


MEMORANDUM

TO: Council, SSC and AP Members  
FROM: Chris Oliver   
Executive Director  
DATE: January 28, 2004  
SUBJECT: Groundfish Management

ESTIMATED TIME 2 HOURS (for all D-1 items)
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ACTION REQUIRED

Review National Bycatch Strategy and Alaska Region Report

BACKGROUND

On March 6, 2003 NOAA Fisheries announced a National Bycatch Strategy, followed by development of regional implementation plans. A draft for the Alaska Region was developed over the summer and fall of 2003, and became available in December 2003 (attached D-1(a)(1)). Council staff was invited, and did participate to a limited degree, in development of this draft. In transmitting this draft to each Region, Dr. Hogarth stated *"I am attaching these regional implementation plans for your information. I consider each of these bycatch plans to be a 'living document'; they will need to be refined and updated as new information becomes available, and your input during this process is very important. We will be working closely with you to develop these recommendations further, consider other recommendations, and ensure that our goals are met"*.

The document focuses on progress made, identifies remaining challenges, and highlights priorities for monitoring, research, management, and education/outreach. I believe the document recognizes that more specific measures have to go through the Council process for evaluation and approval. My read is that NOAA Fisheries is looking to the Council for agreement that this draft accurately portrays our progress, current initiatives, and general priorities relative to bycatch. NOAA Fisheries staff will provide additional detail on this draft for the Council.

**FINAL DRAFT**

**Alaska Region Current Bycatch Priorities and Implementation Plan**

**NOTE:** This is a working document that will be revised in the future as additional, practicable bycatch reduction opportunities occur.

**December 3, 2003**

# FINAL DRAFT

## SUMMARY

### **Alaska Region Current Bycatch Priorities and Implementation Plan**

[NOTE: This is a working document that will be revised in the future as additional, practicable bycatch reduction opportunities occur.]

#### **Improving Standardized Bycatch Reporting Methodologies (SBRMs)**

Improved SBRMs will be developed with research projects and they will be implemented with policy and regulatory actions. The regulatory actions will be developed and implemented cooperatively with the Council. The following will be done to improve the SBRMs.

1. Develop improved protocols for observer documentation of seabird interactions and mortalities
2. Improve species identification by observers
3. Develop and implement methods for shoreside sampling of skates
4. Make enhancements to observer sampling for catch composition determination
5. Evaluate placement of observers on small (< 60 ft) groundfish vessels
6. Certify observer workstations and monitor flow scale testing on certain vessels fishing groundfish
7. Place observer program staff on specific groundfish vessels to customize sampling protocols
8. Evaluate technologies suitable for monitoring groundfish fisheries
9. Develop approaches for optimizing observer deployment and tasking
10. Change observer service delivery model to improve flexibility and data quality
11. Review compliance issues associated with current bycatch reduction programs
12. Promote the use of electronic logbooks to facilitate identification and correction of bias in estimating bycatch for unobserved vessels
13. Promote interagency efforts to develop electronic reporting of landings data by trip
14. Evaluate the need for additional compliance resources to maintain the integrity of observer data.
15. Initiate development of behavior measures for delayed mortality in discards from fisheries
16. Initiate studies of the effect of environmental factors on swimming behavior and performance in fish caught by trawl
17. Evaluate potential for placing observers on commercial halibut vessels
18. Evaluate methods for improving bycatch estimates of marine mammals in state managed MMPA Category II salmon fisheries

## **Improve Our Ability to Estimate the Biological, Ecosystem, Social, and Economic Effects of Bycatch and of Alternative Methods for Reducing Bycatch**

Due to the size of the groundfish fisheries and the levels of bycatch in those fisheries, these activities will be focused on the groundfish fisheries. The following types of activities will be continued and expanded as funding permits:

1. Stock assessments research for non-target groundfish species and seabirds
2. Ecosystem research on the effects of bycatch
3. Economic and social science data collection and research

## **Encourage the Development and Use of Gear Technologies That Provide Efficient Methods for Reducing Bycatch**

Gear technology and fish behavior research will be continued and expanded as funding permits. Two specific projects are as follows:

1. A continuing cooperative project to reduce salmon bycatch during pollock trawling and
2. A project to study the behavioral response of rock sole to disturbance by bottom trawl ground-gear in order to determine how natural behaviors may be utilized to assist in bycatch reduction efforts in the rock sole fishery.

## **Develop and Implement More Effective and Efficient Management Measures to Reduce Bycatch**

This plan addresses only regulatory actions that currently are under development or review. Given the time that it takes to develop and implement regulatory actions that are both effective and efficient and given the cooperative process that is used to develop such actions, it would be counterproductive for this draft plan to include other actions. The specific actions are as follows:

1. Enforcement Interval Change for Pollock Maximum Retainable Allowances (MRA)
2. Minimum Groundfish Retention Standard: Proposed FMP Amendment 79
3. Harvesting Cooperatives for the BSAI Head and Gut Catcher Processors: Proposed FMP Amendment 80
4. Establish a New Program for Observer Procurement and Deployment in the North Pacific
5. Non-target Species Management
6. GOA Groundfish Fishery Rationalization
7. Essential Fish Habitat (EFH)

**Improve the Outreach Activities That Assist in Meeting the First Four Objectives and Provide Information That Can Be Used to Address Bycatch Problems in Other Fisheries**

Actions to be taken to improve outreach programs are categorized as follows:

1. Improve bycatch information available to industry
2. Improve bycatch information available to fishery managers and other stakeholders, including the public at large
3. Obtain better bycatch information
4. Participation in international efforts to address bycatch problems

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3.5.3 Obtain better bycatch information

3.5.4 Participation in international efforts to address bycatch problems

Table 1

Actions to improve SBRMs for the BSAI and GOA groundfish fisheries and the Pacific halibut fishery

## **1. Introduction**

On March 11, 2003, the National Marine Fisheries Service (NMFS) initiated a six-part National Bycatch Strategy to improve its ability to meet its stewardship responsibilities and statutory obligations to monitor and reduce bycatch. These responsibilities and obligations are defined under various laws, including the Magnuson-Stevens Fishery Conservation and Management Act (MSA), the Marine Mammal Protection Act (MMPA) the Endangered Species Act (ESA), the National Environmental Policy Act (NEPA), and the Migratory Bird Treaty Act.

The first component of the announced Strategy is a comprehensive review of the agencies progress toward meeting the National Bycatch Goal, which had been described in a 1998 report entitled *Managing the Nations Bycatch* (NMFS 1998). The second component of the Strategy is the development of national policy and guidance on standardized bycatch reporting methodologies which are required by the MSA. The resulting report, *Evaluating Bycatch: a National Approach to Standardized Bycatch Monitoring Programs* (NMFS 2003), concluded that at-sea observation (observers or digital observation) typically provides the best mechanism to obtain reliable and accurate bycatch estimates. The third component, to which this document contributes, consists of further implementing the national bycatch goal through regional bycatch implementation plans.

The objectives for this plan are listed below.

1. Improve the Standardized Bycatch Reporting Methodologies (SBRMs) for the Alaska fisheries addressed in this plan;
2. Improve our ability to estimate the biological, ecosystem, social, and economic effects of bycatch and of alternative methods for reducing bycatch;
3. Encourage the development and use of gear technologies that provide efficient methods for reducing bycatch;
4. Develop and implement more effective and efficient management measures to monitor and reduce bycatch; and
5. Improve the outreach activities that assist in meeting the first four objectives and provide information that can be used to address bycatch problems in other fisheries.

To meet these objectives, the Alaska Region and Alaska Fisheries Science Center (AFSC) will work collaboratively with the North Pacific Fishery Management Council (Council), the Alaska Department of Fish and Game, the International Pacific Halibut Commission, other international fishery management or scientific organizations, the fishing industry, the environmental community, university or private sector researchers, and other stakeholders.



This bycatch implementation plan includes numerous actions that will assist the Alaska Region in meeting its stewardship responsibilities with respect to monitoring and decreasing bycatch. This includes actions that comply with the U.S. National Plan of Action for Reducing the Incidental Catch of Seabirds in Longline Fisheries, which was jointly developed by NMFS, U.S. Fish & Wildlife Service (USFWS) and the Department of State in response to the United Nations' Food & Agriculture Organization's International Plan of Action for Reducing the Incidental Catch of Seabirds in Longline Fisheries that was adopted in 1999.

The actions that the Alaska Region will take to meet these objectives are discussed below by objective. Some of the actions will have more immediate effects on bycatch. However, others that will improve our ability to estimate bycatch, to determine the extent to which bycatch should be reduced and to implement effective and efficient methods for attaining those reductions will have less immediate impacts on the levels of bycatch, but will contribute substantially to solving the bycatch problems in Alaska fisheries.

The ability of the Alaska Region to rapidly and fully meet these objectives depends on a variety of factors, and the Region has limited control over some of those factors. For example, the resources that are available to address bycatch problems are determined to a great extent by Congress and by the need to meet other stewardship responsibilities. Similarly and appropriately, the Council process is used to develop regulatory actions to improve bycatch monitoring and to reduce bycatch. Therefore, in the case of regulatory actions, the plan includes actions to promote the development of more effective and efficient regulations and it identifies the regulatory actions that are being developed cooperatively by the Council and the Alaska Region or have been adopted by the Council and are currently under review by the Alaska Region. The plan does not include the implementation of specific regulations. Similarly in the case of bycatch monitoring and research, the plan identifies high priority activities that will be undertaken if adequate funding is available. Currently, adequate funding is not available.

## **2. Alaska Regional Fisheries**

Fishery management plans (FMPs) have been implemented for the Bering Sea/Aleutian Islands area (BSAI) and Gulf of Alaska (GOA) groundfish fisheries, the BSAI crab fisheries, the Alaska scallop fishery, and the salmon troll fishery in the US Exclusive Economic Zone (EEZ) off Southeast Alaska. In addition, the Alaska Pacific halibut fishery is managed under federal regulations and the Alaska Region is responsible for monitoring the incidental takes of marine mammals in state managed fisheries that have been designated as Category II fisheries under the MMPA. The Alaska Bycatch Implementation Plan focuses on the bycatch problems for all living marine resources in the BSAI and GOA groundfish fisheries and the halibut fishery and on the bycatch of marine mammals in the state managed, MMPA Category II salmon fisheries. There are two reasons for this. First, the FMPs for the crab, scallop and EEZ salmon fisheries defer most management authority, including basically all bycatch monitoring and management authority, to the State of Alaska. Second, with respect to the state managed Category II fisheries, the management responsibilities and authorities of the Alaska Region are limited to marine

mammals. In those fisheries, monitoring and controlling the bycatch of other living marine resources is a stewardship responsibility of the State of Alaska or the U.S. Fish and Wildlife Service (USFWS).

## 2.1 BSAI and GOA Groundfish Fisheries

Bycatch monitoring and reduction measures have been incorporated into the FMPs for the BSAI and GOA groundfish fisheries since the FMPs were implemented in the late 1970s and early 1980s. These measures were directed at foreign fleets initially, but increasingly were directed at the domestic fleet as the fishery transformed from foreign, to joint venture, and finally to fully domestic operations by the early 1990s.

The main target species or species groups are Alaska pollock, Pacific cod, sablefish, rockfish, flatfish, and Atka mackerel. Trawl, hook and line (including longline and jig gear) and pot gear account for virtually all the catch in the BSAI and GOA groundfish fisheries. The selectivity of each gear type in the multi-species groundfish fisheries varies by gear configuration, target species, area, and time of year. In recent years, trawl fisheries on average accounted for about 90% of the total groundfish catch; however for some species, such as Pacific cod and sablefish, substantially more than 50% of the catch is taken with fixed gear. Catcher vessels and catcher/processor vessels operate in the trawl, longline and pot fisheries. In 2002, catcher vessels less than 60 feet in length accounted for about 1% of the total groundfish catch, larger catcher vessels took about 46% of the total, and catcher/processors took about 53% of the total.

The bycatch monitoring program for the groundfish fisheries currently consists of extensive self reporting requirements and an observer program designed to quantify total catch, including discarded catch of target and non-target fish species and non-fish species such as seabirds and marine mammals. In the BSAI and GOA groundfish fisheries, total catch, including the retained and discarded catch of target and non-target species of living marine resources, is monitored using data from both mandatory self reporting programs and an extensive at-sea observer program. Generally each fishing vessel of at least 125' in length is required to have an observer onboard anytime it is fishing; and each vessel from 60 - 125' is required to have an observer onboard during 30% of its fishing days. No observer requirements have been established for vessels less than 60' due to cost, lack of funding, logistic constraints and the fact that catch from these vessels generally represents only a very small percentage of total catch in the groundfish fisheries. Observer coverage requirements for fish processing plants are established that vary by a plant's monthly levels of production. The observers are supplied by observer providers who are paid directly by the fishing and processing operations for which they supply observers.

There were approximately 35,000 observer deployment days in 2002, including over 30,000 deployment days on catcher vessels, catcher/processors and motherships. It is estimated that the fishing and processing operations paid more than \$12 million for those 35,000 observer deployment days. In 2001, vessels with observers onboard accounted for almost 90% of the total groundfish catch in the BSAI and about 34% of the total in the GOA. Data provided by the

Observer Program are a critical element in the conservation and management of groundfish, other living marine resources, and their habitat. For example, these data are used for: (1) assessing the status of groundfish stocks; (2) setting groundfish quotas and monitoring them in-season; (3) monitoring the bycatch of non-groundfish species in-season; (4) assessing the effects of the groundfish fishery on other living marine resources and their habitat; and (5) assessing methods for improving the conservation and management of groundfish, other living marine resources and their habitat. The Observer Program also provides the industry with bycatch data it needs to make timely fishing decisions that decrease bycatch and increase productivity.

The nature of the bycatch problem and associated management responses have had a basis in both allocation and conservation issues. Allocation issues generally involve fully utilized species taken incidentally in other target fisheries (e.g. crab and halibut in the groundfish fisheries). Conservation issues also exist in the case of protected species taken incidentally in fishing activities (e.g., marine mammal bycatch in the trawl fisheries and seabird bycatch in the hook-and-line fisheries). Conservation issues and potential overfishing concerns also exist for some non-target groundfish species such as rockfish or skates taken incidentally in the groundfish trawl or hook-and-line fisheries.

A variety of factors contribute to the bycatch problems in the Alaska groundfish and make them more difficult to solve. The factors include: (1) the multi-species nature of the bycatch problem; (2) limited information concerning the biological, ecological, social, and economic effects both of bycatch and of alternative methods for reducing bycatch; (3) substantial excess harvesting capacity; (4) the use of the race for fish to allocate quotas among competing fishing operations; and (5) the external benefits and costs associated with bycatch.

Numerous management measures have been implemented to reduce bycatch. They include closed and restricted areas, bycatch limits, gear restrictions, species allocations to gears with lower bycatch rates, individual fishing quota programs, and an improved retention and utilization program for Pacific cod, pollock, and Gulf of Alaska shallow water flatfish. Much attention now is focused on fishery rationalization programs, including new IFQ programs or fishery cooperatives, and their attendant impacts on bycatch.

Research initiatives directed at reducing bycatch are ongoing under partnerships among Alaska Fisheries Science Center (AFSC) scientists, other scientists and industry interests under exempted fishing permits. Recent gear technology research has identified practicable methods to reduce bycatch. They include halibut and salmon excluder devices in trawl gear, trawl gear modifications to avoid crab bycatch and incidental mortality, and gear configuration and deployment modification to avoid gear interactions with seabirds.

The following comparisons of catch and bycatch estimates for 1996 and 2002 for the BSAI and GOA groundfish fisheries provide an indication of the success of the bycatch reduction efforts since the MSA was amended in 1996. Although total groundfish catch increased by 2.5%, groundfish discards decreased by 50%, the discard rate for groundfish decreased to 6.8%, halibut

bycatch mortality decreased by 8%, herring bycatch decreased by 91%, salmon bycatch decreased by 15%, and crab bycatch decreased by 52%. The bycatch rates in the Alaska groundfish fishery are relatively low compared to most other major fisheries in the U.S. or elsewhere; however, the absolute levels of bycatch are high due to the size of the groundfish fishery. In 2002, total groundfish catch exceeded 2.1 million metric tons (t), and bycatch included about 142,000 t of groundfish, 6,100 t of halibut mortality, 137,000 (individual) salmon, 133 t of herring, and almost 3 million (individual) crab (mostly snow and Tanner crab). Plans to further improve bycatch monitoring and to reduce bycatch in the BSAI and GOA groundfish fisheries are discussed in Section 3.

## 2.2 Pacific Halibut Fishery

Commercial, recreational and subsistence users fish for halibut in Alaska. These are hook and line fisheries and the vast majority of the commercial catch is taken with longline gear. The International Pacific Halibut Commission (IPHC) has the primary responsibility for managing the halibut resource off Alaska. Under authority of the North Pacific Halibut Act, the Council is authorized to develop regulations that are in addition to, but not in conflict with, regulations adopted by the IPHC. The Council adopted an individual fishing quota (IFQ) for the commercial Alaska halibut fishery in 1992. NOAA Fisheries implemented the program in 1995. Under the IFQ program, individual fishermen were assigned a quota share based on past participation in the fishery and other criteria developed by the Council. The annual halibut quota established by the IPHC is allocated among fishermen based on their individual quota shares. These quota shares are transferable harvest privileges within specified limitations. Under the IFQ program, fishermen are able to harvest their halibut IFQ whenever and however such harvest is most economical to their fishing operation, subject to program limitations and seasons. The higher catch limits in recent years reflect healthier stock conditions. Commercial halibut fishery landings in 2002 were almost 61 million pounds and generated about \$130 million of ex-vessel revenues.

