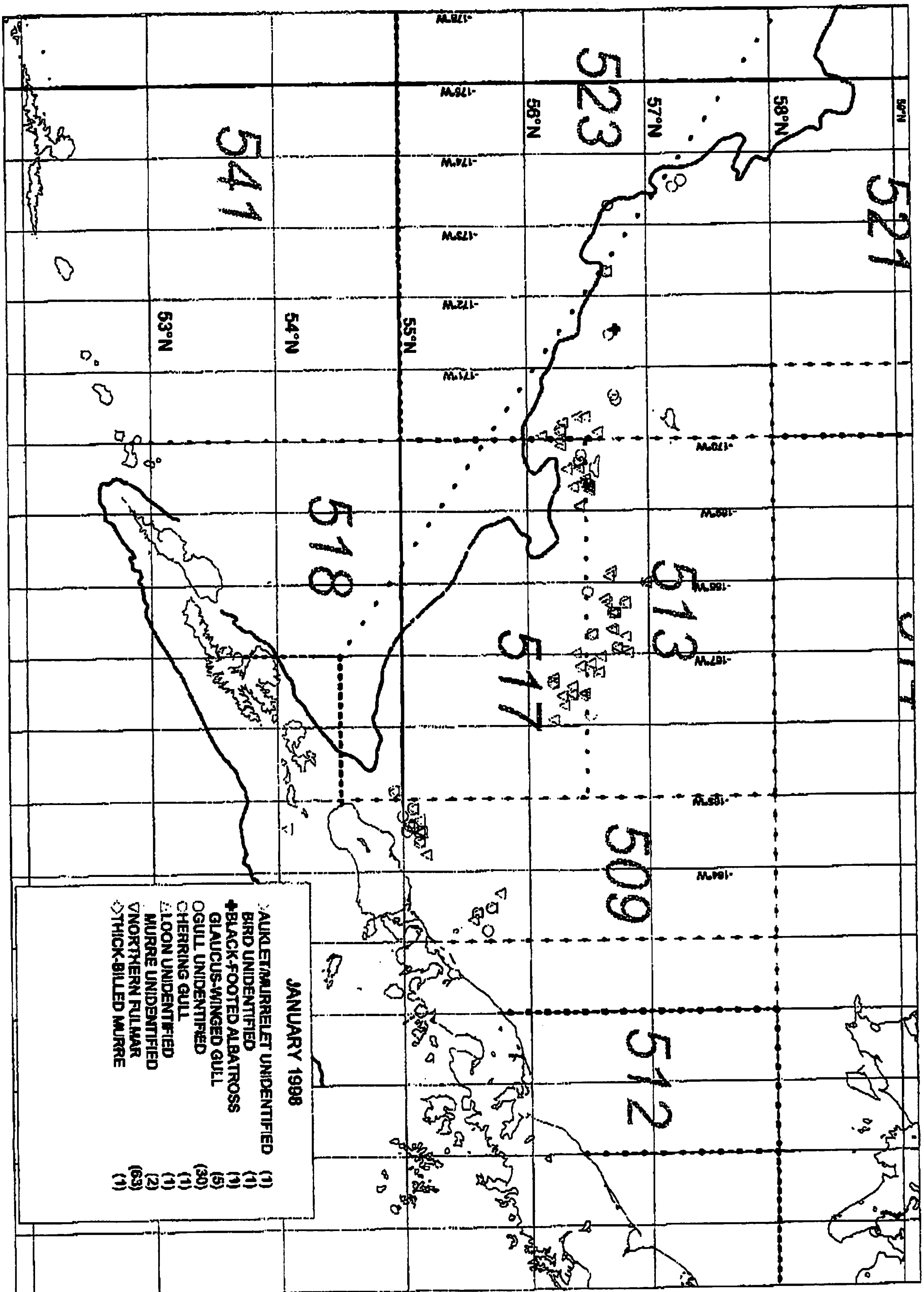
An additional industry-funded program is about to be implemented by Janet Smoker of Fisheries Information Services. She will set up a program which will enable her to create monthly charts showing where seabirds are caught by her freezer-longliner clients, and the species, each month. She will also recap 1998 with monthly charts to let the fishermen know where and when they may expect to encounter seabirds (please see attachment). She will continue to give each vessel its seabird bycatch by week, with a summary of all seabirds caught.

We regret that we do not have a slam-dunk solution to this problem that we can implement tomorrow, but we are optimistic that the imminent research will give us enough information to make further recommendations by the end of the year. We appreciate the Council's continuing interest and assistance in this matter.

Sincerely,

Thorn

Thorn Smith


JANUARY 1998
AUKLET/MURRELET UNIDENTIFIED (1)
BIRD UNIDENTIFIED (1)
BLACK-FOOTED ALBATROSS (1)
GLAUCUS-WINGED GULL (5)
GULL UNIDENTIFIED (30)
HERRING GULL (1)
LOON UNIDENTIFIED (1)
MURRE UNIDENTIFIED (2)
NORTHERN FULMAR (63)
THICK-BILLED MURRE (1)
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State University of New York at Stony Brook
Stony Brook, NY Stony Brook, NY 11794-5000

Environmental Sciences

Charles F. Wurster
Professor Emeritus,

Marine Sciences Research Center
Tel: (516) 941-3612
27-Jan-1999 09:27am EST

FROM: CWURSTER
TO: Remote Addressee (_MGladwish@notes.cc.sunysb.edu)

Subject: FWD: Seabird/Longline Comments

Charles F. Wurster
Marine Sciences Research Center
Tel: (516) 941-3612
26-Jan-1999 10:18pm EST

TO: Remote Addressee (_ricklauber@aol.com)

Subject: Seabird/Longline Comments

15 Crane Neck Road
Setauket, NY 11733

Richard Lauber, Chairman
North Pacific Fishery Management Council
605 West 4th Avenue, Suite 306
Anchorage, Alaska 99501-2252

26 January 1999

Dear Mr. Lauber:

I wish to submit comments for consideration by the North Pacific Fishery Management Council at its meetings on 2-6 February 1999 concerning the problem of seabirds being killed in longline fisheries. I will do so by attaching my letter of 3 December 1998 to Kim Rivera of the National Marine Fisheries Service, which deals with the subject.

This letter emphasizes that the most important bird avoidance techniques involve increased weighting of the lines, along with streamer lines behind the ship.

I would appreciate it if you would place copies of my comments before the participants of these meetings. Thank you very much.

Sincerely,

Charles F. Wurster
Professor Emeritus of Environmental Sciences
State University of New York at Stony Brook

Post-it® Fax Note 7671	Date	# of pages ▶
To R LAUBER	From C WURSTER	
Co./Dept.	Co.	
Phone #	Phone # (516) 941-3612	
Fax # (907) 271 2817	Fax #	

15 Crane Neck Road
Setauket, NY 11733
3 December 1998

Ms. Kim Rivera
Seabird Coordinator, Protected Resources Division
National Marine Fisheries Service, Alaska Region
Juneau, Alaska

Dear Ms. Rivera:

Thank you for your response of November 30 to my letter of November 16. I wish to add to my November 16 letter in which I urged NMFS to issue effective regulations to avoid seabird bycatch in Alaska and Hawaii waters for 1999, and to increase the observer program on longline vessels.

I had circulated my letter of November 16 to Professor John Croxall of Cambridge, UK, and I am forwarding his response to you because it contains several relevant points. As you probably know, Professor Croxall is a world authority on seabirds who has been a leader in efforts in the southern hemisphere to reduce seabird mortality in longline fisheries. He is head of the scientific committee of the Convention for the Conservation of Antarctic Marine Living Resources (CCAMLR), which has issued detailed regulations to protect seabirds in the Southern Ocean.

The recent experience of CCAMLR shows that line weighting is the single most important measure for protecting seabirds. If weights are sufficient to sink the line at 0.3 to 0.4 meter per second, almost no birds are caught. Streamer lines above the hooks can be shorter than if the rate of sinking were slower. Since albatrosses, shearwaters, and petrels are surface feeders and will not go more than a meter or two below the surface after food, it is apparent that the baited hooks will be out of reach of birds within 3 to 6 seconds behind the ship. Those circumstances will be similar for all such birds in all oceans, so the experience of CCAMLR can be applied anywhere.

I believe that NMFS has excessively emphasized the differences between North Pacific and southern hemisphere longline fisheries, and they are many, whereas the similarities between these fisheries are more relevant and should be reflected in the regulations. The essence of the problem is relatively simple: surface feeding birds are going after and sometimes being caught on baited hooks behind the ship, and before the hooks sink a few meters below the birds' reach. The most important element of the solution is also relatively simple: more rapid sinking of the hooks shortens their time near the surface within reach of the birds, and also moves the problem area much closer to the ship. Although differences among longline fisheries are many, these relevant circumstances are similar or identical for all longline fisheries everywhere.

May I once again urge NMFS to issue regulations for Alaska and Hawaii waters mandating increased weighting and sinking rates of the line of hooks, together with streamer lines, for all longline vessels for the 1999 fishing season. Current regulations are not adequate. Observer coverage and reporting of bird sightings and drownings should also be substantially increased for 1999. These steps should be taken as soon as possible to allow time for comments by interested parties, and to allow fishermen time to secure the proper gear for their ships. Failure of NMFS to take these measures will mostly likely result in the additional and needless deaths of thousands of albatrosses and shearwaters, a result that nobody wants to happen.