The halibut fishery does not have an observer program to monitor bycatch. However, logbook data are used by the IPHC to estimate adult halibut mortality due to lost/abandoned gear in the halibut fishery and the IPHC stock assessment surveys collect bycatch data for undersized halibut and for other species. In addition, bycatch data are available for joint groundfish and halibut trips for which a groundfish observer is on board. Although mandatory retention requirements exist for incidental catch of rockfish and Pacific cod, the level of compliance is unknown. Therefore, the uncertainty concerning the level of bycatch of some groundfish species, such as demersal shelf rockfish, is a concern. Seabird bycatch mortality is of concern, and gear and fishery operation regulations are used to reduce seabird bycatch. Plans to address these bycatch concerns are addressed in Section 3.

## 2.3 State Managed MMPA Category II Salmon Fisheries

There is a federal FMP for the relatively small salmon troll fishery in the EEZ off Alaska;

however, the FMP defers management to the State of Alaska. All other salmon fisheries are strictly state managed. Over ten Alaska salmon fisheries are classified as Category II fisheries under the MMPA. An observer program in the Prince William Sound, Cook Inlet, and Kodiak Island salmon drift and set gillnet fisheries documented seabird bycatch and incidental takes of marine mammals. Results confirmed the Category II classification of most of the observed fisheries, and re-classified two fisheries to Category III. The Alaska Region is currently developing a more comprehensive observer program for other Alaska salmon fisheries with the primary focus of determining the nature and extent of marine mammal interactions in these fisheries; seabird and other bycatch information will also be collected.

The MMPA sets out several goals for which observer data are used: 1) determination whether the potential biological removal level of a stock is exceeded; 2) categorization of each fishery in the annual List of Fisheries; and 3) determination of whether a fishery has approached a zero mortality rate for marine mammals. These goals each require an increasing level of precision and accuracy in estimates of serious injury and mortality. Determination of appropriate observer coverage levels to meet the needs of accuracy and precision is currently the subject of serious interest to NOAA Fisheries' National Observer Program Advisory Team, and specific coverage levels for this program still need to be assessed. Currently, the Alaska marine mammal program observes state-managed salmon fisheries on a rotational basis, with one or two fisheries observed per year for two consecutive years each at approximately 5% coverage. With over ten Category II fisheries to monitor for marine mammal bycatch, ten or more years may elapse before a fishery is observed again. Trends in fishery operations and marine mammal populations can change significantly in the intervening years, easily rendering observer data out of date; accuracy and precision of estimates are difficult to achieve on this schedule as well. The program would ideally observe fisheries more frequently (probably no more than 5 years between observing a single fishery) and for more than two consecutive years in each rotation (probably 3-4 consecutive yrs). The current limiting factor in the development of this program is funding. Due to the remoteness of many of the fisheries, the average cost of observing one fishery is over \$1 million per year, although cost savings can be realized in combining concurrent observation of geographically proximal fisheries.

Commercial fishing is conducted in both state and federal waters by about 5,000 relatively small fishing vessels using troll, drift gill-net, set gill-net, and purse-seine gear. All five Pacific salmon species are harvested by commercial, recreational, and subsistence fishermen. In 2002, about 610 million pounds of salmon were landed in the commercial fishery with an ex-vessel revenue of about \$130 million. Due principally to depressed prices, this is the lowest ex-vessel revenue for the Alaska salmon fisheries in more than 20 years.

The intercepts of salmon, including ESA-listed Pacific Northwest stocks, passing through the marine waters off the coast of Alaska on their way to more southerly spawning grounds were the focus of lengthy negotiations and debate among Alaskan, Canadian, and Pacific Coast fishermen, management agencies, and governments. The Northwest Region has the lead for protecting the ESA-listed Pacific Northwest salmon stocks.

Plans to improve the monitoring of marine mammal bycatch in the state managed MMPA Category II salmon fisheries are addressed in Section 3.

### **3. Actions to Meet Plan Objectives**

#### **3.1 Actions to Improve the Standardized Bycatch Reporting Methodologies (SBRMs) for the BSAI and GOA Groundfish Fisheries, the Alaska Pacific Halibut Fishery, and the State Managed MMPA Category II Salmon Fisheries**

##### **3.1.1 BSAI and GOA groundfish fisheries**

Improved SBRMs will be developed with research projects and they will be implemented with policy and regulatory actions. The regulatory actions will be developed and implemented cooperatively with the Council. Expanded outreach efforts will be used for both developing and implementing the improvements. Specific projects are summarized in Table 1. Additional research projects that will be conducted in FY04 and FY05 if adequate funding becomes available are described below.

##### **Research on fish injury and environmental factors affecting escapee and discard mortality**

Bycatch mortality from various sources is dependent on fish condition and environmental factors. Interactions of fish and fishing gear causes injury (wounding, physiological, and behavioral) which is magnified by environmental factors (light, temperature, air exposure). Presently, research in the laboratory determines the role of injury from fishing gear and environmental factors for inducing stress and mortality in fish. Increased funding would increase efforts to design and conduct field experiments to determine fish condition and mortality in a variety of trawl and non trawl gear fisheries under a range of environmental conditions. (\$145,000 per year).

##### **Research on estimation of discard and escape mortality**

To date, only halibut discard mortality rates are estimated and accounted for. Other discard mortalities are assumed to be 100% and mortalities of unobserved escapes are not addressed. Full scale tagging or holding experiments can be used to estimate mortality, or behavioral assays if successfully developed (see below in Behavior section) may be more effective. Significant mortality issues needing attention include: pollock, flatfish and Pacific cod escaping through meshes or excluders, halibut escaping through excluders, and discard mortality for all other discarded species. A number of gear configuration, behavioral, environmental and physiological factors affect bycatch mortality, so this project will be closely coordinated with research on those aspects described above. None of these will be substantially addressed at current funding levels. Approximately \$200,000 and 1 FTE will be needed to initiate a program to evaluate up to one species per year.

### Develop behavior assay of delayed bycatch mortality

While immediate mortality of bycatch can be observed on deck, mortality rates for escapees and discards is generally unknown, especially since delayed mortality can be significant. Prediction of this delayed mortality may best be made using surrogate measures of fish condition that are correlated with delayed mortality, including measures of physical injury and behavior impairment. Present research in the laboratory is developing behavioral assays for delayed mortality of captured fish, including predation on escapees and discards. Increased funding would initiate efforts to design and conduct field experiments measuring delayed mortality using behavior assays in a variety of fisheries (\$140,000).

### Resolve the documented problem of seabird strikes with trawl cables

To resolve the documented problem of seabird strikes with trawl cables, work is currently planned for the FY 04 season where several mitigation devices will be tested. One component of this research will be to document the nature of the interaction and the rate at which it occurs. This work involves 10 dedicated seabird observers spending 60 days each on 10 catcher/processor vessels (5 pelagic and 5 non-pelagic gear vessels). The total funding for this pilot project is estimated at about \$250,000, with about \$210,000 currently earmarked for the project from various sources [North Pacific Research Board (NPRB) grant, NOAA Fisheries, USFWS, and industry]. An additional \$40,000 is needed to implement the project.

### Assessment of seabird underwater drop-off rates

An assessment of seabird underwater drop-off rates for longline gear needs to be conducted. This will require the acquisition of salvaged seabird carcasses from colonies to be used for drop-off experiments, developing an experimental methodology, and implementing a dedicated research cruise. Staff within the Alaska Region have completed some initial coordination with FWS staff in order to have access to salvaged carcasses from albatross colonies. Costs not including vessel charter are about \$70,000. Vessel charter costs will depend on whether or not the vessel is allowed to keep the catch. If it can, and if enough longline sets are authorized to make the fishing activity similar to commercial operations, it is likely that there would be no charter costs.

#### 3.1.2 Pacific halibut fishery

As with the groundfish fisheries, an improved SBRM for the Pacific halibut fishery will be developed with research projects and implemented with policy and regulatory actions. Any regulatory actions will be developed and implemented cooperatively with the Council and IPHC. Expanded outreach efforts will be used for both developing and implementing the improvements. The specific project is summarized in Table 1. The annual cost of 10% coverage would be approximately \$1 million. Some of the projects to improve the SBRMs for the groundfish fisheries will also be applicable to the Pacific halibut fishery.

### 3.1.3 State Managed MMPA Category II Salmon Fisheries

Ten salmon net fisheries in Alaska currently are classified as Category II fisheries under the MMPA. An observer program exists that can monitor these fisheries for marine mammal and bird interactions. However, the level of funding currently available may not be adequate to meet monitoring objectives. The specific objectives for these fisheries are as follows: (1) Determine the optimum monitoring level and (2) Fund the Alaska Marine Mammal Observer Program adequately (AMMOP).

Work is underway through the AMMOP to gain a better understanding of the type and magnitude of marine mammal (and seabird) bycatch in salmon gillnet fisheries in Alaska. AMMOP rotates field operations throughout the Alaska fisheries designated as Category II under the MMPA according to conservation needs and available funding. The AMMOP has observed three fisheries since 1999 for interactions between commercial salmon fisheries and marine mammals and seabirds. These fisheries are the Cook Inlet salmon set and drift gillnet fisheries and the Kodiak set gillnet fishery. Prior to 1999, three other fisheries were observed, including the Prince William Sound set and drift gillnet fisheries and the South Unimak set gillnet fishery. In 2004, the second year of a two-year study will be conducted in the Kodiak salmon set gillnet fishery. The Southeast Alaska salmon drift gillnet and purse seine fisheries are expected to be observed sometime between 2005 and 2010. In addition to the Southeast fisheries, the Bristol Bay salmon set and drift gillnet fisheries and the Yakutat salmon set gillnet fishery will be observed in this rotation prior to returning to observe fisheries previously observed. The total estimated cost of AMMOP operations for FY 04 is \$1.4 million. As with the groundfish and halibut fisheries, the feasibility of using alternative technologies for monitoring bycatch in these fisheries will be evaluated.

### 3.2 Actions to Improve Our Ability to Estimate the Biological, Ecosystem, Social, and Economic Effects of Bycatch and of Alternative Methods for Reducing Bycatch

Due to the size of the groundfish fisheries and the levels of bycatch in those fisheries, efforts to improve our ability to estimate the biological, ecosystem, social, and economic effects of bycatch and of alternative methods for reducing bycatch will be focused on the groundfish fisheries.

#### 3.2.1 Stock Assessment Research

##### Groundfish

There are ongoing research programs that are designed to improve our understanding of the effects of fisheries on living marine resources. Historically, for fish stocks, this research has focused on the principal target species. Improving our knowledge of the status of non-target species (i.e., species taken principally as bycatch in commercial fisheries) will continue to be an active area of research at the AFSC. The objective of this research is to improve the quality of catch, life history, abundance and assessment information on species where stock status is poorly



defined or unknown. The need for new assessments stems from the following concerns regarding management of species that are caught as bycatch:

1. When species are not identified as a single fisheries management unit, quotas may not adequately protect the reproductive potential of the less abundant members of a complex.
2. When stocks are managed in complexes that include species with different life history characteristics, quotas may not adequately protect the reproductive potential of the slower growing, long lived, less fecund members of a complex.
3. Rare species may be vulnerable to overfishing because of their low stock size and patchy distributions.
4. Traditional fishery independent assessment surveys are not designed to assess rare species and biomass estimates for these species may be uncertain.

The AFSC has used Stock Assessment Improvement Plan (SAIP) funds to increase the range and depth of research designed to improve assessments for non-target species. Some of those projects will continue into FY04. If adequate SAIP funds are provided in FY04 and FY05, the AFSC will be continued or expand assessment research for non-target species.

### Seabirds

Currently, there is only one limited program to salvage seabird carcasses recovered during commercial fishing operations. It is unfortunate, as these carcasses represent valuable scientific specimens that could increase our knowledge of trophic level feeding habits, molt patterns, genetic differences between colonies, and other important questions. New Zealand funds a seabird carcass recovery program that has proven very useful not only to add to science, but also as a means to gain a better understanding of the causes of bycatch in fisheries. Work is currently being done to develop a proposal to implement a carcass recovery program for North Pacific fisheries, but no funding source has been identified. Preliminary estimates of funds needed are about \$40,000 per year, with an interest in setting up a program to run for a minimum of 5 years. Total funding needed is \$200,000.

### 3.2.2 Ecosystem Research

Many of the population and ecosystem effects of bycatch mortality are similar to those of other sources of fishing mortality. Our understanding of those effects is continuously being improved by ongoing research and data collection programs. Information concerning our current level of knowledge concerning population and ecosystem effects of fishing mortality are presented in the PSEIS that is being completed for the BSAI and GOA groundfish fisheries and in the SAFE reports for those fisheries.

The ecosystem impacts of bycatch in the Alaska groundfish fisheries are being assessed using a variety of information sources and methods. Observer estimates of retained versus discarded catch of target and non-target species are used to estimate total amount of bycatch. Estimates of total discards are evaluated with regard to magnitude relative to natural dead organic material in the ecosystem and the potential for these re-directed energy sources to cause unintended population changes in scavenger species. Trends in observer-derived bycatch rates of non-target species that are key ecosystem components (e.g., forage, top predators, HAPC biota) are evaluated relative to life-history traits and independently-derived population trends from surveys of these components to determine if there might be trends of concern related to bycatch mortality.

Improvements are needed in the observer monitoring of catch composition of certain fleets/areas. In addition, statistical analysis of bycatch composition trends by fleet/time/gear/area needs to be performed to better understand and predict the composition of bycatch when fleets change gear or area. This latter project would require \$90,000 for one year post-doc analysis.

Discards and offal are used heavily by many seabirds in the North Pacific. Birds are attendant around catcher/processors, and can reach high numbers. The importance of this food source is unknown, as is the risk posed to seabirds from direct mortalities when they are drawn to fishing vessels. Further, there have been very large changes from year to year in the availability of discards and offal as a result of changes to fishery management plans. Effects of these changes to seabird productivity and survival in the North Pacific are unknown. Additionally, the use of offal by seabirds illustrates a large difference in energy flow through the ecosystem than what would be seen without fishing. These aspects need to be explored, first by estimating the total food made available to seabirds, then by identifying the importance of this food resource and also the development of risk profiles due to the attraction to fishing vessels. Funding needs are estimated at \$120,000 over 3 years.

Seabirds depend on the availability of forage fish, squid, and the juveniles of various target species. Some of these occur as bycatch in commercial trawl fisheries, and the total biomass of some species is poorly understood in the North Pacific. Work needs to be conducted to refine estimates of squid and forage fish biomass, dependence of seabirds on these food resources being available, and modeling of the effects of fishery bycatch on seabirds. This work would include some in-house analytical work with available data and also field work to augment current stock assessment surveys. A formal experiment should be conducted near a seabird colony to investigate fishery resources and effects of trawl fisheries on those resources (and their availability to seabirds). Costs for basic analytical work are about \$65,000. This work would help to define future shipboard studies on how to augment stock assessments and experimental work near colonies. Without some initial analytical work, reasonable estimates of the cost of additional studies cannot be provided here.

### 3.2.3 Economic and Social Science Data Collection and Research

Our ability to determine the social and economic impact of either bycatch or bycatch

management measures and to model fisherman behavior is severely limited by the social and economic data that are available. The economic reporting requirements that are part of the proposed BSAI Crab Rationalization Program, would help address this deficiency for the crab fishery. Similar data reporting/collection programs should be developed for other fisheries. In general, existing data collection programs need to be improved and additional programs implemented to provide the economic and social data that are required to assess the effects of bycatch and measures to control it. The Alaska Region and Science Center will assist in developing improved data collection programs and will promote economic and social research to improve our ability to estimate the effects of bycatch and alternative management actions. For example, the Science Center will support the development of location choice models that can be used to estimate how fishermen will respond to time or area restrictions.

### 3.3 Encourage the Development and Use of Gear Technologies That Provide Efficient Methods for Reducing Bycatch

The multispecies BSAI and GOA groundfish fisheries present a broad matrix of bycatch issues by target species, gear type, and bycatch species. In the areas of gear selectivity and bycatch mortality, a few of the most pressing research issues are addressed each year by current programs. Additional funding would increase the number of issues studied and the rate at which answers and solutions are reached.

Due to the size of the groundfish fisheries and the levels of bycatch in those fisheries, fish behavior, gear technology and bycatch mortality research will continue to be focused primarily on the groundfish fisheries. The research that is planned or proposed to improve our estimates of bycatch mortality were discussed in Section 3.1. Research that is needed to develop and encourage the use of gear technologies that provide efficient methods for reducing bycatch is discussed in this section.

Outreach is a critical factor in determining the effectiveness of gear technology research in helping to solve bycatch problems. Outreach in the field of gear technology occurs at both gear development and technology transfer stages. Scientists participate in cooperative research projects with industry groups and individual fishermen to develop more selective fishing gear. Results of these projects are primarily presented to fishermen at annual trade shows and by written and video materials. In addition, the exchange of research findings among scientists doing gear research for other domestic and foreign fisheries contributes to overall efforts to develop more selective gear. Actions intended to improve outreach programs for gear technology are discussed in Section 3.5.1

A top priority for reducing unintended fishing mortality is the continued development of new gear which has higher selectivity for target species. In trawl gear, selectivity can be improved through the understanding of fish and invertebrate behavior relative to gear function. Species move into and through nets in differing ways which can be quantified and exploited for new gear design. Size classes of species should also be investigated, as increased mesh size has been a

mainstay of gear design, while the potential increases in escapee mortality (from injury, stress and predation) with increased mesh size have not been widely considered. Fish attraction to non trawl gear can be dependent on bait scent, while hooking can be dependent on bait visibility and texture, as well as hook size and type. Selectivity can be increased by designing baits, traps and hooks which are more species and size selective, based on behavioral observations in the field and laboratory. Pot gear can also be modified to take advantage of fish escape behavior and size.