NMFS has enthusiastically embraced and is a party to the CCAMLR regulations in the Southern Ocean, yet NMFS has issued ineffective regulations for Alaska and no regulations for Hawaii waters. NMFS regulations should be consistent, as well as effective, since the problem and the solution are similar everywhere. Even as further research into solutions by CCAMLR and NMFS are continued, the most effective known methods for avoiding seabird mortality should be mandatory until still better methods are discovered.

CCAMLR has a serious enforcement problem in the Southern Ocean, with piracy in fisheries apparently widespread. By contrast, Alaska and Hawaii fishermen are law-abiding and conservation oriented. They do not want to be killing seabirds, but they need guidance from NMFS in the form of effective and fair regulations that will avoid the problem. It could even be that increased fishing efficiency, by not losing bait or catching birds, will offset the costs of the necessary gear modifications needed to meet the new regulations. Seabird bycatch in the North Pacific might be easier to deal with than in the Southern Ocean.

Emphasis on the endangered Short-tailed Albatross may have overshadowed mortality that is also occurring in other species. Laysan and Black-footed Albatrosses are being killed by the thousands, as are Sooty and Short-tailed Shearwaters. Thousands of fulmars also are dying, although their numbers are probably being enhanced by the offal released by the fishing industry itself. The Black-footed Albatross is in particular trouble with a steadily declining population, and that is also the bird most often seen by bird and whale watching trips from the coasts of California, Oregon, and Washington. We should not wait for a species to become endangered before protecting it.

I will forward Professor Croxall's letter separately, and I will see that you receive current CCAMLR regulations and reports. And finally, I hope that new and effective NMFS regulations will be issued to avoid further seabird mortality in longline fisheries in the North Pacific for 1999. Thank you for giving these matters your careful attention.

Sincerely,
Charlie
Charles F. Wurster

Professor Emeritus of Environmental Sciences

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The Avian Demography Unit conducts research in partnership with BirdLife South Africa.

Mr Richard Lauber
Chair
North Pacific Fishery Management Council
605 West Fourth Avenue, Suite 306
Anchorage, Alaska 99501-2252
USA

Fax: 091-907-271-2817

26 January 1999

Dear Mr Lauber

REVISION OF SEABIRD AVOIDANCE REGULATIONS IN THE ALASKA LONGLINE FISHERIES

The Seabird Conservation Programme of BirdLife International wishes both to commend and support your Council in its pro-active endeavours to reduce the mortality of seabirds in the Alaska longline fishery. In this regard I would like to make the following comments:

1. Correct weighting of longlines to ensure that their sink rate is sufficient to avoid birds being hooked may be the single most important mitigation measure currently available. It is essential to weight lines so that they will sink to several metres depth while still being protected by a streamer line or equivalent. Research may be needed to ascertain what is the minimum sink rate required in Alaskan waters, since seabird diving abilities and the maximum depths they can attain vary geographically. Until such research results are available a precautionary approach should be taken, specifying minimum sink rates as defined in other fisheries.

2. Underwater setting tubes may still be regarded as being in the developmental stage and current research shows that they are not 100% successful in eliminating seabird mortality. Also, enhanced bait loss may make them an unattractive option to fishers. New regulations for the Alaskan fishery should therefore not be restricted solely to

the fitting of such tubes, but include provisions for streamer lines and line weighting to be used in conjunction.

3. The design and deployment of streamer lines are critical to their efficacy. In this regard the knowledge gained by the Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR) in managing the Patagonian Toothfish fishery of the Southern Ocean should be taken into account.

3. Clear, quantitative evidence for the comparative efficacy of towed buoys, boards or sticks and streamer lines in Alaskan waters appears to be lacking. It is recommended that such information should be gathered by instituting a suitably designed field experiment as soon as is feasible.. Until this is done, it is considered that the option of streamer lines should be encouraged (as a proven measure used elsewhere in the world) ahead of towed objects as currently listed in the Alaska regulations. Consideration should thus be given to removing towing objects as a qualifying measure.

4. Removal of hooks and attached line prior to discarding fish, including heads, needs to be added to the Alaska regulations, to avoid further mortality of scavenging birds, as has been shown to occur in other fishing areas, such as the Southern Ocean and in southern African waters.

5. Information on seabird mortality from longlining and mitigation measures reviewed by the Food and Agriculture Organization of the United Nations (FAO) (Fisheries Circular No. 937) and its draft International Plan of Action to reduce seabird incidental catch from longline fisheries should be taken into account in your Council's deliberations. In this regard your Council should encourage the relevant US authority to produce a National Plan of Action in time to submit it the FAO's Committee on Fisheries (COFI) meeting in 2001, as is being requested by the COFI.

6 Lastly, all speed should be given to introducing improved regulations so as to reduce to a minimum the numbers of birds being killed.

I hope this comments will help in your important deliberations.

Yours sincerely

John Cooper

Coordinator: BirdLife International Seabird Conservation Programme

AMERICAN BIRD CONSERVANCY
CONSERVING WILD BIRDS AND THEIR HABITATS THROUGHOUT THE AMERICAS

January 26, 1999

Mr. Richard Lauber, Chairman
North Pacific Fishery Management Council
321 Highland Dr.
Juneau, AK 99801

Dear Mr. Lauber:

As you and the North Pacific Fishery Management Council prepare for your quarterly meeting from February 3-8, 1999 in Anchorage, we are particularly interested in the sessions concerning measures to avoid the killing of seabirds. We understand that these will be discussed by the Council on February 5. On behalf of the American Bird Conservancy (ABC), I submit these comments and request that they be distributed to all Council members, the Advisory Panel, Scientific Sub-committee, Council Staff, and to your public distribution list.

We appreciate your response to our previous letter and again write you to urge the North Pacific Fishery Management Council (NPFMC) to require the expeditious implementation of more effective seabird avoidance techniques in the longline fisheries in the waters of Alaska. Substantial mortality of seabirds in Alaskan longline fisheries continues to be documented in the Alaskan longline fisheries. These unnecessary deaths have included the killing of two globally endangered Short-tailed Albatrosses (*Diomedea albatrus*) in the Bering Sea/Aleutian Islands groundfish fishery on September 21 and September 28, 1998. Laysan and Black-footed Albatrosses, thousands of Northern Fulmars, and many other seabirds such as Black-legged Kittiwakes and shearwaters continue to be killed unnecessarily in the Alaskan longline fisheries. We are of the opinion, and hope you and the Council agree, that these deaths are unnecessary as they can be avoided with little costs and modest changes to fishing practices with increased fishing efficiency. For every albatross or fulmar impaled on a fishing hook, there are probably at least eight or nine other baits stolen where the bird escapes. Keeping the birds from the hooks means that more fish are caught and fewer seabirds, the goal of all of us concerned with this issue.

We urge the Council, working with NMFS, to adopt new regulations that will require all vessels over 26 feet in length setting longlines to:
(1) use weights on all longlines, with the exact weight and settings to be determined by the Council and NMFS;
(2) use poles towing bird scaring lines; and
(3) set lines at night--modified, of course, for Alaskan summers as is mentioned in the current regulations.

The adoption of these three measures should completely eliminate the killing of seabirds from these vessels. The FAO Technical Guidelines attached to an international agreement on seabird bycatch negotiated in Rome, Italy, are contained in FAO Circular 937. I hope you and the Council have a copy of this document. This document and the international agreement were developed with the leadership and support of NMFS and the Fish and Wildlife Service, including the Alaska representatives of these agencies. The well-researched data in FAO Circular 937 clearly indicate that just the proper deployment of a pole towing a bird scaring line (with no other avoidance measure employed) can reduce seabird killing by 90-98% in demersal fisheries, citing Lokkeborg (1996). (see page 68 of FAO Circular 937).

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In table 11 of the Circular at page 83, the author notes that, overall, these bird scaring lines reduce seabird kills by 80% but when employed with properly weighted lines the reduction is 90%. Line weights alone reduce seabird killing by 80% (see page 68 of FAO Circular 937). Add night setting, and seabird kills are reduced to zero in demersal fisheries.

We would suggest that the Council prohibit the discharge of offal (fish heads in particular) containing hooks. And, we ask the Council to consider prohibiting the discharge of offal during line setting and hauling. Please note that Australia is acting to prohibit offal discharge during line setting and hauling.