Through a mix of cooperative and direct research, AFSC scientists have assumed a critical role in the improvement of fishing technology used in Alaska waters, and aided such developments in other regions. Our efforts have emphasized Science Center capabilities that complement the efforts of industry, including specialized observation equipment, and experimental, testing and analysis abilities. Presently, research in the laboratory analyzes the effects of environmental factors (light, temperature, bait scent) on fish behavior (orientation, swimming, chemosensory, gustation, escape), while field research makes observations of fish behavior in trawl and non trawl fishing gear. This capture related behavior is used to make gear modifications which are then tested in the field for effectiveness in reducing unobserved fishing mortality. A growing number of opportunities to reduce fishery problems exist through improvements in fishing technology and the Science Center is positioned to serve a critical role in such efforts, limited by staff and funding. Problems waiting to be addressed include: salmon bycatch in pollock trawl fisheries, crab bycatch in bottom trawl fisheries, better size selection in flatfish fisheries (reduce discards), halibut bycatch in longline fisheries for cod, shark bycatch in pollock fisheries, skate bycatch in bottom trawl fisheries, and crab injuries (mortalities) from trawl bridle (sweep) encounters.

Current budgets allow continuation of work on this subject, but limit field projects to either pilot level studies in several of these areas or full studies in only one at a time over several years. We have taken the former approach and will work this year on the following two projects:

1. a continuing cooperative project to reduce salmon bycatch during pollock trawling and
2. a project to study the behavioral response of rock sole to disturbance by bottom trawl ground-gear in order to determine how natural behaviors may be utilized to assist in bycatch reduction efforts in the rock sole fishery.

Small projects on other problems may also be possible with existing funding. A program addressing multiple selectivity improvement projects per year would require \$500,000 and 2 additional FTEs. An additional \$185,000 is needed to expedite the transition of key laboratory studies into field applications.

The following gear research projects will be initiated if adequate funding is obtained.

Research on measuring factors affecting fishing selectivity and bycatch mortality

To understand fish interactions with fishing gear, selectivity and subsequent survival, we must have effective tools for observation and data recording. Light conditions have a strong effect on the way fish find and react to fishing gear, and on bycatch mortality. Light conditions on all fishing gear must be measured so that light can be related to gear performance and bycatch production. Past research has relied on visual observations in lighted conditions and on low resolution sonar for making observations. Recently, observations have been made in dark conditions with infra-red videography for near field (1-2 meters) observations, while high resolution sonar has made observations up to 20 meters possible. This new technology should be exploited to quantify fish behavior in as many fishing situations as possible. Such information will be valuable for developing a comprehensive understanding of the breadth of fish responses to fishing gear and for more selective gear designs. Temperature has a strong effect on fish reactions to fishing gear, and on bycatch mortality. Temperature must be measured on all fishing gear so that temperature can be related to fish behavior, gear selectivity, and the thermal history of fish during capture and possible escape, landing and discarding. Sea state has a strong effect on gear performance, fish interactions and ultimate mortality. New techniques should be developed to monitor sea state and gear state and relate this to gear selectivity, and escapee and discard mortality. A cost estimate for this work has not been developed.

#### Research on effect of environmental and social factors on gear selectivity

Fish capture results from behavioral interactions of fish with fishing gear. These behavioral interactions are strongly modified by environmental and social factors. Presently, research in the laboratory determines the role of light, temperature, and bait scent in controlling the capture of fish, as well as how social interactions modify fish capture. Field research involves observation of fish interactions with gear under a variety of fishing conditions in an effort to improve gear selectivity and efficiency. Increased funding would increase efforts to link laboratory and field research by conducting field experiments to test the role of environmental and social factors in fish capture and selectivity (\$130,000).

#### Observe the behavior of seabirds around trawl vessels during setting and hauling of the gear

This project will develop risk-profiles for surface feeding birds which should provide direction for future research in gear modification to eliminate bycatch of surface feeding birds (albatross, fulmars, gulls). This initial phase will require dedicated biologists to spend time at sea, and analytical work to develop the profile. The second phase (gear modification) would require funding for a workshop that included substantial participation by industry and academics experienced with seabird-related gear modification. Recommended funding is \$85,000.

#### Seabird avoidance methods for longline fisheries

The Alaska Region and AFSC have supported work completed by the Washington Sea Grant Program to test several seabird avoidance measures for longline vessels. This was a highly collaborative approach among academia, NOAA Fisheries, Washington Sea Grant Program, and

the fishing industry and resulted in very effective measures being developed. That collaboration is now continuing to further develop integrated weighted groundlines. If this development proves successful, these two measures used in tandem would likely virtually eliminate seabird bycatch in demersal longline fisheries.

The Alaska Region and AFSC will continue to work closely with USFWS to identify needed research projects to address current fishery management needs. For the past three years, USFWS has received Congressional appropriations (totaling ~\$1.5M) specifically for Alaska seabird bycatch initiatives. In the event that the USFWS funds are discontinued, it is likely that NOAA Fisheries will need to identify funds to continue necessary collaborative projects.

### 3.4 Develop and Implement More Effective and Efficient Management Measures to Monitor and Reduce Bycatch

Addressing bycatch problems has been a very high priority for the Alaska Region and Council for more than 25 years. Therefore, regulatory actions to improve bycatch monitoring and bycatch management are continuously being developed, reviewed and implemented. The actions discussed below reflect priorities set by the Alaska Region and the Council. They are actions that currently are under development or review. Given the time that it takes to develop and implement regulatory actions that are both effective and efficient and given the cooperative process that is used to develop such actions, it would be counterproductive for this draft plan to include other actions.

The actions include some that can be implemented relatively quickly and others that will take longer to develop and implement. The latter include two fishery rationalization programs and a restructuring of observer funding and deployment. These three regulatory actions could be very effective in providing long-term solutions to bycatch problems and to related management problems. During the last 25 years, there usually have been annual changes to the groundfish management regime in order to address bycatch problems. This is in part the result of using bycatch management measures that can only be effective and efficient if conditions in the fisheries are relatively static and are well understood by fishery managers. Often neither condition is met and the management measures that are implemented address the symptoms of the bycatch problem and not its source; therefore, ongoing treatment is necessary.

As noted in Section 2.1, a variety of factors both contribute to the bycatch problems in the Alaska groundfish fisheries and make them more difficult to solve. The factors include: (1) the multi-species nature of the bycatch problem; (2) limited information concerning the biological, ecological, social, and economic effect both of bycatch and of alternative methods for reducing bycatch; (3) substantial excess harvesting capacity; (4) the race for fish among competing fishing operations; and (5) the external benefits and costs associated with bycatch. A well designed fishery rationalization program (e.g., individual fishing quotas or harvesting cooperatives) can eliminate or substantially reduce the contribution of each of these five interdependent factors to the bycatch problems.

First, it can reduce an aspect of the multi-species nature of the problem. Specifically, the problem of an action to decrease the bycatch of one species resulting in the increase of bycatch of another can be addressed for some bycatch species by allowing each fishing operation to make decisions concerning such tradeoffs based both on its ability to decrease different types of bycatch and on the price it has to pay for using quota for different species.

Second, the prices of the rights to harvest individual species will reflect the value of some of the alternative uses of those species. That information is useful in determining some of the economic effects of bycatch and reductions in bycatch. If the program includes reporting requirements for economic data, such as are in the Crab Rationalization Program proposed by the Council, the program will provide additional economic and social data needed to develop effective and efficient management actions to address bycatch and other management problems.

Third, it can decrease fishing capacity and eliminate the perverse incentive that fishermen currently have to maintain or increase excess capacity.

Fourth, it can eliminate the race for fish and, therefore, eliminate its adverse effects, including increased bycatch.

Finally, a well designed program can internalize many of the externalities that are the root cause of fishermen taking too much bycatch. This can result in fishermen receiving the right incentives and making decisions that will "minimize bycatch to the extent practicable for some species. In part it can do that by providing fishermen with a strong incentive to support gear technology research and to fully use advances in gear technology when they occur.

Adequate monitoring of total catch by species for each vessel or cooperative is required to obtain the full range of benefits from a rationalization program. Fortunately, adequate monitoring probably is economically viable for many sectors of the BSAI and GOA groundfish fisheries. Enhanced vessel monitoring programs have been established for two rationalization programs that have been implemented for the BSAI groundfish fishery, the community development quota (CDQ) program and the American Fisheries Act (AFA) cooperatives for the BSAI pollock fishery. These enhanced programs provide better information on total catch by species, including bycatch. These monitoring programs include certified flow scales for processor vessels, observer sampling stations and platform scale requirements for catcher and catcher processor vessels, increased observer coverage, shoreside processor catch monitoring plans, and electronic catch reporting programs to improve the accuracy and timeliness of catch data.

Industry support for rationalization is in part based on its belief that rationalization is the most effective way to deal with the bycatch problem. This is demonstrated by the following excerpts from a presentation that Paul MacGregor, an industry spokesman, made at the recent conference "Managing our Nations Fisheries".

#### Key Elements of a Successful Bycatch Management Program

- Reliable monitoring of total catch including bycatch
- Reliable accounting for discard mortality
- Incentives for bycatch reduction
- Tools to facilitate bycatch reduction

These examples (sablefish/halibut IFQs, CDQs, and pollock harvesting cooperatives) have all shown that, by providing both the tools and the incentives for individual fishermen to conduct their fishing operations in a rational manner and eliminating the “race for fish”, fishermen and processors can:

- Slow down and operate at a more measured pace
- Extract more value from the fish they catch
- Benefit from their individual efforts to reduce bycatch
- More fully harvest the TACs of their target species

#### Privatizing Bycatch Management through Harvesting Cooperatives: A Case Study (Pollock Inter-cooperative Salmon Bycatch Avoidance Agreement )

The members of the pollock harvesting cooperatives have entered into co-op agreements to engage in a salmon bycatch avoidance plan in which the co-ops agree to hire an independent contractor to:

- Monitor salmon bycatch rates
- Identify real-time bycatch “hot spots” for the fleet
- Set bycatch rates that trigger closures
- Close areas to co-ops that exceed trigger points

Such agreements establish real-time, incentive-based bycatch management programs that “privatize” the sanctions necessary to ensure compliance with bycatch-reduction programs. The contractual commitments that the co-op members make to each other are enforceable on a private basis between the members of the co-op. This avoids the due process, notice and comment and other regulatory obstacles that prevent NMFS from identifying and enforcing “Hot Spot” closures on a real-time basis.

Therefore, a high priority is placed on developing and implementing well designed fishery rationalization programs in order to have a long-term solution to the bycatch problem and related management problems.

The Alaska Region will assist in developing and implementing the regulatory actions discussed below. These efforts will include identifying effective and efficient regulatory actions.

#### 3.4.1 Enforcement Interval Change for Pollock Maximum Retainable Allowances (MRA)



Adjusting the enforcement interval for the Maximum Retainable Allowances (MRA) would change the enforcement of the pollock MRA to an offload to offload basis in the BSAI, allowing non-AFA vessels that have otherwise been forced to discard pollock, to retain additional pollock as long as they are under the MRA for pollock at the end their trip. This would decrease regulatory discards of pollock providing flexibility for non-AFA vessels to increase the amount of pollock retained. The proposed regulatory change could potentially affect all vessels that catch pollock incidental to other target fisheries. However, as the analysis indicates, only the head and gut trawl catcher processor sector has been constrained by the current instantaneous enforcement of the MRA. The head and gut trawl catcher processing sector regularly have high enough incidental catches of pollock to be significantly affected by a change in the enforcement interval. This proposed action, is also intended to provide greater operating flexibility to vessels that will be required to adhere to a second proposed bycatch reduction standard, FMP Amendment 79, the minimum Groundfish Retention Standard.

#### 3.4.2 Minimum Groundfish Retention Standard: Proposed FMP Amendment 79

For catcher processing vessels of the head and gut fleet in the BSAI, a minimum groundfish retention standard (GRS) is proposed by the Council that would phase in a minimum groundfish retention threshold over a four year period beginning in 2005, starting at 65 percent and increasing to 85 percent. Under the preferred alternative head and gut catcher processors at least 125' in length would be required to retain all groundfish catches at a level that was equal to or exceeds the GRS. This retention standard would be determined and enforced at the end of the year. In 2002, the overall groundfish retention rate for head and gut trawl catcher processors  $\geq 125$  ft. was 71 percent. The purpose of the GRS is to create a standard for retention of groundfish for the BSAI groundfish fishery, reduce groundfish discards, while continuing to allow for the a multi-species trawl fishery to continue to be a viable fishery. One of the challenges will be to identify methods to enforce the GRS that are effective but not so costly that they eliminate the net benefits of implementing a GRS.

#### 3.4.3 Harvesting Cooperatives for the BSAI Head and Gut Catcher Processors: Proposed FMP Amendment 80

Currently, the Council is developing a fishery cooperative for the sectors targeting flatfish species in the Bering Sea and Aleutian Islands, a program designed to provide this sector with the operational tools to adhere to the increased retention standards. These measures are expected to further reduce the overall discards of groundfish in the BSAI groundfish fisheries. A first step in developing such cooperatives is establishing BSAI sector allocations for the groundfish TACs and the prohibited species catch (PSC) limits. In addition to being required for the formation of cooperatives in the flatfish fishery, these allocations will facilitate the rationalization of other sectors of the BSAI groundfish fishery through either future regulatory actions or voluntary actions by the participants in a specific sector.

#### 3.4.4 Establish a New Program for Observer Procurement and Deployment in the North Pacific

The North Pacific Groundfish Observer Program (Observer Program) is widely recognized as a successful and essential program for management of the North Pacific groundfish fisheries. However, the Observer Program faces a number of longstanding problems that result primarily from its current structure. The existing program design is driven by coverage levels based on vessel size that, for the most part, have been established in regulation since 1990. The quality and utility of observer data suffer because coverage levels and deployment patterns cannot be effectively tailored to respond to current and future management needs and circumstances of individual fisheries. In addition, the existing program does not allow fishery managers to control when and where observers are deployed. This results in potential sources of bias that could jeopardize the statistical reliability of catch and bycatch data. The current program is also one in which many smaller vessels face observer costs that are disproportionately high relative to their gross earnings. Furthermore, the complicated and rigid coverage rules have led to observer availability and coverage compliance problems. The current funding mechanism and program structure do not provide the flexibility to solve many of these problems, nor do they allow the program to effectively respond to evolving and dynamic fisheries management objectives. In addition to providing better catch and bycatch data for vessels that currently have observer coverage requirements, this action could extend observer coverage to the Pacific halibut fishery and to groundfish vessels that are less than 60' in length.

#### 3.4.5 Non-target Species Management

The Council is considering plan amendments to the BSAI and GOA Groundfish FMPs to develop criteria for management of groundfish at the complex (e.g., pelagic shelf rockfish), group (e.g., sharks), and species (e.g., Pacific ocean perch) levels. The process uses data quality and species vulnerability (to overfishing) to "sort" complexes, groups, and species to prioritize management strategies. An ad hoc working group of scientists has convened three times to develop these criteria. The group sorted complexes, groups, and species into two categories: (1) "targets" are those species intended to be harvested, and (2) "non-targets" or those incidentally-caught. The management goal of target species categories would be to optimize sustainable yields. The goal of non-target management is to protect them from fishing effects. Management options for non-target species would include prohibiting directed fishing, establishing Maximum Retainable Allowances (MRAs) and taking other actions to minimize bycatch to the extent practicable.

#### 3.4.6 GOA Rationalization

Over the past year, the Council has developed a suite of elements and options for consideration as part of the GOA Rationalization SEIS process. Through the development of these alternatives, the Council has used the SEIS public scoping process and public testimony to identify this suite of alternatives, elements, options. This process has refined the proposed action, purpose and need, and alternatives, elements, options for consideration for GOA Rationalization. These refinements are being incorporated into the SEIS that Council and NMFS staff are currently preparing.

The purpose of the proposed action is to create a management program that provides greater economic stability for harvesters, processors, and communities. The allocation of harvesting and possibly processing privileges would allow harvesters and processors to manage their operations in a more economically efficient manner. Rationalization of the harvesting sector eliminates the derby-style race for fish by providing economic incentives to consolidate operations and improve operational efficiencies of remaining operators. Greater economic stability may improve stock conservation by creating incentives to eliminate wasteful fishing practices. Rationalization programs may provide additional opportunities to address conservation goals by providing opportunities to utilize fishing methods that reduce bycatch and gear conflicts. Rationalization programs may also reduce the incentive to fish during unsafe conditions.

#### 3.4.7 Essential Fish Habitat (EFH)

The Council is continuing to addressing EFH issues, including associated bycatch issues (e.g., the bycatch of corals and sponges), by developing an environmental impact statement (EIS) that evaluates alternatives for three actions: (1) describing EFH for fisheries managed by the Council; (2) adopting an approach for the Council to identify Habitat Areas of Particular Concern (HAPCs) within EFH; and (3) minimizing to the extent practicable the adverse effects of Council-managed fishing on EFH. The Alaska Region and Science Center will assist the Council in preparing a final EIS. The Alaska Region will implementing the appropriate regulatory actions to protect EFH.

#### 3.5 Improve the Outreach Activities That Assist in Meeting the First Four Objectives and Provide Information That Can Be Used to Address Bycatch Problems in Other Fisheries

The design of the Alaska Bycatch Implementation Plan is based on the following beliefs.

- Better information is needed to address the bycatch problems effectively and efficiently.
- NOAA Fisheries is the best source for only some of that information.
- A collaborative effort is needed to provide the desired information.
- The usefulness of that information is determined by how effectively it is shared.

Therefore, outreach programs to develop and share information are a critical element of the plan. The Alaska Region has used a variety of outreach programs. Those programs will be enhanced as part of the plan.

##### 3.5.1 Improve bycatch information available to industry

Participants in the fisheries make a variety of decisions that affect bycatch levels and the effects of efforts to reduce bycatch. Therefore, it is important that they have information concerning gear technology, the effects of bycatch, and in-season bycatch data they can use to decrease

bycatch. The Alaska Region and Science Center will continue to work with industry to ensure that these types of information will be available to the industry as quickly as possible.

The Alaska Region currently cooperates very closely with the fishing industry, academia, and NGOs in seabird/fishery interaction issues. The work done to date on developing mitigation measures was a very collaborative process. Additional work on reaching out to broader portions of the fleet once good measures are designed is important. The recent Washington Sea Grant Program video being distributed to the Alaska longline fleet is a good model for future efforts.