As to night setting, we know that in summer months there may be little or no true night in the Bering Sea and Aleutian Islands. However, when there are sufficient hours of darkness, night setting should be required along with line weighting and bird scaring lines. Night setting reduces seabird kills when used alone by 90% according to FAO Circular 937 at pages 46 and 83.
When used with weights and bird scaring lines---our goal is achieved---seabird killing is eliminated! As to night setting being impracticable for Alaska, consider these documented dates and places of the killing of Short-tailed Albatrosses in Alaskan waters by longliners:
1) October, 1987 in the GOA at 59 Degrees 27.7N', 145 Degrees 53.3'W.--At least 12 hours of darkness at even a date as early as October 1.
2) August 28, 1995 in the GOA at 53 Degrees 31'N, 165 Degrees 38'W. At least 8 hours of darkness.
3) October 8, 1995 in the Bering Sea at 57 Degrees 01'N, 170 Degrees 39'W. Over 12 hours of darkness.
4) September 27, 1996 in the Bering Sea at 58 Degrees 41.3'N, 177 Degrees 02.6'W. Over 12 hours of darkness.
5) September 21, 1998 in the Bering Sea at 57 Degrees 30'N, 173 Degrees 57'W. 12 hours of darkness.
6) September 28, 1998 in the Bering Sea at 58 Degrees 27'N, 175 Degrees 16'W. Over 12 hours of darkness.
If lines had of been set at night in these cases with weighted lines, the probability is very high that the Short-tailed Albatross kills would not have occurred and it is near a certainty that with a properly deployed bird scaring line plus night setting and line weighting they would not have occurred.

Proposals by the NPLA to simply require the freezer/longliners to use an underwater lining tube (ULT) will do very little to reduce overall seabird killings. The FAO document substantiates some problems with such ULT's despite their being the most costly avoidance measure. They
appear to be still in an experimental stage and we believe they hold great promise for the future after some bugs are worked out. Requiring such devices on 69 freezer/longliners of the 1,800 plus longline vessels in Alaskan ground fisheries hardly seems to be the answer to the problem of
eliminating the killing of seabirds. If the proposal is further restricted to apply to only freezer vessels over 124 feet, then the number of vessels covered shrinks to 35. Once these ULT's are perfected, we could support requirements for their use on certain vessels coupled with the weighted lines, bird scaring lines and night setting. To keep the status quo for nearly 1,800 vessels and require lining tubes on at most 69 vessels doesn't seem to reach our goal of 100% elimination of seabird killings.

The current proposal to require weights to be added to sink lines to at least 1-2 meters before reaching the end of the streamer line or bird buoy is not sufficient. Many seabirds can reach
baits at 1-2 meters. We believe that specific weights and their placement should be required. Such specificity is readily enforceable and clear to all fishermen. Again, properly weighting lines will reduce seabird killing by 80% when done without any other avoidance measures. (see page 83, Table 11 of FAO Circular 937).

Current regulations allowing the towing of a board, stick, or other such device, without the use of any

other avoidance measure, are not effective. However, 74% of the covered vessels use this technique or the bird buoy. We are still not convinced that the buoy is as effective as the bird scaring line. In any event, no one measure can eliminate the killing of seabirds; a combination must be employed. We are supportive of the NMFS proposal to eliminate the board, stick or other device from the regulations, but such a change needs to be accompanied by the requirements for weighted lines, bird scaring lines and night setting..

ABC is a national organization dedicated to the conservation of wild birds in the Americas. Our Policy Council consists of 76 member organizations many of whom are quite concerned over the unnecessary deaths of seabirds. These groups include the Pacific Seabird Group, Center for Marine Conservation, Environmental Defense Fund, Defenders of Wildlife, National Audubon Society, and the World Wildlife Fund. ABC and several of these member groups were advised at the time of the adoption of the existing regulations in early 1997 that the full CCAMLR regulations were not being adopted because flexibility was being given to the fishermen and there would be an evaluation of the effectiveness of the measures being employed with necessary changes in the regulations after that review. Two years have passed and it is time for change.

ABC urges the North Pacific Fisheries Management Council and NMFS to adopt the proven and cost-effective measures of weighted lines, bird-scaring lines, and night setting for all ground fishing longline vessels in Alaskan waters. Documentation now exists of the killing of seven Short-tailed Albatrosses in the Alaskan longline fishery, two in 1995, one in 1996, and two in 1998. These are the observed and positively identified kills of this rare seabird. Most hooks set are not observed by NMFS observers and the halibut fishery is virtually unobserved. The potential is great that more Short-tailed Albatrosses are killed in Alaskan longlines fisheries than observed. This species is listed as endangered internationally with less than 1,000 of these birds in existence. The implementation of these techniques will greatly reduce if not eliminate the taking of Short-tailed Albatrosses and other seabirds. These same techniques will increase the efficiency of the fishing vessels as more bait is kept on hooks and albatrosses and other seabirds are kept from the bait and hooks.