A planned effort that would both contribute to bycatch reduction measures while providing excellent outreach opportunities is the vessel-specific seabird bycatch reduction project. This effort trains AFSC staff or individuals under contract to the AFSC to fully understand the proper deployment of seabird avoidance measures, and then matches these personnel with vessels that have a history of high seabird bycatch relative to the rest of the fleet. Currently, we have made little progress with this effort due to limited funding and sporadic staff availability. Approximately \$40,000 per year over three years (\$120,000 total) would allow a potentially very successful program to move forward and better serve our industry clients.

Other outreach efforts with industry will include the following:

1. Preparing materials for trade shows and conferences;
2. Conducting workshop for high priority fisheries; and
3. Attending trade shows & conferences that fishery participants attend.

### 3.5.2 Improve bycatch information available to fishery managers and other stakeholders, including the public at large

The decisions fishery managers and the public make concerning fishery management measures and policies can be improved by providing them with better information concerning the bycatch problem, actions taken to address the problem, successes and failures in addressing the problem, and the merits of alternative methods of addressing the bycatch problems. The Alaska Region and Science Center will expand their efforts to improve the information that is available to these decision makers. In addition to preparing and presenting reports on bycatch topics, Alaska Region and Science Center will improve their web sites to ensure that they more effectively provide current information on bycatch issues.

### 3.5.3 Obtain better bycatch information

The Alaska Region and Science Center will continue to support a broad range of data collection and research programs to provide bycatch information and will attempt to encourage and attempt to coordinate funding for this research from internal sources (including Saltonstall-Kennedy grants), Sea Grant, NPRB, and foundations. The internal funds will be used to support internal

research, contract, grants, and cooperative agreements, and, where appropriate, they will be used to leverage external funds.

#### 3.5.4 Participation in international efforts to address bycatch problems

Participation in international efforts to address bycatch problems can be an effective means of both providing information to others and obtaining information from others. Alaska Region and Center staff have been involved in a variety of such efforts. These include limited involvement with the development of the United Nations Food and Agriculture Organization (UN FAO) Code of Conduct for Responsible Fisheries, more substantial involvement with the Organization for Economic Cooperation and Development (OECD) efforts to address a variety of management issues including bycatch, and more recently substantial involvement in international seabird bycatch issues, including the support of establishment of international guidelines for reducing the incidental mortality of seabirds in longline fisheries. With respect to seabirds, efforts to date have included work with: the UN's Food & Agriculture Organization (FAO) development of an international plan of action (IPOA); International Pacific Halibut Commission (IPHC); Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR); Asia-Pacific Economic Cooperation (APEC); diplomatic communications to 23 longlining nations in support of the FAO's IPOA; International Fishers Forum; fishery bilateral meetings with Russia, People's Republic of China, Mexico, Canada, Chile, Spain, Taiwan, European Union, and Japan. The Alaska Region and Science Center will continue to participate in international efforts to address the bycatch problems.

Table 1 Actions to improve SBRMs for the BSAI and GOA groundfish fisheries and the Pacific halibut fishery.

Activity Number	Action	2004	2005	Beyond	Outcome	Type of Activity		
						Monitoring	Research	Management
<b>BSAI and GOA Groundfish Fisheries</b>								
1	Develop improved protocols for observer documentation of seabird interactions and mortalities	Conduct pilot studies and develop protocols	Implement protocols	Ongoing	Improved accuracy and precision in estimates of seabird interactions and bycatch	Subsequent	Initial	No
2	Improved species identification by observers	Ongoing	Ongoing	Ongoing	Improved accuracy in identification of catch and bycatch species and quantification of removals. Improved bycatch estimates through comparison of catch and estimated retention.	Yes	Yes	Maybe
3	Develop and implement methods for shoreside sampling of skates	Conduct pilot studies and develop methods	Implement methods if appropriate	Ongoing	Understanding of magnitude and composition of skate fishery in currently unobserved vessels. Ability to compare removals with deliveries if fishery is observed	Yes	Yes	Maybe
4	Enhancements to observer sampling for catch composition determination	Evaluate recent work and develop recommendations	Evaluate alternative approaches	Implement changes	Improved accuracy and precision in estimates of total removals by species. Improved bycatch estimates through comparison of catch and estimated retention.	Subsequent	Initial	Maybe

Activity Number	Action	2004	2005	Beyond	Outcome	Type of Activity		
						Monitoring	Research	Management
5	Evaluate placement of observers on small (<60ft) groundfish vessels	Conduct pilot studies, in part to explore and address safety concerns	Complete study, analyze results, develop recommendations	Implement if cost effective and supported by regulations	Basis for evaluating costs and benefits associated with direct observation of bycatch on small groundfish vessels. Potential for improved bycatch estimates.	Subsequent	Initial	Yes
6	Certify observer workstations and monitor flow scale testing on certain vessels fishing groundfish	Ongoing	Ongoing	Ongoing	Improved accuracy in estimating total catch and catch composition,	Yes	No	No
7	Place observer program staff on specific groundfish vessels to customize sampling protocols	Ongoing	Ongoing	Ongoing	Improved sampling precision and reduction in bias. Improvements in vessel-specific and overall estimates of catch and bycatch.	Yes	No	Yes
8	Evaluate technologies suitable for monitoring groundfish fisheries	Complete contract to evaluate candidate technologies	Conduct field testing if funds available	Implement as appropriate and cost effective	Basis for determining best mix of technological and human resources to address specific monitoring needs. Potential for improved bycatch estimates.	Possibly subsequent	Initial	Yes

Activity Number	Action	2004	2005	Beyond	Outcome	Type of Activity		
						Monitoring	Research	Management
9	Develop approaches for optimizing observer deployment and tasking	Initiate contract and complete initial evaluation	Develop system and evaluate capabilities	Implement in Gulf of Alaska as appropriate and subject to funding and regulatory authority	Improved efficiency in allocation of observer resources. Flexibility in assigning observers based on priorities, logistics, and costs.	Subsequent	Initial	Yes
10	Change observer service delivery model to improve flexibility and data quality	Evaluate alternatives and conduct draft rulemaking	Complete rulemaking & develop implementation plan	Implement if supported by statutory and regulatory provisions.	Improved efficiency in allocation of observer resources. Flexibility in assigning observers based on priorities, logistics, and costs.	Yes	Yes	Yes
11	Review compliance issues associated with current bycatch reduction programs	Initiate review	Complete review, develop recommendations and draft strategy	Implement strategy	Bycatch reduction programs which greatly reduce or eliminate incentives for interfering with monitoring	Yes	Yes	Yes
12	Promote the use of electronic logbooks to facilitate identification and correction of bias in estimating bycatch for unobserved vessels	Expand contract to provide e-logbook software to fishing vessels if funds available	Extend contract if funds are available	Extend contract if funds are available	More complete, accurate and timely data will be available to identify and correct for bias in estimating bycatch for unobserved vessels	Ongoing	Initial (to make effective use of improved data)	Maybe
13	Promote interagency efforts to develop electronic reporting of landings data by trip	Participate in interagency meeting to develop an electronic reporting system	If feasible, implement more extensive electronic reporting and use that data to improve SBRMs	Continue to improve electronic reporting systems and the SBRMs	More complete, accurate and timely data will be available to identify and correct for bias in estimating bycatch for unobserved vessels	Ongoing	Initial (to make effective use of improved data)	Maybe



Activity Number	Action	2004	2005	Beyond	Outcome	Type of Activity		
						Monitoring	Research	Management
14	Evaluate the need for additional compliance resources to maintain the integrity of observer data.	Initiate evaluation.	Pursue additional resources if justified.	Utilize additional compliance resources.	Decreased occurrences of interference with observer sampling or reporting by crew and stricter adherence to performance requirements by observers.	Subsequent	Initial	Maybe
15	Initiate development of behavior measures for delayed mortality in discards from fisheries	Initiate research	Complete research and prepare findings	Use findings to improve SBRMs	The development of new, sensitive behavioral measures of delayed mortality in discards from fisheries will improve the SBRMs and the resulting estimates of bycatch mortality and could be used to improve discard procedures.	Subsequent	Initial	Maybe
16]	Initiate studies of the effect of environmental factors on swimming behavior and performance in fish caught by trawl	Initiate research	Complete research and prepare findings	Use findings to improve SBRMs	Research results will be used: (1) to predict how these stress effects may control immediate and delayed mortality of fish that escape from trawls and (2) to develop new strategies for reduction and elimination of mortality in fish that escape from trawls as a result of bycatch reduction devices (BRD).	Subsequent	Initial	Maybe

Activity Number	Action	2004	2005	Beyond	Outcome	Type of Activity		
						Monitoring	Research	Management
<b>Pacific Halibut Fishery</b>								
17	Evaluate potential for placing observers on commercial halibut vessels	Establish contract if funds available, develop priorities and sampling protocols, and address safety concerns	Complete study, analyze results, develop recommendations	Implement if cost effective and supported by regulations	Basis for evaluating costs and benefits associated with direct observation of bycatch on halibut vessels	Subsequent	Initial	Yes

**NOAA Fisheries Objectives, Protocol, and Recommended Precision Goals  
for Standardized Bycatch Reporting Methodologies  
[final draft version]**

In 1996, Congress amended the Magnuson-Stevens Fishery Conservation and Management Act (MSA) in part to define the term “bycatch” as well as to require that it be minimized to the extent practicable. National Standard 9 of the MSA requires that “conservation and management measures shall, to the extent practicable, (A) minimize bycatch and (B) to the extent bycatch cannot be avoided, minimize the mortality of such bycatch” (16 U.S.C. § 1851(9)). Section 303 of the MSA expands on this requirement somewhat, stating that fishery management plans (FMPs) are required to “establish a standardized reporting methodology to assess the amount and type of bycatch occurring in the fishery” (16 U.S.C. § 1853(11)). The MSA requirement for a standardized bycatch reporting methodology (SBRM) for each FMP fishery is intended to address only the bycatch of fish, where “fish” is defined to include all living marine resources, including sea turtles but excluding marine mammals and seabirds.

Based on its stewardship responsibilities defined elsewhere in the MSA and in the Marine Mammal Protection Act (MMPA), the Endangered Species Act (ESA), and the National Environmental Policy Act (NEPA), NOAA Fisheries believes that: (1) the SBRM for each FMP fishery should address the bycatch of marine mammals and seabirds, as well as fish and sea turtles, and (2) an effective and efficient SBRM should be established for each federally managed fishery and for each MMPA Category I and II fishery<sup>1</sup>. Such an SBRM will improve the bycatch estimates for each fishery, which will improve both the estimates of total catch and the scientific basis for making the often interdependent decisions concerning the reductions in bycatch to be attained and the methods to be used to attain those reductions.

This document identifies the SBRM objectives, protocol, and recommended precision goals that NOAA Fisheries has established to meet its stewardship responsibilities for monitoring bycatch. The actions that are being taken by the agency and the Fishery Management Councils to further reduce bycatch are addressed elsewhere.

NOAA Fisheries has established the following SBRM objectives:

- The development and documentation of an effective and efficient SBRM for each federally managed fishery and each MMPA Category I and II fishery.
- The periodic review of the SBRM for each of these fisheries.
- The development of more effective and efficient methods for estimating bycatch or total catch.

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<sup>1</sup> Category I and II fisheries include both federally and state managed fisheries.

The combination of data collection and analyses that is used to estimate bycatch in a fishery constitutes the SBRM for that fishery. For example, an at-sea observer program, effort and landings data collection, and analyses to estimate overall bycatch can constitute an SBRM. NOAA Fisheries, working with the Fishery Management Councils, has implemented some or all of the elements of an SBRM for each federally managed fishery and each MMPA Category I and II fishery.

To assist in meeting these objectives, NOAA Fisheries has established the following protocol for SBRMs:

- The deployment of at-sea observers in most cases as the preferred method for collecting bycatch data.
- The use of appropriate sampling design as determined by the objectives of the observer program, which include providing a scientific and statistically valid basis for estimating bycatch or total catch.
- The use of appropriate models for combining observer data with effort, landings, and/or other data to obtain accurate estimates of total bycatch or total catch.
- The use of additional appropriate methods to identify and decrease sources of bias.
- The goal of achieving recommended levels of precision (20-30% CV) in estimating bycatch from observer data.
- The adherence to standards established by NOAA Fisheries to ensure the integrity and quality of the data collected in NOAA Fisheries-approved observer programs.
- Where appropriate, the use of other monitoring methods for estimating bycatch (e.g., using data from experimental tows, fishery-independent survey data, data from electronic monitoring technology, strandings data, or self-reported data).

At-sea observer program sampling designs should be formulated to achieve precision goals for the least amount of observation effort, while also striving to increase accuracy. These designs require the development of appropriate sampling strata and sampling allocation procedures. The overall design of a bycatch monitoring program should address the potential for observer effect bias. An observer effect bias exists either if fishing practices change for trips or sets that are observed or if crew members take actions to prevent accurate catch or bycatch estimates for observed sets. In some cases, a compliance program will be needed to decrease the latter source of bias.

Observer sampling programs are driven by recommended precision goals that address management needs for estimating management quantities such as allowable catches through a stock assessment, for evaluating bycatch relative to a management standard such as allowable take, and for developing mitigation mechanisms. The recommended precision goals for estimates of bycatch are defined in terms of the coefficient of variation (CV) of each estimate.

The recommended precision goals for estimates of bycatch, in general, are as follows:

*Protected Species*

For marine mammals and other protected species, including seabirds and sea turtles, the recommended precision goal is a 20-30% CV for estimates of bycatch for each species/stock taken by a fishery.

*Fishery Resources*

For fishery resources, excluding protected species, caught as bycatch in a fishery, the recommended precision goal is a 20-30% CV for estimates of total discards (aggregated over all species) for the fishery; or if total catch cannot be divided into discards and retained catch then the recommended goal for estimates of total catch is a CV of 20-30%.

These CV goals are levels of precision to which NOAA Fisheries strives to achieve. However, it is important to recognize that (1) there are intermediate steps in increasing precision which may not immediately achieve the goals; (2) there are circumstances in which higher levels of precision may be desired, particularly when management is needed on fine spatial or temporal scales; (3) there are circumstances under which meeting the precision goal would not be an efficient use of public resources; and (4) there may be significant logistical constraints to achieving the goal. However, a decision to accept lower precision should be based on analyses and understanding of the implications of that decision. Therefore, flexibility should be considered when setting CV targets. For example, the rare-event nature of encounters with some protected species might mean that CV's of 20-30% cannot be attained and that precision in absolute numbers be considered. In such cases more adaptive management-observation systems may be needed. Also, if CV's of 20-30% for *individual* fishery species can be obtained and are needed for management, then this precision should be encouraged.

NOAA Fisheries recognizes that when there are multiple objectives for an observer program, the objective of better estimates of bycatch or total catch needs to be balanced with other program objectives to obtain an optimal sampling design.

To assist both in establishing an effective and efficient SBRM for each federally managed fishery and each MMPA Category I and II fishery and in periodically reviewing the SBRM for each of these fisheries, NOAA Fisheries will work cooperatively with stakeholders to:

- Identify the appropriate mix of methods to be used to estimate bycatch or total catch;
- Develop the sample design for at-sea observation programs;
- Estimate the precision of the estimates of bycatch or total catch;
- Identify and decrease sources of bias, including the observer effect bias; and
- Identify the appropriate sample size(s).

NOAA Fisheries recognizes that many of the characteristics of an appropriate SBRM will be determined by a variety of factors that are both fishery and time-specific. Therefore, the SBRMs that result from these cooperative efforts often will differ by fishery and vary over time.

In many instances, NOAA Fisheries will establish, review and improve SBRMs collaboratively with the Regional Fishery Management Councils, MMPA Take Reduction Teams, other fishery management agencies, the fishing industry, the environmental community, university or private sector researchers, and other stakeholders. In most cases, a NOAA Fisheries Regional Office or Science Center will take the lead and be principally responsible for implementing the SBRM objectives and protocol for specific fisheries.

The ability of NOAA Fisheries to improve the SBRMs by implementing its SBRM objectives, protocol and precision goals will depend on the funding and staffing resources that will be available. Therefore, it will pursue adequate, stable and equitable sources of funding for the following: (1) enhanced bycatch monitoring programs; (2) if necessary, additional monitoring methods or a compliance program to address the observer effect bias; and (3) the research and analysis that are necessary to implement a more effective and efficient SBRM for each fishery, and to periodically evaluate each SBRM and determine how to improve it in a cost-effective manner.

In general, NOAA Fisheries should be expected to use funds appropriated by Congress or collected from the fishing industry to pay for standard bycatch collection as required under its MSA, MMPA, and ESA mandates to monitor bycatch. For bycatch data collection during fishing activities that NOAA Fisheries might otherwise not allow (e.g., experimental or exempted fishing permits), fishing vessel operators or grantees may be required to fund the observers or other data-collection mechanism, following the SBRM protocol.

It is unlikely that adequate funding will be available to immediately assess the need to enhance the SBRM for each fishery, and to make the necessary enhancements. Therefore, NOAA Fisheries will use an efficient and equitable mechanism for allocating the funds that are made

**North Pacific Fishery Management  
Council  
February 2004**

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D-1(a)

Groundfish Management

Review National Bycatch Strategy

and

Alaska Region Report

# National Bycatch Strategy

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On March 6, 2003, NOAA Fisheries released a six-part National Bycatch Strategy to improve its ability to meet its stewardship responsibilities and statutory obligations to monitor and reduce bycatch.

These responsibilities and obligations are defined under various laws, including the Magnuson-Stevens Fishery Conservation and Management Act (MSA), the Marine Mammal Protection Act (MMPA), the Endangered Species Act (ESA), the National Environmental Policy Act (NEPA), and the Migratory Bird Treaty Act.



# National Bycatch Strategy (Continued)

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The National Bycatch Strategy is based on the 1998 NOAA Fisheries report, *Managing the Nation's Bycatch* (MTNB), which contains the agency's national bycatch goal, "to implement conservation and management measures for living marine resources that will minimize, to the extent practicable, bycatch and the mortality of bycatch that cannot be avoided."