NMFS developed and published a Test Plan to Evaluate Effectiveness of Seabird Avoidance Measures Required in Alaska's Hook-and-Line Groundfish and Halibut Fisheries on April 15, 1998. This was done to comply with the terms and conditions of the U.S. Fish and Wildlife Service's Biological Opinion dated February 19, 1997 on Alaskan longline fisheries
and the Short-tailed Albatross. The BO requires NMFS to both complete such a research plan outlining specifics for evaluating seabird bycatch avoidance gear and to implement such a plan. Just recently funding of this Plan has been found. We are concerned that the completion of the Test Plan may be used as an excuse to revise the apparently ineffective current regulations. We would urge the Council not to engage in "paralysis by analysis" and to act promptly to implement the seabird avoidance measures we have cited herein in Alaskan waters.

If the U.S. can exercise leadership in this fishery in successfully requiring the implementation of effective avoidance measures, we can serve as a role model for the rest of the fishing nations on Earth. U.S. leadership can lead to full implementation of the FAO Seabird Avoidance Protocol by the world's longlining nations and keep Albatrosses flying over the world's oceans.

Sincerely,

Gerald W. Winegrad

Gerald W. Winegrad
Vice President for Policy

January 27, 1999

Mr. Richard M. Lauber
Chairman
North Pacific Fishery Management Council
321 Highland Dr.
Juneau, AK 99801

VIA FAX

Dear Mr. Lauber:

At the upcoming meeting of the North Pacific Fishery Management Council, you will once again address the troubling problem of seabird bycatch in the longline fishery. I would like to submit the following comments on behalf of the more than 275,000 members and supporters of Defenders of Wildlife and request that these comments be distributed to the Council members.

Defenders applauds the initiative of the Council in addressing this issue at their last meeting. However, we do not feel that steps have been taken far enough to solve the very real problem of seabird bycatch. Thousands of birds are being unnecessarily killed in Alaskan longline fisheries including the critically endangered Short-tailed albatross (*Diomedea albatrus*). It has been well documented, even by fishermen in your own fishery, that if proper measures are taken, the deaths of thousands of birds can be completely eliminated.

We encourage the Council to work with NMFS to adopt the following three measures which would almost eliminate the killing of birds in the longline fishery:

1) require all vessels over 26 feet to use weighted lines;
2) tow bird-scaring lines; and
3) set lines at night, with the neccesary modifications for Alaskan summers.

When the above measures are used in combinations, studies have shown that they are virtually 100% effective in avoiding bycatch which not only helps protect seabirds, but also improves fishing efficiency.

At a minimum, we encourage the Council to eliminate the towing of a board, buoy, or stick as a viable option for avoiding seabird bycatch. This method, although used by nearly three-quarters of longline vessels, has never been proven in any tests to reduce seabird bycatch and with the availability of proven and economical methods of bycatch avoidance, there is no need to even suggest this option, much less allow its widespread use.

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Washington, DC 20005
Telephone 202-682-9400
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http://www.defenders.org

We also encourage the Council to reject the proposal by the North Pacific Longline Association to require underwater lining tubes on freezer longliners of any size. While this is, again, an admirable attempt to remedy a serious problem, by only requiring the use of lining tubes on freezer longliners, hundreds of boats would continue to fish under the current, ineffective regulations. In short, NPLA's proposal does not go far enough. Furthermore, as was stated in the NMFS "Report on Seabird Bycatch Issues Relating to the Commercial Longline Fishery" which was presented to the Council at its last meeting, based on initial tests of lining tubes on a vessel during the 1998 fishing season and the tests of such devices in other fisheries, the requirement is premature and may actually increase seabird bycatch in some instances. Although this method shows promise for use in the future there are currently available several cheaper, more effective measures which I mentioned earlier.

I hope that the Council will carefully consider the suggestions laid out here and make a commitment to protect seabirds from needless slaughter in longline fisheries. With your help, Alaska can be a leader to other American fisheries and the United States can be a leader to the rest of the world in eliminating seabird bycatch.

Sincerely,

Heather M. Pellet

Heather M. Pellet
Program Coordinator
Species Conservation Division

The Ornithological Council

PROVIDING SCIENTIFIC INFORMATION ABOUT BIRDS

29 January, 1999

Mr. Richard Lauber, Chairman
North Pacific Fishery Management Council
321 Highland Dr.
Juneau, AK 99801

BY FAX

Dear Mr. Lauber,

Gerald Winegrad, Vice President for Policy of the American Bird Conservancy (ABC), has advised me that the North Pacific Fishery Management Council will discuss the issue of seabird bycatch in longline fisheries at its quarterly meeting will be held February 3-8, 1999 in Anchorage. Our organization has been working with ABC on the issue of seabird bycatch in longline fisheries. On behalf of the Ornithological Council, I submit these comments and request that they be distributed to all Council members, the Advisory Panel, Scientific Sub-committee, Council Staff, and to your public distribution list. The Ornithological Council consists of nine leading scientific ornithological societies - the American Ornithologists' Union, Association of Field Ornithologists, Seccion Mexicana del Consejo Internacional para la Preservacion de las Aves (CIPAMEX), Cooper Ornithological Society, Colonial Waterbird Society, Pacific Seabird Group, Raptor Research Foundation, Society for Caribbean Ornithology, and Wilson Ornithological Society - that together have a membership of nearly 6,500 ornithologists. It is our mission to provide scientific information about birds to legislators, regulatory agencies, industry decision makers, conservation organizations and others, and to promote the use of that scientific information in the making of policies that affect birds.

We urge the North Pacific Fishery Management Council (NPFMC) to require the expeditious implementation of more effective seabird avoidance techniques in the longline fisheries in the waters of Alaska. Substantial mortality of seabirds in Alaskan longline fisheries continues to be documented in the Alaskan longline fisheries. These unnecessary deaths have included the killing of two globally endangered Short-tailed Albatrosses (*Diomedea albatrus*) in the Bering Sea/Aleutian Islands groundfish fishery on September 21 and September 28, 1998. Laysan and Black-footed Albatrosses, thousands of Northern Fulmars, and many other seabirds such as Black-legged Kittiwakes and shearwaters continue to be killed unnecessarily in the Alaskan longline fisheries. Research suggests that these deaths are unnecessary as they can be avoided with little costs and modest changes to fishing practices while, at the same time, increasing fishing efficiency. For every albatross or fulmar impaled on a fishing hook, there are probably at least eight or nine other baits stolen where the bird escapes. Keeping the birds from the hooks means that more fish are caught and fewer seabirds, the goal of all of us concerned with this issue.

vid E. Blockstein, Ph.D.
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Ellen Paul
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Chevy Chase, MD 20815
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E-Mail: epaul@dclink.com

As Mr. Winegrad pointed out in his letter to you dated January 26, the FAO Technical Guidelines (FAO Circular 937) provide numerous mitigation measures. Three of these, used together, should prevent most seabird bycatch on longlining vessels. These are:

(1) use weights on all longlines, with the exact weight and settings to be determined by the Council and NMFS;
(2) use poles towing bird scaring lines; and
(3) set lines at night--modified, of course, for Alaskan summers as is mentioned in the current regulations.

Although research is ongoing, data clearly indicate that the proper deployment of a pole towing a bird scaring line (BSL) alone can reduce seabird killing by as much as 90-98% in demersal fisheries (Løkkeborg 1996), depending on the bird species (Brothers 1991), the design of the BSL, and weather conditions. The cost is low. Commercially-produced BSLs range from US$150 - 200. A vessel should carry extra BSLs to replace those that wear our or are accidentally lost.

The exact extent to which line weights alone reduce seabird killing has not been adequately studied, but a strong inverse relationship was found between weight and bird catch rate in twin-line demersal fishing (Brothers 1995a). When used in conjunction with BSLs, line weights can further reduce seabird bycatch. Weighting requirements should take into account the need to sink lines below the depth of two metres, as birds can easily reach bait two metres below the surface. (Brothers & Baker, unpublished data).

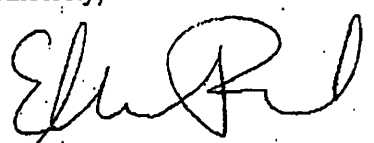
Night setting would further reduce bycatch, by as much as 60 - 96% (Murray *et al.* 1993, Klaer and Polacheck 1995, Cherel *et al.* 1996). Although there may be little or no true night in the Bering Sea and Aleutian Islands during the summer months, when there are sufficient hours of darkness, night setting should be required along with line weighting and bird scaring lines.

These three measures are inexpensive and readily available and are therefore the most expeditious and practical way to reduce seabird bycatch immediately. Although there are other technologies in development, such as various underwater line setting chutes, these are expensive and not yet perfected. The cost may be excessive for all but the largest vessels. Therefore, the other measures should be required now, while research and development continues on underwater line setting chutes.

We would also suggest that the Council prohibit the discharge of offal (fish heads in particular) containing hooks. And, we ask the Council to consider prohibiting the discharge of offal during line setting and hauling. According to the FAO Circular, reduction of offal discharge is well-suited to demersal fishing, has little cost, and is extremely effective in reducing seabird bycatch.

We hope that these comments prove useful to the Council in devising a plan to reduce seabird bycatch in longline fisheries.