NOAA Fisheries, along with the regional fishery management councils, fishermen and other stakeholders, has made significant progress in bycatch reduction over the past several years. The National Bycatch Strategy identifies actions the agency will take to ensure continued progress.

# National Bycatch Strategy

## (Continued)

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NOAA Fisheries believes this strategy provides the most efficient and effective plan to achieve further success in reducing bycatch

Bycatch working definition (slightly modified from MTNB):

Discarded catch of any living marine resource and unobserved mortality due to a direct encounter with fishing gear. When possible and appropriate, retained incidental catch must also be considered as bycatch.

# **National Bycatch Strategy**

## **(Continued)**

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In response to a request from an environmental advocacy group to reduce bycatch through fishery regulations and related public comments, NOAA Fisheries updated its strategy to achieve significant results in reducing bycatch.

NOAA Fisheries Director Bill Hogarth said "Minimizing bycatch is one of the most important things we can do to conserve fish and other marine species. We are continuing to work with fishermen to find ways to reduce unintentional catches, and this strategy will allow us to renew our commitment to bycatch reduction efforts and update our 1998 strategy."

# National Bycatch Strategy

## (Continued)

The NOAA Fisheries National Bycatch Strategy contains six components:

- Assess progress toward meeting the national bycatch goal
- Develop a national approach to a standardized bycatch reporting methodology
- Implement the national bycatch goal through regional implementation plans
- Undertake education and outreach involving cooperative efforts, at the regional level (and other levels as appropriate), by fishery managers, scientists, fishermen, and other stakeholders to develop effective and efficient methods for reducing bycatch.
- Utilize existing partnerships and develop new international approaches to reducing bycatch of living marine resources including fish stocks, sea turtles, marine mammals, and migratory birds, where appropriate.
- Identify new funding requirements to effectively support the NMFS National Bycatch Strategy on an ongoing basis

# **National Bycatch Strategy**

## **Products to Date for Components 1 - 3**

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- A final draft Bycatch Assessment Report was prepared for each Regional Bycatch Team (July 2003)
- The following final draft documents were completed by the National Working Group on Bycatch (NWGB) (December 2003)
  - Evaluating Bycatch: A National Approach to Standardized Bycatch Monitoring Programs
  - NOAA Fisheries Objectives, Protocol, and Recommended Precision Goals for Standardized Bycatch Reporting Methodologies (SBRM)
- A final draft report, Current Bycatch Priorities and Implementation Plan, was prepared by each Regional Bycatch Team December 2003)

Note: The SBRM document summarizes the main conclusions and policy recommendations in the full NWGB report. The documents for Components 2 and 3 are available at:  
<http://www.nmfs.noaa.gov/bycatch.htm>

# **Final Draft**

## **Alaska Region Current Bycatch Priorities and Implementation Plan**

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This is a working document that will be revised in the future as additional, practicable bycatch reduction opportunities occur and as the Council and public contribute to it.

# Plan Objectives

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- Improve the Standardized Bycatch Reporting Methodologies (SBRMs) for the Alaska fisheries addressed in this plan
- Improve our ability to estimate the biological, ecosystem, social, and economic effects of bycatch and of alternative methods for reducing bycatch
- Encourage the development and use of gear technologies that provide efficient methods for reducing bycatch
- Develop and implement more effective and efficient management measures to monitor and reduce bycatch
- Improve the outreach activities that assist in meeting the first four objectives and provide information that can be used to address bycatch problems in other fisheries

## **Meeting Plan Objectives**

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To meet these objectives, the Alaska Region and Alaska Fisheries Science Center (AFSC) will work collaboratively with the North Pacific Fishery Management Council (Council), the Alaska Department of Fish and Game, the International Pacific Halibut Commission, other international fishery management or scientific organizations, the fishing industry, the environmental community, university or private sector researchers, and other stakeholders.



# Meeting Plan Objectives

## (Continued)

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- This plan addresses only regulatory actions that currently are under development or review. Given the time that it takes to develop and implement regulatory actions that are both effective and efficient and given the cooperative process that is used to develop such actions, it would be counterproductive for this draft plan to include other actions.
- The plan does not include the implementation of specific regulations.
- The plan identifies high priority bycatch monitoring and research activities that will be undertaken if adequate funding is available.
- Currently, adequate funding is not available.

# Fisheries Addressed in the Plan

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The Plan focuses on the bycatch of:

- All living marine resources in the BSAI and GOA groundfish fisheries and the halibut fishery
- Marine mammals in the state managed, MMPA Category II salmon fisheries.

# **Fisheries Addressed in the Plan**

## **(Continued)**

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Two reasons exist for focusing on the groundfish, halibut, and MMPA category II salmon fisheries:

- The FMPs for the crab, scallop and EEZ salmon fisheries defer most management authority, including basically all bycatch monitoring and management authority, to the State of Alaska.
- For the state managed Category II fisheries, the management responsibilities and authorities of the Alaska Region principally are limited to marine mammals. In those fisheries, monitoring and controlling the bycatch of other living marine resources is a stewardship responsibility of the State of Alaska or the U.S. Fish and Wildlife Service (USFWS)

# **Actions to Improve Standardized Bycatch Reporting Methodologies**

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- Develop improved protocols for observer documentation of seabird interactions and mortalities
- Improve species identification by observers
- Develop and implement methods for shoreside sampling of skates
- Make enhancements to observer sampling for catch composition determination

# **Actions to Improve Standardized Bycatch Reporting Methodologies**

(Continued)

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- Evaluate placement of observers on small (< 60 ft) groundfish vessels
- Certify observer workstations and monitor flow scale testing on certain vessels fishing groundfish
- Place observer program staff on specific groundfish vessels to customize sampling protocols
- Evaluate technologies suitable for monitoring groundfish fisheries
- Develop approaches for optimizing observer deployment and tasking

# **Actions to Improve Standardized Bycatch Reporting Methodologies**

(Continued)

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- Change observer service delivery model to improve flexibility and data quality
- Review compliance issues associated with current bycatch reduction programs
- Promote the use of electronic logbooks to facilitate identification and correction of bias in estimating bycatch for unobserved vessels
- Promote interagency efforts to develop electronic reporting of landings data by trip
- Evaluate the need for additional compliance resources to maintain the integrity of observer data.

# **Actions to Improve Standardized Bycatch Reporting Methodologies**

(Continued)

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- Initiate development of behavior measures for delayed mortality in discards from fisheries
- Initiate studies of the effect of environmental factors on swimming behavior and performance in fish caught by trawl
- Evaluate potential for placing observers on commercial halibut vessels
- Evaluate methods for improving bycatch estimates of marine mammals in state managed MMPA Category II salmon fisheries

# **Actions to Improve Our Ability to Estimate the Biological, Ecosystem, Social, and Economic Effects of Bycatch and of Alternative Methods for Reducing Bycatch**

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- Stock assessments research for non-target groundfish species and seabirds
- Ecosystem research on the effects of bycatch
- Economic and social science data collection and research



# **Actions to Encourage the Development and Use of Gear Technologies That Provide Efficient Methods for Reducing Bycatch**

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The following projects are underway:

- A continuing cooperative project to reduce salmon bycatch during pollock trawling
- A project to study the behavioral response of rock sole to disturbance by bottom trawl ground-gear in order to determine how natural behaviors may be utilized to assist in bycatch reduction efforts in the rock sole fishery.

# **Actions to Encourage the Development and Use of Gear Technologies That Provide Efficient Methods for Reducing Bycatch (Continued)**

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The following gear research projects will be initiated if adequate funding is obtained:

- Research on measuring factors affecting fishing selectivity and bycatch mortality
- Research on effect of environmental and social factors on gear selectivity
- Observe the behavior of seabirds around trawl vessels during setting and hauling of the gear
- Seabird avoidance methods for longline fisheries

# **Actions to Develop and Implement More Effective and Efficient Management Measures to Reduce Bycatch**

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The Plan emphasizes the role fishery rationalization can play in managing bycatch.

The following eight management actions are identified:

- Enforcement Interval Change for Pollock Maximum Retainable Allowances (MRA)
- Minimum Groundfish Retention Standard (FMP Amendment 79)
- Harvesting Cooperatives for the BSAI Head and Gut Catcher Processors (FMP Amendment 80)

# **Actions to Develop and Implement More Effective and Efficient Management Measures to Reduce Bycatch**

(Continued)

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- Establish a New Program for Observer Procurement and Deployment in the North Pacific
- Non-target Species Management
- GOA Groundfish Fishery Rationalization
- Essential Fish Habitat (EFH)
- New PSC limits for GOA groundfish fisheries (Inadvertently omitted from Dec. 2003 Draft Plan)

# **Basis for Actions to Improve the Outreach Programs**

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The design of the Alaska Bycatch Implementation Plan is based on the following beliefs.

- Better information is needed to address the bycatch problems effectively and efficiently.
- NOAA Fisheries is the best source for only some of that information.
- A collaborative effort is needed to provide the desired information.
- The usefulness of that information is determined by how effectively it is shared.

# **Actions to Improve the Outreach Programs**

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- Improve bycatch information available to industry
- Improve bycatch information available to fishery managers and other stakeholders, including the public at large
- Obtain better bycatch information
- Participation in international efforts to address bycatch problems

# **Alaska Region Current Bycatch Priorities and Implementation Plan What is Next?**

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NOAA Fisheries, will work with the Council and other stakeholders to improve and implement the Plan.

**D-1(a) Groundfish Management  
Review National Bycatch Strategy and Alaska Region  
Report**

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End of Presentation



**FINAL DRAFT**

**Alaska Region Current Bycatch Priorities and Implementation Plan**

NOTE: This is a working document that will be revised in the future as additional, practicable bycatch reduction opportunities occur.

**December 3, 2003**

# FINAL DRAFT

## SUMMARY

### **Alaska Region Current Bycatch Priorities and Implementation Plan**

[NOTE: This is a working document that will be revised in the future as additional, practicable bycatch reduction opportunities occur.]

#### **Improving Standardized Bycatch Reporting Methodologies (SBRMs)**

Improved SBRMs will be developed with research projects and they will be implemented with policy and regulatory actions. The regulatory actions will be developed and implemented cooperatively with the Council. The following will be done to improve the SBRMs.

1. Develop improved protocols for observer documentation of seabird interactions and mortalities
2. Improve species identification by observers
3. Develop and implement methods for shoreside sampling of skates
4. Make enhancements to observer sampling for catch composition determination
5. Evaluate placement of observers on small (< 60 ft) groundfish vessels
6. Certify observer workstations and monitor flow scale testing on certain vessels fishing groundfish
7. Place observer program staff on specific groundfish vessels to customize sampling protocols
8. Evaluate technologies suitable for monitoring groundfish fisheries
9. Develop approaches for optimizing observer deployment and tasking
10. Change observer service delivery model to improve flexibility and data quality
11. Review compliance issues associated with current bycatch reduction programs
12. Promote the use of electronic logbooks to facilitate identification and correction of bias in estimating bycatch for unobserved vessels
13. Promote interagency efforts to develop electronic reporting of landings data by trip
14. Evaluate the need for additional compliance resources to maintain the integrity of observer data.
15. Initiate development of behavior measures for delayed mortality in discards from fisheries
16. Initiate studies of the effect of environmental factors on swimming behavior and performance in fish caught by trawl
17. Evaluate potential for placing observers on commercial halibut vessels
18. Evaluate methods for improving bycatch estimates of marine mammals in state managed MMPA Category II salmon fisheries

## **Improve Our Ability to Estimate the Biological, Ecosystem, Social, and Economic Effects of Bycatch and of Alternative Methods for Reducing Bycatch**

Due to the size of the groundfish fisheries and the levels of bycatch in those fisheries, these activities will be focused on the groundfish fisheries. The following types of activities will be continued and expanded as funding permits:

1. Stock assessments research for non-target groundfish species and seabirds
2. Ecosystem research on the effects of bycatch
3. Economic and social science data collection and research

## **Encourage the Development and Use of Gear Technologies That Provide Efficient Methods for Reducing Bycatch**

Gear technology and fish behavior research will be continued and expanded as funding permits. Two specific projects are as follows:

1. A continuing cooperative project to reduce salmon bycatch during pollock trawling and
2. A project to study the behavioral response of rock sole to disturbance by bottom trawl ground-gear in order to determine how natural behaviors may be utilized to assist in bycatch reduction efforts in the rock sole fishery.

## **Develop and Implement More Effective and Efficient Management Measures to Reduce Bycatch**

This plan addresses only regulatory actions that currently are under development or review. Given the time that it takes to develop and implement regulatory actions that are both effective and efficient and given the cooperative process that is used to develop such actions, it would be counterproductive for this draft plan to include other actions. The specific actions are as follows:

1. Enforcement Interval Change for Pollock Maximum Retainable Allowances (MRA)
2. Minimum Groundfish Retention Standard: Proposed FMP Amendment 79
3. Harvesting Cooperatives for the BSAI Head and Gut Catcher Processors: Proposed FMP Amendment 80
4. Establish a New Program for Observer Procurement and Deployment in the North Pacific
5. Non-target Species Management
6. GOA Groundfish Fishery Rationalization
7. Essential Fish Habitat (EFH)

**Improve the Outreach Activities That Assist in Meeting the First Four Objectives and Provide Information That Can Be Used to Address Bycatch Problems in Other Fisheries**

Actions to be taken to improve outreach programs are categorized as follows:

1. Improve bycatch information available to industry
2. Improve bycatch information available to fishery managers and other stakeholders, including the public at large
3. Obtain better bycatch information
4. Participation in international efforts to address bycatch problems

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- 3.5.3 Obtain better bycatch information
- 3.5.4 Participation in international efforts to address bycatch problems

Table 1      Actions to improve SBRMs for the BSAI and GOA groundfish fisheries and the Pacific halibut fishery

## 1. Introduction

On March 11, 2003, the National Marine Fisheries Service (NMFS) initiated a six-part National Bycatch Strategy to improve its ability to meet its stewardship responsibilities and statutory obligations to monitor and reduce bycatch. These responsibilities and obligations are defined under various laws, including the Magnuson-Stevens Fishery Conservation and Management Act (MSA), the Marine Mammal Protection Act (MMPA) the Endangered Species Act (ESA), the National Environmental Policy Act (NEPA), and the Migratory Bird Treaty Act.

The first component of the announced Strategy is a comprehensive review of the agencies progress toward meeting the National Bycatch Goal, which had been described in a 1998 report entitled *Managing the Nations Bycatch* (NMFS 1998). The second component of the Strategy is the development of national policy and guidance on standardized bycatch reporting methodologies which are required by the MSA. The resulting report, *Evaluating Bycatch: a National Approach to Standardized Bycatch Monitoring Programs* (NMFS 2003), concluded that at-sea observation (observers or digital observation) typically provides the best mechanism to obtain reliable and accurate bycatch estimates. The third component, to which this document contributes, consists of further implementing the national bycatch goal through regional bycatch implementation plans.

The objectives for this plan are listed below.

1. Improve the Standardized Bycatch Reporting Methodologies (SBRMs) for the Alaska fisheries addressed in this plan;
2. Improve our ability to estimate the biological, ecosystem, social, and economic effects of bycatch and of alternative methods for reducing bycatch;
3. Encourage the development and use of gear technologies that provide efficient methods for reducing bycatch;
4. Develop and implement more effective and efficient management measures to monitor and reduce bycatch; and
5. Improve the outreach activities that assist in meeting the first four objectives and provide information that can be used to address bycatch problems in other fisheries.

To meet these objectives, the Alaska Region and Alaska Fisheries Science Center (AFSC) will work collaboratively with the North Pacific Fishery Management Council (Council), the Alaska Department of Fish and Game, the International Pacific Halibut Commission, other international fishery management or scientific organizations, the fishing industry, the environmental community, university or private sector researchers, and other stakeholders.

This bycatch implementation plan includes numerous actions that will assist the Alaska Region in meeting its stewardship responsibilities with respect to monitoring and decreasing bycatch. This includes actions that comply with the U.S. National Plan of Action for Reducing the Incidental Catch of Seabirds in Longline Fisheries, which was jointly developed by NMFS, U.S. Fish & Wildlife Service (USFWS) and the Department of State in response to the United Nations' Food & Agriculture Organization's International Plan of Action for Reducing the Incidental Catch of Seabirds in Longline Fisheries that was adopted in 1999.

The actions that the Alaska Region will take to meet these objectives are discussed below by objective. Some of the actions will have more immediate effects on bycatch. However, others that will improve our ability to estimate bycatch, to determine the extent to which bycatch should be reduced and to implement effective and efficient methods for attaining those reductions will have less immediate impacts on the levels of bycatch, but will contribute substantially to solving the bycatch problems in Alaska fisheries.

The ability of the Alaska Region to rapidly and fully meet these objectives depends on a variety of factors, and the Region has limited control over some of those factors. For example, the resources that are available to address bycatch problems are determined to a great extent by Congress and by the need to meet other stewardship responsibilities. Similarly and appropriately, the Council process is used to develop regulatory actions to improve bycatch monitoring and to reduce bycatch. Therefore, in the case of regulatory actions, the plan includes actions to promote the development of more effective and efficient regulations and it identifies the regulatory actions that are being developed cooperatively by the Council and the Alaska Region or have been adopted by the Council and are currently under review by the Alaska Region. The plan does not include the implementation of specific regulations. Similarly in the case of bycatch monitoring and research, the plan identifies high priority activities that will be undertaken if adequate funding is available. Currently, adequate funding is not available.