Sincerely,



Ellen Paul
Executive Director

Literature cited:

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not handed over

4 February 1999

Mr. Richard B. Lauber
Chairman, North Pacific Fishery Management Council
605 West 4th Avenue, Suite 306
Anchorage, Alaska 99501

Dear Mr. Lauber,

On behalf of the Center For Marine Conservation (CMC), I wish to make the following comments on the proposed alternatives to the 1997 seabird mitigation measures that were presented to the National Marine Fisheries Service (NMFS) at the December meeting of the North Pacific Fishery Management Council (NPFMC). CMC applauds the longliner representatives' leadership in developing the current measures and appreciates the importance and value of this kind of conservation initiative coming from the fishing community. It is in this spirit that I express the following concerns as to specificity and implementation of the regulations as currently written.

Seabird mortality in longline bycatch continues to be a serious problem. Species affected include the endangered Short-tailed Albatross , Laysan and Black-footed Albatrosses, Northern Fulmars, Black-legged Kittiwakes and shearwaters. Of particular concern is the documented take of two Short- tailed Albatrosses in the Bering Sea/ Aleutian Islands groundfish fishery on September 21 and September 28 1998. To avoid the continued mortality of these seabirds, we urge the Council to work quickly with NMFS to adopt regulations that will require all longline vessels over 26 feet in length to :

* employ weights on all longlines, those weights and settings to be determined by the Council and NMFS;
* employ poles towing bird scaring lines, and;
* set lines at night - modified for Alaskan summers, as referenced in the current regulations.

The current regulations do not require specific longline weighting regimes. There are no specifications for streamer lines to effectively cover the vulnerable zone just aft of the vessel where baited hooks remain near the water's surface. The current proposal would allow longliners to fish at night without weighted lines, an issue that has real importance in the context of how little darkness there is in our bright Alaskan summer nights. The FAO Technical Guidelines contained in FAO Circular 937 were developed with the leadership and support of NMFS and the United States Fish and Wildlife Service, with important contributions from representatives of these agencies' Alaskan offices. The data contained in these Guidelines indicate that proper deployment of a pole towing bird

scaring lines, with no further avoidance measures employed, can reduce seabird bycatch in demersal fisheries by 90-98 %. (FAO Circular 937, page 68, citing Lokkeborg 1996.). When used in combination with properly weighted lines, bird-scaring lines can reduce seabird bycatch by 90%. Id. at page 83. When used in combination with both proper weight regimes and night setting (where feasible) seabird mortality in the fishery can be reduced to zero. Id.

Proposal Numbers 1-5, 7 - Weighting regimes

The current proposals suggest setting freezer longline setting tubes at 1.5 meters below the water's surface, without a requirement for a specific mainline weighting regime. In conversations with observers, CMC has been told that albatrosses plunge entirely below surface, often past 2 meters. Additionally, tests with setting tubes have shown that the lines may float back to the surface when not properly weighted, thereby becoming available for seabird contact again in the vessel's aft. (Lokkeborg, 1996, 1998)

Proposal Number 6 - Streamer line poles

Specifications for streamer line placement and length are needed to insure maximum effectiveness of this seabird deterrent. Placement of the bird lines directly over the gear reduces the amount of birds attempting to steal bait, as does placing the lines on either side of the gear with an appropriate separation distance. Length specifications that allow the terminal end of the bird line to maintain enough drag to keep the line at an adequate height above the water is necessary to keep the line up over the baited hooks that are often at the water's surface. (Brothers, 1996a, 1996b)

Proposal Number 8 - Weight setting times

The feeding habits of the Short-tailed albatross, whether at night or day, are unknown. (Sherbourne 1993) Reports of night by-catch of seabirds are not unusual, particularly in the summer months where there may be little or no true night in the Bering Sea and Aleutian Islands. Yet there is much fishing that takes place in this system when there is in fact true darkness. The American Bird Conservancy's comments to the Council (attached) articulate a convincing list of documented dates and places of the take of Short -tailed albatrosses in the longline fishery. Had a combination of properly weighted lines, properly deployed bird scaring lines and line-setting in true darkness conditions been used, the incidence of albatross mortality would most likely have been reduced to near zero.

Finally, we urge the Council to prohibit the practice of discharging offal during line setting and hauling and discharge of offal containing hooks. [Although we are aware of anecdotal accounts of some fishermen discharging offal to distract seabirds from baited lines, prudence dictates that a more structured prohibition be engaged that would take into account the many variances in offal discharge practices that exist in the longline fishery.

Thank you for the opportunity to bring our concerns to the Council's attention. We urge you to act quickly and efficiently in implementing seabird avoidance measures that reflect these concerns.

Sincerely,

Kris Balliet
Director, Alaska Field Office
Center for Marine Conservation
425 G Street, Suite 400
Anchorage, Alaska 99501

Sources

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