## **2. Alaska Regional Fisheries**

Fishery management plans (FMPs) have been implemented for the Bering Sea/Aleutian Islands area (BSAI) and Gulf of Alaska (GOA) groundfish fisheries, the BSAI crab fisheries, the Alaska scallop fishery, and the salmon troll fishery in the US Exclusive Economic Zone (EEZ) off Southeast Alaska. In addition, the Alaska Pacific halibut fishery is managed under federal regulations and the Alaska Region is responsible for monitoring the incidental takes of marine mammals in state managed fisheries that have been designated as Category II fisheries under the MMPA. The Alaska Bycatch Implementation Plan focuses on the bycatch problems for all living marine resources in the BSAI and GOA groundfish fisheries and the halibut fishery and on the bycatch of marine mammals in the state managed, MMPA Category II salmon fisheries. There are two reasons for this. First, the FMPs for the crab, scallop and EEZ salmon fisheries defer most management authority, including basically all bycatch monitoring and management authority, to the State of Alaska. Second, with respect to the state managed Category II fisheries, the management responsibilities and authorities of the Alaska Region are limited to marine



mammals. In those fisheries, monitoring and controlling the bycatch of other living marine resources is a stewardship responsibility of the State of Alaska or the U.S. Fish and Wildlife Service (USFWS).

## 2.1 BSAI and GOA Groundfish Fisheries

Bycatch monitoring and reduction measures have been incorporated into the FMPs for the BSAI and GOA groundfish fisheries since the FMPs were implemented in the late 1970s and early 1980s. These measures were directed at foreign fleets initially, but increasingly were directed at the domestic fleet as the fishery transformed from foreign, to joint venture, and finally to fully domestic operations by the early 1990s.

The main target species or species groups are Alaska pollock, Pacific cod, sablefish, rockfish, flatfish, and Atka mackerel. Trawl, hook and line (including longline and jig gear) and pot gear account for virtually all the catch in the BSAI and GOA groundfish fisheries. The selectivity of each gear type in the multi-species groundfish fisheries varies by gear configuration, target species, area, and time of year. In recent years, trawl fisheries on average accounted for about 90% of the total groundfish catch; however for some species, such as Pacific cod and sablefish, substantially more than 50% of the catch is taken with fixed gear. Catcher vessels and catcher/processor vessels operate in the trawl, longline and pot fisheries. In 2002, catcher vessels less than 60 feet in length accounted for about 1% of the total groundfish catch, larger catcher vessels took about 46% of the total, and catcher/processers took about 53% of the total.

The bycatch monitoring program for the groundfish fisheries currently consists of extensive self reporting requirements and an observer program designed to quantify total catch, including discarded catch of target and non-target fish species and non-fish species such as seabirds and marine mammals. In the BSAI and GOA groundfish fisheries, total catch, including the retained and discarded catch of target and non-target species of living marine resources, is monitored using data from both mandatory self reporting programs and an extensive at-sea observer program. Generally each fishing vessel of at least 125' in length is required to have an observer on board anytime it is fishing; and each vessel from 60 - 125' is required to have an observer onboard during 30% of its fishing days. No observer requirements have been established for vessels less than 60' due to cost, lack of funding, logistic constraints and the fact that catch from these vessels generally represents only a very small percentage of total catch in the groundfish fisheries. Observer coverage requirements for fish processing plants are established that vary by a plant's monthly levels of production. The observers are supplied by observer providers who are paid directly by the fishing and processing operations for which they supply observers.

There were approximately 35,000 observer deployment days in 2002, including over 30,000 deployment days on catcher vessels, catcher/processers and motherships. It is estimated that the fishing and processing operations paid more than \$12 million for those 35,000 observer deployment days. In 2001, vessels with observers onboard accounted for almost 90% of the total groundfish catch in the BSAI and about 34% of the total in the GOA. Data provided by the

Observer Program are a critical element in the conservation and management of groundfish, other living marine resources, and their habitat. For example, these data are used for: (1) assessing the status of groundfish stocks; (2) setting groundfish quotas and monitoring them in-season; (3) monitoring the bycatch of non-groundfish species in-season; (4) assessing the effects of the groundfish fishery on other living marine resources and their habitat; and (5) assessing methods for improving the conservation and management of groundfish, other living marine resources and their habitat. The Observer Program also provides the industry with bycatch data it needs to make timely fishing decisions that decrease bycatch and increase productivity.

The nature of the bycatch problem and associated management responses have had a basis in both allocation and conservation issues. Allocation issues generally involve fully utilized species taken incidentally in other target fisheries (e.g. crab and halibut in the groundfish fisheries). Conservation issues also exist in the case of protected species taken incidentally in fishing activities (e.g., marine mammal bycatch in the trawl fisheries and seabird bycatch in the hook-and-line fisheries). Conservation issues and potential overfishing concerns also exist for some non-target groundfish species such as rockfish or skates taken incidentally in the groundfish trawl or hook-and-line fisheries.

A variety of factors contribute to the bycatch problems in the Alaska groundfish and make them more difficult to solve. The factors include: (1) the multi-species nature of the bycatch problem; (2) limited information concerning the biological, ecological, social, and economic effects both of bycatch and of alternative methods for reducing bycatch; (3) substantial excess harvesting capacity; (4) the use of the race for fish to allocate quotas among competing fishing operations; and (5) the external benefits and costs associated with bycatch.

Numerous management measures have been implemented to reduce bycatch. They include closed and restricted areas, bycatch limits, gear restrictions, species allocations to gears with lower bycatch rates, individual fishing quota programs, and an improved retention and utilization program for Pacific cod, pollock, and Gulf of Alaska shallow water flatfish. Much attention now is focused on fishery rationalization programs, including new IFQ programs or fishery cooperatives, and their attendant impacts on bycatch.

Research initiatives directed at reducing bycatch are ongoing under partnerships among Alaska Fisheries Science Center (AFSC) scientists, other scientists and industry interests under exempted fishing permits. Recent gear technology research has identified practicable methods to reduce bycatch. They include halibut and salmon excluder devices in trawl gear, trawl gear modifications to avoid crab bycatch and incidental mortality, and gear configuration and deployment modification to avoid gear interactions with seabirds.

The following comparisons of catch and bycatch estimates for 1996 and 2002 for the BSAI and GOA groundfish fisheries provide an indication of the success of the bycatch reduction efforts since the MSA was amended in 1996. Although total groundfish catch increased by 2.5%, groundfish discards decreased by 50%, the discard rate for groundfish decreased to 6.8%, halibut

bycatch mortality decreased by 8%, herring bycatch decreased by 91%, salmon bycatch decreased by 15%, and crab bycatch decreased by 52%. The bycatch rates in the Alaska groundfish fishery are relatively low compared to most other major fisheries in the U.S. or elsewhere; however, the absolute levels of bycatch are high due to the size of the groundfish fishery. In 2002, total groundfish catch exceeded 2.1 million metric tons (t), and bycatch included about 142,000 t of groundfish, 6,100 t of halibut mortality, 137,000 (individual) salmon, 133 t of herring, and almost 3 million (individual) crab (mostly snow and Tanner crab). Plans to further improve bycatch monitoring and to reduce bycatch in the BSAI and GOA groundfish fisheries are discussed in Section 3.

## 2.2 Pacific Halibut Fishery

Commercial, recreational and subsistence users fish for halibut in Alaska. These are hook and line fisheries and the vast majority of the commercial catch is taken with longline gear. The International Pacific Halibut Commission (IPHC) has the primary responsibility for managing the halibut resource off Alaska. Under authority of the North Pacific Halibut Act, the Council is authorized to develop regulations that are in addition to, but not in conflict with, regulations adopted by the IPHC. The Council adopted an individual fishing quota (IFQ) for the commercial Alaska halibut fishery in 1992. NOAA Fisheries implemented the program in 1995. Under the IFQ program, individual fishermen were assigned a quota share based on past participation in the fishery and other criteria developed by the Council. The annual halibut quota established by the IPHC is allocated among fishermen based on their individual quota shares. These quota shares are transferable harvest privileges within specified limitations. Under the IFQ program, fishermen are able to harvest their halibut IFQ whenever and however such harvest is most economical to their fishing operation, subject to program limitations and seasons. The higher catch limits in recent years reflect healthier stock conditions. Commercial halibut fishery landings in 2002 were almost 61 million pounds and generated about \$130 million of ex-vessel revenues.

The halibut fishery does not have an observer program to monitor bycatch. However, logbook data are used by the IPHC to estimate adult halibut mortality due to lost/abandoned gear in the halibut fishery and the IPHC stock assessment surveys collect bycatch data for undersized halibut and for other species. In addition, bycatch data are available for joint groundfish and halibut trips for which a groundfish observer is on board. Although mandatory retention requirements exist for incidental catch of rockfish and Pacific cod, the level of compliance is unknown. Therefore, the uncertainty concerning the level of bycatch of some groundfish species, such as demersal shelf rockfish, is a concern. Seabird bycatch mortality is of concern, and gear and fishery operation regulations are used to reduce seabird bycatch. Plans to address these bycatch concerns are addressed in Section 3.

## 2.3 State Managed MMPA Category II Salmon Fisheries

There is a federal FMP for the relatively small salmon troll fishery in the EEZ off Alaska;

however, the FMP defers management to the State of Alaska. All other salmon fisheries are strictly state managed. Over ten Alaska salmon fisheries are classified as Category II fisheries under the MMPA. An observer program in the Prince William Sound, Cook Inlet, and Kodiak Island salmon drift and set gillnet fisheries documented seabird bycatch and incidental takes of marine mammals. Results confirmed the Category II classification of most of the observed fisheries, and re-classified two fisheries to Category III. The Alaska Region is currently developing a more comprehensive observer program for other Alaska salmon fisheries with the primary focus of determining the nature and extent of marine mammal interactions in these fisheries; seabird and other bycatch information will also be collected.

The MMPA sets out several goals for which observer data are used: 1) determination whether the potential biological removal level of a stock is exceeded; 2) categorization of each fishery in the annual List of Fisheries; and 3) determination of whether a fishery has approached a zero mortality rate for marine mammals. These goals each require an increasing level of precision and accuracy in estimates of serious injury and mortality. Determination of appropriate observer coverage levels to meet the needs of accuracy and precision is currently the subject of serious interest to NOAA Fisheries' National Observer Program Advisory Team, and specific coverage levels for this program still need to be assessed. Currently, the Alaska marine mammal program observes state-managed salmon fisheries on a rotational basis, with one or two fisheries observed per year for two consecutive years each at approximately 5% coverage. With over ten Category II fisheries to monitor for marine mammal bycatch, ten or more years may elapse before a fishery is observed again. Trends in fishery operations and marine mammal populations can change significantly in the intervening years, easily rendering observer data out of date; accuracy and precision of estimates are difficult to achieve on this schedule as well. The program would ideally observe fisheries more frequently (probably no more than 5 years between observing a single fishery) and for more than two consecutive years in each rotation (probably 3-4 consecutive yrs). The current limiting factor in the development of this program is funding. Due to the remoteness of many of the fisheries, the average cost of observing one fishery is over \$1 million per year, although cost savings can be realized in combining concurrent observation of geographically proximal fisheries.

Commercial fishing is conducted in both state and federal waters by about 5,000 relatively small fishing vessels using troll, drift gill-net, set gill-net, and purse-seine gear. All five Pacific salmon species are harvested by commercial, recreational, and subsistence fishermen. In 2002, about 610 million pounds of salmon were landed in the commercial fishery with an ex-vessel revenue of about \$130 million. Due principally to depressed prices, this is the lowest ex-vessel revenue for the Alaska salmon fisheries in more than 20 years.

The intercepts of salmon, including ESA-listed Pacific Northwest stocks, passing through the marine waters off the coast of Alaska on their way to more southerly spawning grounds were the focus of lengthy negotiations and debate among Alaskan, Canadian, and Pacific Coast fishermen, management agencies, and governments. The Northwest Region has the lead for protecting the ESA-listed Pacific Northwest salmon stocks.

Plans to improve the monitoring of marine mammal bycatch in the state managed MMPA Category II salmon fisheries are addressed in Section 3.

### **3. Actions to Meet Plan Objectives**

#### **3.1 Actions to Improve the Standardized Bycatch Reporting Methodologies (SBRMs) for the BSAI and GOA Groundfish Fisheries, the Alaska Pacific Halibut Fishery, and the State Managed MMPA Category II Salmon Fisheries**

##### **3.1.1 BSAI and GOA groundfish fisheries**

Improved SBRMs will be developed with research projects and they will be implemented with policy and regulatory actions. The regulatory actions will be developed and implemented cooperatively with the Council. Expanded outreach efforts will be used for both developing and implementing the improvements. Specific projects are summarized in Table 1. Additional research projects that will be conducted in FY04 and FY05 if adequate funding becomes available are described below.

##### **Research on fish injury and environmental factors affecting escapee and discard mortality**

Bycatch mortality from various sources is dependent on fish condition and environmental factors. Interactions of fish and fishing gear causes injury (wounding, physiological, and behavioral) which is magnified by environmental factors (light, temperature, air exposure). Presently, research in the laboratory determines the role of injury from fishing gear and environmental factors for inducing stress and mortality in fish. Increased funding would increase efforts to design and conduct field experiments to determine fish condition and mortality in a variety of trawl and non trawl gear fisheries under a range of environmental conditions. (\$145,000 per year).

##### **Research on estimation of discard and escape mortality**

To date, only halibut discard mortality rates are estimated and accounted for. Other discard mortalities are assumed to be 100% and mortalities of unobserved escapes are not addressed. Full scale tagging or holding experiments can be used to estimate mortality, or behavioral assays if successfully developed (see below in Behavior section) may be more effective. Significant mortality issues needing attention include: pollock, flatfish and Pacific cod escaping through meshes or excluders, halibut escaping through excluders, and discard mortality for all other discarded species. A number of gear configuration, behavioral, environmental and physiological factors affect bycatch mortality, so this project will be closely coordinated with research on those aspects described above. None of these will be substantially addressed at current funding levels. Approximately \$200,000 and 1 FTE will be needed to initiate a program to evaluate up to one species per year.

### Develop behavior assay of delayed bycatch mortality

While immediate mortality of bycatch can be observed on deck, mortality rates for escapees and discards is generally unknown, especially since delayed mortality can be significant. Prediction of this delayed mortality may best be made using surrogate measures of fish condition that are correlated with delayed mortality, including measures of physical injury and behavior impairment. Present research in the laboratory is developing behavioral assays for delayed mortality of captured fish, including predation on escapees and discards. Increased funding would initiate efforts to design and conduct field experiments measuring delayed mortality using behavior assays in a variety of fisheries (\$140,000).

### Resolve the documented problem of seabird strikes with trawl cables

To resolve the documented problem of seabird strikes with trawl cables, work is currently planned for the FY 04 season where several mitigation devices will be tested. One component of this research will be to document the nature of the interaction and the rate at which it occurs. This work involves 10 dedicated seabird observers spending 60 days each on 10 catcher/processor vessels (5 pelagic and 5 non-pelagic gear vessels). The total funding for this pilot project is estimated at about \$250,000, with about \$210,000 currently earmarked for the project from various sources [North Pacific Research Board (NPRB) grant, NOAA Fisheries, USFWS, and industry]. An additional \$40,000 is needed to implement the project.

### Assessment of seabird underwater drop-off rates

An assessment of seabird underwater drop-off rates for longline gear needs to be conducted. This will require the acquisition of salvaged seabird carcasses from colonies to be used for drop-off experiments, developing an experimental methodology, and implementing a dedicated research cruise. Staff within the Alaska Region have completed some initial coordination with FWS staff in order to have access to salvaged carcasses from albatross colonies. Costs not including vessel charter are about \$70,000. Vessel charter costs will depend on whether or not the vessel is allowed to keep the catch. If it can, and if enough longline sets are authorized to make the fishing activity similar to commercial operations, it is likely that there would be no charter costs.

### 3.1.2 Pacific halibut fishery

As with the groundfish fisheries, an improved SBRM for the Pacific halibut fishery will be developed with research projects and implemented with policy and regulatory actions. Any regulatory actions will be developed and implemented cooperatively with the Council and IPHC. Expanded outreach efforts will be used for both developing and implementing the improvements. The specific project is summarized in Table 1. The annual cost of 10% coverage would be approximately \$1 million. Some of the projects to improve the SBRMs for the groundfish fisheries will also be applicable to the Pacific halibut fishery.

### 3.1.3 State Managed MMPA Category II Salmon Fisheries

Ten salmon net fisheries in Alaska currently are classified as Category II fisheries under the MMPA. An observer program exists that can monitor these fisheries for marine mammal and bird interactions. However, the level of funding currently available may not be adequate to meet monitoring objectives. The specific objectives for these fisheries are as follows: (1) Determine the optimum monitoring level and (2) Fund the Alaska Marine Mammal Observer Program adequately (AMMOP).

Work is underway through the AMMOP to gain a better understanding of the type and magnitude of marine mammal (and seabird) bycatch in salmon gillnet fisheries in Alaska. AMMOP rotates field operations throughout the Alaska fisheries designated as Category II under the MMPA according to conservation needs and available funding. The AMMOP has observed three fisheries since 1999 for interactions between commercial salmon fisheries and marine mammals and seabirds. These fisheries are the Cook Inlet salmon set and drift gillnet fisheries and the Kodiak set gillnet fishery. Prior to 1999, three other fisheries were observed, including the Prince William Sound set and drift gillnet fisheries and the South Unimak set gillnet fishery. In 2004, the second year of a two-year study will be conducted in the Kodiak salmon set gillnet fishery. The Southeast Alaska salmon drift gillnet and purse seine fisheries are expected to be observed sometime between 2005 and 2010. In addition to the Southeast fisheries, the Bristol Bay salmon set and drift gillnet fisheries and the Yakutat salmon set gillnet fishery will be observed in this rotation prior to returning to observe fisheries previously observed. The total estimated cost of AMMOP operations for FY 04 is \$1.4 million. As with the groundfish and halibut fisheries, the feasibility of using alternative technologies for monitoring bycatch in these fisheries will be evaluated.

### 3.2 Actions to Improve Our Ability to Estimate the Biological, Ecosystem, Social, and Economic Effects of Bycatch and of Alternative Methods for Reducing Bycatch

Due to the size of the groundfish fisheries and the levels of bycatch in those fisheries, efforts to improve our ability to estimate the biological, ecosystem, social, and economic effects of bycatch and of alternative methods for reducing bycatch will be focused on the groundfish fisheries.

#### 3.2.1 Stock Assessment Research

##### Groundfish

There are ongoing research programs that are designed to improve our understanding of the effects of fisheries on living marine resources. Historically, for fish stocks, this research has focused on the principal target species. Improving our knowledge of the status of non-target species (i.e., species taken principally as bycatch in commercial fisheries) will continue to be an active area of research at the AFSC. The objective of this research is to improve the quality of catch, life history, abundance and assessment information on species where stock status is poorly

defined or unknown. The need for new assessments stems from the following concerns regarding management of species that are caught as bycatch:

1. When species are not identified as a single fisheries management unit, quotas may not adequately protect the reproductive potential of the less abundant members of a complex.
2. When stocks are managed in complexes that include species with different life history characteristics, quotas may not adequately protect the reproductive potential of the slower growing, long lived, less fecund members of a complex.
3. Rare species may be vulnerable to overfishing because of their low stock size and patchy distributions.
4. Traditional fishery independent assessment surveys are not designed to assess rare species and biomass estimates for these species may be uncertain.

The AFSC has used Stock Assessment Improvement Plan (SAIP) funds to increase the range and depth of research designed to improve assessments for non-target species. Some of those projects will continue into FY04. If adequate SAIP funds are provided in FY04 and FY05, the AFSC will be continued or expand assessment research for non-target species.

### Seabirds

Currently, there is only one limited program to salvage seabird carcasses recovered during commercial fishing operations. It is unfortunate, as these carcasses represent valuable scientific specimens that could increase our knowledge of trophic level feeding habits, molt patterns, genetic differences between colonies, and other important questions. New Zealand funds a seabird carcass recovery program that has proven very useful not only to add to science, but also as a means to gain a better understanding of the causes of bycatch in fisheries. Work is currently being done to develop a proposal to implement a carcass recovery program for North Pacific fisheries, but no funding source has been identified. Preliminary estimates of funds needed are about \$40,000 per year, with an interest in setting up a program to run for a minimum of 5 years. Total funding needed is \$200,000.

### 3.2.2 Ecosystem Research

Many of the population and ecosystem effects of bycatch mortality are similar to those of other sources of fishing mortality. Our understanding of those effects is continuously being improved by ongoing research and data collection programs. Information concerning our current level of knowledge concerning population and ecosystem effects of fishing mortality are presented in the PSEIS that is being completed for the BSAI and GOA groundfish fisheries and in the SAFE reports for those fisheries.



The ecosystem impacts of bycatch in the Alaska groundfish fisheries are being assessed using a variety of information sources and methods. Observer estimates of retained versus discarded catch of target and non-target species are used to estimate total amount of bycatch. Estimates of total discards are evaluated with regard to magnitude relative to natural dead organic material in the ecosystem and the potential for these re-directed energy sources to cause unintended population changes in scavenger species. Trends in observer-derived bycatch rates of non-target species that are key ecosystem components (e.g., forage, top predators, HAPC biota) are evaluated relative to life-history traits and independently-derived population trends from surveys of these components to determine if there might be trends of concern related to bycatch mortality.

Improvements are needed in the observer monitoring of catch composition of certain fleets/areas. In addition, statistical analysis of bycatch composition trends by fleet/time/gear/area needs to be performed to better understand and predict the composition of bycatch when fleets change gear or area. This latter project would require \$90,000 for one year post-doc analysis.

Discards and offal are used heavily by many seabirds in the North Pacific. Birds are attendant around catcher/processors, and can reach high numbers. The importance of this food source is unknown, as is the risk posed to seabirds from direct mortalities when they are drawn to fishing vessels. Further, there have been very large changes from year to year in the availability of discards and offal as a result of changes to fishery management plans. Effects of these changes to seabird productivity and survival in the North Pacific are unknown. Additionally, the use of offal by seabirds illustrates a large difference in energy flow through the ecosystem than what would be seen without fishing. These aspects need to be explored, first by estimating the total food made available to seabirds, then by identifying the importance of this food resource and also the development of risk profiles due to the attraction to fishing vessels. Funding needs are estimated at \$120,000 over 3 years.

Seabirds depend on the availability of forage fish, squid, and the juveniles of various target species. Some of these occur as bycatch in commercial trawl fisheries, and the total biomass of some species is poorly understood in the North Pacific. Work needs to be conducted to refine estimates of squid and forage fish biomass, dependence of seabirds on these food resources being available, and modeling of the effects of fishery bycatch on seabirds. This work would include some in-house analytical work with available data and also field work to augment current stock assessment surveys. A formal experiment should be conducted near a seabird colony to investigate fishery resources and effects of trawl fisheries on those resources (and their availability to seabirds). Costs for basic analytical work are about \$65,000. This work would help to define future shipboard studies on how to augment stock assessments and experimental work near colonies. Without some initial analytical work, reasonable estimates of the cost of additional studies cannot be provided here.

### 3.2.3 Economic and Social Science Data Collection and Research

Our ability to determine the social and economic impact of either bycatch or bycatch

management measures and to model fisherman behavior is severely limited by the social and economic data that are available. The economic reporting requirements that are part of the proposed BSAI Crab Rationalization Program, would help address this deficiency for the crab fishery. Similar data reporting/collection programs should be developed for other fisheries. In general, existing data collection programs need to be improved and additional programs implemented to provide the economic and social data that are required to assess the effects of bycatch and measures to control it. The Alaska Region and Science Center will assist in developing improved data collection programs and will promote economic and social research to improve our ability to estimate the effects of bycatch and alternative management actions. For example, the Science Center will support the development of location choice models that can be used to estimate how fishermen will respond to time or area restrictions.

### 3.3 Encourage the Development and Use of Gear Technologies That Provide Efficient Methods for Reducing Bycatch

The multispecies BSAI and GOA groundfish fisheries present a broad matrix of bycatch issues by target species, gear type, and bycatch species. In the areas of gear selectivity and bycatch mortality, a few of the most pressing research issues are addressed each year by current programs. Additional funding would increase the number of issues studied and the rate at which answers and solutions are reached.

Due to the size of the groundfish fisheries and the levels of bycatch in those fisheries, fish behavior, gear technology and bycatch mortality research will continue to be focused primarily on the groundfish fisheries. The research that is planned or proposed to improve our estimates of bycatch mortality were discussed in Section 3.1. Research that is needed to develop and encourage the use of gear technologies that provide efficient methods for reducing bycatch is discussed in this section.

Outreach is a critical factor in determining the effectiveness of gear technology research in helping to solve bycatch problems. Outreach in the field of gear technology occurs at both gear development and technology transfer stages. Scientists participate in cooperative research projects with industry groups and individual fishermen to develop more selective fishing gear. Results of these projects are primarily presented to fishermen at annual trade shows and by written and video materials. In addition, the exchange of research findings among scientists doing gear research for other domestic and foreign fisheries contributes to overall efforts to develop more selective gear. Actions intended to improve outreach programs for gear technology are discussed in Section 3.5.1

A top priority for reducing unintended fishing mortality is the continued development of new gear which has higher selectivity for target species. In trawl gear, selectivity can be improved through the understanding of fish and invertebrate behavior relative to gear function. Species move into and through nets in differing ways which can be quantified and exploited for new gear design. Size classes of species should also be investigated, as increased mesh size has been a

mainstay of gear design, while the potential increases in escapee mortality (from injury, stress and predation) with increased mesh size have not been widely considered. Fish attraction to non trawl gear can be dependent on bait scent, while hooking can be dependent on bait visibility and texture, as well as hook size and type. Selectivity can be increased by designing baits, traps and hooks which are more species and size selective, based on behavioral observations in the field and laboratory. Pot gear can also be modified to take advantage of fish escape behavior and size.

Through a mix of cooperative and direct research, AFSC scientists have assumed a critical role in the improvement of fishing technology used in Alaska waters, and aided such developments in other regions. Our efforts have emphasized Science Center capabilities that complement the efforts of industry, including specialized observation equipment, and experimental, testing and analysis abilities. Presently, research in the laboratory analyzes the effects of environmental factors (light, temperature, bait scent) on fish behavior (orientation, swimming, chemosensory, gustation, escape), while field research makes observations of fish behavior in trawl and non trawl fishing gear. This capture related behavior is used to make gear modifications which are then tested in the field for effectiveness in reducing unobserved fishing mortality. A growing number of opportunities to reduce fishery problems exist through improvements in fishing technology and the Science Center is positioned to serve a critical role in such efforts, limited by staff and funding. Problems waiting to be addressed include: salmon bycatch in pollock trawl fisheries, crab bycatch in bottom trawl fisheries, better size selection in flatfish fisheries (reduce discards), halibut bycatch in longline fisheries for cod, shark bycatch in pollock fisheries, skate bycatch in bottom trawl fisheries, and crab injuries (mortalities) from trawl bridle (sweep) encounters.

Current budgets allow continuation of work on this subject, but limit field projects to either pilot level studies in several of these areas or full studies in only one at a time over several years. We have taken the former approach and will work this year on the following two projects:

1. a continuing cooperative project to reduce salmon bycatch during pollock trawling and
2. a project to study the behavioral response of rock sole to disturbance by bottom trawl ground-gear in order to determine how natural behaviors may be utilized to assist in bycatch reduction efforts in the rock sole fishery.

Small projects on other problems may also be possible with existing funding. A program addressing multiple selectivity improvement projects per year would require \$500,000 and 2 additional FTEs. An additional \$185,000 is needed to expedite the transition of key laboratory studies into field applications.

The following gear research projects will be initiated if adequate funding is obtained.

Research on measuring factors affecting fishing selectivity and bycatch mortality

To understand fish interactions with fishing gear, selectivity and subsequent survival, we must have effective tools for observation and data recording. Light conditions have a strong effect on the way fish find and react to fishing gear, and on bycatch mortality. Light conditions on all fishing gear must be measured so that light can be related to gear performance and bycatch production. Past research has relied on visual observations in lighted conditions and on low resolution sonar for making observations. Recently, observations have been made in dark conditions with infra-red videography for near field (1-2 meters) observations, while high resolution sonar has made observations up to 20 meters possible. This new technology should be exploited to quantify fish behavior in as many fishing situations as possible. Such information will be valuable for developing a comprehensive understanding of the breadth of fish responses to fishing gear and for more selective gear designs. Temperature has a strong effect on fish reactions to fishing gear, and on bycatch mortality. Temperature must be measured on all fishing gear so that temperature can be related to fish behavior, gear selectivity, and the thermal history of fish during capture and possible escape, landing and discarding. Sea state has a strong effect on gear performance, fish interactions and ultimate mortality. New techniques should be developed to monitor sea state and gear state and relate this to gear selectivity, and escape and discard mortality. A cost estimate for this work has not been developed.

#### Research on effect of environmental and social factors on gear selectivity

Fish capture results from behavioral interactions of fish with fishing gear. These behavioral interactions are strongly modified by environmental and social factors. Presently, research in the laboratory determines the role of light, temperature, and bait scent in controlling the capture of fish, as well as how social interactions modify fish capture. Field research involves observation of fish interactions with gear under a variety of fishing conditions in an effort to improve gear selectivity and efficiency. Increased funding would increase efforts to link laboratory and field research by conducting field experiments to test the role of environmental and social factors in fish capture and selectivity (\$130,000).

#### Observe the behavior of seabirds around trawl vessels during setting and hauling of the gear

This project will develop risk-profiles for surface feeding birds which should provide direction for future research in gear modification to eliminate bycatch of surface feeding birds (albatross, fulmars, gulls). This initial phase will require dedicated biologists to spend time at sea, and analytical work to develop the profile. The second phase (gear modification) would require funding for a workshop that included substantial participation by industry and academics experienced with seabird-related gear modification. Recommended funding is \$85,000.

#### Seabird avoidance methods for longline fisheries

The Alaska Region and AFSC have supported work completed by the Washington Sea Grant Program to test several seabird avoidance measures for longline vessels. This was a highly collaborative approach among academia, NOAA Fisheries, Washington Sea Grant Program, and

the fishing industry and resulted in very effective measures being developed. That collaboration is now continuing to further develop integrated weighted groundlines. If this development proves successful, these two measures used in tandem would likely virtually eliminate seabird bycatch in demersal longline fisheries.

The Alaska Region and AFSC will continue to work closely with USFWS to identify needed research projects to address current fishery management needs. For the past three years, USFWS has received Congressional appropriations (totaling ~\$1.5M) specifically for Alaska seabird bycatch initiatives. In the event that the USFWS funds are discontinued, it is likely that NOAA Fisheries will need to identify funds to continue necessary collaborative projects.

#### 3.4 Develop and Implement More Effective and Efficient Management Measures to Monitor and Reduce Bycatch

Addressing bycatch problems has been a very high priority for the Alaska Region and Council for more than 25 years. Therefore, regulatory actions to improve bycatch monitoring and bycatch management are continuously being developed, reviewed and implemented. The actions discussed below reflect priorities set by the Alaska Region and the Council. They are actions that currently are under development or review. Given the time that it takes to develop and implement regulatory actions that are both effective and efficient and given the cooperative process that is used to develop such actions, it would be counterproductive for this draft plan to include other actions.

The actions include some that can be implemented relatively quickly and others that will take longer to develop and implement. The latter include two fishery rationalization programs and a restructuring of observer funding and deployment. These three regulatory actions could be very effective in providing long-term solutions to bycatch problems and to related management problems. During the last 25 years, there usually have been annual changes to the groundfish management regime in order to address bycatch problems. This is in part the result of using bycatch management measures that can only be effective and efficient if conditions in the fisheries are relatively static and are well understood by fishery managers. Often neither condition is met and the management measures that are implemented address the symptoms of the bycatch problem and not its source; therefore, ongoing treatment is necessary.

As noted in Section 2.1, a variety of factors both contribute to the bycatch problems in the Alaska groundfish fisheries and make them more difficult to solve. The factors include: (1) the multi-species nature of the bycatch problem; (2) limited information concerning the biological, ecological, social, and economic effect both of bycatch and of alternative methods for reducing bycatch; (3) substantial excess harvesting capacity; (4) the race for fish among competing fishing operations; and (5) the external benefits and costs associated with bycatch. A well designed fishery rationalization program (e.g., individual fishing quotas or harvesting cooperatives) can eliminate or substantially reduce the contribution of each of these five interdependent factors to the bycatch problems.

First, it can reduce an aspect of the multi-species nature of the problem. Specifically, the problem of an action to decrease the bycatch of one species resulting in the increase of bycatch of another can be addressed for some bycatch species by allowing each fishing operation to make decisions concerning such tradeoffs based both on its ability to decrease different types of bycatch and on the price it has to pay for using quota for different species.

Second, the prices of the rights to harvest individual species will reflect the value of some of the alternative uses of those species. That information is useful in determining some of the economic effects of bycatch and reductions in bycatch. If the program includes reporting requirements for economic data, such as are in the Crab Rationalization Program proposed by the Council, the program will provide additional economic and social data needed to develop effective and efficient management actions to address bycatch and other management problems.

Third, it can decrease fishing capacity and eliminate the perverse incentive that fishermen currently have to maintain or increase excess capacity.

Fourth, it can eliminate the race for fish and, therefore, eliminate its adverse effects, including increased bycatch.

Finally, a well designed program can internalize many of the externalities that are the root cause of fishermen taking too much bycatch. This can result in fishermen receiving the right incentives and making decisions that will "minimize bycatch to the extent practicable for some species. In part it can do that by providing fishermen with a strong incentive to support gear technology research and to fully use advances in gear technology when they occur.

Adequate monitoring of total catch by species for each vessel or cooperative is required to obtain the full range of benefits from a rationalization program. Fortunately, adequate monitoring probably is economically viable for many sectors of the BSAI and GOA groundfish fisheries. Enhanced vessel monitoring programs have been established for two rationalization programs that have been implemented for the BSAI groundfish fishery, the community development quota (CDQ) program and the American Fisheries Act (AFA) cooperatives for the BSAI pollock fishery. These enhanced programs provide better information on total catch by species, including bycatch. These monitoring programs include certified flow scales for processor vessels, observer sampling stations and platform scale requirements for catcher and catcher processor vessels, increased observer coverage, shoreside processor catch monitoring plans, and electronic catch reporting programs to improve the accuracy and timeliness of catch data.

Industry support for rationalization is in part based on its belief that rationalization is the most effective way to deal with the bycatch problem. This is demonstrated by the following excerpts from a presentation that Paul MacGregor, an industry spokesman, made at the recent conference "Managing our Nations Fisheries".

#### Key Elements of a Successful Bycatch Management Program

- Reliable monitoring of total catch including bycatch
- Reliable accounting for discard mortality
- Incentives for bycatch reduction
- Tools to facilitate bycatch reduction

These examples (sablefish/halibut IFQs, CDQs, and pollock harvesting cooperatives) have all shown that, by providing both the tools and the incentives for individual fishermen to conduct their fishing operations in a rational manner and eliminating the “race for fish”, fishermen and processors can:

- Slow down and operate at a more measured pace
- Extract more value from the fish they catch
- Benefit from their individual efforts to reduce bycatch
- More fully harvest the TACs of their target species

#### Privatizing Bycatch Management through Harvesting Cooperatives: A Case Study (Pollock Inter-cooperative Salmon Bycatch Avoidance Agreement )

The members of the pollock harvesting cooperatives have entered into co-op agreements to engage in a salmon bycatch avoidance plan in which the co-ops agree to hire an independent contractor to:

- Monitor salmon bycatch rates
- Identify real-time bycatch “hot spots” for the fleet
- Set bycatch rates that trigger closures
- Close areas to co-ops that exceed trigger points

Such agreements establish real-time, incentive-based bycatch management programs that “privatize” the sanctions necessary to ensure compliance with bycatch-reduction programs. The contractual commitments that the co-op members make to each other are enforceable on a private basis between the members of the co-op. This avoids the due process, notice and comment and other regulatory obstacles that prevent NMFS from identifying and enforcing “Hot Spot” closures on a real-time basis.

Therefore, a high priority is placed on developing and implementing well designed fishery rationalization programs in order to have a long-term solution to the bycatch problem and related management problems.

The Alaska Region will assist in developing and implementing the regulatory actions discussed below. These efforts will include identifying effective and efficient regulatory actions.

#### 3.4.1 Enforcement Interval Change for Pollock Maximum Retainable Allowances (MRA)

Adjusting the enforcement interval for the Maximum Retainable Allowances (MRA) would change the enforcement of the pollock MRA to an offload to offload basis in the BSAI, allowing non-AFA vessels that have otherwise been forced to discard pollock, to retain additional pollock as long as they are under the MRA for pollock at the end their trip. This would decrease regulatory discards of pollock providing flexibility for non-AFA vessels to increase the amount of pollock retained. The proposed regulatory change could potentially affect all vessels that catch pollock incidental to other target fisheries. However, as the analysis indicates, only the head and gut trawl catcher processor sector has been constrained by the current instantaneous enforcement of the MRA. The head and gut trawl catcher processing sector regularly have high enough incidental catches of pollock to be significantly affected by a change in the enforcement interval. This proposed action, is also intended to provide greater operating flexibility to vessels that will be required to adhere to a second proposed bycatch reduction standard, FMP Amendment 79, the minimum Groundfish Retention Standard.

#### 3.4.2 Minimum Groundfish Retention Standard: Proposed FMP Amendment 79

For catcher processing vessels of the head and gut fleet in the BSAI, a minimum groundfish retention standard (GRS) is proposed by the Council that would phase in a minimum groundfish retention threshold over a four year period beginning in 2005, starting at 65 percent and increasing to 85 percent. Under the preferred alternative head and gut catcher processors at least 125' in length would be required to retain all groundfish catches at a level that was equal to or exceeds the GRS. This retention standard would be determined and enforced at the end of the year. In 2002, the overall groundfish retention rate for head and gut trawl catcher processors  $\geq 125$  ft. was 71 percent. The purpose of the GRS is to create a standard for retention of groundfish for the BSAI groundfish fishery, reduce groundfish discards, while continuing to allow for the a multi-species trawl fishery to continue to be a viable fishery. One of the challenges will be to identify methods to enforce the GRS that are effective but not so costly that they eliminate the net benefits of implementing a GRS.

#### 3.4.3 Harvesting Cooperatives for the BSAI Head and Gut Catcher Processors: Proposed FMP Amendment 80

Currently, the Council is developing a fishery cooperative for the sectors targeting flatfish species in the Bering Sea and Aleutian Islands, a program designed to provide this sector with the operational tools to adhere to the increased retention standards. These measures are expected to further reduce the overall discards of groundfish in the BSAI groundfish fisheries. A first step in developing such cooperatives is establishing BSAI sector allocations for the groundfish TACs and the prohibited species catch (PSC) limits. In addition to being required for the formation of cooperatives in the flatfish fishery, these allocations will facilitate the rationalization of other sectors of the BSAI groundfish fishery through either future regulatory actions or voluntary actions by the participants in a specific sector.

#### 3.4.4 Establish a New Program for Observer Procurement and Deployment in the North Pacific



The North Pacific Groundfish Observer Program (Observer Program) is widely recognized as a successful and essential program for management of the North Pacific groundfish fisheries. However, the Observer Program faces a number of longstanding problems that result primarily from its current structure. The existing program design is driven by coverage levels based on vessel size that, for the most part, have been established in regulation since 1990. The quality and utility of observer data suffer because coverage levels and deployment patterns cannot be effectively tailored to respond to current and future management needs and circumstances of individual fisheries. In addition, the existing program does not allow fishery managers to control when and where observers are deployed. This results in potential sources of bias that could jeopardize the statistical reliability of catch and bycatch data. The current program is also one in which many smaller vessels face observer costs that are disproportionately high relative to their gross earnings. Furthermore, the complicated and rigid coverage rules have led to observer availability and coverage compliance problems. The current funding mechanism and program structure do not provide the flexibility to solve many of these problems, nor do they allow the program to effectively respond to evolving and dynamic fisheries management objectives. In addition to providing better catch and bycatch data for vessels that currently have observer coverage requirements, this action could extend observer coverage to the Pacific halibut fishery and to groundfish vessels that are less than 60' in length.

#### 3.4.5 Non-target Species Management

The Council is considering plan amendments to the BSAI and GOA Groundfish FMPs to develop criteria for management of groundfish at the complex (e.g., pelagic shelf rockfish), group (e.g., sharks), and species (e.g., Pacific ocean perch) levels. The process uses data quality and species vulnerability (to overfishing) to "sort" complexes, groups, and species to prioritize management strategies. An ad hoc working group of scientists has convened three times to develop these criteria. The group sorted complexes, groups, and species into two categories: (1) "targets" are those species intended to be harvested, and (2) "non-targets" or those incidentally-caught. The management goal of target species categories would be to optimize sustainable yields. The goal of non-target management is to protect them from fishing effects. Management options for non-target species would include prohibiting directed fishing, establishing Maximum Retainable Allowances (MRAs) and taking other actions to minimize bycatch to the extent practicable.

#### 3.4.6 GOA Rationalization

Over the past year, the Council has developed a suite of elements and options for consideration as part of the GOA Rationalization SEIS process. Through the development of these alternatives, the Council has used the SEIS public scoping process and public testimony to identify this suite of alternatives, elements, options. This process has refined the proposed action, purpose and need, and alternatives, elements, options for consideration for GOA Rationalization. These refinements are being incorporated into the SEIS that Council and NMFS staff are currently preparing.

The purpose of the proposed action is to create a management program that provides greater economic stability for harvesters, processors, and communities. The allocation of harvesting and possibly processing privileges would allow harvesters and processors to manage their operations in a more economically efficient manner. Rationalization of the harvesting sector eliminates the derby-style race for fish by providing economic incentives to consolidate operations and improve operational efficiencies of remaining operators. Greater economic stability may improve stock conservation by creating incentives to eliminate wasteful fishing practices. Rationalization programs may provide additional opportunities to address conservation goals by providing opportunities to utilize fishing methods that reduce bycatch and gear conflicts. Rationalization programs may also reduce the incentive to fish during unsafe conditions.

#### 3.4.7 Essential Fish Habitat (EFH)

The Council is continuing to addressing EFH issues, including associated bycatch issues (e.g., the bycatch of corals and sponges), by developing an environmental impact statement (EIS) that evaluates alternatives for three actions: (1) describing EFH for fisheries managed by the Council; (2) adopting an approach for the Council to identify Habitat Areas of Particular Concern (HAPCs) within EFH; and (3) minimizing to the extent practicable the adverse effects of Council-managed fishing on EFH. The Alaska Region and Science Center will assist the Council in preparing a final EIS. The Alaska Region will implementing the appropriate regulatory actions to protect EFH.

#### 3.5 Improve the Outreach Activities That Assist in Meeting the First Four Objectives and Provide Information That Can Be Used to Address Bycatch Problems in Other Fisheries

The design of the Alaska Bycatch Implementation Plan is based on the following beliefs.

- Better information is needed to address the bycatch problems effectively and efficiently.
- NOAA Fisheries is the best source for only some of that information.
- A collaborative effort is needed to provide the desired information.
- The usefulness of that information is determined by how effectively it is shared.

Therefore, outreach programs to develop and share information are a critical element of the plan. The Alaska Region has used a variety of outreach programs. Those programs will be enhanced as part of the plan.

##### 3.5.1 Improve bycatch information available to industry

Participants in the fisheries make a variety of decisions that affect bycatch levels and the effects of efforts to reduce bycatch. Therefore, it is important that they have information concerning gear technology, the effects of bycatch, and in-season bycatch data they can use to decrease

bycatch. The Alaska Region and Science Center will continue to work with industry to ensure that these types of information will be available to the industry as quickly as possible.

The Alaska Region currently cooperates very closely with the fishing industry, academia, and NGOs in seabird/fishery interaction issues. The work done to date on developing mitigation measures was a very collaborative process. Additional work on reaching out to broader portions of the fleet once good measures are designed is important. The recent Washington Sea Grant Program video being distributed to the Alaska longline fleet is a good model for future efforts.

A planned effort that would both contribute to bycatch reduction measures while providing excellent outreach opportunities is the vessel-specific seabird bycatch reduction project. This effort trains AFSC staff or individuals under contract to the AFSC to fully understand the proper deployment of seabird avoidance measures, and then matches these personnel with vessels that have a history of high seabird bycatch relative to the rest of the fleet. Currently, we have made little progress with this effort due to limited funding and sporadic staff availability. Approximately \$40,000 per year over three years (\$120,000 total) would allow a potentially very successful program to move forward and better serve our industry clients.

Other outreach efforts with industry will include the following:

1. Preparing materials for trade shows and conferences;
2. Conducting workshop for high priority fisheries; and
3. Attending trade shows & conferences that fishery participants attend.

#### 3.5.2 Improve bycatch information available to fishery managers and other stakeholders, including the public at large

The decisions fishery managers and the public make concerning fishery management measures and policies can be improved by providing them with better information concerning the bycatch problem, actions taken to address the problem, successes and failures in addressing the problem, and the merits of alternative methods of addressing the bycatch problems. The Alaska Region and Science Center will expand their efforts to improve the information that is available to these decision makers. In addition to preparing and presenting reports on bycatch topics, Alaska Region and Science Center will improve their web sites to ensure that they more effectively provide current information on bycatch issues.

#### 3.5.3 Obtain better bycatch information

The Alaska Region and Science Center will continue to support a broad range of data collection and research programs to provide bycatch information and will attempt to encourage and attempt to coordinate funding for this research from internal sources (including Saltonstall-Kennedy grants), Sea Grant, NPRB, and foundations. The internal funds will be used to support internal

research, contract, grants, and cooperative agreements, and, where appropriate, they will be used to leverage external funds.

#### 3.5.4 Participation in international efforts to address bycatch problems

Participation in international efforts to address bycatch problems can be an effective means of both providing information to others and obtaining information from others. Alaska Region and Center staff have been involved in a variety of such efforts. These include limited involvement with the development of the United Nations Food and Agriculture Organization (UN FAO) Code of Conduct for Responsible Fisheries, more substantial involvement with the Organization for Economic Cooperation and Development (OECD) efforts to address a variety of management issues including bycatch, and more recently substantial involvement in international seabird bycatch issues, including the support of establishment of international guidelines for reducing the incidental mortality of seabirds in longline fisheries. With respect to seabirds, efforts to date have included work with: the UN's Food & Agriculture Organization (FAO) development of an international plan of action (IPOA); International Pacific Halibut Commission (IPHC); Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR); Asia-Pacific Economic Cooperation (APEC); diplomatic communications to 23 longlining nations in support of the FAO's IPOA; International Fishers Forum; fishery bilateral meetings with Russia, People's Republic of China, Mexico, Canada, Chile, Spain, Taiwan, European Union, and Japan. The Alaska Region and Science Center will continue to participate in international efforts to address the bycatch problems.

Table 1 Actions to improve SBRMs for the BSAI and GOA groundfish fisheries and the Pacific halibut fishery.

Activity Number	Action	2004	2005	Beyond	Outcome	Type of Activity		
						Monitoring	Research	Management
<b>BSAI and GOA Groundfish Fisheries</b>								
1	Develop improved protocols for observer documentation of seabird interactions and mortalities	Conduct pilot studies and develop protocols	Implement protocols	Ongoing	Improved accuracy and precision in estimates of seabird interactions and bycatch	Subsequent	Initial	No
2	Improved species identification by observers	Ongoing	Ongoing	Ongoing	Improved accuracy in identification of catch and bycatch species and quantification of removals. Improved bycatch estimates through comparison of catch and estimated retention.	Yes	Yes	Maybe
3	Develop and implement methods for shoreside sampling of skates	Conduct pilot studies and develop methods	Implement methods if appropriate	Ongoing	Understanding of magnitude and composition of skate fishery in currently unobserved vessels. Ability to compare removals with deliveries if fishery is observed	Yes	Yes	Maybe
4	Enhancements to observer sampling for catch composition determination	Evaluate recent work and develop recommendations	Evaluate alternative approaches	Implement changes	Improved accuracy and precision in estimates of total removals by species. Improved bycatch estimates through comparison of catch and estimated retention.	Subsequent	Initial	Maybe

Activity Number	Action	2004	2005	Beyond	Outcome	Type of Activity		
						Monitoring	Research	Management
5	Evaluate placement of observers on small (<60ft) groundfish vessels	Conduct pilot studies, in part to explore and address safety concerns	Complete study, analyze results, develop recommendations	Implement if cost effective and supported by regulations	Basis for evaluating costs and benefits associated with direct observation of bycatch on small groundfish vessels. Potential for improved bycatch estimates.	Subsequent	Initial	Yes
6	Certify observer workstations and monitor flow scale testing on certain vessels fishing groundfish	Ongoing	Ongoing	Ongoing	Improved accuracy in estimating total catch and catch composition,	Yes	No	No
7	Place observer program staff on specific groundfish vessels to customize sampling protocols	Ongoing	Ongoing	Ongoing	Improved sampling precision and reduction in bias. Improvements in vessel-specific and overall estimates of catch and bycatch.	Yes	No	Yes
8	Evaluate technologies suitable for monitoring groundfish fisheries	Complete contract to evaluate candidate technologies	Conduct field testing if funds available	Implement as appropriate and cost effective	Basis for determining best mix of technological and human resources to address specific monitoring needs. Potential for improved bycatch estimates.	Possibly subsequent	Initial	Yes

Activity Number	Action	2004	2005	Beyond	Outcome	Type of Activity		
						Monitoring	Research	Management
9	Develop approaches for optimizing observer deployment and tasking	Initiate contract and complete initial evaluation	Develop system and evaluate capabilities	Implement in Gulf of Alaska as appropriate and subject to funding and regulatory authority	Improved efficiency in allocation of observer resources. Flexibility in assigning observers based on priorities, logistics, and costs.	Subsequent	Initial	Yes
10	Change observer service delivery model to improve flexibility and data quality	Evaluate alternatives and conduct draft rulemaking	Complete rulemaking & develop implementation plan	Implement if supported by statutory and regulatory provisions.	Improved efficiency in allocation of observer resources. Flexibility in assigning observers based on priorities, logistics, and costs.	Yes	Yes	Yes
11	Review compliance issues associated with current bycatch reduction programs	Initiate review	Complete review, develop recommendations and draft strategy	Implement strategy	Bycatch reduction programs which greatly reduce or eliminate incentives for interfering with monitoring	Yes	Yes	Yes
12	Promote the use of electronic logbooks to facilitate identification and correction of bias in estimating bycatch for unobserved vessels	Expand contract to provide e-logbook software to fishing vessels if funds available	Extend contract if funds are available	Extend contract if funds are available	More complete, accurate and timely data will be available to identify and correct for bias in estimating bycatch for unobserved vessels	Ongoing	Initial (to make effective use of improved data)	Maybe
13	Promote interagency efforts to develop electronic reporting of landings data by trip	Participate in interagency meeting to develop an electronic reporting system	If feasible, implement more extensive electronic reporting and use that data to improve SBRMs	Continue to improve electronic reporting systems and the SBRMs	More complete, accurate and timely data will be available to identify and correct for bias in estimating bycatch for unobserved vessels	Ongoing	Initial (to make effective use of improved data)	Maybe

Activity Number	Action	2004	2005	Beyond	Outcome	Type of Activity		
						Monitoring	Research	Management
14	Evaluate the need for additional compliance resources to maintain the integrity of observer data.	Initiate evaluation.	Pursue additional resources if justified.	Utilize additional compliance resources.	Decreased occurrences of interference with observer sampling or reporting by crew and stricter adherence to performance requirements by observers.	Subsequent	Initial	Maybe
15	Initiate development of behavior measures for delayed mortality in discards from fisheries	Initiate research	Complete research and prepare findings	Use findings to improve SBRMs	The development of new, sensitive behavioral measures of delayed mortality in discards from fisheries will improve the SBRMs and the resulting estimates of bycatch mortality and could be used to improve discard procedures.	Subsequent	Initial	Maybe
16]	Initiate studies of the effect of environmental factors on swimming behavior and performance in fish caught by trawl	Initiate research	Complete research and prepare findings	Use findings to improve SBRMs	Research results will be used: (1) to predict how these stress effects may control immediate and delayed mortality of fish that escape from trawls and (2) to develop new strategies for reduction and elimination of mortality in fish that escape from trawls as a result of bycatch reduction devices (BRD).	Subsequent	Initial	Maybe



Activity Number	Action	2004	2005	Beyond	Outcome	Type of Activity		
						Monitoring	Research	Management
<b>Pacific Halibut Fishery</b>								
17	Evaluate potential for placing observers on commercial halibut vessels	Establish contract if funds available, develop priorities and sampling protocols, and address safety concerns	Complete study, analyze results, develop recommendations	Implement if cost effective and supported by regulations	Basis for evaluating costs and benefits associated with direct observation of bycatch on halibut vessels	Subsequent	Initial	Yes

**PUBLIC TESTIMONY SIGN-UP SHEET FOR  
AGENDA ITEM D1(a) Bycatch**

	NAME (PLEASE PRINT)	AFFILIATION
1	THOMAS SMITH	MPLA
2	GERRY MERRIGAN	PROWLER FISHERIES
3	LORI SWANSON	Groundfish Forum
4	Paul MacCombs	At Sea Processor
5	GARY PATTON	Hait. Kalialek Nation
6	BRENT PAINE	UCB
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NOTE to persons providing oral or written testimony to the Council: Section 307(1)(I) of the Magnuson-Stevens Fishery Conservation and Management Act prohibits any person "to knowingly and willfully submit to a Council, the Secretary, or the Governor of a State false information (including, but not limited to, false information regarding the capacity and extent to which a United State fish processor, on an annual basis, will process a portion of the optimum yield of a fishery that will be harvested by fishing vessels of the United States) regarding any matter that the Council, Secretary, or Governor is considering in the course of carrying out this Act.